# 2. Status indications

The display codes of a status indicator are arranged alphanumerically. The following is available for each code:

- meaning,
- possible causes, and,
- remedial actions (in the case of either faults or warnings)

Displays on H1 (on the drive controller): see section 2.1
Displays on H2 (on the SERCOS interface module): see section 2.2

**The power source on the drive controller must be ready to operate before the status displays can be used for fault diagnostics.**

*Cancelling a fault*

After clearing a fault, it is necessary to first cancel the error message before the drive can be ready to operate.

An error message is cancelled as follows:

- via the controller, if a SERCOS interface module is used,
- via the fault clearance key "S1" on the drive, if the ANALOG interface module is used, and,
- via the fault clerance key "S1" on the drive, and the "CL" key on the control unit's control panel if a single-axis positioning module (DLC) is used.

## 2.1. H1 status indicator (on the drive controller)

***Clearing data RAM*** ***(temporary operating status)***
Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Checking and, if necessary, automatic clearing of the parameter memory (EEPROM) in the software module*** ***(temporary operating status)***
This is displayed on new software modules for approximately 15 seconds. Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Loading program*** ***(temporary operating status)***
The firmware is loaded into programm memory from EPROM .
Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Checking Hardware*** ***(temporary operating status)***

Checking data RAM.

Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Initializing hardware*** ***(temporary operating status)***

Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Initializing software*** ***(temporary operating status)***

Data from EEPROM are copied onto the RAM and verified to see whether the limiting values have been maintained.

Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Initializing the software*** ***(temporary operating status)***

(Oscillator functions and feedback codes.)

Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Initializing the software*** ***(temporary operating status)***

(reading DSF data)

Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Initializing the SERCOS*** ***(temporary operating status)***

Should the drive controller stall in this display, then the drive controller must be replaced. (See relevant documentation in Applications Manual.)

***Watchdog*** ***(fault message)***

*Cause 1: Software module not installed or defective.*

*Remedy* **Install or replace the software module.**

*Cause 2: Processor defective.*

*Remedy* **Replace the drive controller.**

***Drive ready*** ***(operating status)***

The control and power sections of the drive are ready. Power is on. Drive enable signal from the NC control unit has not been applied.

***Drive enable signal*** ***(operating status)***

The drive enable signal has been applied and the drive activated. The drive will follow the velocity command.

***Drive halt*** ***(operating status)***

The drive is braked to a stop at the acceleration rate set in the parameters (ID no. 00136 for SERCOS) and remains under control.

***Starting lock-out*** ***(operating status)***

The power output stage has been locked. This signal ensures safe torque disabling of the drive independently of the current operating status of the drive package (see Applications Manual).

***Ready for input power*** ***(operating status)***

The control section of the drive is ready for powering up.

***E-STOP (Emergency stop)*** ***(operating status)***

The E-STOP has been activated. The AC servo drive will be shut down according to the set error reaction (see Applications Manual).

***Park axis command*** ***(operating status)***

The NC control unit has issued this command. The drive controller has been deactivated.

***Phase 0*** ***(temporary operating status)***

The drive is in Phase 0 and is waiting for phase progression from Phase 0 to Phase 1. If the drive controller stalls in this display, then there is a problem with phase progression.

For further diagnostics, please check the definition of the display presently on H2 (on the SERCOS interface module) in the relevant section of this manual.

***Phase 1*** ***(temporary operating status)***

The drive is in Phase 1 and is waiting for phase progression from Phase 1 to Phase 2. If the drive controller stalls in this display, then there is a problem with phase progression.

For further diagnostics, please check the definition of the display presently on H2 (on the SERCOS interface module) in the relevant section of this manual.

***Phase 2*** ***(temporary operating status)***

Before the NC control unit progresses to Communications Phase 3, the drive controller checks the parameters entered for completeness and for compliance with the input limits (but not for logical accuracy!). If the controller detects any invalid parameter values, it will prevent progression of the communications phase.

*Does not progress to Phase 3*

*Remedy*

**The "ID no. List of Invalid Operation Data for Communications Phase 2" (ID no. S-0-0021) contains parameters that are recognized as invalid prior to transition to Communications Phase 3. These parameters must be run through before any progression to Phase 3 is possible. Check the parameters.**

***Phase 3*** ***(temporary operating status)***

Before the control unit progresses to Communications Phase 4, the drive controller checks the parameters entered for completeness and for compliance with the input limits (but not for logical accuracy!). These parameters must be run through before any progression to Phase 4 is possible.

*Does not progress to Phase 4*

*Remedy*

**The "ID no. List of Invalid Operation Data for Communications Phase 3" (ID.-Nr. S-0-0022) contains parameters that are recognized as invalid prior to transition to Communications Phase 4. These parameters must be run through before any progression to Phase 4 is possible. Check the parameters.**

***Double MST error shutdown*** ***(fault message)***

The drive has not received the master synchronization telegram for two successive SERCOS cycles.

*Cause 1: Error in the optical-fiber transmission cable, or excessive damping of optical signals.*

*Remedy*

**Check the optical-fiber (LWL) connections in the SERCOS ring. Check the damping in the LWL cable (maximum damping between Tx and Rx: 12.5 dB).**

*Cause 2: Fault in the SERCOS interface module (general).*

*Remedy*

**Replace the SERCOS interface module in the drive package.**

***Double MST error shutdown*** ***(fault message)***

The drive has not received the master synchronization telegram for two successive SERCOS cycles.

For cause and remedial actions see display "01" (double MST error shutdown).

***Invalid communication phase shutdown*** ***(fault message)***

The SERCOS master module has commanded an invalid communication phase (phase > 4).

*Fault in the SERCOS master module of the NC control unit*

*Remedy* **Consult the control unit manufacturer.**

***Error during phase progression*** ***(fault message)***

Phase progression did not comply with the prescribed sequence.

For cause and remedial action see error message "03" (invalid communication phase shutdown).

***Error during phase regression*** ***(fault message)***

The phase did not revert to Phase 0 during regression.

For cause and remedial action see error message "03" (invalid communication phase shutdown).

***Phase progression without ready signal*** ***(fault message)***

The SERCOS master attempted to switch phases without waiting for the drive's "ready" signal.

For cause and remedial action see error message "03" (invalid communication phase shutdown).

***Switching to uninitialized operating mode*** ***(fault message)***

*No operating mode defined in the activated operating mode parameter.*

*Remedy* **Enter the desired operating mode in the activated operating mode parameter.**

See control unit manual for entering the desired operating mode as well as the parameters S-0-0032 (primary operating mode) and S-0-0033 to S-0-0035 (secondary operating modes 1 through 3) in the SERCOS interface manual.

Permissible operating modes are:

- torque loop
- velocity loop
- position loop with position feedback value 1
- position loop with position feedback value 2
- position loop with position feedback value 1, lagless
- position loop with position feedback value 2, lagless
- position loop with command filter with lag error
- position loop with command filter, lagless

***Drive overtemperature shutdown*** ***(fault message)***

Overtemperature was detected in the power output stage of the DDS 2.1 drive controller. The drive controller then emitted a thirty-second warning: 50 "amplifier overtemperature warning", and shut itself down according to the selected error reaction, while signalling the above error message.

*Cause 1: Failure of internal cooling system of unit.*

*Remedy* **Replace the drive controller.**

*Cause 2: Failure of the cabinet air conditioning.*

*Remedy* **Restore the cabinet air conditioning function.**

*Cause 3: Incorrectly dimensioned heat dissipation of the cabinet air conditioning.*

*Remedy* **Check the cabinet dimensioning.**

***Motor overtemperature shutdown*** ***(fault message)***

The motor temperature has risen above the permissible level. The drive controller then a emitted a thirty-second warning: 51 "motor overtemperature warning". The drive then shut down according to the selected error reaction, while signalling the above error message (see selection options for error reactions in the Application Manual).

*Cause 1: The motor was overloaded. The effective torque demanded from the motor was above the permissible nominal torque for too long.*

*Remedy* **Check motor dimensioning. For plants which have been in operation for some time, check whether the drive conditions have changed (e.g., contamination, friction, moved masses, etc.).**

*Cause 2: Earthing or short-circuit in the conductor for motor temperature monitoring.*

*Remedy* **Check the motor temperature monitoring conductor X 6/1 and X 6/2 for earth-short or breaks.**

***Bleeder overtemperature shutdown*** ***(fault message)***

*Excessively high continuous regenerative power.*

*Remedy* **Change the process cycle or choose a DKS with a higher rated current.**

***Motor encoder failure*** ***(fault message)***

The signals emitted by the motor encoder are monitored. If the signals lie outside their tolerance window, the main power will be cut out.

*Cause 1: Defective or disconnected encoder cable.*

*Remedy*

**Check feedback cable.**

*Cause 2: Motor feedback is defective.*

*Remedy*

**If no error can be found on the cable, replace the motor (see relevant documentation).**

**Danger of uncontrolled axis motion!**
**For drives with absolute encoders, make sure to set the right reference point when changing the motor (refer to Applications Manual).**

***Overcurrent*** ***(fault message)***

*One of the three phase currents has risen to a level higher than 1.5 times the rated current of the unit.*

*Remedy*

**Check the motor cable.**

**Check the current regulator parameters. Contact an INDRAMAT service representative.**

***Overvoltage error*** ***(fault message)***

The DC link circuit voltage has risen above the permissible level. ($U_d$ > 475 V). The drive torque has been disabled in order not to risk damaging the power output stage of the controller.

*The energy of a braking main spindle motor could not be converted quickly enough by the installed bleeder resistors.*

*Remedy*

**Reduce the gradient of the braking ramp for the main spindle or increase bleeder resistance by installing an additional bleeder (see relevant Applications Manual).**

***Undervoltage error*** ***(fault message)***

The DC link circuit voltage is monitored in the supply module. It signals to the drive controller via the control voltage bus whether the DC link circuit voltage exceeds the minimum permissible level of +200. If the voltage falls below this level, the drive will be shut down according to the selected error reaction. A prerequisite is that an NCB bridge is not used on the supply module (see Applications Manual, "Error Reactions" section).

*Cause 1: Mains power shutdown without first deactivating the drive by cancelling the controller enable signal (RF).*

*Remedy*

**Check the NC control logics for activating the drive.**

*Cause 2: Malfunction of the supply unit*

*Remedy*

**Remedy the malfunction in the power supply unit (see Applications Manual of the supply unit).**

***Excessive deviation*** ***(fault message)***

The drive could not follow the given command value and reacted according to the selected error reaction.

*Cause 1: The command signal exceeded the acceleration potential of the drive.*

*Remedy* **Check the parameter "bipolar torque limit value" (no. S-0-0092) and set to the maximum permissible value for the application (see the section on "Limit Values" in the Applications Manual), or reduce the acceleration command in the control unit (see the control unit manual).**

*Cause 2: The axis has jammed.*

*Remedy* **Check the mechanics and remedy any jamming.**

*Cause 3: Error in the drive parameters.*

*Remedy* **Check the drive parameters (see section "Velocity Loop" in the relevant Applications Manual).**

*Cause 4: S-0-0159 monitoring window incorrectly parametrized.*

*Remedy* **To check parameter S-0-0159, see section on Operating Modes / Monitoring of Control Loops in the relevant Applications Manual.**

*Cause 5: Main power was switched off without the controller enable signal having been cancelled. Possible cause is an error in one AC servo drive in the common supply module.*

*Remedy* **Check AC servo drive for errors other than denoted by message "28".**

***Travel limit switch is exceeded*** ***(fault message)***

*The drive has received a command value which would move the axis outside the permitted travel range.*

*Remedy* **Check position limit parameters S-0-0049 and S-0-0050 (see Applications Manual, section on "Limit Values") or check the software limits in the control unit.**

***Command error*** ***(fault message)***

Error messages occurring while a command is being executed are displayed as a collective diagnostic message on the H2 status indicator (32, flashing). The exact error message can be called up via the SERCOS parameter S-0-0095 "diagnostic messages". The definition of all emitted errors is listed in section 2.3 "Command Errors".

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***External power supply error*** ***(fault message)***

Different optional plug-in modules have DC-decoupled inputs and outputs. An external power supply must be applied for proper operation of these inputs and outputs.

*The voltage lies above the permissible level.*

*Remedy*

**Check the external power supply.**

| Description | unit | minimum | rated | maximum |
|---|---|---|---|---|
| External operating voltage $+U_L$ | V | 18 | 24 | 32 |
| Current consumption of external $+U_L$ | mA | | | 100 |

*Figure 2.1: Voltage tolerances*

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***Error in internal software synchronization*** ***(fault message)***

*Faulty communication between the drive's processor and the SERCOS interface module*

*Remedy*

**Replace the SERCOS interface module or the drive controller (see relevant Applications Manual).**

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***Invalid reference cam position*** ***(fault message)***

*The position of the reference cam relative to the null point of the motor encoder is outside the permissible range.*

*Remedy*

**For software status ≤ DSM2.1-S01.9:**
**Parameter P-0-0020 gives the offset of the home switch flank to the optimum point. Shift the reference cam by this amount, then initiate a drive-generated homing procedure.**

**For software status ≥ DSM2.1-S01.10:**
**Load the value displayed in parameter P-0-0020 into parameter S-0-0299.**

For the tolerance range of the permissible home switch flank positions in the encoder cycle, see Figure 1.2.:

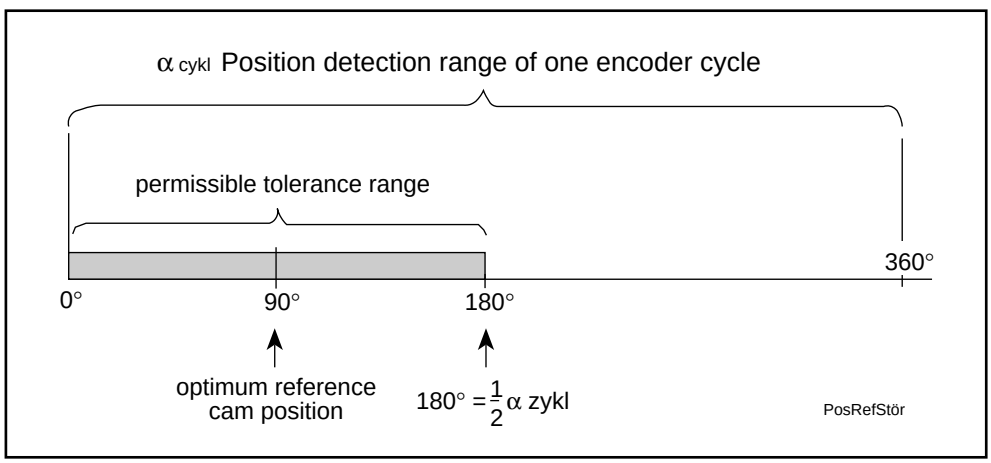


*Figure 2.2: Positioning the reference cam.*

***Excessive actual position difference*** ***(fault message)***

In the prepare phase progression command on Communications Phase 4, actual position value 2 is stored on the position feedback value, and the cyclical evaluation of both encoders is initiated. During this cyclical operation (phase 4), the position difference of both encoders is compared every 8 milliseconds. If the difference is greater than one parametrized monitoring window (P-0-0120), then error "36" appears and the parametrized error reaction (P-0-0007) is executed.

*Cause 1: The parameter for the external encoder is incorrect (S-0-0115, S-0-0117, S-0-0118).*

*Remedy* **Check position encoder parameter (S-0-0115) and encoder resolution (S-0-0117 or S-0-0118).**

*Cause 2: The mechanics between the motor shaft and the external encoder are incorrectly parametrized.*

*Remedy* **Check input and output revolutions of load mechanism (S-0-0121, S-0-0122) and feed constants (S-0-0123).**

*Cause 3: The mechanics between motor shaft and external encoder are not rigid (e.g., gear backlash).*

*Remedy* **Enlarge monitoring window for external encoder (P-0-0120).**

*Cause 4: The encoder cable is defective.*

*Remedy* **Replace the encoder cable**

*Cause 5: DEF 1.1 is defective.*

*Remedy* **Replace DEF 1.1.**

*Cause 6: Maximum input frequency of the encoder interface exceeded.*

*Remedy* **Reduce velocity.**

*Cause 7: External encoder not mounted to running axis.*

*Remedy* **Set monitoring window for external encoder (P-0-0120) to "0" (= monitoring disengaged).**

***Excessive position command difference*** ***(fault message)***

When the drive is working in position loop mode, position command signals arriving through the SERCOS interface are monitored.

*If the velocity demanded of the drive by two successive position command signals is equal to or greater than the "bipolar velocity limit value", the positon command monitoring function will be activated. The excessive position command is stored in parameter P-0-0010. The last valid position command is stored in parameter P-0-0011 (see Applications Manual).*

*Remedy* **Compare the "bipolar velocity limit value" (ID-Nr. S-0-0091) with the velocity stored in the part program and adapt, if necessary.**

***External encoder failure: signals too small*** ***(fault message)***

For high-resolution evaluation, an external measuring system will use its analog signals.

*The signal amplitudes are below a permissible limit.*

*Remedy*

**Check the cable to the measuring system.**

***Invalid feedback data --> Phase 2*** ***(fault message)***

Error 22 (motor encoder failure) has occurred during cyclic operation (Phase 4). This error message is generated by the drive controller once the first message has been cleared in Phase 4.

*Defective feedback cable or feedback*

*Remedy*

**Check feedback and feedback cable, repair/replace, if necessary, and clear the error in Phase 2.**

***Travel limit switch detected*** ***(fault message)***

*The travel limit switch has been detected, resulting in shutdown of the relevant drive package's power supply. The servo drive was brought to a standstill with maximum acceleration.*

*Remedy*

**1. Clear the error on the control unit.**
**2. Reactivate the power supply.**
**3. Move the axis back into the permissible travel range.**

**Commands that would move the axis still further out of range will not be accepted by the drive. If it receives another such command, it will emit the same error message.**

***External encoder failure: quadrant error*** ***(fault message)***

A hardware fault has been detected on the DLF 1.1 high-resolution position interface for sine signals in the external measuring system.

*Cause 1: Defective encoder cable.*

*Remedy*

**Replace encoder cable.**

*Cause 2: Interference in the encoder cable.*

*Remedy*

**Lay encoder cable away from power-carrying cables.**

*Cause 3: Defective DLF 1.1 module.*

*Remedy*

**Replace DLF 1.1 module.**

***External encoder failure:***
***frequency limit exceeded*** ***(fault message)***

The interface module for connection of the external measuring system may only be operated up to a maximum input frequency.
Maximum input frequencies: DEF 1.1 = 1000 kHz
DEF 2.1 = 1000 kHz
DLF 1.1 = 150 kHz

*Maximum input frequency exceeded.*

*Remedy*

**Reduce the velocity.**

***Error in detecting the marker of the external encoder (fault message)***

*Cause 1: Defective DLF 1.1 module.*

*Remedy*

**Replace DLF 1.1 module.**

*Cause 2: Error in detecting the marker of the external encoder.*

*Remedy*

**Contact an INDRAMAT service representative as the installed encoder is not compatible with the evaluation electronics.**

***Low absolute encoder battery voltage*** ***(fault message/ warning)***
Absolute encoders incorporating a battery in the feedback are voltage-monitored. This mesage is emitted if the battery voltage falls below 2.8V. The absolute encoder will still function for roughly another four weeks.

**When this period has elapsed, the absolute reference point may be lost. This means danger of uncontrolled axis motions! Replace the battery as soon as possible!**

*Battery voltage has dropped below 2.8V.*

*Remedy*

**Replace with new battery (part no. 257101).**

*Procedure*

The following tools are needed to exchange the battery:

- torx screwdriver, size 10
- pointed pliers
- torque wrench

**Danger of uncontrolled axis motions when replacing batteries!**
**Therefore:**
- **Switch power supply off. Secure it against being swtiched back on.**
- **Exchange the battery while the control voltage is on!**
  **If the control voltage is switched off while the battery has been pulled, then the absolute reference point will be lost.**
  **The absolute reference point must then first be reset.**

<u>Removing the old battery:</u>

- Using a screwdriver, remove the four torx screws (1).
- Manually pull out the lid of the resolver feedback RSF with hood.
- Carefully remove the battery plug (2).
- Use the pointed pliers to pull the batteries out (3).

Putting the new battery in:

- Manually place the battery (part no. 257101) into the housing. **Attention:** do not pinch the battery cable!
- Re-connect the battery plug (2) to the pc board. **Attention:** make sure polarity is correct!
- Put lid of the resolver feedback RSF with hood back into the housing. **Attention:** Only one lid position is possible!
- Screw the four torx screw (1) back into place and, with the use of the torque wrench, tighten them with 1.8 Nm.

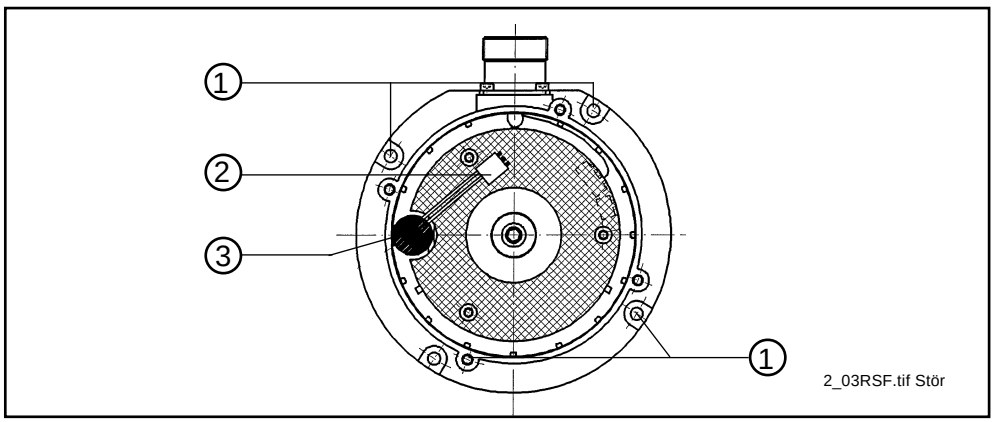


*Figure 2.3: Resolver feedback with back-up battery*

***Master encoder failure*** ***(fault message)***

The master encoder signals are monitored. This error message is generated when they move out of the tolerance range.

*Cause 1: The encoder cable is faulty.*

*Remedy* **Check the encoder cable.**

*Cause 2: The feedback is defective.*

*Remedy* **Replace the feedback.**

*Cause 3: The DFF card is defective.*

*Remedy* **Replace the DFF card.**

***Drive overtemperature warning*** ***(warning)***

The temperature of the heatsink in the drive controller has reached the maximum permissible level. The drive will follow the command value for 30 seconds. This permits the axis to be brought to a halt by the NC control unit without endangering the process (e.g., completing a machining operation, retreating from an area where collisions might occur, etc.).
After 30 seconds, the drive will react according to the parameter "error reaction (P-0-0007) (see relevant Applications Manual).

*Cause 1: Failure of unit's internal cooling system.*

*Remedy* **Replace the drive controller.**

*Cause 2: Failure of the cabinet's air conditioning system.*

*Remedy* **Restore the cabinet air conditioning function.**

*Cause 3: Insufficiently dimensioned cabinet heat dissipation.*

*Remedy* **Check cabinet dimensioning.**

***Motor overtemperature warning*** ***(warning)***

The motor has risen above the permissible temperature. The drive will follow the given command value for 30 seconds. This permits the axis to be brought to a halt by the NC control unit without endangering the process (e.g., completing a machining operation, retreating from an area where collisions might occur, etc.). After 30 seconds, the drive will react according to the parameter "error reaction" (see Applications Manual).

*The motor was overloaded. The effective torque demanded from the motor was above the permissible nominal torque for too long.*

*Remedy*

**Check the motor dimensioning. For plants which have been in operation for some time, check whether the drive conditions have changed (e.g., contamination, friction, moved masses, etc.).**

***Bleeder overtemperature warning*** ***(warning)***

*On reversing, the motor briefly enters the bleeder overload range.*

The contact on the plug terminal block X7 closes and can thus be evaluated. If a predetermined limit is exceeded, error message 20 "bleeder overtemperature shutdown" will be generated.

***Bridge fuse*** ***(fault message)***

The current in the power transistor bridge has risen to more than twice the unit's rated current. The drive torque function is immediately disabled.

*Cause 1: Short-circuit in the motor cable.*

*Remedy*

**Check the motor cable for short-circuits.**

*Cause 2: Power section of the drive controller is defective.*

*Remedy*

**Replace the drive controller, if necessary.**

***Overcurrent: short to ground*** ***(fault message)***

The sum of the phase currents is monitored. During normal operation, the sum = 0. The earth connection fuse will react when the sum of the currents rises above 0.5 x $I_N$.

*Defective motor cable or earth short in the motor.*

*Remedy*

**Check motor cable and motor for shorting to earth and replace, if necessary (see relevant documentation when replacing).**

***Erroneous internal hardware synchronization*** ***(fault message)***

The pulse width modulator of the drive controller is synchronized by a phase control loop. The synchronization is monitored and the above error message signalled when a fault is detected.

*Cause 1: Faulty synchronization of the pulse width modulator.*

*Remedy*

**Replace the unit and send it in for checking.**

*Cause 2: Error in MST from master (NC control unit).*

*Remedy*

**Check transmission starting time. (Consult the manufacturer of the NC control unit.)**

***Brake error*** ***(fault message)***

For MDD motors with integral brakes, the drive controller pilots the brake. The brake current is monitored. If it lies outside the permissible range, the above error message will be signalled.

Cause 1: The supply voltage for the holding brake has not been properly connected or lies outside the tolerance window (24 V, ±10 %).

*Remedy*

**Check voltage supply.**

*Cause 2: Motor cable incomplete or wrongly connected (reverse polarity).*

*Remedy*

**Check motor cable.**

*Cause 3: Defective holding brake.*

*Remedy*

**Replace the motor (see relevant documentation).**

*Cause 4: Defective drive controller.*

*Remedy*

**Replace the controller.**

***±15 V error*** ***(fault message)***

The controller has detected a vault in the ±15 V supply.

*Cause 1: Defective control voltage bus cable.*

*Remedy*

**Check and, if necessary, replace the control voltage bus cable or plug connector.**

*Cause 2: Defective supply module.*

*Remedy*

**Check the power supply module (see Applications Manual for supply module).**

***+24 V error*** ***(fault message)***

The controller has detected a fault in the +24 V supply.

*Cause 1: Defective control voltage bus cable.*

*Remedy*

**Check and, if necessary, replace the control voltage bus cable or plug connector.**

*Cause 2: Overload in the 24 V voltage supply.*

*Remedy*

**Check the 24 V voltage supply in the power supply module.**

*Cause 3: Defective supply module.*

*Remedy*

**Check the power supply module (see Applications Manual for supply module).**

*Cause 4: Short in the E-stop circuit.*

*Remedy*

**Check the E-stop circuit for shorting.**

***±10 V error*** ***(fault message)***

The supply voltage to the current sensors is faulty.

*Defect in the drive controller.*

*Remedy*

**Replace the drive controller.**

***+8 V error*** ***(fault message)***

The supply voltage to the encoder systems is faulty.

*Short-circuit in motor encoder cable or in cable for external encoders.*

*Remedy*

**Check cables and replace, if necessary.**

***Power supply to driver stage.*** ***(fault message)***

The voltage supply to the driver stages is faulty.

*Defect in the drive controller.*

*Remedy*

**Replace drive controller.**

***Pattern data transmission time invalid*** ***(fault message)***

The pattern calculator is not sending the pattern data synchronously to the lead axis position.

*Remedy*

*Wrong trigger signals for sending pattern data.*

**Check trigger signal (consult NC control unit manufacturer).**

***Number of transmitted pattern data invalid*** ***(fault message)***

Too few or no pattern data have been transmitted.

*Cause 1: Faulty connection between pattern calculator and control card.*

*Remedy*

**Check the connection between pattern calculator and control card.**

*Cause 2: Velocity of lead axis is excessive.*

*Remedy*

**Reduce the velocity of the lead axis.**

***Absolute encoder error*** ***(fault message)***

When a DDS with absolute encoder motor (multiturn) is switched off, the instantaneous actual position is stored. When the unit is powered up again, this position is compared with the position detected by the absolute encoder evaluation. If the deviation is outside the parametrized absolute encoder monitoring window P-0-0097, the above error message is generated and signalled to the NC control unit.

*Cause 1: Initial start-up (stored position invalid).*

*Remedy*

**Clear error (set reference dimensions).**

*Cause 2: While shut down, the axis was moved outside the permissible range as parametrized in the absolute encoder monitoring window P-0-0097.*

**Before clearing the fault, check whether a start-up command will cause any damage.**

*Remedy*

**If no damage is possible, then the fault may be cleared.**

*Cause 3: Erroneous position initialization (feedback defective).*

**Danger of uncontrolled axis movement!**

*Remedy*

**Check the reference dimension. If this is erroneous, then the feedback is defective. Replace the motor (see relevant Applications Manual for replacing motor).**

***Velocity loop error*** ***(fault message)***

If, when the velocity loop is active, the difference between the velocity command value and the feedback value is greater than 10% of the maximum motor speed, the velocity feedback value should alter to approach the command value. If this has not happened after 10 milliseconds, the system will shut down while signalling an error to the power supply module.

*Cause 1 : Motor cable wrongly connected.*

*Remedy*

**Check the motor cable connection.**

*Cause 2: Defective drive controller power section.*

*Remedy*

**Replace the drive controller.**

*Cause 3: Feedback is defective.*

*Remedy*

**Replace the motor (see relevant Applications Manual).**

*Cause 4: Wrong velocity loop parametrization.*

*Remedy*

**Check the velocity loop according to the Applications Manual.**

***Program RAM error*** ***(fault message)***

The memory blocks in the drive controller are checked during initialization. If an error is detected, the above message will be signalled.

*Hardware error in the controller.*

*Remedy*

**Replace the controller.**

***Data RAM error*** ***(fault message)***

The memory blocks in the drive controller are checked during initializaton. If an error is detected, the above message will be signalled.

*Hardware error in the drive controller.*

*Remedy*

**Replace the drive controller.**

***Error reading drive data*** ***(fault message)***

The operating software reads data from an EEPROM in the drive controller during initialization. If this is not successful, the above message will be generated.

*Hardware error in the drive controller.*

*Remedy*

**Replace the drive controller.**

***Drive data invalid*** ***(fault message)***

*Hardware error.*

*Remedy*

**Replace the drive controller.**

***Error while writing to parameter memory*** ***(fault message)***

*The parameter memory in the programing module will not accept data.*

*Remedy*

**1. Save the parameter set in the programming module.**
**2. Replace the software module.**
**3. Transfer the parameter set to the new module.**

***Parameter data invalid*** ***(fault message)***

During the controller initialization phase, one or more parameters in the software module were found to be invalid.

*Cause1: The software module was not initialized before, or the operating software EEPROMs in the software module have been changed.*

*Remedy*

**Start the operator interface (see application manual) and call up each of the submenus in the "PARAMETERS" menu. Invalid parameters are indicated by "***". Enter new parameters for these items.**

*Cause 2: Hardware fault in the software module.*

*Remedy*

**Replace the software module.**

***Error reading motor data*** ***(fault message)***

All motor data are stored in a data memory in the motor feedback. An error has occurred while reading these data.

*Cause 1: Defective motor feedback cable.*

*Remedy*

**Check motor feedback cable and replace, if necessary.**

*Cause 2: Defective motor feedback.*

*Remedy*

**Replace motor (see relevant replacement documentation).**

***Motor data invalid*** ***(fault message)***

*Defective motor feedback.*

*Remedy*

**Replace motor (see relevant replacement documentation).**

***Error while writing motor data*** ***(fault message)***

An error has been detected while writing data to the motor feedback.

*Cause 1: Defective motor feedback cable.*

*Remedy*

**Check motor feedback cable and replace, if necessary.**

*Cause 2: Defective motor feedback.*

*Remedy*

**Replace motor (see relevant documentation).**

***Configuration error*** ***(fault message)***

*Cause 1: Software and hardware configurations do not match.*

*Remedy*

**Check the drive controller against its configuration data sheet and replace software or hardware, if necessary.**

*Cause 2: Plug-in module defective, not installed or not properly inserted.*

*Remedy*

**Check the plug-in modules.**

***Absolute encoder not calibrated*** ***(fault message)***

The parameter "reference position" and/or "counting direction" in the menu "ABSOLUTE ENCODER PARAMETER" could not be read.

*Cause 1: These parameters have not yet been entered.*

*Remedy*

**Enter or confirm parameters.**

*Cause 2: Defective DSF feedback.*

*Remedy*

**Replace motor (see relevant documentation)**

***DLC watchdog error, no communication with DLC possible***
***(fault message)***

The drive controller monitors that the DLC is operating correctly. If the processor system of the DLC is out of synchronization with the drive contoller's processors, error no. 93 will be generated in the DKS.

*Defective DLC card.*

*Remedy*

**Replace DLC card. If the error is still present after the DLC card has been replaced, replace the DKS.**

## 2.2 H2 status indicator (on SERCOS interface module)

***Output power*** ***(operating status)***

With the use of the decimal point, it can be determined with what output power the SERCOS interface module is working.

Decimal point lit up: output power is high (factory setting)
Decimal point not lit up: output power is low

If necessary, the output power can be switched via switch S1 on the printed circuit board of the SERCOS interface module.

***EPROM checksum error*** ***(fault message)***

*The EPROM is faulty.*

*Remedy* **Replace SERCOS interface module.**

***Invalid communications phase*** ***(fault message)***

*The NC control unit has attempted to switch into a presently invalid communications phase.*

*Remedy* **Contact the NC control unit manufacturer.**

***Error during phase progression*** ***(fault message)***

*The NC control unit has attempted to switch into a presently invalid communications phase.*

*Remedy* **Contact the NC control unit manufacturer.**

***Error during phase regression*** ***(fault message)***

*The NC control unit has attempted to switch into a presently invalid communications phase.*

*Remedy* **Contact the NC control unit manufacturer.**

***No progression to Phase 1*** ***(temporary operating status)***

There is an error in phase progression if this value remains displayed.

*The NC control unit has not yet triggered progression from Phase 0 to Phase 1.*

*Remedy* **Refer to NC control unit manual, or contact the manufacturer.**

***NC control unit has not yet triggered progression to Phase 2 (temporary operating status)***

There is an error in phase progression if this value remains displayed.

*The NC control unit has not yet triggered the progression from Phase 1 to Phase 2.*

*Remedy*

**See control unit manual or contact control unit manufacturer.**

***Invalid parameters for Phase 3*** ***(fault message)***

Before the NC control unit progresses to Communications Phase 3, the drive controller checks the input parameters for completeness and compliance with input limits (but not for logical accuracy!). If any invalid parameters are detected, the controller will prevent any further phase progression.

*Parameters for Phase 3 are invalid*

*Remedy*

**The "ID no. list of invalid operation data for Communications Phase 2", ID no. S-0-0021, contains parameters which the drive recognizes as invalid prior to progression to Communications Phase 3. These parameters must be run through before any further phase progression is possible. Check the parameters.**

***Invalid parameters for Phase 4*** ***(fault message)***

Before the NC control unit switches to Communications Phase 4, the drive controller checks the input parameters for completeness and compliance with input limits (but not for logical accuracy!). If any invalid parameters are detected, the controller will prevent any further phase progression.

*Invalid parameters for Phase 4*

*Remedy*

**The "ID no. list of invalid operation data for Communications Phase 2", ID no. S-0-0021, contains parameters which the drive recognizes as invalid prior to progression to Communications Phase 4. These parameters must be run through before any further phase progression is possible. Check the parameters.**

***Cyclical operation*** ***(operating status)***

The SERCOS ring is in cyclical operation. The communications link within the SERCOS ring has been successfully established.

***Hardware error*** ***(fault message)***

*General hardware error.*

*Remedy*

**Replace SERCOS interface module and/or the drive controller.**

***MST not yet received*** ***(temporary operating status)***

No "Master-Sync-Telegram" indicating Communications Phase 0 has yet been received.
If this value remains displayed, then there is an error in phase progression.

*Cause 1: Error in phase progression.*

*Remedy*

**See NC control unit manual or contact manufacturer.**

*Cause 2: Problem with fiber optics cable.*

*Remedy*

**Check fiber optics connections for proper contact and firm fit of terminal connections.**

 or 

***Test mode*** ***(operating status)***

*The SERCOS interface has switched to test mode.*

*Remedy*

**Contact an INDRAMAT service representative.**

***Address 0 set*** ***(fault message)***

*Address 0 has been set on the SERCOS interface module. According to SERCOS specifications, this is invalid.*

*Remedy*

**Set a valid drive address (see NC control unit manual).**

***Double MDT error*** ***(fault message)***

Double master data telegram (MDT) error; will be monitored beginning with Communications Phase 3.

*Cause 1: A telegram with an incorrect length was sent.*

*Remedy*

**Check that fiber optic cables are properly connected.**

*Cause 2: Checksum error*

*Remedy*

**Replace SERCOS interface module.**

***Double MST error*** ***(fault message)***

Double master synchronization telegram (MST) error; will be monitored beginning with Communications Phase 3.

*Cause 1: Fiber optic cable is defective.*

*Remedy*

**Check that fiber optic cables are properly connected.**

*Cause 2: The SERCOS interface module in the NC control unit, or in one of the drive controllers, is defective.*

*Remedy*

**Replace SERCOS interface module.**