■ Warnings/alarm messages and corrective actions

The table below gives the drive's warnings and alarms and indicates whether the fault trip locks the drive. After a Trip Lock Fault, the input power must be removed, the cause of the fault corrected, and input power restored to reset the drive. A Trip can be reset manually in any one of three ways.

1. Pressing the keypad key RESET
2. A digital input
3. Serial communication

In addition, an automatic reset may be selected in parameter 405, *Reset function* which will reset all non-trip lock faults.

Wherever an "X" is placed under both Warning and Alarm in the table below, this means that a Warning precedes the Alarm. It can also mean that it is possible to program whether a given fault is to result in a Warning or an Alarm. This is possible, for example, through parameter 128, *Motor thermal protection*. After a trip, the motor will be coasting and the drive's Alarm and Warning indications will flash. If the fault is removed, only the Alarm will flash. After a reset, the drive will be ready to start operation again.

In the following detailed descriptions of warning and alarm messages, corrective actions to resolve the condition are recommended.

No.	Description	Warning	Alarm	Trip locked
2	Live zero error (LIVE ZERO ERROR)	X	X	X
4	AC line phase loss (AC LINE PHASE LOSS)	X	X	X
5	Voltage warning high (DC LINK VOLTAGE HIGH)	X		
6	Voltage warning low (DC LINK VOLTAGE LOW)	X		
7	Overvoltage (DC LINK OVERVOL T)	X	X	X
8	Undervoltage (DC LINK UNDERVOL T)	X	X	X
9	Inverter overload (INVERTER TIME)	X	X	
10	Motor overloaded (MOTOR, TIME)	X	X	
11	Motor thermistor (MOTOR THERMISTOR)	X	X	
12	Current limit (CURRENT LIMIT)	X	X	
13	Overcurrent (OVERCURRENT)	X	X	X
14	Ground fault (GROUND FAULT)		X	X
15	Switch mode fault (SWITCH MODE FAULT)		X	X
16	Short-circuit (CURR. SHORT CIRCUIT)		X	X
17	Serial communication timeout (STD BUS TIMEOUT)	X	X	
18	HPFB bus timeout (HPFB TIMEOUT)	X	X	
33	Out of frequency range (OUT FREQ RNG/ROT LIM)	X		
34	HPFB communication fault (PROFIBUS OPT. FAULT)	X	X	
35	Inrush fault (INRUSH FAULT)		X	X
36	Overtemperature (OVERTEMPERA TURE)	X	X	
37-45	Internal fault (INTERNAL FAULT)		X	X
50	AMT not possible		X	
51	AMT fault re. nameplate data (AMT TYPE.DA TA FAULT)		X	
54	AMT wrong motor (AMT WRONG MOTOR)		X	
55	AMT timeout (AMT TIMEOUT)		X	
56	AMT warning during AMT (AMT WARN. DURING AMT)		X	
99	Locked (LOCKED)	X		

LED indication	
Warning	yellow
Alarm	red
Trip locked	yellow and red

WARNING/ALARM 2: Live zero fault
The voltage or current signal on terminal 53 or 60 is below 50% of the preset value in parameter 309 or 315 *Terminal, min. scaling*.

WARNING/ALARM 4: AC line phase fault
Missing phase on AC line supply side.

Check the supply voltage to the adjustable frequency drive. This fault is only active in 3-phase AC line.

WARNING 5: Voltage warning high
If the DC bus voltage (VDC) is higher than *Voltage warning high*, the adjustable frequency drive will give a warning and the motor will continue to operate unchanged.

Check whether the supply voltage matches the rating of the adjustable frequency drive. (See *Technical data*.) If the VDC remains above the voltage warning limit, the inverter will trip after a fixed period of time. The time depends on the unit and is set at 5 - 10 sec.

NOTE: The adjustable frequency drive will trip with an alarm 7 (overvoltage). A voltage warning can also occur if the motor frequency is reduced too quickly due to the ramp down time being too short.

WARNING 6: Voltage warning low
If the DC bus voltage (VDC) is lower than *Voltage warn low*, the adjustable frequency drive will give a warning and the motor will continue to operate unchanged.

Check whether the supply voltage matches the rating of the adjustable frequency drive. (See *Technical data*.) If the VDC remains below the voltage warning limit, the inverter will trip after a fixed period of time. The time depends on the unit and is set at 2 - 25 sec.

NOTE: The adjustable frequency drive will trip with an alarm 5 (undervoltage). When the adjustable frequency drive is switched off, a warning 6 (and warning 8) is displayed briefly.

WARNING/ALARM 7: Overvoltage
If the DC bus voltage (VDC) is higher than the inverter's *Overvoltage limit*, the inverter will switch off until the VDC once more falls below the overvoltage limit. If the VDC remains above the overvoltage limit, the inverter will trip after a fixed period of time. The time depends on the unit and is set at 5 - 10 sec.

NOTE: Voltage warning high (warning 5) will thus also be able to generate an alarm 7. An overvoltage in the DC bus can occur if the motor frequency is reduced too quickly due to ramp-down time being too short.

WARNING/ALARM 8: Undervoltage
If the DC bus voltage is lower than the inverter's *Undervoltage limit*, the inverter will switch off until the VDC once more goes above the undervoltage limit.

Check whether the supply voltage fits the adjustable frequency drive. (See Technical data.) If the VDC remains under the undervoltage limit, the inverter will trip after a fixed period of time. The time depends on the unit and is set at 1 - 3 sec. When the adjustable frequency drive is switched off a warning 8 (and warning 6) is displayed briefly.

NOTE: Voltage warning low (warning 6) will thus also be able to generate an alarm 8.

WARNING/ALARM 9: Inverter overload
Electronic thermal inverter protection indicates that the adjustable frequency drive is close to disconnecting due to overloading (output current too high for too long). The counter for electronic thermal inverter protection gives a warning at 98% and trips at 100% giving an alarm.

The adjustable frequency drive cannot be reset until the counter is below 90%. Remove the overload condition to the drive.

WARNING/ALARM 10: Motor overloaded
According to the electronic thermal inverter protection the motor is too hot. In parameter 128 the user can select whether the VLT adjustable frequency drive should emit a warning or an alarm when the counter reaches 100%. This fault is due to the motor being overloaded by more than 100% for too long.

Check that motor parameters 102–106 are set correctly.

WARNING/ALARM 11: Motor thermistor
The motor is too hot or the thermistor/thermistor connection is cut off. Parameter 128 *Motor thermal protection* allows a choice of whether the adjustable frequency drive is to give a warning or an alarm.

Check that the PTC thermistor has been correctly connected between terminal 18, 19, 27 or 29 (digital input) and terminal 50 (+10 V supply).

WARNING/ALARM 12: Current limit
The output current is greater than the value in parameter 221 *Current Limit* I_{LIM}.

The adjustable frequency drive will trip after a set period of time, as selected in parameter 409 *Trip delay overcurrent*.

WARNING/ALARM 13: Overcurrent
The inverter's peak current limit (approx. 200% of rated output current) has been exceeded. The warning will last for approx. 1-2 secs, and the adjustable frequency drive will then trip and give an alarm.

Switch off the adjustable frequency drive and check that the motor shaft can be turned and that the motor size fits the adjustable frequency drive.

ALARM: 14: Ground fault
There is a discharge from the output phases to ground, either in the cable between the adjustable frequency drive and the motor, or in the motor.

Turn off the adjustable frequency drive and remove the ground fault.

ALARM: 15: Switch mode fault
Fault in switch mode power supply (internal supply).

Contact your Danfoss supplier.

ALARM: 16: Short-circuit
There is a short-circuit on the motor terminals or in the motor.

Disconnect the AC line supply to the adjustable frequency drive and remove the short-circuit.

WARNING/ALARM 17: Serial communication timeout
There is no serial communication to the adjustable frequency drive.

The warning will only be active when parameter 514 *Bus time interval function* has been set to a value other than OFF. If parameter 514 *Bus time interval function* has been set to *Stop and trip* [5], it will first give a warning and then until it trips and issues an alarm. Parameter 513 *Bus time interval* could possibly be increased.

WARNING/ALARM 18: HPFB bus timeout
There is no serial communication to the adjustable frequency drive's communication option card.

The warning will only be active when parameter 804 *Bus time interval function* has been set to a value other than OFF. If parameter 804 *Bus time interval function* has been set to *Stop and trip*, it will first give a warning and then ramp down, trip and issue an alarm. Parameter 803 *Bus time interval* could possibly be increased.

WARNING 33: Out of frequency range
This warning is active if the output frequency has reached *Output frequency low limit* (parameter 201) or *Output frequency high limit* (parameter 202).

If the VLT adjustable frequency drive is in a mode other than *Process regulation, closed loop* (parameter 100) the warning will be active in the display. If the VLT adjustable frequency drive is in a mode other than *Process regulation, closed loop* bit 008000 *Out of frequency range* in the extended status word will be active, but there will be no warning in the display.

WARNING/ALARM: 34: HPFB communication fault
Communication fault only occurs in Profibus versions.

ALARM 35: Inrush fault
This alarm appears when the adjustable frequency drive has been connected to the AC line supply too many times within 1 minute.

WARNING/ALARM 36: Overtemperature
If the temperature of the heatsink moves above 167°F - 185°F (75° - 85°C), depending on the unit, the adjustable frequency drive gives a warning, and the motor continues to operate unchanged. If the temperature continues to rise, the switching frequency is reduced automatically.

See *Temperature-dependent switching frequency*.

If the temperature of the heatsink rises above 199°F - 212°F (92 - 100 °C), depending on the unit, the adjustable frequency drive will trip.

The temperature fault cannot be reset until the temperature of the heatsink has dropped to below 158°F (70 °C). The tolerance is ±9°F (±5 °C). The temperature can be caused by the following:
- Ambient temperature too high.
- Motor cable too long.
- AC line voltage too high.

ALARMS 37–45: Internal faults
ALARM 37: Internal fault number 0
Communication fault between control card and BMC2.

ALARM 38: Internal fault number 1
Flash EEPROM fault on control card.

ALARM 39: Internal fault number 2
RAM fault on control card.

ALARM 40: Internal fault number 3
Calibration constant error in EEPROM.

ALARM 41: Internal fault number 4
Data values error in EEPROM.

ALARM 42: Internal fault number 5
Fault in motor parameter database.

ALARM 43: Internal fault number 6
General power card fault.

ALARM 44: Iinternal fault number 7
Minimum software version of control card or BMC2.

ALARM 45: Internal fault number 8
I/O fault (digital input/output, relay or analog input/output).

NOTE!
When restarting after an alarm 38–45, the VLT adjustable frequency drive will display an alarm 37. In parameter 615 the actual alarm code can be read.

ALARMS 50–56: AMT faults
ALARM 50: AMT not possible
One of the following three possibilities can occur:
- The calculated R_S value falls outside permitted limits.
- The motor current in at least one of the motor phases is too low.
- The motor in use is probably too small for AMT calculations to be performed.

ALARM 51: AMT Fault re. nameplate data
There is inconsistency in the registered motor data.

Check the motor data for the relevant setup.

ALARM 52: AMT faulty motor phase
The motor current in at least one of the motor phases is too low.

ALARM 53: AMT motor too small
The motor used is probably too small for the AMT calculations to be carried out.

ALARM 54: AMT incorrect motor
AMT cannot be performed on the motor being used.

ALARM 55: AMT timeout
The calculations are taking too long, possibly due to noise in the motor cables.

ALARM 56: AMT warning during AMT
An adjustable frequency drive warning is given while AMT is being performed.

WARNING 99: Locked
The control panel functions have been locked via parameter 018.

■ Warning words, extended status words and alarm words

Warning words, status words and alarm words appear in the display in Hex format. If there are several warnings, status words or alarms, a total of all will be displayed. Warning words, status words and alarm words can also be read out using the serial bus in parameters 540, 541 and 538 respectively.

Bit (Hex)	Warning words
000008	HPFB bus timeout
000010	Standard bus timeout
000040	Current limit
000080	Motor thermistor
000100	Motor overload
000200	Inverter overload
000400	Undervolt
000800	Overvolt
001000	Voltage warning low
002000	Voltage warning high
004000	Phase loss
010000	Live zero error
400000	Out of frequency range
800000	Profibus communication fault
40000000	Switch mode warning
80000000	Heat sink temperature high

Bit (Hex)	Extended status words
000001	Ramping
000002	AMT running
000004	Start forw./reverse
000008	Slow down
000010	Catch-up
000020	Feedback high
000040	Feedback low
000080	Output current high
000100	Output current low
000200	Output frequency high
000400	Output frequency low
002000	Braking
008000	Out of frequency range

Bit (Hex)	Alarm words
000002	Triplock
000004	AMT tuning fail
000040	HPFP bus timeout
000080	Standard bus timeout
000100	Curr. short circuit
000200	Switch mode fault
000400	Ground fault
000800	Overcurrent
002000	Motor thermistor
004000	Motor overload
008000	Inverter overload
010000	Undervolt
020000	Overvolt
040000	Phase loss
080000	Live zero error
100000	Heat sink temperature too high
2000000	Profibus communication fault
8000000	Inrush fault
10000000	Internal fault