Diagnostics

11

11.1   Overview

General information about faults and alarms

The errors and states detected by the individual components of the drive system are indicated by messages.

The messages are categorized into faults and alarms.

Properties of faults and alarms

- Faults
  - Are identified by Fxxxxx.
  - Can lead to a fault reaction.
  - Must be acknowledged once the cause has been remedied.
  - Status via control unit and LED RDY.
  - Status via MODBUS status word PZD1.1 (fault status).
  - Entry in the fault buffer.

- Alarms
  - Are identified by Axxxxx.
  - Have no further effect on the drive.
  - The alarms are automatically reset once the cause has been remedied. No acknowledgement is required.
  - Status via Control Unit and LED RDY.
  - Entry in the alarm buffer.

- General properties of faults and alarms
  - Triggering on selected messages possible.
  - Contain the component number for identifying the affected SINAMICS component.
  - Contain diagnostic information on the relevant message.

Differences between faults and alarms

The differences between faults and alarms are shown as follows:

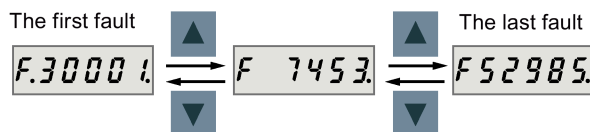| Type	BOP display (example)		Status indicator		Reaction	Acknowledgement
			RDY	COM		
Fault	$F\ \ 7985$	Single fault	Slow flashing in red	-	• **NONE**: no reaction • **OFF1**: servo motor ramps down • **OFF2**: servo motor coasts down • **OFF3**: servo motor stops quickly (emergency stop) • **ENOCDER**: Encoder fault causes OFF2.	• **POWER ON**: re-power on the servo drive to clear a fault after eliminating its cause. • **IMMEDIATELY**: the fault disappears immediately after eliminating its cause. • **PULSE INHIBIT**: The fault can only be acknowledged with a pulse inhibit. The same options are available for acknowledging as described under acknowledgment with IMMEDIATELY.
	$F.\ \ 7985.$	The first fault in the case of multiple faults				
	$F\ \ 7985.$	Non-first fault in the case of multiple faults				
Alarm	$A30016$	Single alarm	Slow flashing in red	-	• **NONE**: no reaction	Self-acknowledgement
	$A.30016.$	The first alarm in the case of multiple alarms				
	$A30016.$	Non-first alarm in the case of multiple alarms				

NOTICE

Faults have higher display priority than alarms

In the case that both faults and alarms occur, only faults are displayed until they have been acknowledged.
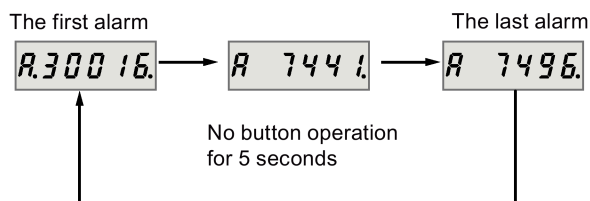

BOP operations for faults and alarms

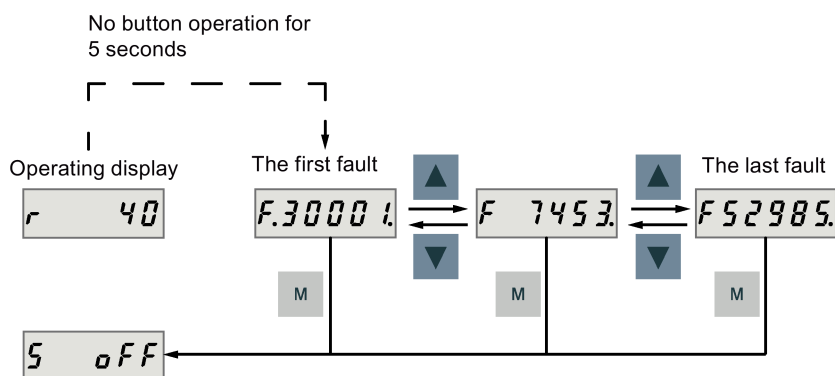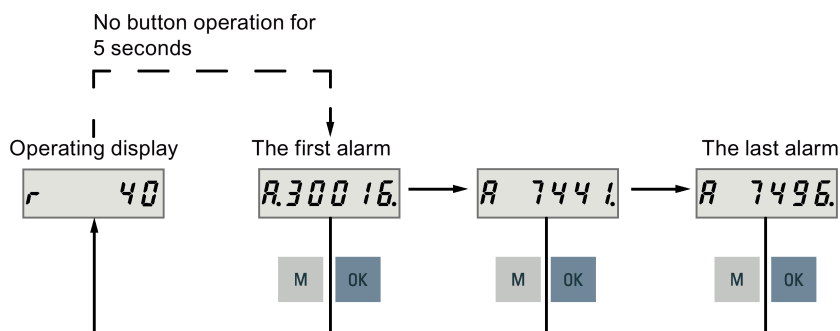To view faults or alarms, proceed as follows:

- Faults

The first fault   ▲   ▲   The last fault

`F.30001.` ⇄ `F  7453.` ⇄ `F 52985.`

          ▼   ▼

- Alarms

The first alarm   The last alarm

`A.30016.` → `A  7441.` → `A  7496.`

No button operation
for 5 seconds

To exit from fault or alarm display, proceed as follows:

- Faults

No button operation for
5 seconds

Operating display   The first fault   ▲   ▲   The last fault

`r    40`   `F.30001.` ⇄ `F  7453.` ⇄ `F 52985.`

                   ▼   ▼

             M   M   M

`S   oFF`

- Alarms

No button operation for
5 seconds

Operating display   The first alarm   The last alarm

`r    40`   `A.30016.` → `A  7441.` → `A  7496.`

             M   OK   M   OK   M   OK
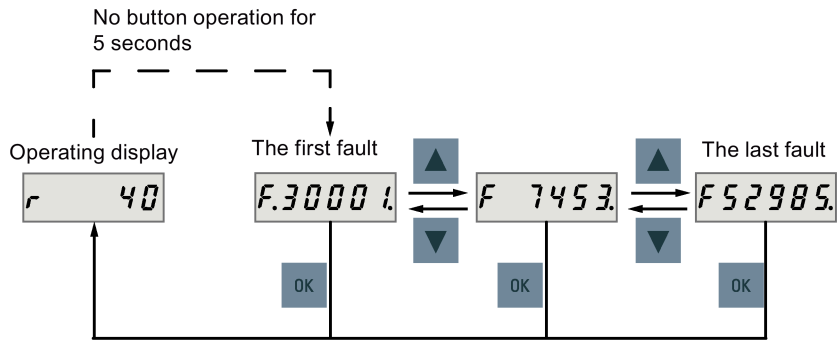
To acknowledge faults, proceed as follows:

Note

- If you do not eliminate the cause(s) of the fault, it can appear again after no button operation for five seconds. Make sure that you have eliminated the cause(s) of the fault.
- You can acknowledge faults using RESET signal. For details of the signal, refer to DIs (Page 90).
- You can acknowledge faults on the SINAMICS V-ASSISTANT. For details, refer to SINAMICS V-ASSISTANT Online Help.

Two LED status indicators (RDY and COM) are available to indicate drive status. Both LEDs are dual color (green/red).
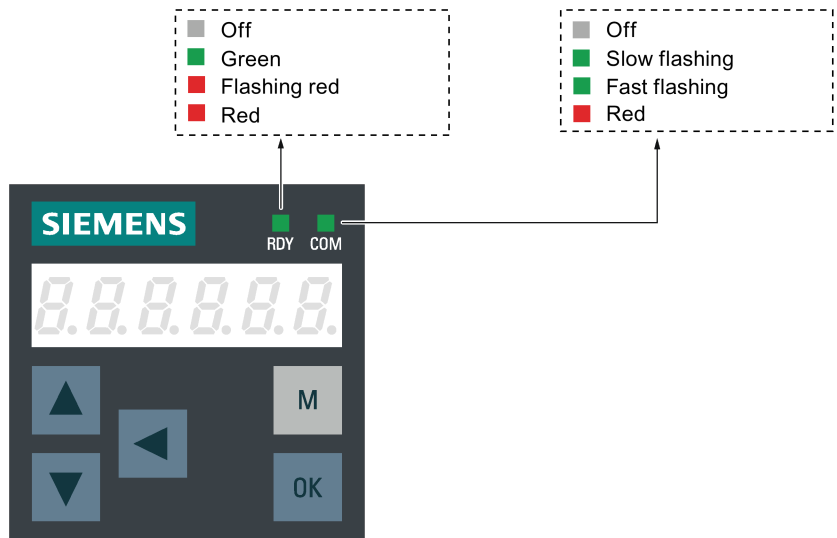
You can find detailed information about the status indications in the table below:

Status indicator	Color	Status	Description
RDY	-	Off	24 V control board power supply is missing
	Green	Continuously lit	The drive is in "S ON" state
	Red	Continuously lit	The drive is in "S OFF" state or in startup state
		Flash at 1 Hz	Alarms or faults occurs

Status indicator	Color	Status	Description
COM	-	Off	Communication with PC is not active
	Green	Flash at 0.5 Hz	Communication with PC is active
		Flash at 2 Hz	Micro SD card/SD card operating (read or write)
	Red	Continuously lit	Communication with PC is in error

11.2 List of faults and alarms

This section lists only common faults and alarms. To view the detailed information of all faults and alarms, call the online help for an active fault/alarm in the SINAMICS V-ASSISTANT engineering tool.

Fault list

Fault	Cause	Remedy
F1000: Internal software error Reaction: OFF2 Acknowledgement: POWER ON	An internal software error has occurred.	• Evaluate fault buffer. • Carry out a POWER ON (power off/on) for all components. • Upgrade firmware to later version. • Contact the Hotline. • Replace the Control Unit.
F1001: FloatingPoint exception Reaction: OFF2 Acknowledgement: POWER ON	An exception occurred during an operation with the FloatingPoint data type.	• Carry out a POWER ON (power off/on) for all components. • Upgrade firmware to the latest version. • Contact the Hotline.
F1002: Internal software error Reaction: OFF2 Acknowledgement: IMMEDIATELY	An internal software error has occurred.	• Carry out a POWER ON (power off/on) for all components. • Upgrade firmware to the latest version. • Contact the Hotline.
F1003: Acknowledgement delay when accessing the memory Reaction: OFF2 Acknowledgement: IMMEDIATELY	A memory area was accessed that does not return a "READY".	• Carry out a POWER ON (power off/on). • Contact the Hotline.
F1015: Internal software error Reaction: OFF2 Acknowledgement: POWER ON	An internal software error has occurred.	• Carry out a POWER ON (power off/on) for all components. • Upgrade firmware to the latest version. • Contact the Hotline.

Fault	Cause	Remedy
F1018: Booting has been interrupted several times Reaction: NONE Acknowledgement: POWER ON	Module booting was interrupted several times. As a consequence, the module boots with the factory setting. Possible reasons for booting being interrupted: • Power supply interrupted. • CPU crashed. • Parameterization invalid. After this fault is output, then the module is booted with the factory settings.	• Carry out a POWER ON (power off/on). After switching on, the module reboots from the valid parameterization (if available). • Restore the valid parameterization Examples: • Carry out a first commissioning, save, carry out a POWER ON (switch-off/switch-on). • Load another valid parameter backup (e.g. from the memory card), save, carry out a POWER ON (switch-off/switch-on). Note: If the fault situation is repeated, this fault is again output after several interrupted boots.
F1030: Sign-of-life failure for master control Reaction: OFF3 Acknowledgement: IMMEDIATELY	For active PC master control, no sign-of-life was received within the monitoring time.	Contact the Hotline.
F1611: SI CU: Defect detected Reaction: OFF2 Acknowledgement: IMMEDIATELY	The drive-integrated "Safety Integrated" (SI) function on the Control Unit (CU) has detected an error and initiated an STO	• Carry out a POWER ON (power off/on) for all components. • Upgrade software. • Replace the Control Unit.
F1910: Fieldbus: setpoint timeout Reaction: OFF3 Acknowledgement: IMMEDIATELY	The reception of setpoints from the fieldbus interface (Modbus/USS) has been interrupted. • Bus connection interrupted. • Controller switched off. • Controller set into the STOP state.	Restore the bus connection and set the controller to RUN.
F7011: Motor overtemperature Reaction: OFF2 Acknowledgement: IMMEDIATELY	• Motor overloaded • Motor surrounding temperature too high • Wire breakage or sensor not connected • Motor temperature model incorrectly parameterized	• Reduce the motor load. • Check the surrounding temperature and the motor ventilation. • Check the wiring and the connection. • Check the motor temperature model parameters.
F7085: Open-loop/closed-loop control parameters changed Reaction: NONE Acknowledgement: IMMEDIATELY	Open-loop/closed-loop control parameters have had to be changed for the following reasons: • As a result of other parameters, they have exceeded the dynamic limits. • They cannot be used due to the fact that the hardware detected not having certain features.	It is not necessary to change the parameters as they have already been correctly limited.

Fault	Cause	Remedy
F7093: Drive: Test signal error Reaction: OFF3 Acknowledgement: IMMEDIATELY	The limit rotation of the motor (p29027) is inappropriate.	Modify the value of parameter p29027.
F7220: Drive: Master control by PLC missing Reaction: OFF1 Acknowledgement: IMMEDIATELY	The "master control by PLC" signal was missing in operation. • Input for "master control by PLC" is incorrect. • The higher-level control has withdrawn the "master control by PLC" signal. • Data transfer via the fieldbus (master/drive) was interrupted.	• Check the input for "master control by PLC". • Check the "master control by PLC" signal and, if required, switch in. • Check the data transfer via the fieldbus (master/drive).
F7403: Lower DC link voltage threshold reached Reaction: OFF1 Acknowledgement: IMMEDIATELY	The DC link voltage monitoring is active and the lower DC link voltage threshold was reached in the "Operation" state.	• Check the line supply voltage. • Check the infeed. • Reduce the lower DC link threshold. • Switch out (disable) the DC link voltage monitoring.
F7404: Upper DC link voltage threshold reached Reaction: OFF2 Acknowledgement: IMMEDIATELY	The DC link voltage monitoring is active and the upper DC link voltage threshold was reached in the "Operation" state.	• Check the line supply voltage. • Check the infeed module or the brake module. • Increase the upper DC link voltage threshold. • Switch out (disable) the DC link voltage monitoring.
F7410: Current controller output limited Reaction: OFF2 Acknowledgement: IMMEDIATELY	The condition "I_act = 0 and Uq_set_1 longer than 16 ms at its limit" is present and can be caused by the following: • Motor not connected or motor contactor open. • No DC link voltage present. • Motor Module defective.	• Connect the motor or check the motor contactor. • Check the DC link voltage. • Check the Motor Module.

Fault	Cause	Remedy
F7412: Commutation angle incorrect (motor model) Reaction: ENCODER Acknowledgement: IMMEDIATELY	An incorrect commutation angle was detected that can result in a positive coupling in the speed controller. Possible causes: • The motor encoder is incorrectly adjusted with respect to the magnet position. • The motor encoder is damaged. • Data to calculate the motor model has been incorrectly set. • Pole position identification might have calculated an incorrect value when activated. • The motor encoder speed signal is faulted. • The control loop is instable due to incorrect parameterization.	• If the encoder mounting was changed, re-adjust the encoder. • Replace the defective motor encoder. • Correctly set the motor stator resistance, cable resistance and motor-stator leakage inductance. Calculate the cable resistance from the cross-section and length, check the inductance and stator resistance using the motor data sheet, measure the stator resistance, e.g. using a multimeter - and if required, again identify the values using the stationary motor data identification. • With pole position identification activated, check the procedure for pole position identification and force a new pole position identification procedure by means of de-selection followed by selection.
F7420: Drive: Current setpoint filter natural frequency > Shannon frequecy	One of the filter natural frequencies is greater than the Shannon frequency.	• Reduce the numerator or denominator natural frequency of the current setpoint filter involved. • Switch out the filter involved (p1656).
F7430: Changeover to open-loop torque controlled operation not possible Reaction: OFF2 Acknowledgement: POWER ON	For encoderless operation, the converter cannot change over to closed-loop torque-controlled operation.	• Do not attempt to change over to closed-loop torque-controlled operation. • Check the encoder cable connection.
F7431: Changeover to encoderless operation not possible Reaction: OFF2 Acknowledgement: POWER ON	For closed-loop torque control, the converter cannot change over to encoderless operation.	• Do not attempt to change over to encoderless operation. • Check the encoder cable connection.

Fault	Cause	Remedy

F7442: LR: Multiturn does not match the modulo range
 	
Reaction: OFF1 (OFF2, OFF3)
 	
Acknowledgement: IMMEDIATELY
	The ratio between the multiturn resolution and the modulo range (p29246) is not an integer number. This results in the adjustment being set back, as the position actual value cannot be reproduced after power-off/power-on.	Make the ration between the multiturn resolution and the modulo range an integer number.
		
		The ratio v is calculated as follows:
		
		• Motor encoder without position tracking (p29243 = 0):
		
		  – For multiturn encoders:
		
		  v = (4096 * p29247 * p29248)/(p29249 * p29246)
		
		  – For singleturn encoders:
		
		  v = (p29247 * p29248)/(p29249 * p29246)
		
		• Motor encoder with position trakcing (p29243 = 1):
		
		  v = (p29244 * 29247)/p29246

F7443: Reference point coordinate not in the permissible range Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	The reference point coordinate received when adjusting the encoder via connector input p2599 lies outside the half of the encoder range and cannot be set as actual axis position. Fault value (r0949, interpret decimal): Maximum permissible value for the reference point coordinate.	Set the reference point coordinate to a lower value than specified in the fault value. See also: p2599 (EPOS reference point coordinate value. For a motor with an absolute encoder, the maximum permissible encoder range is calculated by the following formula: • For multiturn encoders: (4096 * p29247) / 2 • For singleturn encoders: p29247 / 2
F7450: Standstill monitoring has responded Reaction: OFF1 Acknowledgement: IMMEDIATELY	After the standstill monitoring time expired, the drive left the standstill window. • Position loop gain too low. • Position loop gain too high (instability/oscillation). • Mechanical overload. • Connecting cable, motor/drive converter incorrect (phase missing, interchange).	Check the causes and resolve.
F7451: Position monitoring has responded Reaction: OFF1 Acknowledgement: IMMEDIATELY	When the position monitoring time (p2545) expired, the drive had still not reached the positioning window (p2544). • Positioning window parameterized too small (p2544). • Position monitoring time parameterized too short (p2545). • Position loop gain is too low. • Position loop gain is too high (instability/oscillation). • Drive mechanically locked.	Check the causes and resolve.

Fault	Cause	Remedy
F7452: Following error too high Reaction: OFF1 Acknowledgement: IMMEDIATELY	The difference between the position set-point and position actual value (following error dynamic model) is greater than the tolerance (p2546). • The value of p2546 is too small. • The gain of position loop is too small. • The drive torque or accelerating capacity exceeded. • Position measuring system fault. • Position control sense incorrect. • Mechanical system locked. • Excessively high traversing velocity or excessively high position reference value (setpoint) differences.	Check the causes and resolve.
F7453: Position actual value preprocessing error Reaction: OFF2 Acknowledgement: IMMEDIATELY	An error has occurred during the position actual value preprocessing.	Check the encoder for the position actual value preprocessing.
F7458: EPOS: Reference cam not found Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	After starting the search for reference, the axis moved through the maximum permissible distance to seach for the reference cam without actually finding the reference cam.	• Check the "reference cam" input. • Check the maximum permissible distance to the reference cam (p2606). See also: p2606 (EPOS search for reference reference cam maximum distance)
F7459: Zero mark not detected Reaction: OFF1 Acknowledgement: IMMEDIATELY	After leaving the reference cam, the axis has traversed the maximum permissible distance (p2609) between the reference cam and the zero mark without finding the zero mark.	• Check the encoder regarding zero mark. • Check the maximum permissible distance between the reference cam and zero mark (p2609). • Use an external encoder zero mark (equivalent zero mark). See also: p2609 (EPOS search for reference max distance ref cam and zero mark)
F7460: EPOS: End of reference cam not found Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	During the search for reference, when the axis reached the zero mark it also reached the end of the traversing range without detecting an edge at the binector input "reference cam". Maximum traversing range: -2147483648 [LU] ... -2147483647 [LU]	• Check the "reference cam" input. • Repeat the search for reference.
F7464: EPOS: Traversing block is inconsistent Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	The traversing block does not contain vaild information. Alarm value: Number of the traversing block with invaild information.	Check the traversing block and where relevant, take into consideration alarms that are present.

Fault	Cause	Remedy
F7475: EPOS: Target position < start of traversing range Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	The target position for relative traversing lies outside the traversing range.	Correct the target position.
F7476: EPOS: Target position > end of the traversing range Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	The target position for relative traversing lies outside the traversing range.	Correct the target position.
F7481: EPOS: Axis position < software limit switch minus Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	The actual position of the axis is less than the position of the software limit switch minus.	• Correct the target position. • Change software limit switch minus (CI: p2580).
F7482: EPOS: Axis position > software limit switch plus Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	The actual position of the axis is greater than the position of the software limit switch plus.	• Correct the target position. • Change software limit switch plus (CI: p2581).
F7484: Fixed stop outside the monitoring window Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	In the "fixed stop reached" state, the axis has moved outside the defined monitoring window (p2635).	• Check the monitoring window (p2635). • Check the mechanical system.
F7485: Fixed stop not reached Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	In a traversing block with the task FIXED STOP, the end position was reached without detecting a fixed stop.	• Check the traversing block and locate the target position further into the workpiece. • Check the "fixed stop reached" control signal. • If required, reduce the maximum following error window to detect the fixed stop (p2634).
F7488: EPOS: Relative positioning not possible Reaction: OFF1 (OFF2, OFF3) Acknowledgement: IMMEDIATELY	In the mode "direct setpoint input/MDI", for continuous transfer relative positioning was selected.	Check the control.

Fault	Cause	Remedy
F7490: Enable signal with-drawn while traversing Reaction: OFF1 Acknowledgement: IMMEDIATELY	• For a standard assignment, another fault may have occurred as a result of withdrawing the enable signals. • The drive is in the "switching on inhibit-ed" state (for a standard assignment).	• Set the enable signals or check the cause of the fault that first occurred and then re-sult (for a standard assignment). • Check the assignment to enable the basic positioning function.
F7491: STOP cam minus reached Reaction: OFF3 Acknowledgement: IMMEDIATELY	The STOP cam minus was reached. For a positive traversing direction, the STOP cam minus was reached, i.e. the wiring of the STOP cam is incorrect.	• Leave the STOP cam minus in the posi-tive traversing direction and return the ax-is to the valid traversing range. • Check the wiring of the STOP cam.
F7492: STOP cam plus reached Reaction: OFF3 Acknowledgement: IMMEDIATELY	The STOP cam plus was reached. For a negative traversing direction, the STOP cam plus was reached, i.e. the wiring of the STOP cam is incorrect.	• Leave the STOP cam plus in the negative traversing direction and return the axis to the valid traversing range. • Check the wiring of the STOP cam.

F7493: LR: Overflow of the value range for position actu-al value
 	
Reaction: OFF1 (OFF2, OFF3)
 	
Acknowledgement: IMMEDIATELY
	The value range (-2147483648 ... 2147483647) for the position actual value representation was exceeded. When the overflow occurs, the "referenced" or "ad-justment absolute measuring system" status is reset.
	
	• The position actual value (r2521) has exceeded the value range.
	
	• The encoder position actual value has exceeded the value range.
	
	• The maximum encoder value times the factor to convert the absolute position from increments to length units (LU) has exceeded the value range for dis-playing the position actual value.
		If required, reduce the traversing range or position resolution p29247.
		
		Note for case = 3:
		
		If the value for the maximum possible abso-lute position (LU) is greater than 4294967296, then it is not possible to make an adjustment due to an overflow.
		
		For rotary encoders, the maximum possible absolute position (LU) is calculated as fol-lows:
		
		Motor encoder with position tracking:
		
		• IPos: p29247 * p29244
		
		• PTI: 1048576 * p29012[X] * p29244 / p29013
		
		Motor encoder without position tracking:
		
		• For multiturn encoders:
		  – IPos: p29247 * p29248 * 4096 / p29249
		  – PTI: 1048576 * p29012[X] * 4096 / p29013
		
		• For singleturn encoders:
		  – IPos: p29247 * p29248 / p29249
		  – PTI: 1048576 * p29012[X] / p29013

Fault	Cause	Remedy

F7599: Encoder 1: Adjustment not possible
 	
Reaction: OFF1 (NONE, OFF2, OFF3)
 	
Acknowledgement: IMMEDIATELY
	The maximum encoder value times the factor to convert the absolute position from increments to length units (LU) has exceeded the value range (-2147483648 ... 2147483647) for displaying the position actual value.	If the value for the maximum possible absolute position (LU) is greater than 4294967296, then it is not possible to make an adjustment due to an overflow.
		
		For rotary encoders, the maximum possible absolute position (LU) is calculated as follows:
		
		Motor encoder with position tracking:
		• IPos: p29247 * p29244
		• PTI: 1048576 * p29012[X] * p29244 / p29013
		
		Motor encoder without position tracking:
		• For multiturn encoders:
		  – IPos: p29247 * p29248 * 4096 / p29249
		  – PTI: 1048576 * p29012[X] * 4096 / p29013
		• For singleturn encoders:
		  – IPos: p29247 * p29248 / p29249
		  – PTI: 1048576 * p29012[X] / p29013

F7800 Drive: No power unit present Reaction: NONE Acknowledgement: IMMEDIATELY	The power unit parameters cannot be read or no parameters are stored in the power unit.	• Carry out a POWER ON (power off/on) for all components. • Change the module.
F7801: Motor overcurrent Reaction: OFF2 Acknowledgement: IMMEDIATELY	The permissible motor limit current was exceeded. • Effective current limit set too low. • Current controller not correctly set. • Motor was braked with an excessively high stall torque correction factor. • Up ramp was set too short or the load is too high. • Short-circuit in the motor cable or ground fault. • Motor current does not match the current of Motor Module.	• Reduce the stall torque correction factor. • Increase the up ramp or reduce the load. • Check the motor and motor cables for short-circuit and ground fault. • Check the Motor Module and motor combination.
F7802: Infeed or power unit not ready Reaction: OFF2 Acknowledgement: IMMEDIATELY	After an internal power-on command, the infeed or drive does not signal ready because of one of the following reasons: • Monitoring time is too short. • DC link voltage is not present. • Associated infeed or drive of the signaling component is defective.	• Ensure that there is a DC link voltage. Check the DC link busbar. Enable the infeed. • Replace the associated infeed or drive of the signaling component.

Fault	Cause	Remedy
F7815: Power unit has been changed Reaction: NONE Acknowledgement: IMMEDIATELY	The code number of the actual power unit does not match the saved number.	Connect the original power unit and power up the Control Unit again (POWER ON).
F7900: Motor blocked/speed controller at its limit Reaction: OFF2 Acknowledgement: IMMEDIATELY	The servo motor has been operating at the torque limit longer than the delay time (p2177) and below the speed threshold (p2175). This signal can also be initiated if the speed actual value is oscillating and the speed controller output repeatedly goes to its limit.	• Check whether the servo motor can rotate freely or not. • Check the torque limit. • Check the inversion of the actual value. • Check the motor encoder connection. • Check the encoder pulse number.
F7901: Motor overspeed Reaction: OFF2 Acknowledgement: IMMEDIATELY	• The maximumly permissible speed has been exceeded. • The speed limit has been exceeded.	• Check and correct the maximum speed (p1082). • Check and correct the speed limit (p29070, p29071), and the DI signals SLIM1 and SLIM2. • Check if there are any peaks of actual speed. If the value of the peak is especially large, contact the hotline.
F7995: Motor identification failure Reaction: OFF2 Acknowledgement: IMMEDIATELY	For incremental motor, needs pole position identification when first SON. If the motor already in run (i.e. by external force) position identification may failure.	Stop the motor before servo on.
F30001: Power unit: Overcurrent Reaction: OFF2 Acknowledgement: IMMEDIATELY	The power unit has detected an overcurrent condition. • Closed-loop control is incorrectly parameterized. • Controller parameters are not proper. • Motor has a short-circuit or fault to ground (frame). • Power cables are not correctly connected. • Power cables exceed the maximum permissible length. • Power unit defective. • Line phase interrupted.	• Check the motor data - if required, carry out commissioning. • Modify speed loop Kp (p29120), position loop Kv (p29110). • Check the motor circuit configuration (star-delta). • Check the power cable connections. • Check the power cables for short-circuit or ground fault. • Check the length of the power cables. • Replace power unit. • Check the line supply phases. • Check the external braking resistor connection.

Fault	Cause	Remedy
F30002: DC link voltage, overvoltage Reaction: OFF2 Acknowledgement: IMMEDIATELY	The power unit has detected overvoltage in the DC link. • Motor regenerates too much energy. • Device connection voltage too high. • Line phase interrupted.	• Increase the ramp-down time. • Activate the DC link voltage controller. • Use a braking resistor. • Increase the current limit of the infeed or use a larger module. • Check the device supply voltage. • Check the line supply phases.
F30003: DC link voltage, undervoltage Reaction: OFF2 Acknowledgement: IMMEDIATELY	The power unit has detected an undervoltage condition in the DC link. • Line supply failure • Line supply voltage below the permissible value. • Line supply infeed failed or interrupted. • Line phase interrupted.	• Check the line supply voltage • Check the line supply infeed and observe the fault messages relating to it (if there are any) • Check the line supply phases. • Check the line supply voltage setting.
F30004: Drive heat sink over-temperature Reaction: OFF2 Acknowledgement: IMMEDIATELY	The temperature of the power unit heat sink has exceeded the permissible limit value. • Insufficient cooling, fan failure. • Overload. • Surrounding temperature too high. • Pulse frequency too high.	• Check whether the fan is running. • Check the fan elements. • Check whether the surrounding temperature is in the permissible range. • Check the motor load. • Reduce the pulse frequency if this is higher than the rated pulse frequency.
F30005: Power unit: Overload I^2t Reaction: OFF2 Acknowledgement: IMMEDIATELY	The power unit was overloaded. • The permissible rated power unit current was exceeded for an inadmissibly long time. • The permissible load duty cycle was not maintained.	• Reduce the continuous load. • Adapt the load duty cycle. • Check the motor and power unit rated currents.
F30011: Line phase failure in main circuit Reaction: OFF2 Acknowledgement: IMMEDIATELY	At the power unit, the DC link voltage ripple has exceeded the permissible limit value. Possible causes: • A line phase has failed. • The 3 line phases are inadmissibly unsymmetrical. • The fuse of a phase of a main circuit has ruptured. • A motor phase has failed.	• Check the main circuit fuses. • Check whether a single-phase load is distorting the line voltages. • Check the motor feeder cables.

Fault	Cause	Remedy
F30015: Phase failure motor cable Reaction: OFF2 Acknowledgement: IMMEDIATELY	A phase failure in the motor feeder cable was detected. The signal can also be output in the following case: The motor is correctly connected, however the closed-speed control is instable and therefore an oscillating torque is generated.	• Check the motor feeder cables. • Check the speed controller settings.
F30021: Ground fault Reaction: OFF2 Acknowledgement: IMMEDIATELY	Power unit has detected a ground fault. • Ground fault in the power cables. • Winding fault or ground fault at the motor.	• Check the power cable connections. • Check the motor.
F30027: Precharging DC link time monitoring Reaction: OFF2 Acknowledgement: IMMEDIATELY	• The power unit DC link was not able to be pre-charged within the expected time. There is no line supply voltage connected. • The line contactor/line side switch has not been closed. • The line supply voltage is too low. • The pre-charging resistors are overheated as there were too many pre-charging operations per time unit • The pre-charging resistors are overheated as the DC link capacitance is too high. • The pre-charging resistors are overheated. • The pre-charging resistors are overheated as the line contactor was closed during the DC link fast discharge through the Braking Module. • The DC link has either a ground fault or a short-circuit. • The pre-charging circuit is possibly defective.	Check the line supply voltage at the input terminals.
F30036: Internal overtemperature Reaction: OFF2 Acknowledgement: IMMEDIATELY	The temperature inside the drive converter has exceeded the permissible temperature limit. • Insufficient cooling, fan failure. • Overload. • Surrounding temperature too high.	• Check whether the fan is running. • Check the fan elements. • Check whether the surrounding temperature is in the permissible range. Notice: This fault can only be acknowledged once the permissible temperature limit minus 5 K has been fallen below.

Fault	Cause	Remedy
F30050: 24 V supply over-voltage Reaction: OFF2 Acknowledgement: POWER ON	The voltage monitor signals an overvoltage fault on the module.	• Check the 24 V power supply. • Replace the module if necessary.
F30071: No new actual values received from the power unit Reaction: OFF2 Acknowledgement: IMMEDIATELY	The number of actual value telegrams from the power unit that have failed has exceeded the permissible number.	Replace the module if necessary.
F31100: Zero mark distance error Reaction: ENCODER Acknowledgement: PULSE INHIBIT	The measured zero mark distance does not correspond to the parameterized zero mark distance. For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.	• Check that the encoder cables are routed in compliance with EMC. • Check the plug connections • Replace the encoder or encoder cable
F31101: Zero mark failed Reaction: ENCODER Acknowledgement: PULSE INHIBIT	The 1.5 x parameterized zero mark distance was exceeded.	• Check that the encoder cables are routed in compliance with EMC. • Check the plug connections. • Replace the encoder or encoder cable.
F31110: Serial communications error Reaction: ENCODER Acknowledgement: PULSE INHIBIT	Serial communication protocol transfer error between the encoder and evaluation module.	• Check the encoder cable and shielding connection. • Replace the encoder cable/encoder.
F31111: Encoder 1: Absolute encoder internal error Reaction: ENCODER Acknowledgement: PULSE INHIBIT	The absolute encoder fault word supplies fault bits that have been set.	• Check the encoder cable connection and make sure the cables are routed in compliance with EMC. • Check the motor temperature. • Replace the motor/encoder.
F31112: Error bit set in the serial protocol Reaction: ENCODER Acknowledgement: PULSE INHIBIT	The encoder sends a set error bit via the serial protocol.	Refer to F31111.
F31117: Inversion error signals A/B/R Reaction: ENCODER Acknowledgement: PULSE INHIBIT	For a square-wave encoder (bipolar, double ended) signals A*, B* and R* are not inverted with respect to signals A, B and R.	• Check the encoder and cable and the connection of them. • Does the encoder supply signals and the associated inverted signals?

Fault	Cause	Remedy
F31130: Zero mark and position error from the coarse synchronization Reaction: ENCODER Acknowledgement: PULSE INHIBIT	After initializing the pole position using track C/D, Hall signals or pole position identification routine, the zero mark was detected outside the permissible range. For distance-coded encoders, the test is carried out after passing 2 zero marks. Fine synchronization was not carried out.	• Check that the encoder cables are routed in compliance with EMC. • Check the plug connections • If the Hall sensor is used as an equivalent for track C/D, check the connection. • Check the connection of track C or D. • Replace the encoder or encoder cable.
F31150: Initialization error Reaction: ENCODER Acknowledgement: PULSE INHIBIT	Encoder functionality is not operating correctly.	• Check the encoder type used (incremental/absolute) and the encoder cable. • If relevant, note additional fault messages that describe the fault in detail.
F52903: Fault inconsistence between fault status and fault buffer Reaction: OFF2 Acknowledgement: IMMEDIATELY	Fault status and fault number buffer are inconsistent.	Repower on.
F52904: Control mode change Reaction: OFF2 Acknowledgement: POWER ON	When the control mode is changed, the drive must be saved and restarted.	Save and restart the drive.
F52911: Positive torque limitation value error Reaction: OFF2 Acknowledgement: IMMEDIATELY	One of positive torque limitation values (p29050, p1520) becomes less than 0.	Configure all of positive torque limitation values (p29050, p1520) not less than 0.
F52912: Negative torque limitation value error Reaction: OFF2 Acknowledgement: IMMEDIATELY	One of negative torque limitation values (p29051, p1521) becomes greater than 0.	Configure all of negative torque limitation values (p29051, 1521) not greater than 0.
F52931: Gear box limit Reaction: OFF1 Acknowledgement: IMMEDIATELY	The electronic gear ratio (p29012[x] / p29013[x]) exceeds the range from 0.02 to 200.	Adjust the electronic gear ratio within the permissible range from 0.02 to 200.
F52933: PTO gear box limit Reaction: OFF1 Acknowledgement: IMMEDIATELY	The electronic gear ratio (p29031[0] / p29032[0]) exceeds the range from 0.02 to 200.	Adjust the electronic gear ratio within the permissible range from 0.02 to 200.
F52980: Absolute encoder motor changed Reaction: OFF1 Acknowledgement: IMMEDIATELY	The servo motor with absolute encoder is changed. Actual motor ID is different from commissioned motor ID.	The servo motor will be automatically configured after the acknowledgement of this fault.

Fault	Cause	Remedy
F52981: Absolute encoder motor mismatched Reaction: OFF1 Acknowledgement: IMMEDIATELY	Connected absolute encoder motor cannot be operated. The servo drive in use does not support the Motor ID.	Use a suitable absolute encoder motor.
F52983: No encoder detected Reaction: OFF1 Acknowledgement: IMMEDIATELY	The servo drive in use does not support encoderless operation.	• Check the encoder cable connection between the servo drive and the servo motor. • Use a servo motor with encoder.
F52984: Incremental encoder motor not configured Reaction: OFF1 Acknowledgement: IMMEDIATELY	• Commissioning of the servo motor has failed. • The incremental encoder motor is connected but fails to commission.	Configure the motor ID by setting the parameter p29000.
F52985: Absolute encoder motor wrong Reaction: OFF1 Acknowledgement: IMMEDIATELY	• Motor ID is downloaded wrong during manufacture. • The firmware of the servo drive does not support the Motor ID.	• Update the firmware. • Use a correct absolute encoder motor.
F52987: Absolute encoder replaced Reaction: OFF1 Acknowledgement: IMMEDIATELY	Incorrect absolute encoder data.	Contact the Hotline.

Alarm list

Alarm	Cause	Remedy
A1009: Control module over-temperature	The temperature of the control module (Control Unit) has exceeded the specified limit value.	• Check the air intake for the Control Unit. • Check the Control Unit fan. Note: The alarm automatically disappears after the limit value has been undershot.
A1019: Writing to the removable data medium unsuccessful	The write access to the removable data medium was unsuccessful.	Remove and check the removable data medium. Then run the data backup again.
A1032: All parameters must be saved	The parameters of an individual drive object were saved, although there is still no backup of all drive system parameters. The saved object-specific parameters are not loaded the next time that the system powers up. For the system to successfully power up, all of the parameters must have been completely backed up.	Save all parameters.

Alarm	Cause	Remedy
A1045: Configuring data invalid	An error was detected when evaluating the parameter files saved in the non-volatile memory. Because of this, under certain circumstances, several of the saved parameter values were not able to be accepted.	Save the parameterization in SINAMICS V-ASSISTANT using the "Copy RAM to ROM" function or on the BOP. This overwrites the incorrect parameter files in the non-volatile memory – and the alarm is withdrawn.
A1920: Drive Bus: Receive setpoints after To	Output data of Drive Bus master (setpoints) received at the incorrect instant in time within the Drive Bus clock cycle.	• Check bus configuration. • Check parameters for clock cycle synchronization (ensure To > Tdx). Note: To: Time of setpoint acceptance Tdx: Data exchange time
A1932: Drive Bus clock cycle synchronization missing for DSC	There is no clock synchronization or clock synchronous sign of life and DSC is selected. Note: DSC: Dynamic Servo Control	Set clock synchronization across the bus configuration and transfer clock synchronous sign-of-life.
A5000: Drive heat sink over-temperature	The alarm threshold for overtemperature at the inverter heat sink has been reached. If the temperature of the heat sink increases by an additional 5 K, then fault F30004 is initiated.	Check the following: • Is the surrounding temperature within the defined limit values? • Have the load conditions and the load duty cycle been appropriately dimensioned? • Has the cooling failed?
A7012: Motor temperature model 1/3 overtemperature	The motor temperature model 1/3 identified that the alarm threshold was exceeded.	• Check the motor load and reduce it if required. • Check the motor surrounding temperature.
A7441: LR: Save the position offset of the absolute encoder adjustment	The status of the absolute encoder adjustment has changed. In order to permanently save the determined position offset (p2525) it must be saved.	Not necessary. This alarm automatically disappears after the offset has been saved. See also: p2525 (LR encoder adjustment offset)
A7454: LR: Position value preprocessing does not have a valid encoder	The parameter configuration of encoder is incorrect.	Default the drive and re-configure the parameters.
A7455: EPOS: Maximum velocity limited	The maximum velocity (p2571) is too high to correctly calculate the modulo correction. Within the sampling time for positioning, with the maximum velocity, a maximum of the half modulo length must be moved through. p2571 was limited to this value.	Reduce the maximum velocity (p2571).
A7456: EPOS: Setpoint velocity limited	The actual setpoint velocity is greater than the parameterized maximum velocity and is therefore limited.	Decrease the actual setpoint velocity.
A7461: EPOS: Reference point not set	When starting a traversing block/direct setpoint input, a reference point is not set.	Reference the system (search for reference, flying referencing, set reference point).

Alarm	Cause	Remedy
A7469: EPOS: Traversing block < target position < software limit switch minus	In the traversing block the specified absolute target position lies outside the range limited by the software limit switch minus.	• Correct the traversing block. • Change software limit switch minus (p2580).
A7470: EPOS: Traversing block > target position > software limit switch plus	In the traversing block the specified absolute target position lies outside the range limited by the software limit switch plus.	• Correct the traversing block. • Change software limit switch plus (p2581).
A7471: EPOS: Traversing block target position outside the modulo range	In the traversing block the target position lies outside the modulo range.	• In the traversing block, correct the target position. • Change the modulo range (p29246).
A7472: EPOS: Traversing block ABS_POS/ABS_NEG not possible	In the traversing block the positioning mode ABS_POS or ABS_NEG were parameterized with the modulo correction not activated.	Correct the traversing block.
A7473: EPOS: Beginning of traversing range reached	When traversing, the axis has moved to the traversing range limit.	Move away in the positive direction.
A7474: EPOS: End of traversing range reached	When traversing, the axis has moved to the traversing range limit.	Move away in the negative direction.
A7477: EPOS: Target position < software limit switch minus	In the actual traversing operation, the target position is less than the software limit switch minus.	• Correct the target position. • Change software limit switch minus (CI: p2580).
A7478: EPOS: Target position > software limit switch plus	In the actual traversing operation, the target position is greater than the software limit switch plus.	• Correct the target position. • Change software limit switch plus (CI: p2581).
A7479: EPOS: Software limit switch minus reached	The axis is at the position of the software limit switch minus. An active traversing block was interrupted.	• Correct the target position. • Change software limit switch minus (CI: p2580).
A7480: EPOS: Software limit switch plus reached	The axis is at the position of the software limit switch plus. An active traversing block was interrupted.	• Correct the target position. • Change software limit switch plus (CI: p2581).
A7496: SON enable missing	• In the IPos control mode or a compound control mode with IPos, no servo on command is sent to the drive via Modbus when p29008 = 1. • In the IPos control mode, rising edge is triggered for the P-TRG signal when the drive is in servo off status. • In the PTI control mode, any faults which is caused by implementing the "Enable trial run" operation with the V-ASSISTANT lead to A7496.	• Send servo on command to the drive via Modbus • Set the drive to servo on status firstly and trigger a rising edge for the P-TRG signal. • Acknowledge the faults firstly and implement "Enable trial run" again.
A7576: Encoderless operation due to a fault active	Encoderless operation is active due to a fault.	• Remove the cause of a possible encoder fault. • Carry out a POWER ON (power off/on) for all components.

Alarm	Cause	Remedy
A7582: Position actual value preprocessing error	An error has occurred during the position actual vaule preprocessing.	Check the encoder for the position actual value preprocessing. Refer to F52931.
A7585: P-TRG or CLR active	In the PTI mode or a compound mode with PTI, the P-TRG or CLR function is activated.	In the PTI mode, deactivate the P-TRG or CLR function; in the compound mode with PTI, do not switch to other modes.
A7588: Encoder 2: Position value preprocessing does not have a valid encoder	The parameter configuration of PTI counter is incorrect.	Default the drive and re-configure the parameters.
A7805: Power unit overload I^2t	Alarm threshold for I^2t overload of the power unit exceeded.	• Reduce the continuous load. • Adapt the load duty cycle. • Check the assignment of the rated currents of the motor and motor module.
A7965: Save required	The angular commutation offset was re-defined and has still not been saved. In order to permanently accept the new value, it must be saved in a non-volatile fashion.	This alarm automatically disappears after the data has been saved.
A7971: Angular commutation offset determination activated	The automatic determination of the angular commutation offset (encoder adjustment) is activated. The automatic determination is carried out at the next power-on command.	The alarm automatically disappears after determination.
A7991: Motor data identification activated	The motor data ident. routine is activated. The motor data identification routine is carried out at the next power-on command.	The alarm automatically disappears after the motor data identification routine has been successfully completed. If a POWER ON or a warm restart is performed with motor data identification selected, the motor data identification request will be lost. If motor data identification is required, it will need to be selected again manually following ramp-up.
A30016: Load supply switched off	The DC link voltage is too low.	• Switch on the load supply. • Check the line supply if necessary.

Alarm	Cause	Remedy
A30031: Hardware current limiting in phase U	Hardware current limit for phase U responded. The pulsing in this phase is inhibited for one pulse period. • Closed-loop control is incorrectly parameterized. • Fault in the motor or in the power cables. • The power cables exceed the maximum permissible length. • Motor load too high. • Power unit defective. Note: Alarm A30031 is always output if, for a power unit, the hardware current limiting of phase U, V or W responds.	Check the motor data. As an alternative, run a motor data identification. • Check the motor circuit configuration (star-delta) • Check the motor load. • Check the power cable connections. • Check the power cables for short-circuit or ground fault. • Check the length of the power cables.
A31411: Encoder 1: Absolute encoder signals internal alarms	The absolute encoder fault word includes alarm bits that have been set.	• Check the encoder cable connection and make sure the cables are routed in compliance with EMC. • Check the motor temperature. • Replace the motor/encoder.
A31412: Error bit set in the serial protocol	The encoder sends a set error bit via the serial protocol.	• Carry out a POWER ON (power off/on) for all components. • Check that the cables are routed in compliance with EMC. • Check the plug connections. • Replace the encoder.
A52900: Failure during data copying	• Copying is halted. • The micro SD card/SD card was plugged out. • The drive is not in the stop state.	• Re-plug in the micro SD card/SD card. • Make sure the drive is in the stop state.
A52901: Braking resistor reaches alarm threshold	The heat capacity reaches the threshold (p29005) of the braking resistor capacity.	• Change the external braking resistor. • Increase deceleration time.
A52902: Emergency missing	Implement servo on when the emergency input (EMGS) is switched off.	Switch on the emergency input (EMGS) and then implement servo on.
A52932: PTO max limit	For incremental encoder, when PTO frequency exceeds 280K, drive will output A52932 to remind that exceed limitation. For absolute encoder, when PTO frequency exceeds 120K, drive will output A52932 to remind that exceed limitation.	Change PTO ratio.