F6 and S6 Warning and Error Messages

Standard inverter

Air cooler and liquid cooler

Input voltage 230VAC / 400 VAC // 325VDC / 565VDC

Table of Content

History of changes

Date	Version	Changed:	Page	Author:
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Safety Regulations

ESD Protection

Sensitivity to ESD and measures for protection
All IGBT or MOSFET power modules are sensitive to ESD (**E**lectro **S**tatic **D**ischarge) due to the thickness of their gate isolation (gate oxide layer), which amounts to some ten nanometers only. This is why they are classified as ESD (**E**lectrostactic **S**ensitive **D**evices) in accordance with EN 61340-5-1 and EN 61340-2-3 – i.e. devices which are prone to damage by electrostatic fields or electrostatic discharge during routine handling, testing and transportation. IGBT and power MOSFET with big chip areas are characterized by high input capacitances and, compared to small signal devices, are classified as minor sensitive components according to procedure 3015.6 of the MIL-STD 883C standard.
When handling IGBT or MOSFET power modules, the regulations set down in the aforementioned MIL standard, as well as those of DIN VDE 0843 T2, which is identical to IEC 801-2, must be adhered to. Inspection and further processing must always be carried out by suitably clothed staff (antistatic overalls, wrist strap, if available). Before ESD-sensitive components are processed, all transportation and assembly equipment, as well as PCBs must be adjusted to the potential of the ESD-sensitive components, and electrostatic re-charge must be prevented. For identification purposes, a warning label as specified in IEC 60417, reg. no. 5134 must be attached to packaging of electrostatic sensitive devices.

The power modules are supplied with gate and emitter / source terminals short-circuited by suitable conductive packaging, packaging lined with conductive foam or rubber mats, self-sealing metal foils, with annular rivets on the terminals or caps on the connectors. If possible, this short circuit should not be removed until connecting the gate.

Faults / Warnings Messages F6 and S6

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
0	no exception	No error	x	x	No release via the control word co.00
3	ERROR over current PU	Overcurrent detection in the power section has triggered, (e.g. short circuit, defective output stage)	x	x	Wiring at the inverter Check motor for short circuit Check wiring star / delta. Check earth fault. EMC interference on the motor cable / inverter. Motor cable too long. Acceleration time too short see parameter xyz, extend time. Disconnect motor cable from inverter, - If the error is still present with the motor disconnected motor is still present, the unit is defective and must be sent to KEB Service. be sent in. - Measure the power semiconductors according to the instructions.
4	ERROR over current analog	Overcurrent level on the control card exceeded (e.g. incorrect setting of the controllers or the torque limit characteristic)	x	x	Check the wiring on the inverter / motor for short circuits. Check for sluggishness of the drive. Acceleration time too short see parameter xyz, extend time.

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
5	ERROR over potential	Overvoltage in the DC link (e.g. deceleration ramp too fast, braking resistor not connected, braking transistor defective). Limit display => de31	x	x	Parameter pn32 braking transistor level set too high. Parameter is30 braking transistor function => the braking transistor is not activated. Delay time too short see parameter xyz / extend time. Braking resistor not connected correctly, or defective (high resistance). Input voltage too high, check input voltage. Poor controller adjustment Strongly fluctuating speed of the drive, check controller parameters xyz.
6	ERROR under potential	Undervoltage in the DC link Display of the default limit de32	x	x	If all input phases are connected to the terminals L1 / L2 (N) / L3. (Parameter de32) Incorrect connection of the braking resistor to the + and - terminals. Only occurs with short acceleration ramps, check motor / inverter dimensioning, avoid 1:1 dimensioning with controlled drives.
7	ERROR overload	Module overload (I2 t) => OL (long-term average current utilisation is above 100%)	x	x	Check for mechanical sluggishness of the drive. Acceleration time too short see parameter xyz, extend time. Is the brake switched on? (F6/S6 X1C pin 1/2)
8	reset E. overload	Reset of overload possible OL counter (ru29) < 50% of the warning level	x	x	Reset of error E.OL now possible.
9	ERROR overload 2	Module overload 2 (fast overload protection - defined by standstill continuous current and short-time limit current - has responded)	x	x	Check for mechanical sluggishness of the drive. Acceleration time too short see parameter xyz, extend time. Is the brake switched on? (F6/S6 X1C pin 1/2)

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
10	ERROR overheat powmod.	Overtemperature power semiconductor (heat sink)	x	x	Check the heat sink fan(s), clean or replace the fans if necessary. The inverters F6 7 - 9 are connected to the external 24V for the heat sink fans, is the power supply correctly rated 24V/4A? Are the fuses on the internal fan board OK? In the case of liquid coolers, does the solenoid valve for the coolant switch, or is there enough coolant in the system, vent the system.
11	reset E overheat pmod.	Overtemperature power semiconductor decayed (temperature 5° below OH level)	x	x	Reset of error E.OH now possible.
12	ERROR overheat internal	Overtemperature inside power section	x	x	Check the internal fan(s) / installation position of the unit, clean dirty fans, replace defective fans. Nevertheless, keep the control cabinet door closed
13	reset E. overheat internal	Overtemperature in the interior of the power unit has decreased	x	x	Resetting the E.OHI error is now possible.
14	ERROR motorprotection	Electronic (software) motor protection function has triggered	x	x	Check wiring of the motor Star or delta. Enter motor data correctly in the inverter, see parameter dr03/dr34. Is the brake switched on? (F6/S6 X1C pin 1/2)
15	reset E. motorprotection	Error Motor protection function can be reset	x	x	Reset of error E.OH2 now possible.
16	ERROR drive overheat	Temperature sensor in the motor (e.g. PTC or KTY) has tripped	x	x	Check connection of terminal TA1/TA2 Inverter (F6/S6 X1C A & K card pin 5/6, P card 9/10) Check connection to motor. Possible cable break Check if the correct temperature sensor is set in parameter dr33. Parameter pn14 Is the brake switched on? (F6/S6 X1C pin 1/2)
17	reset ERROR drive overheat	Motor overtemperature decreased	x	x	Reset of error E.dOH now possible.
18	ERROR overspeed	Overspeed (speed > pn26 * nominal speed)	x	x	Is the encoder line number (encoder1 or encoder2) set correctly in parameter ec29? Is the encoder cable correctly routed / EMC?

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
20	ERROR drive data	Error in motor data specification (Normalsiatuation of the motor data triggered an error => motor data do not match)	x	x	Check the set motor data, see parameter xyz. Check star / delta wiring Is the brake switched on? (F6/S6 X1C pin 1/2)
21	ERROR motordata not stored	Motor data has not yet been confirmed with dr99	x	x	Confirm parameter dr99.
22	ERROR ident	An error occurred during identification (Info on the type of error in dr57)	x	x	See explanations in parameter dr57 / ident error info. Is the brake switched on? (F6/S6 X1C pin 1/2)
23	ERROR speed diff	Speed difference greater than level (monitoring of the difference between the setpoint speed and the actual speed directly before the speed governor within a parameterisable time has addressed pn38/pn39)	x	x	Adjusting the controllers Change value in pn38 / 39 Is the encoder correctly connected to the motor shaft Check the set and actual speed (parameters ru08/ru09) Is the brake switched on? (F6/S6 X1C pin 1/2)
24	ERROR fieldbus memory	Faulty drive software configuration	x	x	Contact the KEB service department
27	WARNING overload	Module overload ru29 (I2 t function) > pn03 OL warning level	x	x	The drive is outside the programmed limit Parameter pn03 Is the brake switched on? (F6/S6 X1C Pin 1/2)
28	reset W. overload		x	x	Reset of the warning EOL now possible.
29	WARNING overload 2	Module overload 2 ru27 (fast overload protection) > pn05 OL2 warning level	x	x	The drive is outside the programmed limit Parameter pn05 Is the brake switched on? (F6/S6 X1C Pin 1/2)
30	WARNING overheat powmod.	Heat sink temperature ru25[1], ru25[2] or ru25[3] > pn07	x	x	The drive is outside the programmed limit Parameter pn07
31	reset W. overheat pmod.		x	x	Reset of the warning EOH now possible.
32	WARNING overheat intern.	Interior temperature ru26[1], ru26[2], ru26[3] or ru77 > pn09	x	x	The drive is outside the programmed limit Parameter pn09
33	reset W. overheat intern		x	x	Reset of the warning EOHI now possible.

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
34	WARNING motorprotection	motor protection counter ru32 > pn15 OH2 warning level	x	x	The drive is outside the programmed limit Parameter pn15 Check settings in dr34-dr39. Check for sluggishness of the drive. Is the brake switched on? (F6/S6 X1C pin 1/2)
35	reset W. motorprotection		x	x	Reset of warning EOH2 now possible. For more information see Plaintext 34
36	WARNING drive overheat	KTY: ru28 motor temperature > pn11 dOH warning level PTC: PTC status (ru28) = PTC open If "warning" is programmed as the error response in pn12, ru03 switches to ERROR status after the dOH delay time pn13 has elapsed.	x	x	The drive is outside the programmed limit Check motor temperature sensor type Parameter pn14 / pn28
37	reset W. drive overheat		x	x	Reset of the EdOH warning now possible.
38	ERROR memory size	Faulty drive software configuration	x	x	Contact the KEB service department
39	ERROR power unit software version	Invalid checksum of the parameter area (en115) Incorrect power unit CPU software			Contact the KEB service department
40	ERROR FPGA conf.	FPGA configuration failed	x	x	Contact the KEB service department
41	ERROR safety module SACB comm.	No communication with the safety module (only control type A or P)	x	x	Contact the KEB service department
42	ERROR power unit SACB comm.	No communication with the power unit (from enclosure size F6-6 – 7)	x		Contact the KEB service department
43	ERROR enc.intf. SACB comm.	No communication with encoder interface	x		Contact the KEB service department
44	ERROR invalid power unit data	Incorrect power part data (en26/en27)	x	x	Contact the KEB service department
45	ERROR power unit reset	Power unit in reset state			Contact the KEB service department
46	ERROR power unit Vref	Reference voltage Temperature measurement invalid			Contact the KEB service department
47	ERROR power unit flash	The plausibility check of the flash memory of the power unit CPU has reported an error	x		Contact the KEB service department
48	ERROR power unit CPU	Internal error power section CPU			Contact the KEB service department
49	ERROR license invalid		F6-P	S6-P	Contact the KEB service department

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
51	ERROR heartbeat		X	X	CAN heartbeat signal failed (check heartbeat settings pn23 and address 0x1016, 0x1017)
52	ERROR undervoltage phase	Phase failure at mains input (L1,L2,L3)	x	x	Measure input voltage at terminals Measure L1 ... L3, possibly defective back-up fuse, PKZ has tripped or DC link voltage ripple too high due to application (acceleration / braking)
55	ERROR safety module	The safety module has reported an error	x	x	The safety module is in an error status. Contact the KEB service or the machine builder.
56	ERROR software switch left	Software limit switch has triggered error	x	x	Check the programming of the software limit switches
57	ERROR software switch right		x	x	
58	ERROR fieldbus watchdog	Fieldbuswatchdog has responded	x	x	Are the RJ45 plugs correctly plugged in, cable break, possible EMC interference?
59	ERROR prg. input	Error via programmable input	x	x	If no deliberate action: Check wiring, programming of digital inputs
60	ERROR safety module type changed	the safetymodule was replaced without authorisation	x	x	Contact the KEB service department
61	ERROR safety module changed	Safety module changed (de37 / de38)	x	x	
62	ERROR power unit changed	Power unit changed (de20 / de21)	x		Contact the KEB service department
63	ERROR enc. intf. changed	Encoder interface changed (en48)			Contact the KEB service department
64	ERROR power unit type changed	Power unit type changed (de26 / de27)	x		Contact the KEB service department
65	ERROR enc. intf. version	Invalid version of the encoder interface	x		Contact the KEB service department
66	ERROR overcurrent PU	Overcurrent power unit	x	x	Contact the KEB service department
67	ERROR max acc/dec	Maximum acceleration/deceleration specification exceeded (monitoring especially necessary for cyclic synchronous operating modes)	x	x	Checking the setpoint input and the ramp settings
68	ERROR overcurrent Brake	Overcurrent on the brake output	x	x	Check the brake output for short circuit, disconnect the connector from the control card. (F6/S6 X1C pin 1/2)
83	ERROR Limit Switch Forward	Positive (hardware) limit switch triggered	x	x	Check the limit switches, wiring / position / possibly the limit switches are interchanged.

Display text Parameter ru01 / ru02 /ru03		Description		F6	S6	Possible cause / workaround
84	ERROR Limit Switch Reverse	Negative (hardware) limit switch triggered		x	x	Check the limit switches, wiring / position / possibly the limit switches are interchanged.
85	ERROR Override Limit Switch Forward	Positive (hardware) limit switch overrun by hm19		x	x	Check stopping process in application Limit switch (control, ramp profile)
86	ERROR Override Limit Switch Reverse	Negative (hardware) limit switch overrun by hm20		x	x	Check stopping process in application Limit switch (control, ramp profile)
87	ERROR Limit Switch	Either both (hardware) limit switches tripped or one (hardware) limit switch tripped and only the actual direction of rotation corresponds to limit switch direction		x	x	Check the limit switches, wiring / position / possibly the limit switches are interchanged.
88	ERROR power off end					Power Off Funktion Einstellung überprüfen (cu 32 Subindex 7 … Status Power Off Funktion)
89	ERROR at encoder type change	Incompatible encoder interface and drive software versions		x		Contact the KEB service department
90	ERROR enc.intf.fast comm.	Communication error control card encoder interface		x		Contact the KEB service department
91	init encoder interface	Encoder interface in initialisation routine		x	x	Contact the KEB service department
92	ERROR encoder A	Error encoder A	Hardware defect or incorrect setting of the encoder parameters (type, line count, etc.)	x	x	Geberkabel überprüfen, ist der Geber korrekt mit der Motorwelle verbunden
93	ERROR encoder B	Error encoder B		x	x	Encoder A -X3A / Encoder B -X3B (F6/S6)
94	init encoder A	Inialisation of encoder A in progress		x	x	Check encoder wiring Check setting of ec16
95	init encoder B	Initialisation encoder B running		x	x	Check encoder wiring Check setting of ec16
96	ERROR encoder missing	In a mode that requires an encoder, no encoder type is selected in ec16.		x	x	Control ec16 setting
97	ERROR overspeed (EMF)	pn72 overspeed level (EMF) has been exceeded		x	x	Checking the setpoint speed, Overshoot speed control. Fault in actual encoder value.
98	ERROR encoder A changed	Encoder A changed	Serial number read from the encoder does not correspond to the stored serial number (ec48 != ec49)	x	x	The correct serial number of the encoder in parameter - ec48 = encoder 1 (A) - ec49 = encoder 2 (B).
99	ERROR encoder B changed	Encoder B changed		x	x	

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
100	ERROR overcurrent out1	Surge on the digital output 1	x	x	Check whether there is an overload/short circuit on digital output 1 of the control card. F6 / S6 devices A- Card X2A Pin 11 (100mA) K- board X2A pin 17 (100mA) P- board X2A pin 10 (100mA)
101	ERROR overcurrent out2	Surge on the digital output 2	x	x	Check whether there is an overload/short circuit on digital output 2 of the control card. F6 / S6 devices A- Card X2A Pin 12 (100mA) K- Card X2A Pin 19 (100mA) P- Card X2A Pin 12 (100mA)
102	ERROR overcurrent out3	Surge on the digital output 3	x	x	Check whether there is an overload / short circuit on digital output 3 of the control card. F6 / S6 devices K - Card X2B Pin 5 (100mA)
103	ERROR overcurrent out4	Surge on the digital output 4	x	x	Überp Check whether there is an overload/short circuit on digital output 4 of the control card. F6 / S6 devices K - Card X2B Pin 6 (100mA)
104	ERROR overcurrent fan		x	x	Check if a fan is blocked or if there is another defect. Disconnect the fan from the plug contact and replace the defective fan.
105	ERROR overcurrent encoder	Overcurrent at the encoder interface	x	x	Check encoder data sheet Check permissible total current Short circuit in encoder / encoder cable Is the correct encoder voltage set in parameter ec14?
106	ERROR overcurrent 24V	Overcurrent on the 24V outputs of the control terminal strip	x	x	Check the permissible load at the output.
107	ERROR over frequency	The maximum output frequency de120 has been exceeded. (599Hz)	x	x	Reduce setpoint (associated frequency must have safety distance to de120) Check control performance Check system position with synchronous machine (in case of uncontrolled acceleration)
108	reset E. overheat intern CB	Overtemperature control card decayed	x		ERROR overheat internal CB has occurred => check temperature in the control cabinet, max. 45°C
109	ERROR overheat internal CB	Overtemperature inside control board	x		Check temperature in the control cabinet, max. 45°.
110	ERROR OH ramp	Maximum time available between the occurrence of an overtemperature error and the modulation switch-off has expired.	x	x	Deceleration ramp after ERROR OH exceeds 2 seconds time limit

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
111	ERROR OHI ramp	Maximum time available between the occurrence of an overtemperature error and the modulation switch-off has expired.	x	x	Deceleration ramp after ERROR OHI exceeds 2 seconds time limit
112	ERROR 24V supply low	24V supply has dropped to a value lower than 18V	x		Check the external 24V supply on the control card
114	ERROR ext 24V low		x	x	Check the external 24V supply at the control board => dips due to overload?
115	ERROR GTR7 always OFF	GTR7 can no longer be switched on	x		Check braking resistor, or deactivation is 30 if no braking resistor is connected.
116	ERROR GTR7 OC	UCE monitoring GTR7 reports OC	x		Short circuit / earth fault at terminals + / R, the braking resistor has a short circuit. Disconnect the defective braking resistor.
117	ERROR GTR7 always ON	GTR7 can no longer be switched off	x		Check braking resistor, or deactivate is 30 if no braking resistor is connected. Disconnection from the mains may be necessary.
118	OC at 5V diag	Short circuit of the 5V at the diagnostic interface	x	x	Contact the KEB service department
119	ERROR extreme overpotential	extreme overvoltage in the DC link (can lead to damage of the DC capacitors)	x	x	Extreme overvoltage Causes: faulty filter wiring / parameterisation Uncontrolled run-up of a synchronous motor Defective unit => check / repair at KEB.
120	ERROR DC capacitor damaged	DC capacities have been damaged by too long / high overvoltage in the intermediate circuit	x	x	The device is broken, the device must be sent to KEB for inspection/repair.
121	ERROR runtime	Activation of too many functions. => Runtime monitoring	x	x	Contact the KEB service department
122	ERROR underpotential 2	Error when the transition of the status machine is requested after "switched on" and after the delay time in ru04 supply unit state the status "run" has not yet been reached.	x	x	Missing mains voltage, checking the timing of mains connection and activation
123	ERROR LT ready	e An error is triggered if the "Ready" signal of the power unit goes away during activated modulation.	x		Hochspannungsversorgung überprüfen, EMV Störungen, Kabelführung der Motor und Steuerleitungen ändern.
123	ERROR PU ready		x		
124	General Fieldbus Error	General fieldbus error (analysis via parameter fb91 fieldbus error code)	x	x	The fieldbus has reported an error. Problem analysis via fb91
125	ERROR Fieldbus type changed	The selected fieldbus type in fb68 fieldbus selection has been changed, the new fieldbus type cannot yet be used	x	x	The selected fieldbus type in fb68 fieldbus selection has been changed and a PowerOn reset has not yet been performed.

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
126	ERROR overheat 2 powmod.	Heat sink over temperature (2)	x		Overtemperature cooling 2 => Check whether sufficient cooling of the heat sink is ensured (fan function, ambient or coolant temperature, overload of the inverter). (fan function, ambient or coolant temperature, overload of the inverter)
127	reset E. overheat 2 pmod.	Overtemperature heat sink (2) decayed	x		Overtemperature cooling 2 was previously active Reasons and remedy see ERROR 126
128	ERROR overheat 3 powmod.	Heat sink over temperature (3)	x		Overtemperature cooling 3 => Check whether sufficient cooling of the heat sink is guaranteed (fan function, ambient or coolant temperature). (fan function, ambient or coolant temperature)
129	reset E. overheat 3 pmod.	Overtemperature heat sink (3) decayed	x		Overtemperature cooling 3 was previously active Reasons and remedy see ERROR 129
130	ERROR overheat 2 internal	Overtemperature interior (2)	x		Overtemperature interior 2 (fan function, ambient temperature, overload)
131	reset E. overheat 2 intern	Overtemperature inside (2) subsided	x		Overtemperature interior 2 was previously active Reasons and remedy see ERROR 130
132	ERROR overheat 3 internal	Overtemperature interior (3)			Overtemperature interior 3 (fan function, ambient temperature, overload)
133	reset E. overheat 3 intern	Overtemperature inside (3) subsided			Overtemperature interior 3 was previously active Reasons and remedy see ERROR 133
134	ERROR Safety Stop	Safety module reports reaction SS1 or SS2	x	x	An error has been triggered because the safety module has reached the SS! or SS2 status. (Can be activated via pn80)
135	ERROR File Code	P card only: invalid file code	x		Contact the KEB service department
136	ERROR blockade detected	ERROR Drive blockade triggered	x	x	Ramp output value higher than actual value. Check the drive for a blockage.
137	warning blockage	Warning drive blockage	x	x	A blockade reaction has been addressed Warning" is programmed as a reaction to the blockade status
138	warning PUready	Warning Power unit not ready	x		Check mains voltage supply

Display text Parameter ru01 / ru02 /ru03		Description	F6	S6	Possible cause / workaround
139	ERROR STO	STO in the safetymodule is active	x	x	Check parameterisation of safety module, STO wiring or check application, as STO may have triggered correctly.
140	ERROR Fail Safe	Fail Safe in the safety module is active	x	x	Check parameterisation of safety module or application

Note

Disclaimer

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Inspection of our units in view of their suitability for the intended use must be done generally by the user. Inspections are particular necessary, if changes are executed, which serve for the further development or adaption of our products to the applications (hardware, software or download lists). Inspections must be repeated completely, even if only parts of hardware, software or download lists are modified.

Application and use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the user.

KEB Automation KG
Südstraße 38 ● D-32683 Barntrup
fon: +49 5263 401-0 ● fax: +49 5263 401-116
www.keb.de ● **email:** knowledge@keb.de