

## Error description for GP-Centrifuge family

<b>Error code</b>	E-01	System clock pulse unstable
<b>Caused by</b>	Defective crystal or microcontroller on main board.	
<b>Centrifuge behavior</b>	Drive system is switched off, rotor coasts until complete stop.	
<b>Error code</b>	E-02	Invalid state of the main state machine detected
<b>Caused by</b>	Defective microcontroller on main board.	
<b>Centrifuge behavior</b>	Drive system is switched off, rotor coasts until complete stop.	
<b>Error code</b>	E-03	Stack overflow detected
<b>Caused by</b>	Defective microcontroller on main board.	
<b>Centrifuge behavior</b>	Drive system is switched off, rotor coasts until complete stop.	
<b>Error code</b>	E-04	Stack underflow detected
<b>Caused by</b>	Defective microcontroller on main board.	
<b>Centrifuge behavior</b>	Drive system is switched off, rotor coasts until complete stop.	
<b>Error code</b>	E-05	System reset by hardware watchdog
<b>Caused by</b>	Defective microcontroller on main board.	
<b>Centrifuge behavior</b>	The hardware watchdog will reset the software. If the rotor is spinning after reboot, it will coast until completely stopped.	
<b>Error code</b>	E-06	Reserved for use in other instruments
<b>Error code</b>	E-07	Reserved for use in other instruments
<b>Error code</b>	E-08	Program code checksum error
<b>Caused by</b>	Defective flash memory in the microcontroller on main board.	
<b>Centrifuge behavior</b>	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped.	
<b>Error code</b>	E-09	Invalid checksum for transmitted external data
<b>Caused by</b>	Defective data in external memory on main board. Defective external memory chip on main board.	
<b>Centrifuge behavior</b>	Drive system is switched off, rotor coasts until complete stop.	
<b>Error code</b>	E-10	No communication with external memory
<b>Caused by</b>	Defective external memory chip on main board. External memory on main board not installed.	
<b>Centrifuge behavior</b>	Drive system is switched off, rotor coasts until complete stop.	
<b>Error code</b>	E-11	Data in external memory not valid for this instrument
<b>Caused by</b>	Wrong external memory chip installed on main board.	
<b>Centrifuge behavior</b>	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped.	
<b>Error code</b>	E-12	Checksum error in factory settings
<b>Caused by</b>	Defective external memory chip on main board.	
<b>Centrifuge behavior</b>	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped.	

Error code	E-13	Checksum error in user defined settings
Caused by	Defective external memory chip on main board. Centrifuge switched off during write access to external memory.	
Centrifuge behavior	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped. Software will try to recover from error during next boot process.	

Error code	E-14	Measured chamber temperature above limit
Caused by	Defective temperature sensor. Not enough refrigerant in cooling system. Compressor not working.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-15	Temperature sensor not connected
Caused by	Temperature sensor not connected or defective. Broken cable temperature sensor.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-16	Temperature sensor shorted
Caused by	Temperature sensor defective.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-17	Maximum speed for automatic rotor identification exceeded
Caused by	Start pressed with coasting rotor above 4700rpm. Defective main board.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	

Error code	E-18	Bucket not defined for identified rotor
Caused by	Selected bucket is not defined for the identified rotor.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	

Error code	E-19	Identified rotor not in the list of allowed rotors
Caused by	Rotor not intended to be use in this centrifuge. Wrong external memory chip installed on main board.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	

Error code	E-20	No valid rotor identification found
Caused by	Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	

Error code	E-21	No rotor identification signal detected
Caused by	Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board. Defective main board.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	

Error code	E-22	No valid signal for speed measurement detected
Caused by	Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board. Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-23	Secondary speed measurement failed
Caused by	Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board. Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-24	Lid latch blocked
Caused by	Lid latch blocked by obstacles. Defective lid latch. Defective main board.	
Centrifuge behavior	Error occurs while rotor is not spinning.	

Error code	E-25	Timeout opening lid latch
Caused by	Lid latch micro switch defective. Broken cable lid latch. Bad connection to main board. Defective main board.	
Centrifuge behavior	Error is detected while rotor is not spinning.	

Error code	E-26	Timeout closing lid latch
Caused by	Lid latch micro switch defective. Broken cable lid latch. Bad connection to main board. Defective main board.	
Centrifuge behavior	Error is detected while rotor is not spinning.	

Error code	E-27	Illegal state information for lid latch
Caused by	Lid latch micro switch defective. Defective main board.	
Centrifuge behavior	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped.	

Error code	E-28	Drive system motor spins in wrong direction
Caused by	Wrong connection of drive system motor.	
Centrifuge behavior	Error occurs immediately after run has been started. Drive system is switched off, rotor coasts until complete stop.	

Error code	E-29	Drive system motor did not start spinning
Caused by	Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board. Defective main board.	
Centrifuge behavior	Error occurs immediately after run has been started. Drive system is switched off, rotor coasts until complete stop.	

Error code	E-30	Reserved for use in other instruments
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Error code	E-31	Drive system motor overtemperature
Caused by	Temperature sensor in motor has tripped. Bad connection of motor cable to main board. Broken cable motor temperature sensor. Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-32	Electronics overtemperature
Caused by	Temperature sensor main board has tripped. Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-33	Cooling system overpressure
Caused by	Air inlet blocked. Condenser fan not working. Bad connection of pressure sensor cable to main board. Broken cable pressure sensor. Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-34	Frequency converter voltage above upper limit
Caused by	Brake resistor not connected or defective. Temperature protection of brake resistor activated. Bad connection of brake resistor to main board. Broken cable brake resistor. Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-35	Frequency converter overcurrent occurred.
Caused by	Defective drive system motor. (windings short) Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-36	Frequency converter protection system activated
Caused by	Defective drive system motor. (windings short) Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-37	Reserved for use in other instruments
Error code	E-38	Reserved for use in other instruments
Error code	E-39	Reserved for use in other instruments
Error code	E-40	Poor acceleration of rotor detected
Caused by	Rotor extensively imbalanced. Defective drive system motor. (windings short, too much friction) Defective main board.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	
Error code	E-41	Invalid input signal imbalance detection
Caused by	Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board. Defective main board.	
Centrifuge behavior	Error is detected while rotor is not spinning.	
Error code	E-42	Reserved for use in other instruments
Error code	E-43	Reserved for use in other instruments

Error code	E-44	DC link voltage low
Caused by	Low line voltage Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-45	Drive system safety test failed.
Caused by	No rotor installed and centrifuge switched off after start pressed. Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board. Defective main board.	
Centrifuge behavior	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped.	

Error code	E-46	Reserved for use in other instruments
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Error code	E-47	Reserved for use in other instruments
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Error code	E-50	Reserved for use in other instruments
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Error code	E-60	Reserved for use in other instruments
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Error code	E-61	Lid latch protection system failed
Caused by	Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-62	Reserved for use in other instruments
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Error code	E-63	Reserved for use in other instruments
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Error code	E-64	Reserved for use in other instruments
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Error code	E-65	Reserved for use in other instruments
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Error code	E-66	Reserved for use in other instruments
Error code	E-67	Reserved for use in other instruments
Error code	E-68	Reserved for use in other instruments
Error code	E-69	Reserved for use in other instruments
Error code	E-70	Internal microcontroller software trap occurred
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-71	Software initiated system reset.
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	The software has reset the centrifuge. If the rotor is spinning after reboot, it will coast until completely stopped.	
Error code	E-72	Illegal state during rotor identification occurred
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	
Error code	E-73	Illegal user interface identification
Caused by	Defective data in external memory on main board. Defective external memory chip on main board. Defective microcontroller on main board.	
Centrifuge behavior	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped.	
Error code	E-74	Drivers of lid latch motors in error state
Caused by	Defective lid latches. Defective main board.	
Centrifuge behavior	Error is detected while rotor is not spinning.	
Error code	E-75	Microcontroller RAM test failed
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Error is detected during boot process. If the rotor is spinning after reboot, it will coast until completely stopped.	
Error code	E-76	DC link not disconnected from line voltage
Caused by	Defective main board.	
Centrifuge behavior	Error is detected while lid is open.	
Error code	E-77	Changed microcontroller configuration detected
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-78	Set speed above maximum rotor speed
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-79	Actual speed above maximum rotor speed
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	

Error code	E-80	Invalid identified rotor ID used for memory access
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-81	Invalid maximum rotor speed detected
Caused by	Defective microcontroller on main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-82	Reserved for use in other instruments
Error code	E-83	Reserved for use in other instruments
Error code	E-84	Reserved for use in other instruments
Error code	E-85	Reserved for use in other instruments
Error code	E-86	Reserved for use in other instruments
Error code	E-87	Reserved for use in other instruments
Error code	E-88	Reserved for use in other instruments
Error code	E-89	Reserved for use in other instruments
Error code	E-90	Reserved for use in other instruments
Error code	E-91	Reserved for use in other instruments
Error code	E-92	Reserved for use in other instruments
Error code	E-93	Reserved for use in other instruments
Error code	E-94	Reserved for use in other instruments
Error code	E-95	Reserved for use in other instruments
Error code	E-96	Reserved for use in other instruments
Error code	E-97	Lid latch monitoring circuit signals error condition
Caused by	Lid latch opened manually while centrifuge switched on. Lid latch micro switch defective. Broken cable lid latch. Bad connection to main board. Defective main board.	
Centrifuge behavior	Drive system is switched off, rotor coasts until complete stop.	
Error code	E-98	Imbalance detected
Caused by	Imbalanced rotor. Defective rotor identification board. Broken cable rotor identification board. Bad connection to main board. Defective main board.	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	

Error code	E-99	Centrifuge stopped because of set speed mismatch
Caused by	Entered set speed above maximum rotor speed. (Value entered before rotor had been identified.)	
Centrifuge behavior	Centrifuge starts decelerating using the fastest deceleration profile.	