3.3. FAULT CODES

When certain faults are detected an audible alarm is switched on in addition to a code and a message.

According to the fault, the machine stops automatically under the conditions indicated in the following table.

Code	Reason	Comments/exit
ERR 1	During rotation measured speed suddenly = zero.	Tacho info considered unreliable. Cycle stops without braking. Lid opening impossible for 10 minutes.
ERR 2	Values of successive speed measurements too different.	Idem code 1
ERR 3	Run does not function normally.	Idem code 1
ERR 4	Non zero speed when machine is switched on.	Machine expects to see zero spin. Exit = press a key or open the lid.
CLOSE LID ERR 5	Lid unlocked when START selected.	Start impossible Exit : press ENTER.
ERR 6	Lid unlocked during rotation	Run stopped using brake. Exit : press ENTER.
ERR 7	Imbalance detected	Idem code 6
ERR 8	Motor overtemperature (above 120°C)	Idem code 6
ERR 9	Chamber overtemperature (above 50°C).	Idem code 6
ERR 10	Operating anomaly	The machine is blocked and the keyboard is dead. Exit = Switch off the machine.

3.4. TROUBLESHOOTING CHART

Preliminary remark : when a fault is reported, first carry out the appropriate functional test, then refer to the troubleshooting chart below.

Problem	Possible cause	Remedy
1) No control active and no indicator lights ON.	No voltage being applied to the centrifuge.	Check mains outlet and power cable.
	Fuses blown (C3*i*).	Check for short circuits. Check the absence of short circuits with an ohm-meter (mains cable disconnected). Reset the circuit breaker (replace as required).
	Switching of the line differential (CR3*i*).	Check the insulation between the mains and the earth of the centrifuge.
	Short circuit at the power level.	Disconnect the mains wires arriving at the µP p.c.b. If there is still a short circuit at this level change the µP board or the capacitor. Check the connections.
	Short circuit on the +5V.	Check the presence of +5 V on the mother board with the board disconnected from the display board. If +5 V is present change the display board. If +5 V is absent check the resistance between the µP board earth and +5 V with the ohm-meter. If the resistance is zero, change the µP board. If not zero, carry out the following test.
	Absence of low voltage on the µP board.	Check the presence of alternating voltages on the transformer output.
	Faulty display.	Check the cables/connectors linking the µP board to the display card.
2) All controls inoperative. The display is lit up without information.	Faulty microprocessor board.	Check the cables/connectors to the display. Check the correct positioning: - of the EPROM on the µP board - of the microprocessor on the µP board.
3) Compressor test incorrect (CR3*i*).	Control fault.	Check the voltage applied to the compressor terminals. If not apparent or if incorrect, change the control board. If no effect, change the mother board. If correct (230 or 120 V according to the version) change the condenser and/or the compressor start-up relay. If no effect the compressor coils.
	Faulty compressor or its accessories.	
4) Lid lock solenoid test incorrect.	Control fault.	Check the voltage applied to the solenoid terminals. If not apparent or incorrect (far from 24 VDC) change the mother board or the transformer.
	Faulty solenoid.	If the voltage is correct, change the solenoid.

Problem	Possible cause	Remedy
5) Tacho test incorrect.	Faulty tacho.	Check the presence of a signal at the input to the mother board (with an oscilloscope or DC voltmeter). Pulses should appear every 12 sec. If absent or incorrect, change the tacho.
	Faulty µP board.	If the pulses are correct, change the µP board.
	Failure of the motor bearings.	Check by hand that the motor turns freely.
6) Vibrations.	Imbalanced load not detected.	Check and adjust, if necessary, the sensitivity of the imbalance detector (see ch. 5.1). If necessary, change the imbalance board.
	Incorrectly fitted rotor.	Check the condition of the drive shaft collet (plastic piece at base of shaft) and the spring washers placed below the collet. Change these pieces if necessary. Grease the washers. N.B. The shaft collet must slide freely on the drive shaft.
	Defective shock absorbers on motor.	Change shock absorbers.
	Defective or poorly fitted motor “nose” seal.	Change or refit the seal. Pay careful attention to positioning and gluing it.
	Failure of the motor bearings.	Check by hand that the motor turns freely and without noise or abnormal friction. If necessary change the motor.
7) Starting impossible. All controls and display are operational.	µP board power bridge broken down.	Change the µP board.
	Defective start switch.	Change the keyboard.