

Protocol III : Troubleshooting and Repair

Equipment	CONCENTRATOR O2 (De Vilbiss 525KS) EEMDCONE4— (old model : 515KS / 515AKS)
Responsible	(Log) Biomed Service



CAUTION: oxygen is highly flammable; do not smoke while conducting repairs. Work in a dust-free environment and away from incandescent objects and sources of sparks. Do not apply grease to any of the components of the O2 concentrator



WARNING: when operating the machine without the covers, keep your fingers away from the compressor. Pay attention not to allow loose clothing to get caught in the compressor.



WARNING: Electric Shock Hazard. Do not touch the terminals of the capacitor. Discharge the capacitor by short-circuiting the terminals with a screwdriver. The capacitor may hold a charge for several days after the unit is switched off.

NOTE: Ensure that the humidifier is fitted properly and that it is clean. Humidifiers that haven't been changed regularly can get obstructed and trigger an alarm. Further troubleshooting should be done without humidifier.

Troubleshoot device malfunction

Observed condition	Actions
- Compressor not starting when unit is switched on - Fan not running	Check power chord, replace if broken. Check circuit breaker (on the front panel), press to reset. Check input voltage (A). Check fuse on PC-board, replace if burnt (B). Check the power switch, replace if broken.
- Compressor not starting when unit is switched on - Fan running	Check compressor input voltage. No voltage: - Check for unplugged internal electrical connections. Voltage present: - Replace the capacitor (C). - Test the compressor (D). Service or replace if necessary.
- Compressor running and flow: 4 l/min And any one, or a combination of, the following: - Low oxygen concentration - Pressure relief valve activated - Fluctuating oxygen flow	Verify if start-up test is OK (4 light + beep), if not OK verify fuse and PC-board (B). Verify output pressure, if outside 8-9 psi: adjust pressure regulator (see technical maintenance protocol). Replace if broken. Verify that there aren't any broken or unplugged hoses and hose connectors, replace if necessary. Check filters and valves for leaks (leaks can be detected with sound or touch, do not use liquids). Clean or replace filters, change broken valves. Continued on next page....

	Check the function of the 4-way valve (particularly if the hours count is above 10'000h): – It should switch the flow from one sieve to the other every 5-6 seconds with an air-exhaust sound. – Check that the sieve bed pressure alternate every 5-6seconds (E) If it does not (no switching or constant switching) : Verify that the 2 cables between board and valve are connected. Verify the PC-board fuse (B), change if necessary Change the 4-way valve If the problem persists: change the PC-board Replace the sieve beds (particularly if the hours count is well above 5'000h) Test the compressor (D). Service (maintenance kit) or replace if necessary Check the flow meter, replace if broken
– Compressor running – Excessive noise	If the noise is caused by pressure relief valve, it is because something is blocking the flow <u>after</u> the compressor. Either the 4-way valve or the sieve beds. See points above. Check the motor mounts, replace if worn out or broken Test the compressor (D) Service or replace the compressor if necessary

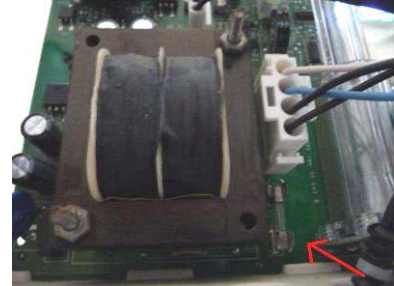
NOTE: Should the problem not be solved by following the instructions in this protocol, refer to the troubleshooting section of the service manual. For instruction on how to change the parts, refer to the “component testing, repair, and replacement” section.

A	Check input voltage
Equipment Multi-meter Parts Spare power cable (if needed) Duration 5 min	1 • Unplug the power chord for the device. • Set the multi-meter to <u>AC-voltmeter</u>. • The measured voltage should be 230V +/- 10V. • If not check the building's power supply. 

B Check/change the PC-board fuse

Equipment Multi-meter
Parts Spare fuse (if needed)
Duration 5 min

- 1
 - Turn off and unplug the device from the power supply.
 - Remove the covers.
 - The fuse is located on the PC-board (see arrow on the figure).
 - Remove the fuse.



- 2
 - Set the multi-meter to ohms.
 - Check the impedance of the fuse, it should be 0 or close to 0.
 - If the meter indicates an open circuit, replace the fuse with one of the same specification.

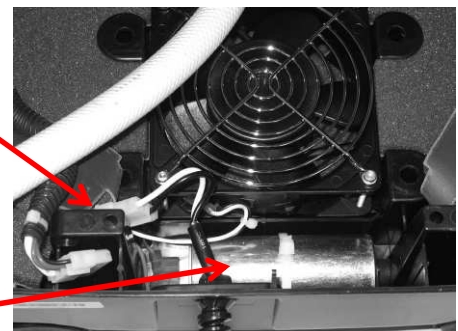


NOTE: Replacing the fuse with one of a different rating could damage the equipment!

C Replace the capacitor

Equipment screwdriver, cable tie
Parts Spare capacitor 10 mf
Duration 20 min

- 1
 - Turn off and unplug the concentrator.
 - Remove front and back covers.
- 2
 - Remove the compressor.
 - Disconnect the two wires from the terminals on the capacitor.
 - Discharge the capacitor by short-circuiting the two terminals with a metal object (e.g. screwdriver)
 - Cut the nylon cable tie holding the capacitor in place and remove the capacitor.
- 3
 - Reconnect the wires to the new capacitor.
 - Install the new capacitor and secure with a new cable tie.
 - Put the compressor back in place.



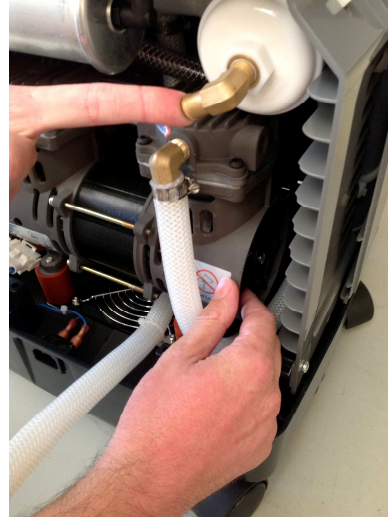
D Test the compressor

Equipment none
Parts none
Duration 10 min



WARNING: Turn off and unplug the concentrator before doing this test!

- 1**
 - Disconnect the tube from the output of the compressor.
 - Close the outlet with your finger.
- 2**
 - Turn the rotor by hand; the rotor should be gradually harder to turn due to the pressure increase.
 - If the pressure does not build up, service (maintenance kit) or change the compressor according to the instructions in the service manual.



E Test the sieve bed output

Equipment None
Parts None
Duration 5 min

- 1**
 - Remove the caps from the test points of each of the sieve beds.
 - Switch on the machine.
- 2**
 - Cover both test points with your fingers to feel if the pressure increases and decreases.
 - Each sieve bed should be under pressure alternately, changing approx. every 5-6 seconds.
 - Replace the caps on the test points.

