

ALCATEL CIT

ASM 110 TCL CONDENSED MANUAL

Edition 10 - 1990

START UP PROCEDURE

- 1 - Connect the leak detector to 115V AC outlet. The throttle valve should be closed, selector valve in Position 0. The inlet port should be blanked off or connected to a test piece.
- 2 - Rotate the leak range selector to the 10×10^{-6} atm cc/sec scale.
- 3 - Depress the green button to start the unit. The mechanical pump will start.
- 4 - Rotate the selector valve counter clockwise to Position 4. After a few minutes the " $< 10^{-2}$ " indicator will light and the turbomolecular pump will start automatically.
- 5 - Wait for the green " $\approx 27\ 000$ " turbo pump indicator to light. Switch on the filament. If the green filament indicator does not remain lit, wait an additional few minutes and turn on the filament again.

CALIBRATION PROCEDURE

- 1 - The leak detector should be running with the filament on and the Triode pressure near 1×10^{-6} mbar.
- 2 - Adjust the leak rate meter to zero with the zero adjust knob.
- 3 - Rotate the leak range selector to the proper scale to correspond to the leak rate value of the calibrated leak.
- 4 - Rotate the selector valve counter clockwise from Position 4 to Position 1. The test port will be evacuated by the mechanical pump.
- 5 - When the pressure on the pirani gauge indicates below 3×10^{-1} mbar, move the selector valve to position 2.
- 6 - Begin opening the throttle valve (Position 3) while watching the Triode gauge (The Triode gauge should stay in the green area).
- 7 - When the throttle valve is fully open, move the selector valve to Position 4.
- 8 - Wait a few seconds for the Helium signal to stabilize.
- 9 - Adjust the Helium peak potentiometer, "He", with a screwdriver for the maximum signal obtained on the leak rate meter.
- 10 - Adjust the emission potentiometer, "E", with a screwdriver until the Helium calibrated leak value correlates to a direct reading on the leak rate meter.
- 11 - Repeat steps 9 and 10, as required, until the peak Helium signal equals the calibrated leak value.

PUMP DOWN FOR TESTING

- 1 - Select the leak range selector to the required sensitivity scale (or work in automatic commutation).
- 2 - Connect the piece to be tested to the test port.
- 3 - Rotate the selector valve to Position 1. The inlet pressure will begin to decrease.

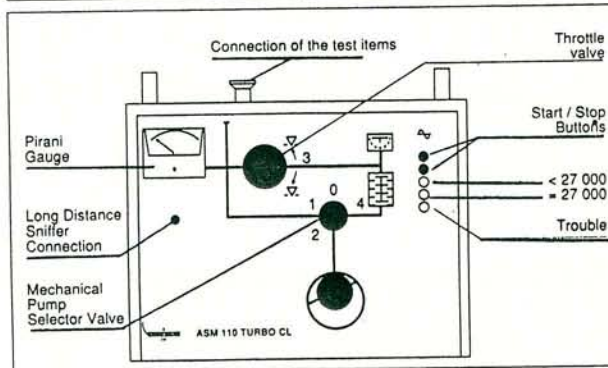
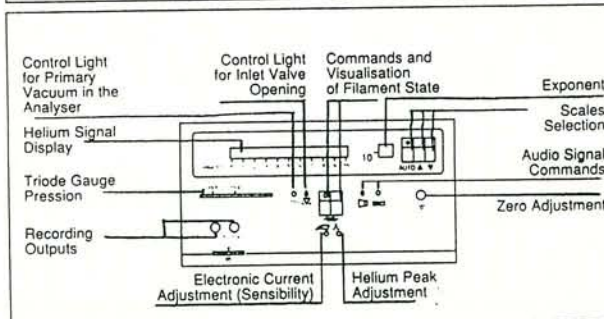
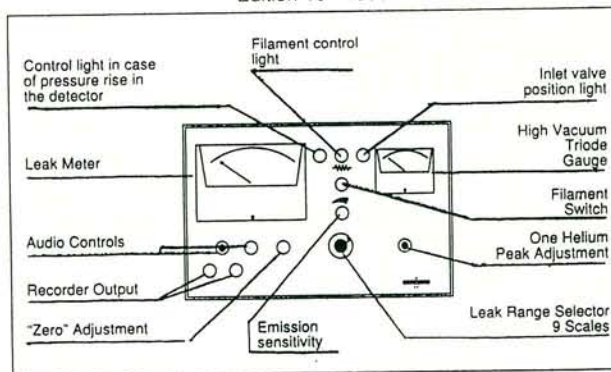
First Possibility:

The inlet pressure will not reach 3×10^{-1} mbar. At this point Helium can be sprayed around the test piece. If there is a leak, it will be registered on the inlet Pirani gauge. Move the selector valve clockwise to Position 0, remove this test piece and begin with step 1 again.

- 4 - If the inlet Pirani gauge pressure goes below $.3 \times 10^{-1}$ mbar, move the selector valve to Position 2.
- 5 - Begin opening the throttle valve (Position 3) while watching the Triode gauge. The Triode gauge pressure should not exceed 1×10^{-4} mbar.
- 6 - Even if the throttle valve cannot be opened completely, Helium can be sprayed and a leak rate signal can be measured. The unit is now in the Closed Loop Detection mode.
- 7 - If the throttle valve can be opened completely move the selector valve to Position 4. The unit is now in Direct Detection mode.
- 8 - You may choose to let the leak detector pump on the test piece for a few minutes to remove any false background signals.
- 9 - Proceed with the test.

GENERAL MAINTENANCE INSTRUCTIONS

- Every: 200 hrs: Check oil level of mechanical pump.
- 1 000 hrs: Check the analyzer background noise at 1×10^{-6} mbar (less than 10^{-6} cc/sec).
- 2000 hrs: Change the oil in the mechanical pump.
- 4000 hrs: Grease the bearings in the turbo pump; Complete cleaning of the analyser cell.
- 10 000 hrs: Replace all seals and gaskets and rebuild the mechanical pump.



PROTECTION

Air In-rush I:

- 1 - If the unit is in direct detection and the test port is accidentally vented to atmospheric pressure:
 - a) The filament will automatically turn off.
 - b) The throttle valve will automatically close.
 - c) The turbo pump will automatically turn off.
- 2 - After less than one minute the " $< 10^{-2}$ " indicator will illuminate again. This will activate the turbo pump and give power to the throttle valve. The throttle valve knob must be closed to "pick-up" the internal valve.
- 3 - Once the " $\approx 27\ 000$ " turbo indicator illuminates again, turn on the filament and begin pump down procedures again.

Air In-rush II:

- 1 - If the unit is in Closed Loop Detection and the test port is accidentally vented to atmospheric pressure:
 - a) The filament will automatically turn off.
 - b) The throttle valve will automatically close.
 - c) The turbo pump will automatically turn off.
 - d) The selector valve must be manually moved to Position 4.
- 2 - Refer to Air In-rush I.2 and I.3

Power Failure

- 1 - No matter what detection mode the unit is in, if power fails:
 - a) The filament will automatically turn off.
 - b) The throttle valve will automatically close.
 - c) The turbo pump will automatically turn off.
 - d) The anti-suckback device in the mechanical pump will automatically close and prevent the vacuum system from venting to atmosphere.
- 2 - After a power failure, the selector valve should be turned to Position 0 and the red power off button should be depressed.
- 3 - When power is restored, begin with "START UP PROCEDURE"

COMPLETE SHUTDOWN

- 1 - Rotate the leak range selector to the 10×10^{-6} atm cc/sec scale (for "old" electronic).
- 2 - Manually close the throttle valve.
- 3 - Rotate selector valve to Position 0.
- 4 - Depress red power off button

STAND-BY / OVERNIGHT

- 1 - Rotate the leak range selector to the 10×10^{-6} atm cc/sec scale.
- 2 - Manually close the throttle valve.
- 3 - Rotate selector valve to Position 4.
- 4 - Turn off the filament.

AUDIO SIGNAL

- 1 - Range on 10×10^{-6} atm cc/sec scale.
- 2 - Turn audio volume control knob clockwise at maximum.
- 3 - Rotate zero control knob to desired reject level.
NOTE: This will be a mechanical set point on the meter. It will reject at the same point regardless of the scale selected.
- 4 - Adjust the audio threshold setting with a screwdriver.
- 5 - Adjust the audio volume.
- 6 - Return leak rate meter to zero using the zero control knob.

LONG DISTANCE SNIFFER (OPTIONAL)

Mfn. Detectable leak: 1×10^{-6} atm cc/sec.
Response Time: 0.2 sec/meter of tubing.

- 1 - Start up and calibrate the leak detector as indicated.
- 2 - Blank off the inlet port.
- 3 - With the throttle valve open and the selector valve in Position 4, plug in the sniffer probe.
- 4 - Upon completion of test, unplug sniffer probe.


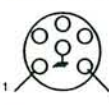
THREE MASS DETECTION (OPTIONAL)

- 1 - Operate leak detector as indicated.
- 2 - Choose which gas is to be detected: M 2, M 3 or M 4 by pressing the appropriate button.
- 3 - Each gas must be calibrated separately following the standard procedure.

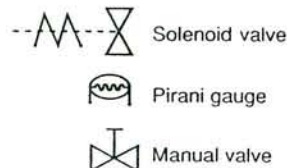
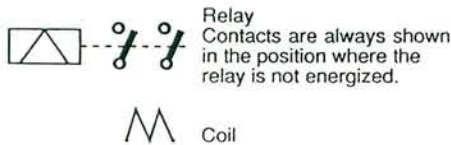
NORMAL OPERATING SEQUENCE
START

TROUBLE SHOOTING

CORRECTIVE PROCEDURES
(Start with 1)

A - Push green buttons on front cabinet to start the unit.		<ol style="list-style-type: none"> 1 - Check main voltage. 2 - If temp. is lower than 10° C use a heater to warm up the mechanical pumps.
B - Mechanical pump will stop gurgling after a few seconds.		<ol style="list-style-type: none"> 1 - Is selector valve in position 4? 2 - Check all vacuum connections and cell seal.
C - Control light indicates $p < 10^{-2}$ mbar.		<ol style="list-style-type: none"> 1 - Check pirani ($\pm 60 \Omega$ between J 09-4 and J 09-6). 2 - Check bulb and bulb voltage. 3 - Check all vacuum connections and cell seal. 4 - Replace printed circuit board E0₂.
D - Turbomolecular Pump will start		<ol style="list-style-type: none"> 1 - Check to see if main switch of the convertor is in the "on" mode. 2 - Check plugs at rear panel. 3 - Check the two relays mounted inside the analyser (on top of the front panel).
E - After approximately 2 minutes, the speed indicator on the converter is in the "green" light.		<ol style="list-style-type: none"> 1 - Check turbomolecular pump instruction manual.
F - Switch on the filament. Filament control light will illuminate.		<ol style="list-style-type: none"> 1 - Check the resistance of the filament point J 06-1 and J 06-5. 2 - Check the bulb. 3 - Check the electrodes of the analyzer cell to be sure they are not grounded or shorted.
G - Pressure will drop $< 10^{-5}$ mbar.		<ol style="list-style-type: none"> 1 - Check the leak detector for leaks by spraying Helium 2 - Clean the cell. 3 - Check mechanical pump oil level. 4 - Check turbo pump performance.
H - The leak rate meter will be stable after 15 minutes. (The needle may not suddenly deflect to extreme right or left and return to normal after a few minutes).		<ol style="list-style-type: none"> 1 - Clean the cell. 2 - Check main voltage. 3 - Check wiring (probably a broken wire in a cable or plug).
I - Adjust the amplifier setting to zero.		<ol style="list-style-type: none"> 1 - Perform the adjustments, described in the operation imannual. 2 - Replace the amplifier. 3 - Replace printed circuit board # E 02.
J - Throttle valve can then be opened.		<ol style="list-style-type: none"> 1 - Check is coil is energized, 5.5 VDC. 2 - Check valve terminals PO 8-1 & PO 08-2. (plug disconnected). 3 - Check the resistance of the coil.
K - The pilot light will illuminate.		<ol style="list-style-type: none"> 1 - Check if pilot light is energized. (5.5 VDC). 2 - Check valve terminals PO 8-2 & PO 8-3. 3 - Replace or adjust microswitch inside the throttle valve housing.
L - With a calibrated leak connected to the detector, there will be an indication on leak rate meter.		<ol style="list-style-type: none"> 1 - Check electronic current to be 1 mA (1 V) on R 8-1 terminals. 2 - Make sure the magnet is properly installed with the pole stamped "N" facing the LN₂ trap. 3 - Check filament alignment. 4 - Check that the electrodes of the analyser cell to be sure they are not grounded. 5 - Check acceleration voltage at terminals PO 6-4 and PO 6-6 to be approx. 220 V. 6 - Check to be sure there isn't a short circuit between the ground and the ionization chamber. (Then the filament brightness varies when acceleration voltage is varied).
M - The unit will meet its sensitivity specifications when prolerly adjusted		<ol style="list-style-type: none"> 1 - Check the filament cleanliness and its alignment. 2 - Change the electron collector. 3 - Clean the cell and its chamber. 4 - It may be necessary to use fine abrasive cloth to remove insulating material, which may not be visible.
N - Helium stablilty has now been attained.		<ol style="list-style-type: none"> 1 - Clean the throttle valve. 2 - <u>Do not</u> use grease. 3 - Check quality of o'rings (porosity)

SYMBOLS



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