

# 947/947D/948 Auto-Test Leak Detectors

The Varian 947 and 948 series leak detectors have been specifically designed for fast cycle, production testing environments. These units allow single button pass/fail testing and fully automatic spectrometer tuning and calibration. The Contra-Flow vacuum system arrangement in these machines uses a valving manifold that has been specially designed for fast cycle times and the maximum possible reliability. The 947D features an all dry vacuum system including oil-free roughing and forepumps.

In addition to the clear, front panel LED leak rate, pressure, and machine condition displays, information is also available on analog, parallel I/O, and RS-232 remote interfaces. An advanced electronics platform provides complete diagnostic information and allows adjustments without testpoints or potentiometers.

While the 947 and 948 leak detectors provide high sensitivity for detecting small leaks, they can begin gross leak testing at pressures as high as atmosphere.

The Multi-Test option for the 947 includes atmospheric gross leak capability and a unique volumetric expansion procedure that detects leaks even if all of the internal helium has escaped from the part prior to the test.



## Features

- Fully automatic operation and spectrometer tuning
- Specially-designed high conductance valve manifold
- Optional atmospheric gross leak valve
- Totally oil-free vacuum system in 947D
- Clean room compatible enclosure
- Liquid nitrogen cold trap on 948
- Hand-held remote leak indicator option
- MacroTorr spectrometer pump option

## Benefits

- One button Pass/Fail testing
- Fully protected from the possibility of operator errors, air inrushes, and power failures
- Operator skill not required for spectrometer tuning, calibration and zeroing
- Reduces pumpdown times for faster test cycling
- Proven reliability to over one million cycles
- No compressed air required
- Allows testing parts and systems with massive leaks
- No risk of hydrocarbon contamination
- No checking, adding or changing oil required
- Unit can be remotely controlled and provide complete real time testing data
- Enhanced reliability when testing wet or outgassing parts
- Provides leak rate indication up to 25 feet away
- Extra high fine test transfer pressure for fastest cycling

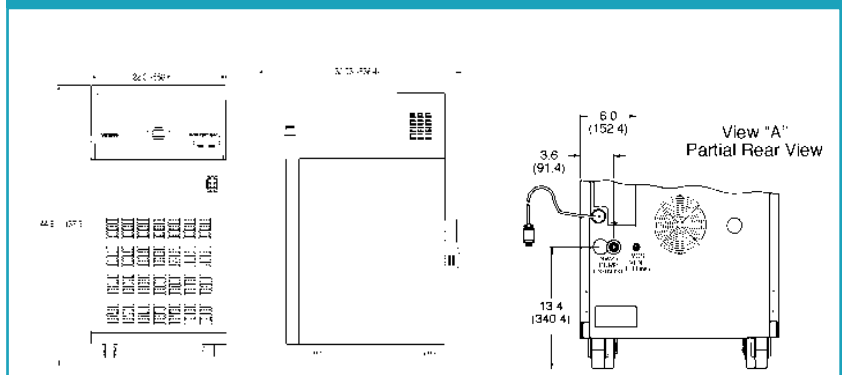
## Technical Specifications

- Sensitivity  
 $2 \times 10^{-10}$  atm cc/sec (helium) (Turbo/DP)  
 $2 \times 10^{-9}$  atm cc/sec (MacroTorr)
- Response time  
 Less than two seconds for helium, in accordance with AVS standard 2.1
- Amplifier drift  
 Less than 2% of the full scale of the most sensitive range, in accordance with AVS standard 2.1
- Noise Level  
 Less than 2% of full scale, peak-to-peak, in accordance with AVS standard 2.1
- Leak Indication  
 A 50-segment bar graph indicator displays leak rates from 10 cc to  $2 \times 10^{-10}$  atm cc/sec automatically. The manual mode can also be used for any decade scale.  
 A leak can also trigger an audible alarm whose frequency varies in proportion to the size of the leak.
- Spectrometer Tube  
 The preamplifier is computer optimized, temperature stabilized, and solid state. Programmed warmup minimizes start-up time. The tube is kept at a constant temperature at all times to maintain stability. The ion source has dual filaments of long-life, thoria-coated iridium.
- Cycle Time  
 Blanked port can be cycled to fine leak test in 4 seconds. The auto sequencer feature provides clear accept/reject signals and allows programming the roughing, testing, and cycling times.
- High Vacuum Pump  
 70 l/s air-cooled, maintenance-free Turbo or MacroTorr pump.
- Rough Pump  
 Dry Scroll Pump (947D)  
 7 cfm (11.9 m<sup>3</sup>/h) direct-drive mechanical pump (947/948)  
 Optional: 11 cfm (18.7 m<sup>3</sup>/h) or 17 cfm (28.9 m<sup>3</sup>/h)
- Forepump  
 V70D MacroTorr and diaphragm pump (947D)  
 7 cfm (11.9 m<sup>3</sup>/h) direct-drive mechanical pump (947/948)
- Automatic Valve Sequencing  
 Microprocessor-controlled valve operation for automatic system cycling. The test and roughing valves are vacuum-actuated, requiring no air supply. Automatic shutdown is achieved with one switch function.
- Test Port  
 1½ in (28 mm) ID quick coupling type, KF25 adapter included.
- Power Requirements  
 115 V and 220 V, 50/60 Hz, (30/15 amps).
- Cabinet  
 The front panel is removable to allow easy access to all components. Electronics are accessed from hinged turret door and removable back panel. Cabinet is caster-mounted for mobility.
- Weight  
 435 lb (198 kg) approx.  
 510 lb (232 kg) approx. shipping

## Ordering Information

Varian Part No.	Description
L94720200T120	947 Turbo Leak Detector, 7 cfm (200 l/m) Roughing Pump, 120 V, 50/60 Hz
L94720200T220	947 Turbo Leak Detector, 7 cfm (200 l/m) Roughing Pump, 220 V, 50/60 Hz
L94720450T120	947 Turbo Leak Detector, 17 cfm (450 l/m) Roughing Pump, 120 V, 50/60 Hz
L94720450T220	947 Turbo Leak Detector, 17 cfm (450 l/m) Roughing Pump, 220 V, 50/60 Hz
L94720200M120	947 MacroTorr Leak Detector, 7 cfm (200 l/m) Roughing Pump, 120 V, 50/60 Hz
L94720200M220	947 MacroTorr Leak Detector, 7 cfm (200 l/m) Roughing Pump, 220 V, 50/60 Hz
L94720450M120	947 MacroTorr Leak Detector, 17 cfm (450 l/m) Roughing Pump, 120 V, 50/60 Hz
L94720450M220	947 MacroTorr Leak Detector, 17 cfm (450 l/m) Roughing Pump, 220 V, 50/60 Hz
L94820200T120	948 Turbo Leak Detector, 7 cfm (200 l/m) Roughing Pump, 120 V, 50/60 Hz
L94820200T220	948 Turbo Leak Detector, 7 cfm (200 l/m) Roughing Pump, 220 V, 50/60 Hz
L94820450T120	948 Turbo Leak Detector, 17 cfm (450 l/m) Roughing Pump, 120 V, 50/60 Hz
L94820450T220	948 Turbo Leak Detector, 17 cfm (450 l/m) Roughing Pump, 220 V, 50/60 Hz
L94820200M120	948 MacroTorr Leak Detector, 7 cfm (200 l/m) Roughing Pump, 120 V, 50/60 Hz
L94820200M220	948 MacroTorr Leak Detector, 7 cfm (200 l/m) Roughing Pump, 220 V, 50/60 Hz
L94820450M120	948 MacroTorr Leak Detector, 17 cfm (450 l/m) Roughing Pump, 120 V, 50/60 Hz
L94820450M220	948 MacroTorr Leak Detector, 17 cfm (450 l/m) Roughing Pump, 220 V, 50/60 Hz
D947L9047301	947 Turbo Dry Leak Detector 120 V, 50/60 Hz
D947L9047302	947 Turbo Dry Leak Detector 220 V, 50/60 Hz
MSPA6690A	947 MacroTorr Dry Leak Detector 120 V, 50/60 Hz
■ Options	
Varian Part No.	Description
L9558301	Remote leak rate indicator with 25 ft cord (requires RS-232 option, L9596301)
L9596301	RS-232 for 947/948 leak detectors
L6839301	Atmospheric gross leak accessory
L5820301	Auto-sequencer option

## 947/948 Dimensions inches (mm)



DS1258 7/97