Multipurpose Leak Detectors
ASM 142 series
General purpose leak detectors have always been synonymous with limited performance units. This belief was based on limited vacuum and electronic technologies available then to meet the key requirements of size and cost. Alcatel has once again revolutionized the world of leak detection, proving its prowess in helium leak detection. The new universal leak detector model ASM 142 is the end result of an innovative engineering approach using the latest electronic technologies and vacuum concepts.

This rugged unit is undeniable proof that multipurpose no longer means compromise. On the contrary, the ASM 142 delivers unmatched features for an entry-level unit such as, a roughing capacity of 10 m³/h (7 cfm) with a usable helium sensitivity in the 10⁻¹¹ atm.cc/s range. In addition, its comprehensive bulletproof display panel loaded with advanced features available at your fingertips delivers a true user-friendly unit.

- The ASM 142 S, a dedicated sniffing unit, based on the same well-proven leak testing concept, is also available for outboard leak testing applications.
- The latest in the famous ASM 142 series, the ASM 142 D is the most simple solution that you can find if you are attracted to « dry » helium leak detection.
The simplest solutions for all applications.

These universal leak detectors can comply with a virtually limitless list of applications. Its remarkable versatility based on a smart design, allows many creative possibilities:

**Maintenance applications and quality control of vacuum systems**
- High helium pumping speed at the inlet port will deliver fast response time.
- A simple operator interface including a vocal synthesizer will provide a unique tool that will ease the operator tasks.
- A convenient transport cart will allow fast mobility while in operation.

**Applications**
- semiconductor
- research and development
- cryogenic
- aerospace industry

**Production or quality control of components**
- High roughing capacity will deliver fast cycle time.
- Advanced electronics will provide full automation of the test cycle.
- Integrated software will control and manage the operation with an auxiliary pump.
- Comprehensive interface capabilities such as discrete I/O and RS 232 will ease its interface with a PLC or a PC.

**Applications**
- mechanical industry (seals, valves, various small pieces)

**Outboard testing of pressurized parts (sniffing test mode)**
- A unique “floating” background suppression device will deliver and guarantee a sensitivity in the $10^{-7}$ atm.cc/s range.
- The 142’s ruggedness will allow its usage in very harsh industrial environments.

**Applications**
- refrigeration
The design of the ASM 142 series brings helium leak detection...

SIMPLICITY

The simple design of this unit results in a quick learning curve for a new user. It takes no more than a few minutes to get familiar with its operation.

In addition, the ASM 142 series also offers evolved features to assist the operator in his daily test operation:
- Auto-calibration with temperature compensation
- Auto-Zero function
- Helium Signal Direct Readout function
- Full automation of the test cycle.

RUGGEDNESS

The ASM 142 series utilizes well proven mechanical vacuum pump technology designed specifically for heavy usage in very harsh industrial environments. The helium stability of the rotary vane pump guarantees excellent stability of the helium signal. The low rotational speed of the M.D.P. (Molecular Drag Pump) at 27,000 rpm makes this unit totally bullet proof against accidental air inrushes. Further, it allows the leak detector to be moved while in operation.

The high compression ratio of the M.D.P. facilitates the gross leak test at a high pressure (7.5 Torr / 10 mbar) which speeds up the leak test process of outgassing parts.

The ASM 142 series requires little maintenance and its internal layout allows easy access to all the components.

In addition, the rotary vane pump is equipped with a practical oil change device to speed-up the process.

VERSATILITY

With its 10 m³/h roughing pump capacity, the ASM 142 leak detector (standard version) delivers performance to address any leak detection application. Its unparalleled versatility makes it a truly universal unit, able to perform effectively both inboard and outboard leak tests.

In addition to these superior features, this unit offers a complete set of options and accessories to meet the requirements of any applications (refer to the following pages for more information).
... to another level allowing any user to enjoy this unit to its full potential.

A comprehensive control panel with two distinct areas, one for entering the test parameters and the other for the operation of the unit, guides the operator each step of the way. The easy entry of the test parameters is performed via simple menus for fast setup.

The operator interface can be customized by selecting the desired operation menu level to address each application requirement.

You can’t miss a leak thanks to the:
- dynamic green/red bargraph
- audio alarm with variable pitch
The Perfect Combination of Performance...

The design of the ASM 142 series includes Alcatel’s newest analyzer cell, innovative operator interface, well proven helium stable rotary vane pump and high compression, low rotational speed (27,000 rpm) molecular drag pump.

New Analyzer cell:
- 180° magnetic deflection mass spectrometer.
- Patented amplification system based on an electron multiplier (multi channel plate concept) which provides unmatched stability and sensitivity.
- Two independent filaments for a better reliability and maintainability (automatic switch from one filament to the other with automatic auto-calibration for maximum up time).

Front Panel Display:
- 4 levels of operation menus for enhanced user friendliness.
- Comprehensive display panel with sensing switches for smoother operation.
- Voice synthesizer for additional operator interface ability.

Rotary vane pump or Dry Roughing System:
Well proven technologies:
2-stage helium stable rotary vane pump:
- 10 m³/h (6 cfm) roughing capacity in the standard version for fast test cycle (ASM 142)
- 5 m³/h (3.2 cfm) for the sniffing version (ASM 142 S)

Dry Roughing System:
The design of the ASM 142 D uses all our cumulated experience in the compact dry pumping systems:
- Diaphragm pump + molecular drag pump which develops an air pumping speed from 1 up to 18 m³/h (0.6 up to 10.5 cfm).

Electronic Interface:
Comprehensive interface to connect easily to a PLC and/or to a PC:
- Discrete I/O interface
- Complete RS 232 interface.
ASM 142 series

The modules of the ASM 142 series are based on the same well proven leak testing concept. They share the same basic components:
• high sensitivity analyzer cell with dual filaments,
• improved molecular drag pump model AMP007
• latest generation of electronics,
• plastic cover and metal frame.

ASM 142, Standard version

The ASM 142 is a truly multipurpose unit that complies with a virtually limitless list of applications. It offers inboard and outboard leak testing capabilities, with unmatched features such as a 10 m³/h (7 cfm) roughing capacity for fast cycle time.

The ASM 142 is the perfect answer to all the users who need to perform various types of leak tests, including a vacuum test.

ASM 142 S, Dedicated sniffing unit

The ASM 142 S delivers a perfect combination of performance with unique features.
• Equipped with a helium-stable 2005 rotary vane pump with an optimized internal vacuum block.
• Integrates a comprehensive operator interface, ideally designed for sniffing leak testing.
• 5 m sniffer probe.
• Auto-calibration performed in sniffing mode with temperature and age compensation for high accuracy calibration.

The ASM 142 S is the perfect answer to all industrial outboard leak testing applications requirements.

ASM 142 D, The most simple solution in terms of dry helium leak detector

The ASM 142 D operates up to 10,000 hours maintenance free and develops an air pumping speed from 1 to 18 m³/h (0.6 to 10.5 cfm) thanks to the association of a diaphragm pump and a molecular drag pump.
Various types of options

Interface board
It accommodates automation of the leak detector through a P.C or a P.L.C. The interface board includes several types of interface:
• Analog signal (Helium signal)
• Discrete input/ output (for remote control through a P.L.C)
• A complete RS 232 (for remote control through a supervision system).

Automatic test chambers
• Small model: hemispherical test chamber Ø 72 mm, depth 31 mm, with start of cycle contact.
• Medium model: cylindrical test chamber Ø 85 mm, depth 68 mm, with start of cycle contact.
This option integrates the interface board.

Metal seal
Allows using the leak detector in very high helium environment.

3 masses option
(ASM 142, ASM 142 D only)
Hydrogen, helium 3, helium 4

and accessories

Remote control
The ASM 142 series uses the same remote control than all the new generation Alcatel leak detectors. It offers all the advanced features such as auto-calibration, auto-zero and zoom function.

Transport cart
This cart allows easy transportation of the leak detector. It also includes a compartment for accessories, maintenance kit and the instruction manual.

Measurements units
The multi-color remote control offers the choice from 3 different measurement units:
• mbar.l/s and mbar.
• Pa.m³/s and Pa.
• Torr.l/s and Torr.

<table>
<thead>
<tr>
<th>Description</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote control</td>
<td>106688</td>
</tr>
<tr>
<td></td>
<td>108880</td>
</tr>
<tr>
<td></td>
<td>108881</td>
</tr>
<tr>
<td>Transport cart</td>
<td>108068</td>
</tr>
<tr>
<td>Kit RS 232</td>
<td>107657</td>
</tr>
<tr>
<td>Helium spray probe</td>
<td>109951</td>
</tr>
<tr>
<td>Standard sniffer probe</td>
<td>SNC1E1T1</td>
</tr>
<tr>
<td>Dedicated sniffer probes</td>
<td>*</td>
</tr>
</tbody>
</table>

* For accessories, see “Accessories for helium leak detectors”.
## Technical Specifications

### Specifications → vacuum mode

<table>
<thead>
<tr>
<th>Minimum detectable helium leak</th>
<th>ASM 142</th>
<th>ASM 142 D</th>
<th>ASM 142 S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.10^{-12} atm.cc/s</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Maximum inlet test pressure</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>10 mbar (7.5 Torr)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helium pumping speed at the inlet of the unit</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>1.3 l/s (78 l/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 m³/h (6 cfm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roughing capacity</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>1 up to 18 m³/h (0.6 up to 10.5 cfm)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Specifications → sniffing mode

<table>
<thead>
<tr>
<th>Minimum detectable helium leak</th>
<th>ASM 142</th>
<th>ASM 142 D</th>
<th>ASM 142 S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.10^{-7} atm.cc/s</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Response time</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>&lt; 1 s</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### General specifications

<table>
<thead>
<tr>
<th>Startup time (including auto-calibration)</th>
<th>ASM 142</th>
<th>ASM 142 D</th>
<th>ASM 142 S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 3 minutes</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Power consumption</td>
<td>&lt; 1 kw</td>
<td>&lt; 500 w</td>
<td>&lt; 500 w</td>
</tr>
</tbody>
</table>

### Integrated Functions

<table>
<thead>
<tr>
<th>Auto-calibration, with built-in temperature compensated calibrated leak</th>
<th>ASM 142</th>
<th>ASM 142 D</th>
<th>ASM 142 S</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Full automation of test cycle including:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- cycle sequence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- memorization of the last test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- test result display</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helium background suppression with “floating zero” to keep the signal from going negative.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Automatic external calibration</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Helium pollution prevention</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Audio alarm with variable pitch (up to 90 dbA)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Vocal synthesizer</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### User defined parameters

<table>
<thead>
<tr>
<th>4 user languages</th>
<th>ASM 142</th>
<th>ASM 142 D</th>
<th>ASM 142 S</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3 pressure and Helium flow units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>56 kg</td>
<td>42 kg</td>
<td>56 kg</td>
</tr>
<tr>
<td>123 lb</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ordering information
ASM 142 - ASM 142 D

Leak detector
ASM 142  ASM 142 D
Code  T  W

Masses
Helium  3 Masses
Code  0  3

Seals for the vacuum module and analyzed cell
Elastomer  Metal *
Code  R  L
* Metal seal not available for the ASM 142 D

Interface board + test chamber
Without  Interface board only  Auto. test chamber small model  Auto. test chamber medium model
Code  0  1  2  3

Language
French  English  German  Japanese
Code  A  B  C  E

Main power supply
100/130 V - 50/60 Hz  220/240 V - 50/60 Hz
Code  7  8

Main power cable type
U.S.A. France/Germany U.K. Italy Switzerland Without plug
Code  1  2  3  4  5  7

For example
You need
ASM 142  T
3 masses  3
Elastomers seal  R
With interface board  1
French  A
220/240 V  8
50/60 Hz  2
France  2

= T 3 R 0 0 0 0 1 A 8 2 0
### Ordering information

#### ASM 142 S

<table>
<thead>
<tr>
<th>Leak detector</th>
<th>ASM 142 S U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface board</td>
<td>With 0, Without 1</td>
</tr>
<tr>
<td>Language</td>
<td>French A, English B, German C, Spanish F</td>
</tr>
<tr>
<td>Main power supply</td>
<td>100/130 V - 50/60 Hz 7, 220/240 V - 50/60 Hz 8</td>
</tr>
<tr>
<td>Main power cable type</td>
<td>U.S.A 1, France/Germany 2, U.K. 3, Italy 4, Switzerland 5, Without plug 7</td>
</tr>
</tbody>
</table>

Standard sniffer probe (wire 5 m long / nozzle 9 cm - SN C1 E1 T1) is provided with the ASM 142 S sniffer unit.

**For example**

**You need**

- ASM 142 S U
- Without interface board 0
- English B
- 220/240 V 8
- 50/60 Hz 3
- U.K. 3

**U 0 R 0 0 0 C 0 B 8 3 0**