COMPACT MULTIPURPOSE
HEL IUM LEAK DETECTORS
ASM 142 SERIES
The ASM 142 Series sets a new performance standard for an entry-level unit

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 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 Series 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 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
- industries which use vacuum process

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/and a PC.

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

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
- air-conditionning
**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).
The perfect combination of performance...

The design of the ASM 142 Series includes Adixen’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 (7 cfm) roughing capacity in the standard version for fast test cycle (ASM 142)
- Large capacity mist eliminator.

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).

- ASM Graph D+: the ACP 15 multistage roots frictionless pump technology guarantees a high level of cleanliness, reliability and longevity.

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, conventional 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 D, the most simple solution in terms of dry helium leak detector**

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 the “dry” helium leak detection.

This 100% hydrocarbon-free leak detector not only guarantees total cleanliness during the leak test, but also provides advantages like simplicity of maintenance.

The roughing pump package of 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.
ASM Graph D+
Power and sensitivity in a small package

Compact and powerful helium leak detector, the ASM Graph D+ combines 14 m³/h clean, dry, roughing capacity with our high sensitivity analyzer cell in very small foot print clean room compatible package.

Highly manoeuvrable, the system is mounted on a unique cart equipped with four large, full swivel wheels with brakes for easy movement through and around cluttered areas and over grilled floors such as Semiconductor Fabs.

Compartments for convenient storage of vacuum hardware and provisions for a helium bottle, are part of this clever package, all in a foot print of just 0.5m x 0.35m (20” x 16”).

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**ASM Graph D+ accessories**

<table>
<thead>
<tr>
<th>Description</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helium bottle holder Dia. 135/126 mm</td>
<td>112532</td>
</tr>
<tr>
<td>Helium bottle holder Dia. 177 mm</td>
<td>112533</td>
</tr>
<tr>
<td>Remote control holder</td>
<td>112534</td>
</tr>
</tbody>
</table>
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
Hydrogen, helium 3, helium 4.

… and accessories

Remote control
The ASM 142 Series uses the same remote control than all the new generation Adixen 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.

<table>
<thead>
<tr>
<th>Description</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote control</td>
<td>106688</td>
</tr>
<tr>
<td>: mbar.l/s</td>
<td>108880</td>
</tr>
<tr>
<td>: Pa.m3/s</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 gun</td>
<td>112535</td>
</tr>
<tr>
<td>Helium spray gun “elite”</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

<table>
<thead>
<tr>
<th>Specifications &gt; vacuum mode</th>
<th>ASM Graph/ASM 142</th>
<th>ASM Graph D/ASM 142 D</th>
<th>ASM Graph D+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum detectable helium leak</td>
<td>$5 \times 10^{-12}$ atm.cc/s</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Maximum inlet test pressure</td>
<td>10 mbar (7.5 Torr)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Helium pumping speed at the inlet of the unit</td>
<td>1.3 l/s (78 l/min)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Roughing capacity</td>
<td>10 m³/h (6 cfm)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 up to 18 m³/h (0.6 up to 10.5 cfm)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>14 m³/h (8 cFm)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specifications &gt; sniffing mode</th>
<th>ASM Graph/ASM 142</th>
<th>ASM Graph D/ASM 142 D</th>
<th>ASM Graph D+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum detectable helium leak</td>
<td>$1 \times 10^{-7}$ atm.cc/s</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Response time</td>
<td>&lt; 1 s</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General specifications</th>
<th>ASM Graph/ASM 142</th>
<th>ASM Graph D/ASM 142 D</th>
<th>ASM Graph D+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up time (including auto-calibration)</td>
<td>Less than 3 minutes</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; 1 kw</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Integrated Functions</th>
<th>ASM Graph/ASM 142</th>
<th>ASM Graph D/ASM 142 D</th>
<th>ASM Graph D+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-calibration, with built-in temperature compensated calibrated leak</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>X</td>
<td>X</td>
<td>X</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”</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>to keep the signal from going negative.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic external calibration</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Helium pollution prevention</td>
<td>X</td>
<td>X</td>
<td>X</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>

<table>
<thead>
<tr>
<th>User defined parameters</th>
<th>ASM Graph/ASM 142</th>
<th>ASM Graph D/ASM 142 D</th>
<th>ASM Graph D+</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 user languages</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3 pressure and Helium flow units</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Weight</td>
<td>56 kg</td>
<td>42 kg</td>
<td>70 kg</td>
</tr>
<tr>
<td></td>
<td>123 lb</td>
<td>92 lb</td>
<td>154 lb</td>
</tr>
</tbody>
</table>

815 mm (32")
343 mm (13.5")
510 mm (20.1")
428 mm (16.8")
## Ordering information

**ASM 142 - ASM 142 D**

### Leak detector

<table>
<thead>
<tr>
<th>Code</th>
<th>ASM 142</th>
<th>ASM 142 D</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>W</td>
<td></td>
</tr>
</tbody>
</table>

### Masses

<table>
<thead>
<tr>
<th>Code</th>
<th>Helium</th>
<th>3 Masses</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**03** Code Masses (3). This option allows the leak detector to detect masses 2, 3 and 4.

### Seals for the vacuum module and analyzed cell

<table>
<thead>
<tr>
<th>Code</th>
<th>Elastomer</th>
<th>Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>L</td>
<td></td>
</tr>
</tbody>
</table>

The leak detector can be provided with:
- Elastomer seals (for the high vacuum as well as the inlet block) as standard (R) or
- with metal seals for specific applications (L).

### Interface board + test chamber

<table>
<thead>
<tr>
<th>Code</th>
<th>Without RS232 interface</th>
<th>With RS232 interface</th>
<th>Auto. test chamber small model</th>
<th>Auto. test chamber medium model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

The automatic test chambers integrate the RS232 interface.

### Language

<table>
<thead>
<tr>
<th>Code</th>
<th>French</th>
<th>English</th>
<th>German</th>
<th>Japanese</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>E</td>
<td></td>
</tr>
</tbody>
</table>

### Voltage

<table>
<thead>
<tr>
<th>Code</th>
<th>100/130 V - 50/60 Hz</th>
<th>220/240 V - 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

### Cable type

<table>
<thead>
<tr>
<th>Code</th>
<th>U.S.A.</th>
<th>France/Germany</th>
<th>U.K.</th>
<th>Italy</th>
<th>Switzerland</th>
<th>Without plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

**For example**

**You need ...**

ASM 142

3 masses

Elastomers seal

With RS232 interface

French

220/240 V

50/60 Hz

France

= **T 3 R 0 0 0 0 1 A 8 2 0**
Ordering information
ASM Graph - ASM Graph D

Leak detector
ASM Graph | ASM Graph D
---|---
Code | G | H

Masses
Helium | 3 masses
---|---
Code | 0 | 3

Seals for the vacuum module and analyzer cell
Elastomer | Metal
---|---
Code | R | L

Interface board + test chamber
Without RS232 interface | With RS232 interface | Test chamber Small model | Test chamber Medium model
---|---|---|---
Code | 0 | 1 | 2 | 3

Language
French | English | German | Japanese
---|---|---|---
Code | A | B | C | E

Voltage
110/130 V - 50/60 Hz | 220/240 V - 50/60 Hz
---|---
Code | 7 | 8

Cable type
USA/Japan | France/Germany | U.K. | Italy | Switzerland | Without plug
---|---|---|---|---|---
Code | 1 | 2 | 3 | 4 | 5 | 7

For example
You need ...

- ASM Graph: G
- 3 masses: 3
- Elastomers seal: R
- Without RS232 interface: 0
- English: B
- 220/240 V: 8
- 50/60 Hz: 2
- Germany: 2

Result: G 3 R 0 0 0 0 B 8 2 0
Ordering information
ASM Graph D+

Leak detector
ASM Graph D+
Code: N

Masses
Helium 3 masses
Code: 0 3

Seals for the vacuum module and analyzer cell
Elastomer Metal
Code: R L

Interface board + test chamber
Without RS232 interface With RS232 interface Test chamber small model Test chamber medium model
Code: 0 1 2 3

Language
French English German Japanese
Code: A B C E

Voltage
110/130 V - 50/60 Hz 220/240 V - 50/60 Hz
Code: 7 8

Cable type
USA/Japan France/Germany U.K. Italy Switzerland Without plug
Code: 1 2 3 4 5 7

For example
You need ...
ASM Graph D+ 3 masses Elastomers seal Without RS232 interface French 220/240 V 50/60 Hz U.K.
N 3 R 0 A 8 2

= N 3 R 0 0 0 0 0 A 8 3 0