

# STATUS SCIENTIFIC CONTROLS

- Refrigerant Identifiers •
- Fixed Gas Detectors • Gas Detection Control Units •



## Mentor Fixed Refrigerant Identifiers For Automotive Applications



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## 1 DESCRIPTION

The Mentor Fixed Refrigerant Identifier is intended for use within Automotive Air Conditioning Service units to provide accurate identification of the refrigerant purity either within storage cylinders or vehicle air conditioning units.

The unit is supported by a comprehensive PC software application that allows Service Unit manufacturers to test and configure the identifiers during the production process.

The units are designed to be compatible with existing equipment and are available in either Bezel Mount or Direct Mount versions as shown below.



**Bezel Mount Version**

**Stock No. SS981**



**Direct Mount Version**

**Stock No. SS982**

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## 2 SCOPE OF THE MANUAL

This manual provides details on the correct and safe use of the **Mentor Fixed Refrigerant Identifier** when used in automotive air system conditioning applications.

## 3 CONFORMITY

CE, ROHS and ISO 9001:2015

Designed and manufactured to meet the SAE J2912 standard.

## 4 SAFETY PRECAUTIONS



Working with refrigerants and mixtures of refrigerants can be dangerous if the correct safety precautions are not adhered to. Please ensure anyone using the Mentor Refrigerant Identifier has read and understands the following precautions.

- Suitable safety glasses and gloves need to be worn when working with refrigerants as these can cause frostbite or loss of sight.
- R1234yf and Hydrocarbon refrigerants are flammable. Make sure you are working in a well-ventilated area with no naked flames.
- R134a and/or mixtures of other refrigerants may also be flammable.
- Ensure the vehicle engine is turned off and/or the keys are removed from the ignition before carrying out any sample tests.
- Avoid breathing refrigerant and oil vapour.

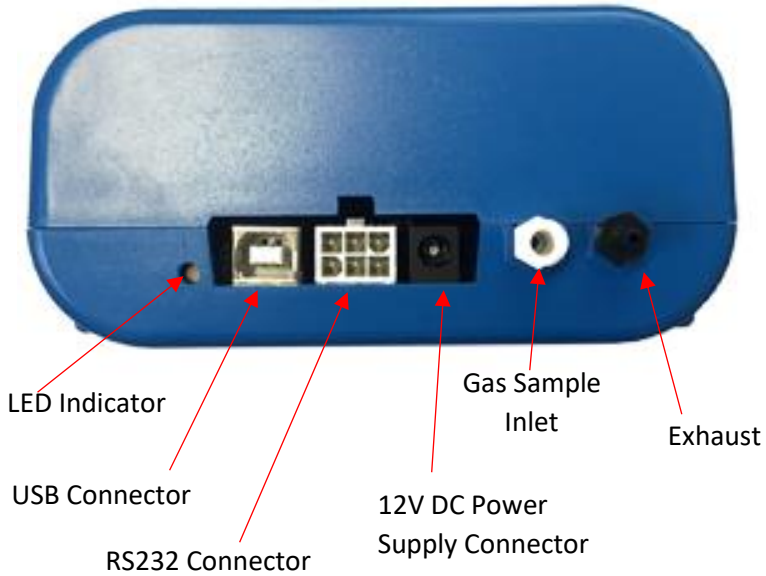
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## 5 CONNECTIONS & INDICATOR

### Module Rear View



#### 5.1 LED Indicator

The LED illuminates or flashes Red or Green indicating the state or process the identifier is in.

#### 5.2 USB Connector

The USB connector is a standard Type B socket.

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## 5.3 RS232 Connector

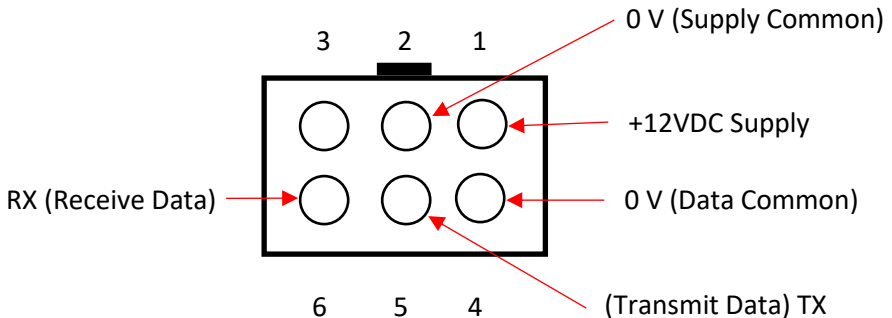
The module is fitted with a 6-way plug from the “TE Connectivity” Mini-Universal MATE-N-LOK series mounted onto the internal circuit board. If requested, the module can be supplied with a cable assembly. Status Scientific Stock No. SS993.

Alternatively, the user can construct additional cable sockets using the following “TE Connectivity” parts: -

Quantity 1 - Housing Part No. 172168-1.

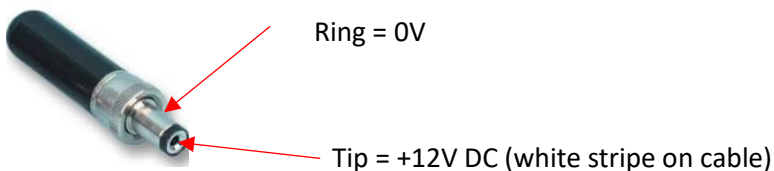
Quantity 6 – Solder Socket Part No. 770902-1.

### Rear view of module RS232 Connector



## 5.4 12V DC Power Supply Connector

The nominal 12V DC power supply for the identifier can either be provided as part of the RS232 cable using the connections shown above or separately supplied via a 2.5 mm power jack plug connected as shown below.





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**Important – After applying the 12V DC supply, wait 2 minutes before using the Identifier to allow the gas sensors to stabilize.**

## 5.5 Gas Sample Inlet

The sample inlet is a Female Bulkhead Leur 1/4-28 UNF Thread, 1/8" Barbed connector.

**Note – The Identifier requires a stable flow rate for a minimum of 60 seconds to produce a successful analysis.**

## 5.6 Exhaust

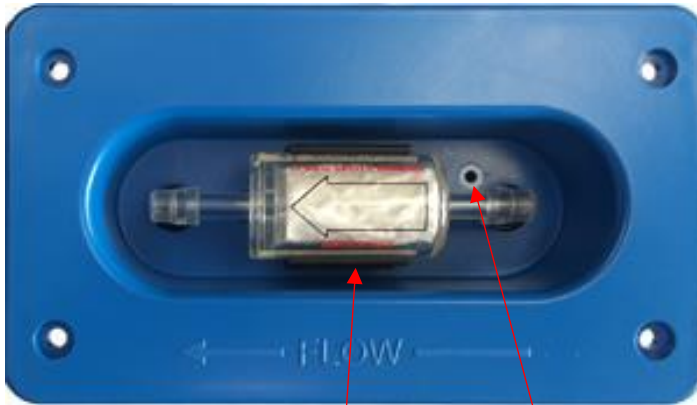
The exhaust outlet is a barbed connector for use with 2.5mm internal diameter tubing. The exhaust outlet will contain small amounts of refrigerant and so must be ported to a lower point than the air inlet.

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## 6 OIL FILTER & AIR INLET



Oil Filter  
Stock No. 210098

Air Inlet

**Module Front View – Bezel Mount Version**

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Oil Filter  
Stock No. 210098



Air Inlet

## Module Front View – Direct Mount Version

### 6.1 Oil Filter

If oil is allowed into the Identifier gas sensing chamber, then this will cause damage and failure of the Identifier thereby invalidating the warranty.

A replaceable white in-line oil filter is provided to minimise the risk of damage in the event of oil entering the sampling hose. Periodic examination of the filter and sample hose is vital and, if oil contamination is observed, then further testing must cease until the filter and/or hose have been replaced.

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The white filter has an activated dye medium that turns red when exposed to oil in the system. The **Bezel Mount** version has the filter accessible from the outside of the Automotive Air Conditioning Service unit so that it can be easily replaced.

The **Direct Mount** version should be mounted with the arrow pointing up to minimize the risk of oil entering the sample hose.

## 6.2 Air Inlet

The identifier draws ambient air through the inlet during the purging (zeroing) cycle that precedes the gas analysis. In the **Bezel Mount** version, the air inlet is located on the outside of the Automotive Air Conditioning Service unit so that the possibility of intake of refrigerant during the purging (zeroing) cycle is minimised.

The air inlet on the **Direct Mount** version is a barbed connector for use with 2.5mm internal diameter tubing. The tubing connected to the air inlet must port to a high position on the outside of the Automotive Air Conditioning Service unit to reduce the risk of accidental intake of refrigerant during the purging (zeroing) cycle and minimise water and dust ingress.

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## 7 COMMUNICATIONS FORMATS

The protocol used to communicate with the Automotive Air Conditioning Service unit can either be specified at the time of ordering or configured by the user by means of our dedicated PC Application 'Automotive Refrigerant Config Pro'. This application will also simulate a service unit to allow operation of the identifier to be fully tested.

The communications protocol options are as follows:

Protocol	Data Encryption	Output Format Options
USB	On or Off	SAE J2912 or VDA Pass/Fail
RS232	On or Off	SAE J2912 or VDA Pass/Fail

**Please refer to the 'Mentor Automotive Refrigerant Identifier PC Software Application' manual TD22/003 for details.**

If Data Encryption is selected, the output will be encrypted (using AES256-CBC) by the Refrigerant Identifier prior to transmission to the Service Unit. The Service Unit will therefore need to have the capability to de-encrypt the data.

### 7.1 SAE J2912 Gas Analysis Output – R134a Mode

If the SAE J2912 output format has been set, the gas analysis data output comprises 7 fields separated by a single space as shown below. (For clarity, the spacing below has been expanded).

095.0	003.2	001.8	000.0	003.0	00000	00055
% R134a	%R12	%R22	%HC	% Air	Status	Test #

In this example (Test # 55) the sample contains 95% R134a, 3.2% R12, 1.8% R22 and 3% Air.

The status value '00000' signifies that no errors have occurred.

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## 7.2 SAE J2912 Gas Analysis Output – R1234yf Mode

If the SAE J2912 output format has been set, the gas analysis data output comprises 7 fields separated by a single space as shown below. (For clarity, the spacing below has been expanded).

008.0	090.0	000.0	002.0	002.0	00000	00056
% R134a	%R1234yf	%R22	%HC	% Air	Status	Test #

In this example (Test # 56) the sample contains 8% R134a, 90% R1234yf, 2% HC and 2% Air.

The status value '00000' signifies that no errors have occurred.

## 7.3 VDA Gas Analysis Output

If the VDA output format has been set, the gas analysis data output simply comprises two 5-digit strings representing PASS or FAIL, and the test number as follows: -

#####

The first 5 digits are the test result where 00000 = PASS, 99999 = FAIL.

The second 5 digits are the test number e.g. 00057.

The percent refrigerant purity indicated by this equipment includes the amount of air that may be in the refrigerant being tested, but the percentage of non-condensable gases (such as air) is an independent number.

If the refrigerant being tested is identified as contaminated, any visual percentages being displayed of HFC-134a (R134a) or HFO-1234yf (R-1234yf), outside the design certified value is informal and may not be accurate.

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## 7.4 Re-calibration

To ensure optimum accuracy of the Identifier it is advisable to periodically re-calibrate the instrument against **certified reference cylinders of 100% R1234yf and 100% R134a.**

It is recommended that re-calibration is carried out at least every 5 years.

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## 8 SPECIFICATION

<b>Refrigerants and other vapours identified</b>	R1234yf and R134a
<b>Design Standard</b>	SAE J2912
<b>Maximum Pressure</b>	0.6 - 16 Bar
<b>Sample type</b>	Vapour only
<b>Sample volume</b>	5 grams per test
<b>Operating temperature range</b>	+10°C to +49°C
<b>Sensor type</b>	NDIR – Non-Dispersive Infrared
<b>Power Rating</b>	12 Volts / 1 Amp DC nominal
<b>Air sensor lifetime</b>	5 + years
<b>Test and purge time</b>	2 minutes 20 seconds
<b>USB Communications</b>	USB 3.0
<b>Serial Port Communications</b>	RS232
<b>Stored test results capability</b>	5 tests maximum
<b>Weights</b>	Direct Mount Version – 470 grams Bezel Mount Version – 625 grams Boxed Weight – 1Kg
<b>Approvals</b>	CE, EMC



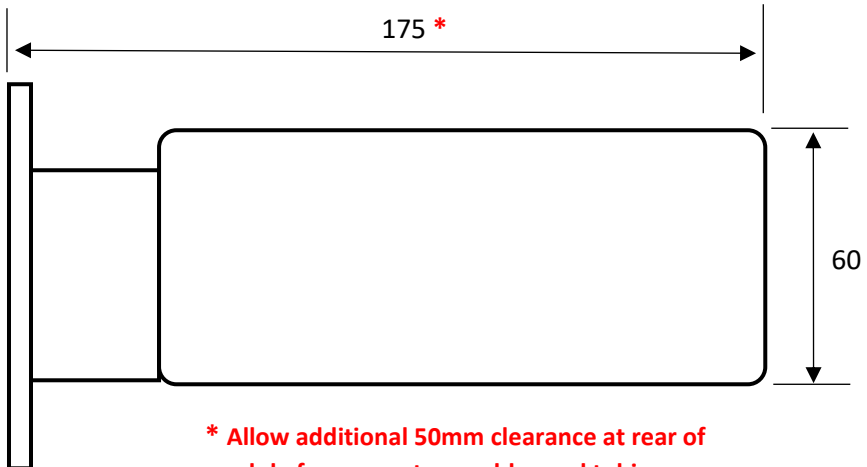
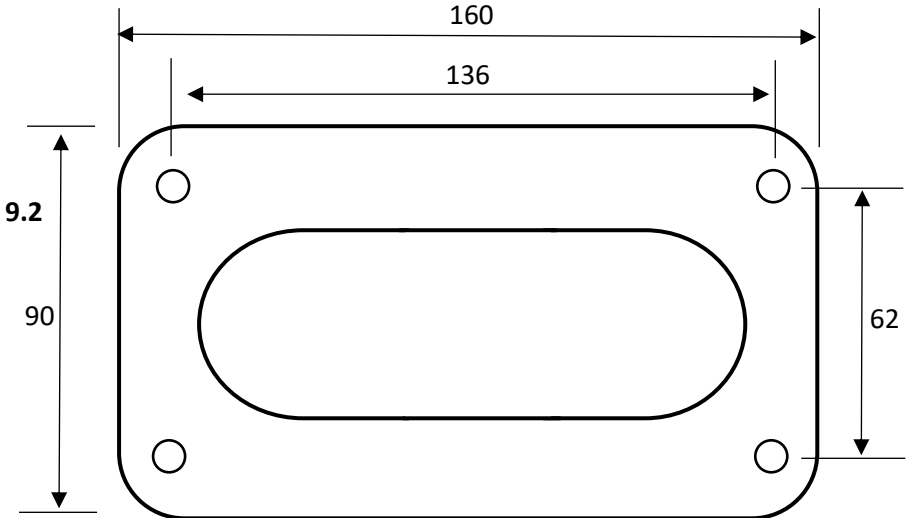
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## 9 DIMENSIONAL DATA

### 9.1 Bezel Mount Version



**\* Allow additional 50mm clearance at rear of module for connectors, cables and tubing**

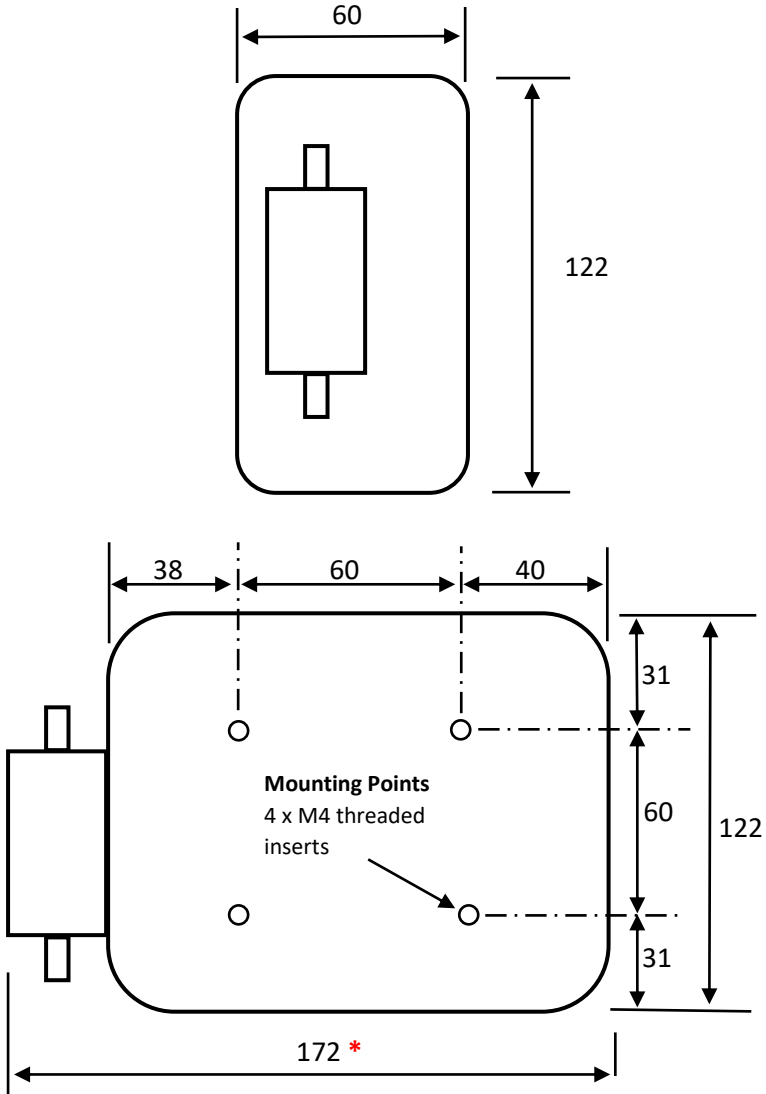
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## 9.3 Direct Mount Version

9.4



**\* Allow additional 50mm clearance at rear of module for connectors, cables and tubing**

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## 10 SPARE PARTS & ACCESSORIES

Part No	Description
SS991	Sample hose with oil restrictor
SS993	RS232 Computer cable
SS994	RS232 Output cable
SS995	12V DC Power cable
150408	Pump c/w cable, connector and ties
210098	Oil filter
250004	Type 2032 3Volt Lithium Battery
270155	Oxygen (Air) sensor c/w cable and connector

## 11 WARRANTY

The Mentor Refrigerant Identifier is warrantied for 2 year against failure of parts.

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