

Issued 1948-11  
Reaffirmed 1991-05  
Revised 2001-07

Superseding AS412A

## Carbon Monoxide Detector Instruments

### FOREWORD

Changes in this Revision are format/editorial only.

#### 1. SCOPE:

This Aeronautical Standard covers the basic type of carbon monoxide detector instrument used to determine toxic concentrations of carbon monoxide by the measurement of heat changes through catalytic oxidation.

##### 1.1 Purpose:

To specify minimum requirements for carbon monoxide detector instruments for use in aircraft, the operation of which may subject the instrument to the environmental conditions specified in Paragraph 3.3. This standard is not intended to cover fire detectors.

#### 2. REFERENCES:

There are no referenced publications specified herein.

#### 3. GENERAL REQUIREMENTS:

##### 3.1 Material and Workmanship:

3.1.1 Materials: Materials shall be of a quality which experience and/or tests have demonstrated to be suitable and dependable for use in aircraft instruments.

3.1.2 Workmanship: Workmanship shall be consistent with high grade aircraft instrument manufacturing practice.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright 2001 Society of Automotive Engineers, Inc.  
All rights reserved.

Printed in U.S.A.

**TO PLACE A DOCUMENT ORDER: (724) 776-4970    FAX: (724) 776-0790    SAE WEB ADDRESS: <http://www.sae.org>**

SAE AS412 Revision B

3.2 Identification:

The following information shall be legibly and permanently marked on the instrument or attached thereto:

- (a) Name of instrument (Carbon Monoxide Detector)
- (b) SAE Aeronautical Standard AS412B
- (c) Manufacturer's part number
- (d) Manufacturer's serial number or date of manufacture
- (e) Manufacturer's name and/or trademark
- (f) Rating

3.3 Environmental Conditions:

The following conditions have been established as design requirements only. Tests shall be conducted as specified in Sections 5, 6, and 7.

3.3.1 Temperature: When installed in accordance with the instrument manufacturer's instructions, the instrument shall function over the range of ambient temperature indicated in Column A below, and shall not be adversely affected by exposure to the temperatures shown in Column B below.

TABLE 1

| <u>Instrument Location</u>          | <u>A</u>     | <u>B</u>     |
|-------------------------------------|--------------|--------------|
| Heated Areas (Temp. controlled)     | -30 to 50 °C | -65 to 70 °C |
| Unheated Areas (Temp. uncontrolled) | -55 to 70 °C | -65 to 70 °C |

3.3.2 Humidity: The instrument shall function and shall not be adversely affected when exposed to any relative humidity in the range from 0 to 95 percent at a temperature of approximately 32 °C.

3.3.3 Altitude: The instrument shall function and not be adversely affected when subjected to a pressure and temperature range equivalent to -1000 feet to 40,000 feet standard altitude except that the instrument temperature shall not be lower than -30 °C.

SAE AS412 Revision B

3.3.4 Vibration: When installed in accordance with the instrument manufacturer's instructions, the instruments shall function and shall not be adversely affected when subjected to vibrations of the following characteristics:

TABLE 2

| <u>Type of Instrument Mounting</u>        | <u>Cycles/Min</u> | <u>Maximum Double Amplitude</u> | <u>Maximum Acceleration</u> |
|---|-------------------|---------------------------------|-----------------------------|
| Airframe Structure Mounted                | 300 - 30,000      | .036 inch                       | 10 g                        |
| Shock Mounted Panel or Shock Mounted Rack | 300 - 3,000       | .020 inch                       | 1.5 g                       |

4. DETAIL REQUIREMENTS:

4.1 Design:

The instrument shall consist of a means for testing air for contamination with carbon monoxide. It shall include an alarm circuit or control circuit which will indicate the presence of contamination when it reaches a concentration between .005 and .007 percent of carbon monoxide by volume.

4.1.1 Sampling Method: A means shall be incorporated in the design to direct the air sample to the sensitive element of the instrument in a positive manner.

4.2 Indicating Method:

The instrument shall be capable of actuating both visual and aural alarm indicators.

4.3 Reliability:

False signals (including failure) in the instrument shall not result from variations in flight attitude, from normal amounts of gasoline vapors and dust likely to accumulate in the instrument in normal flight operations, from accelerations encountered in flight or landing, or from variations in voltage (+25 percent, -100 percent of the rated).

4.4 Power Variations:

All units shall properly function with +10 percent -20 percent variation in DC voltage and/or ±10 percent variation in AC voltage and ±5 percent variation in frequency.