1. INTRODUCTION

The 705 High Temperature (HT) Combustible Gas Sensor is a gas detector that is UL certified for Class I, Division 1, Groups B, C, and D for installation in a hazardous area. It employs a catalytic pellistor sensor device which is used as part of a bridge measuring circuit. The sensor must be mounted on a suitably UL approved high temperature junction box, suitably approved and certified high temperature housing, and a control system which complies with all the relevant standards and regulations. This publication is not strongly advised to obtain copies of the most recently issued standards, and guidelines. This publication is not intended to form the basis of a control system documentation.

2. SAFETY

WARNING

1. This apparatus is not suitable for use in oxygen enriched atmospheres (>21%O2). Oxygen deficient atmospheres (<10%O2) may supress sensor output.
2. Refer to local or national regulations relative to installation at the site.
3. Operators must be fully aware of the action to be taken if the gas concentration exceeds the alar limit value.
4. Atmospheres above 100%LEL may suppress the sensing element.
5. The catalytic detector element is resistant to catalytic poisons, however, abnormally high concentrations of halogenated hydrocarbons, vapours of heavy metals or compounds, some silicone compounds and sulphur compounds may cause loss of sensitivity.

CAUTIONS

1. Do not modify or alter the sensor construction as essential safety requirements may be invalidated.
2. Install using suitably approved and certified high temperature junction box, connectors and glands.
3. Installation should consider not only the best placing for gas leakage relative to potential leak points, gas characteristics and ventilation, but also where the potential of mechanical damage is minimized or avoided.
4. The sintered disc on the sensor assembly must be kept free from contamination, e.g. oil and dirt.
5. The Code of Practice covering Selection, installation, use and maintenance of detectors for flammable gases and oxygen, IEC 60079-29-2, should be complied with at all times.
6. Refer to the appropriate local/national regulations relative to installation site.
7. Dispose of in accordance with local/national disposal regulations.

CAUTION

Indicates hazardous or unsafe practice which could result in severe injury or death to personnel.

Warning: Indicates hazardous or unsafe practice which could result in severe injury or death to personnel, or product or property damage.

Note: Provides useful/helpful/additional information.

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8. SPECIFICATIONS

Weather Protection Housing
Dimensions: 76.5mm x 50.8mm dia.
Weight: 52.5g

Sample Flow Housing
Dimensions: 21.0mm x 46.0mm x 31mm
Weight: 110g

Type 705 High Temperature Combustible Gas Sensor

7. CERTIFICATION

When ordering accessories and parts, always quote the complete part number. Where a component part number is not listed or known, state material, cable entry size and other relevant details.

Complete replacement 705 HT sensor (Part No: 00705-A-1723)
Identify the gas to be detected when ordering a complete replacement sensor.

Collecting Cone (Part No: 00780-A-0032)
Used for the detection of lighter than air gases. A filter must be fitted. A nozzle on the cone permits gassing of the Sensor with the cone in position. Test gas is applied either directly to the nozzle or via a permanently connected pipe line when the sensor is in an inaccessible location.

Weather Protection Housing (Part No: 00780-A-0076)
This accessory, fitted to a sensor installed in an exposed location, protects the sensor from damage from winds of over 30 knots. When mounted close to the ground, it protects from heavy rain rebounding off the ground. It also reduces contamination from industrial waste and enables the application of test gas in high wind speeds without significant error.

Incorporated in the housing is a nozzle to facilitate gassing of the sensor with the housing in position, either by direct application to the nozzle or via a permanently connected pipeline. The nozzle is free to rotate within the housing to allow removal of the sensor without disconnecting a permanently connected pipeline, when changing the filter and cleaning the sensor.

Sample Flow Housing (Part No: 00780-A-0028)
This accessory allows sampling of a closed system by means of two pipes. The housing is fitted to the sensor accessory thread by a locking ring that enables the housing to be removed without disconnecting the pipeline. The filter is retained by the housing and interfaces with a gasket bonded to the housing (Part No: 00780-A-0048).

Stainless Steel Filter (Part No: 00780-F-0016)
Two layers of stainless steel mesh in the form of a disc with a rubber ring to provide mechanical protection of the sinter and exclude large dust particles.
3. INSTALLATION

The 705 HT sensor must be fitted into a suitable UL approved high temperature junction box fitted with an approved cable gland for external wiring. The sensor requires a 200mA current supply, nominal 3V, derived from a suitable control card.

Only a qualified installation engineer should install the sensor.

Install the sensor in a location free from direct heat sources and fits it so that it either points downwards or horizontally. It is not recommended that the sensor points upwards.

1. Isolate all associated power supplies and ensure that they remain OFF during the installation procedure. Ensure a gas free atmosphere.

2. Install a suitably approved UL high temperature junction box.

See the manufacturer’s instructions. The box provides a mounting point for the sensor.

3. Remove the junction box lid.

4. Fit the 705 HT sensor to the junction box.

Ensure that the junction box thread and the sensor thread are compatible. The mounting threads should be coated with an approved anti-seize compound, such as a light petroleum grease.

Push the sensor wires through the cable entry in the junction box and screw the sensor body firmly home into the entry. To comply with certification requirements, a minimum of five threads must be engaged.

5. Connect the sensor wiring to the junction box terminal strip.

See the subsequent wiring diagram. Use multicore cable, three wire minimum, of conductor size 2.5mm² (4/4AWG) max.

6. Fit a suitable gland/condut to the box, secure the control system cable and connect the cable wiring to the terminal strip.

7. Refit the junction box lid.

8. Unscrew the filter housing from the sensor body and remove the filter from the filter housing.

Discard the filter housing with protective disc. The filter housing material cannot withstand high temperatures. Keep the filter.

4. CALIBRATION

Sensors should be calibrated at concentrations representative of those to be measured. It is always recommended that 705 HT is calibrated with the target gas it is to detect. Gassing is carried out at the sensor and adjustments are made at the control card.

5. MAINTENANCE

1. No accessories fitted

Where there are no accessories fitted to the sensor, it is recommended that the Sample Flow Housing accessory is used when gassing the sensor (see 5.3). Where this is not possible, a suitable plastic bag may be used.

Caution: Calibration should only be attempted by qualified service personnel.

2. Collecting Cone or Weather Protection Housing Fitted

1. Using rubber tubing, connect the test gas to the gassing nozzle or to the permanently connected tubing if fitted to the accessory.

Cautions:

1. Spring pressure on the gassing nozzle of the Weather Protection Housing or the Fire Protection Housing may force the nozzle against the sinter. Rotation of the nozzle may sample flow.

2. Disconnect the input pipeline from the input nozzle of the Flow Housing.

3. Using rubber tubing, connect the test gas to the Flow Housing input nozzle.

4. Set the flow rate to 1.5 ± 0.1 litres per minute and test the system in accordance with the instructions in the relevant system equipment manual.

5. On completion, shut off the test gas and disconnect the rubber tubing.

6. Reconnect the input pipeline to the Flow Housing input nozzle and restore the sample flow.

7. Refit the junction box lid.

8. Remove the junction box lid.

9. Fit the 705 HT sensor to the junction box.

10. If required, fit an accessory to the sensor.

Caution: Calibration should only be attempted by qualified service personnel.

6. FAULT FINDING

The following table provides a list of possible faults related to the sensor together with possible causes and remedies.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause/Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor reads zero when gas is applied</td>
<td>Check the wiring</td>
</tr>
<tr>
<td>Sensor reads non-zero when no gas is present</td>
<td>Adjust the control system span setting</td>
</tr>
<tr>
<td>Sensor reads high when gas is applied</td>
<td>Adjust the control system zero setting</td>
</tr>
<tr>
<td>Sensor reads zero when gas is applied</td>
<td>Replace the sensor if poisoning is suspected</td>
</tr>
</tbody>
</table>

In the event of exposure to contaminants, e.g. silicones or silicone based products, or prolonged exposure to high concentration of gas, the sensor should be operated for 24 hours in a clean environment and then recalibrated.

If the sensor is found to be faulty, or cannot be calibrated, the complete sensor must be discarded and replaced.