The Servomex 2700 analyser continuously measures the levels of Oxygen and/or Combustibles (COe) in flue gases to allow improved combustion efficiency and early warning of combustibles (COe) breakthrough

If you have a requirement for Continuous Emissions Monitoring Systems (CEMS) please contact Servomex and we will be pleased to provide you with information on our range of analysers and sample conditioning systems.

Typical applications:
- Power Generation Boilers
- Process Heaters
- Thermal Crackers
- Incinerators

Please contact Servomex for further information on applications in Metals and Cement production industries.

### Specification

<table>
<thead>
<tr>
<th>Gases Measured:</th>
<th>Oxygen (O₂)</th>
<th>Combustibles (COe- Carbon Monoxide Equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Range:</td>
<td>0.01% to 25.00%</td>
<td>Gas and Light Oil* 0ppm to 10,000ppm</td>
</tr>
<tr>
<td>Output Range:</td>
<td>0-1% min. to 0-25% max O₂ in 1% steps</td>
<td>0-500ppm(v) min. to 0-2,000ppm(v)</td>
</tr>
<tr>
<td>Accuracy:</td>
<td>±1% of reading or ±0.1% O₂*</td>
<td>±25ppm(v) or ±5% of reading</td>
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<tr>
<td>Response Time (T₉₀)</td>
<td>10 seconds. sensor head only</td>
<td>20 seconds sensor head only</td>
</tr>
<tr>
<td>*whichever is greater</td>
<td>20 seconds sensor head only</td>
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### PERFORMANCE

- **Display Range:**
  - Oxygen: 0.01% to 25.00%
  - Combustibles: 0ppm to 10,000ppm
- **Output Range:**
  - Oxygen: 0-1% min. to 0-25% max O₂ in 1% steps
  - Combustibles: 0-500ppm(v) min. to 0-2,000ppm(v)
- **Accuracy:**
  - Oxygen: ±1% of reading or ±0.1% O₂*
  - Combustibles: ±25ppm(v) or ±5% of reading
  - Temperature Coefficient: ±75ppm(v) or ±5% of reading
- **Response Time (T₉₀):**
  - Oxygen: 10 seconds. sensor head only
  - Combustibles: 20 seconds sensor head only

### SIGNAL INPUTS/OUTPUTS

- **Analogue Output:**
  - One configurable isolated 0/4-20mA per measurement (1kΩ max).
- **Alarms & Relays:**
  - Four SPCO relays (250VAC/3A or 28VDC/1A max), configurable for Concentration Alarms, Faults, In Calibration, In Blowback, and solenoid valves for blowback and autocalibration.
- **Digital Inputs:**
  - Two non-isolated digital inputs provided to initiate autocalibration and perform blowback

### PHYSICAL

- **Dimensions (typical):**
  - Control Unit: 391 x 167 x 260mm (15.4" x 6.6" x 10.3")
  - Sensor Head: 301 x 330 x 256mm (11.9" x 13.0" x 10.1")
- **Weight:**
  - Control Unit: <11kg (<24.3lbs)
  - Sensor Head: <17kg (<37.3lbs) - Dual transducer
- **Hazardous Area Classification:**
  - Europe: ATEX Group II, Category 3 Gases & Dusts
  - US & Canada: Class I & II, Div 2 & Class III, Div 1 & 2 (Control Unit only)
- **Ingress Protection:**
  - General Purpose (Sensor Head) Contact Servomex for ‘Z’ purge option (USA)
  - IP66 / NEMA 4X
- **Mounting:**
  - Control Unit: Wall, 19" rack and panel mounting
  - Sensor Head: Choice of mounting flanges and adaptors. Full range of sample probes available.

* Consult Servomex for high sulphur and other applications.
**Ambient Conditions**

Temperature
- **Operating**: Sensor Head: -20°C to +70°C (-4°F to +158°F); Control Unit: -10°C to +55°C (+14°F to +131°F)
- **Storage**: Sensor Head: -30°C to +80°C (-22°F to +176°F); Control Unit: -20°C to +55°C (-4°F to +131°F)
- **Altitude**: Up to 2000m

**Power Supply**

- 100 - 120 Vac, 50/60 Hz
- 220 - 240 Vac, 50/60 Hz
- Control Unit: 250VA
- Sensor Head: 600VA

Note: Control Unit & Sensor Head are powered separately. Control unit power supply is fixed at time of order, but is field configurable. The sensor head supply is factory set.

**Sensor Head Compressed Air Requirements**

- **Aspirator Air**
  - Pressure: 3.5psig typical (3 to 5 psig - 0.2 to 0.3barg)
  - Flow: <1.5 litres/min typical
- **Auxiliary Air**
  - Flow: 100 ml/min ±1%

Variations in auxiliary air flow outside the tolerances stated above can affect the COe readings. All Servomex Utilities Units have been fully optimised to provide the stable auxiliary air flow required.

**Sample Wetted Materials**

<table>
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<th>Item</th>
<th>Materials</th>
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<tr>
<td>Sensor Head</td>
<td>stainless steel (303 and 316), gasket sealing material (Klinger grade SLS 150)</td>
</tr>
<tr>
<td>Oxygen Sensor</td>
<td>stainless steel (310 and 316), zirconia, platinum, alumina, Ni/Fe/Cr alloy, high temperature sealing glasses.</td>
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<tr>
<td>Combustibles Sensor</td>
<td>stainless steel (316), platinum, platinum/indium, zirconia, alumina, corrosion resistant glass</td>
</tr>
<tr>
<td>Unfiltered sample</td>
<td>stainless steel (316)</td>
</tr>
<tr>
<td>Filtered sample</td>
<td>stainless steel (316), stainless steel (310), silicon carbide</td>
</tr>
<tr>
<td>Unfiltered sample</td>
<td>Haynes alloy 556, stainless steel (316)</td>
</tr>
<tr>
<td>Filtered sample</td>
<td>stainless steel (310), Haynes alloy 556, stainless steel (316), silicon carbide</td>
</tr>
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Effect of other common combustible flue gases COe reading ppm(v)

| SO₂       | < 60 |
| CH₄       | < 5  |
| Other combustibles, eg. H₂, C₂H₆, C₃H₈ | Response depends on species, consult Servomex |

Hazardous Location Approvals

Control Unit:
Approved as EEEx nC IIC T5 (-20°C < Ta < +55°C) for ATEX Group II, Category 3 Gas and Dust Hazardous Atmospheres T75°C (BASEEFA No. BAS02ATEX3205)

Approved as non-incendive for:
- Class I, Div. 2, Groups A,B,C & D,
- Class II, Div. 2, Groups F & G,
- Class III, Div. 1 & 2
- Enclosure Type 4X
- T5, Ambient Temperature 55°C max.
  (Factory Mutual - FMRC)

Suitable for use in:
- Class I, Div. 2, Groups A,B,C & D,
- Class II, Div. 2, Groups E, F & G,
- Class III, Div. 1 & 2
- T5, Ambient Temperature 55°C max.
  Enclosure Type 4X
  (Canadian Standards Association - CSA)

Sensor Head:
Not approved for installation in hazardous locations.

EC Directive Compliance


It conforms to the following harmonised European standards for electrical safety and electromagnetic compatibility:

EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use.

EN 61326-1: Electrical equipment for measurement, control and laboratory use - EMC requirements

This product is rated for Installation Category II in accordance with IEC 664.

This product is rated for Pollution Degree 2 in accordance with IEC 664.

Safety USA/Canada

Complies with FM approval class number 3810 CAN/CSA - C22.2 No. 1010.1-92

Cross Sensitivity Specification

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<th>Effect of other common combustible flue gases per 1000 ppm(v)</th>
<th>COe reading ppm(v)</th>
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System Response Times T₉₀ (Typical)

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<th>Measurement:</th>
<th>O₂ only</th>
<th>Combustibles (COe) only</th>
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<tr>
<td>&lt;700°C, 1m long, stainless steel sample probe with sample filter</td>
<td>&lt;17s</td>
<td>&lt;30s</td>
</tr>
<tr>
<td>&lt;1000°C, 1m long, H556 alloy sample probe with sample filter</td>
<td>&lt;17s</td>
<td>&lt;27s</td>
</tr>
<tr>
<td>&lt;1750°C, 1m long, Ceramic sample probe with sample filter:</td>
<td>&lt;20s</td>
<td>&lt;27s</td>
</tr>
</tbody>
</table>
Utilities Unit Specification

Temperature
- Operating: -10°C to +50°C (+14°F to +122°F)
- Storage: -20°C to +55°C (-4°F to +131°F)

Compressed Air & Blowback Air requirements:
- Pressure: 1 to 5 barg (15 to 72.5psig)
- Flow: 4.5 to 10 litres/min

Instrument grade compressed air*, free of oil, water & dirt

Calibration Gas requirements:
- Pressure: 1 barg (15 psig)
- Flow: 600ml/min typical

Utilities Unit/s
- 02730-701 (Oxygen only)
  92mmW x 99mmD x 165mmH (3.7” x 3.9” x 6.5”)
  <400gms (<1.0lbs)
- 02730-702 (CO₂ only and Dual), 731 (Oxygen only and manual calibration) and 732 (CO₂ only, Dual and manual calibration)
  390mmW x 174mmD x 265mmH (15.5” x 6.8” x 10.4”)
  <4.5Kgs (<10lbs)

Automatic Calibration and Utilities Units **
- 02730-711, 712, 713, 721, 722 & 723
  400mmW x 220mmD x 500mmH (16” x 9” x 20”)
  <16Kgs (<35lbs)

Ingress Protection:
- IP65/NEMA 12 (Auto cal. units only)

Power Supply:
- 100 - 120 Vac, 50/60Hz <20VA
- (Field Configurable) 220 - 240 Vac, 50/60Hz <20VA

The Nickel plated brass bulkhead connections are suitable for 1/4” NPT and BSP male fittings & tubing. Internal components are brass, plastic fittings and tubing.

* or Nitrogen, if analyser equipped for Nitrogen aspiration.
** The six autocalibration versions of the utility units comply with the “CE Marking Directive” 93/68/EEC.

Interconnecting Cable Requirements

Cross Section Max. Cross Section Max.

Oxygen only
- 3 twisted pairs with overall screen *
  1.0mm² 100m
  1.5mm² 150m
  2.5mm² 300m

Combustibles only
- 8 twisted pairs with individual and overall screens *
  100m

Oxygen and Combustibles
- 9 twisted pairs with individual and overall screens *
  100m

* Maximum loop resistance of 4 Ohms is allowed for the heater connections and use cables with a minimum of 1.0mm² cross section.

NOTE: Add 1 extra twisted pair to the above cable requirements if the optional sensor head temperature readout is required to be displayed by the control unit.

Calibration Gas Requirements

Calibration Gas Composition Oxygen Combustibles

Sensor (Zr) Sensor (CO₂)

Air (20.95%(v) O₂ in Nitrogen)* Span (High) Zero

*Air must be free from combustible gases (eg CO, H₂, Hydrocarbons, etc)

0.3%(v) O₂ in Nitrogen ** Zero (Low) N/A

** gas composition can be between 0.25% and 2.5% O₂ in Nitrogen

500ppm(v) Carbon Monoxide in Air *** N/A Span

*** gas composition can be between 500ppm(v) and 1000ppm(v) in Air

Visit www.servomex.com for technical data sheets, application and technology information for all Servomex analysers.

Servomex has a policy of constant product improvement and therefore reserves the right to change specifications without notice.

Servomex companies, agents and representatives are located throughout the world. Your nearest contact is:

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