



## SERVOTOUGH Oxy (1900)

The SERVOTOUGH Oxy offers reliability, flexibility, simplicity of use and installation for applications in the most hazardous and challenging of environments. The worlds leading paramagnetic technology, combined with advanced safety concepts and additional features make this the analyser against which all others should be judged.

### FEATURES

- **Heated Sample Compartment** - eliminates condensation issues for samples with a dewpoint up to 50°C, significantly simplifying sample system requirements.
- **Servomex Flowcube Technology** - Internal Flow Sensor for peace of mind, improved safety, and preventative maintenance.
- **Internal Pressure Compensation** - compensates for pressure variations caused by either barometric or vent pressure fluctuations e.g. flare stacks.
- **Hazardous Area Approved for Gases and Dusts**  
Atex Cat 2  
IECEX Zone 1 and Zone 21  
cCSA<sub>US</sub> Div 1, Zone 1 and Zone 21  
TlIS Zone 1
- **Autovalidation** - reduces the level of hands on maintenance via remote or local validation for the highest levels of confidence, and measurement availability.
- **Low Cost of Ownership** - no requirement for measurement reference gases or purge gases for certification or flammable samples. Long calibration intervals and cell life.
- **SIL 2 Hardware Compliance** - functional safety manual available.

### APPLICATIONS

- Process control.
- Safety critical oxidation, such as ethylene oxide and propylene oxide purity.
- Feedstock clean up.
- Inerting/blanketing.
- Flare stack analysis.

# SERVOTOUGH

## Oxy

### KEY FEATURES

#### Heated Sample

An innovative, fully heated sample compartment removes the requirement for a sample conditioning system on samples with a dew point of up to 50°C (122°F).

Responsible for up to 80% of failures in comparable units, sample conditioning failure is a major cause of unplanned downtime. The heated sample compartment design reduces this risk of downtime by limiting the need for coolers, dryers and other conditioning devices. This design improves operational cost as well as initial system and integration costs, making it especially ideal for use where 'wet' gases are to be measured.

#### Servomex Flowcube Technology

Servomex's determination to deliver users the most safe, accurate and reliable levels of measurement remains at the forefront of our design philosophy – therefore our unique flow sensor technology has been placed after the measurement transducer, enabling accurate flow trending and alarm setting for many applications including safety critical applications. \*

#### Internal Pressure Compensation


An integrated pressure compensation system that not only compensates for barometric pressure but also for sample vent back pressure variations e.g. from flare stacks, enabling emission compliance targets to be easily met.

#### Low Cost of Ownership

Both the flow sensor and pressure compensation system technologies report via the instrument's standard communication options. This permits simplified installation which can reduce the number of discrete devices needed and greatly reduces complex cabling issues.

\* Not suitable for gas mixtures that contain hydrogen and/or helium at concentrations over 10% of the total mixture.

### HAZARDOUS AREA APPROVALS

|  |   |                       |
|--|---|-----------------------|
| ATEX:  II 2 GD, | Ex ia d IIC T4 Gb                         | (-10°C ≤ Ta ≤ +60°C)* |
|  | Ex tb IIIC T90°C Db                       | (-10°C ≤ Ta ≤ +60°C)* |
| IECEX :  | Ex ia d IIC T4 Gb                         | (-10°C ≤ Ta ≤ +60°C)* |
|  | Ex tb IIIC T90°C Db                       | (-10°C ≤ Ta ≤ +60°C)* |
| cCSA <sub>US</sub>   | Class I, Division 1, Groups A, B, C, D T4 | (-10°C ≤ Ta ≤ +60°C)* |
|  | Class II, Division 1, Groups E, F, G      | (-10°C ≤ Ta ≤ +60°C)* |
|  | Class III, (-10°C Ta +60°C)*              |                       |
|  | Class I, Zone 1, Ex ia d IIC T4           | (-10°C ≤ Ta ≤ +60°C)* |
|  | Class I, Zone 21, Ex tD T90°C             |                       |
|  | Class I, Zone 1, AEx ia d IIC T4          | (-10°C ≤ Ta ≤ +60°C)* |
|  | Class I, Zone 21, Ex tD T90°C             |                       |
| TIIS Zone 1  | Ex ia d IIC T4 X                          | (-10°C ≤ Ta ≤ +50°C)  |

\* (+14°F ≤ Ta ≤ +140°F)

### EC DIRECTIVE COMPLIANCE

The SERVOTOUGH Oxy (1900) complies with the following EC Directives \*:

Electromagnetic Compatibility Directive 2004/108 EC

Atex Directive (94/9/EC)

\* See certification supplement manual for further information

# SERVOTOUGH

## Oxy

### SPECIFICATIONS

|  |  |
|--|--|
| Gas measured:                          | Oxygen   |
| TECHNOLOGY:                            | Paramagnetic   |
| HAZARDOUS AREA:                        | ATEX Cat. 2  |
| Gases and dusts:                       | IECEX Zone 1 and Zone 21<br>USA CSA <sub>US</sub> Div 1, Zone 1 and Zone 21<br>TIIIS Zone 1  |
| PERFORMANCE:                           |  |
| Measurement range:                     | 0-25% O <sub>2</sub> <sup>†</sup>  |
| Lower detection limit:                 | < ± 50ppm O <sub>2</sub>   |
| Linearity error:                       | No measurable error  |
| Repeatability error:                   | 0.02% O <sub>2</sub>   |
| Intrinsic error (accuracy):            | < ±0.05% O <sub>2</sub> (based on ± 95% confidence limits)   |
| Response time (T <sub>90</sub> ):      | <6 seconds at 200ml/min and 1l/min   |
| Zero drift per week:                   | <0.05% O <sub>2</sub> /week  |
| Span drift per week:                   | <0.05% O <sub>2</sub> /week  |
| Temperature Co-efficient zero:         | <±0.03% O <sub>2</sub> /10°C   |
| Sample vent pressure effects:          | Pressure compensation not fitted: 1% change in sample vent pressure corresponds to a 1% change in reading<br>Pressure compensation fitted: 1% change in sample vent pressure corresponds to a <0.05% change in reading |
| Sample flow variations:                | A change in flow from 50-250ml/min (12-70l/hr internal bypass option) will cause a zero change of <0.1% O <sub>2</sub> and a span change of <0.5% of reading   |
| SIGNAL OUTPUTS:                        | As standard each unit comes fitted with:   |
| Analogue outputs:                      | One isolated 4-20mA / 0-20mA   |
| Analogue output range:                 | User selectable over the measurement range (minimum range 0-1% O <sub>2</sub> )  |
| Alarms:                                | Two volt free single pole double throw relays (30V dc 1A)  |
| Status signals:                        | Four volt free single pole double throw relays (30V dc 1A): instrument fault, maintenance required, service in progress and mA range indication  |
| Digital communications:                | Modbus RTU (RS485)<br>Ethernet (Modbus TCP)  |
| OPERATING ENVIRONMENT:                 |  |
| Temperature:                           | Operating: -10°C to +55°C (+14°F to +131°F)<br>Storage: -20°C to +60°C (-4°F to +140°F)  |
| Relative humidity:                     | 0-95% RH, non-condensing   |
| Warm up time:                          | Typically <4 hours (at 20°C ambient (68°F) depending on application and environment)   |
| Operating altitude range:              | -500 to 2000 metres  |
| Ingress protection:                    | IP66 and NEMA 4X   |
| FLOW SENSOR:                           |  |
| Accuracy:                              | < ± 5% of full scale for 100% N <sub>2</sub> *   |
| Minimum detectable change:             | 1% of full scale   |
| Response time (T <sub>63</sub> ):      | <15 seconds  |
| Ambient temperature co-efficient span: | <2% of full scale per 10°C   |
| Calibration interval:                  | 6 to 12 months   |

<sup>†</sup> Not suitable for oxygen enriched concentrations i.e. > 21% O<sub>2</sub>

\* For gases with higher molecular weights than N<sub>2</sub>, the accuracy will be < ± 10% of full scale.

# SERVOTOUGH

## Oxy

### SPECIFICATIONS

|                                |  |  |
|--------------------------------|--|--|
| <b>SAMPLE GAS:</b>             | The sample gas must be clean, non-corrosive and free from oil and condensates  |  |
| Particulate size:              | <3 µm  |  |
| Dew point:                     | Unheated sample compartment:   | a minimum 5°C (9°F) below ambient temperature  |
|                                | Heated sample compartment:   | maximum sample dewpoint 50°C (122°F)   |
| Flow rates:*                   | Standard:  | 50 to 250ml/min (200ml/min recommended)  |
|                                | Optional high flow internal bypass:  | 50 to 70l/hr (60l/hr recommended)  |
| Sample connection:             | 1/4" NPT female, 6mm tube or 1/4" tube   |  |
| Sample wetted materials:       | Standard measurement option:   | 304SS, 316SS, borosilicate glass, platinum, platinum/iridium alloy, electroless nickel, Viton®             |
|                                | Solvent resistant option:  | 304SS, 316SS, borosilicate glass, platinum, platinum/iridium alloy, electroless nickel, Chemraz® 555, PTFE |
| Maximum sample vent pressure:* | 24kPa absolute (18psi absolute) <sup>†</sup>   |  |
| Maximum inlet pressure:*       | 02.kPa (0.03psi) relative to sample vent pressure <sup>†</sup>   |  |
|                                | * The pressure and flow of sample gases must be externally regulated to meet the above requirements  |  |
|                                | <sup>†</sup> For the high flow internal bypass option, the maximum sample vent pressure and maximum sample inlet pressure are limited to:<br>122.8kPa (17.8psia) and 1.4kPa (0.2psi) relative to sample vent pressure respectively |  |
| <b>CORROSIVE PURGE GAS:</b>    |  |  |
| Recommended gas:               | Instrument grade air   |  |
| Flow rate:                     | 40 to 60ml/min   |  |
| Purge inlet connection:        | 1/4" NPT female  |  |
| Purge outlet:                  | Through analyser breather, no external connection  |  |
| POWER SUPPLY:                  | 100-120 or 220-240V AC, 50/60Hz, 50 VA   |  |
|                                | The output will change by <1 % FSR for a deviation from the selected supply voltage of up to 15%   |  |
|                                | The output will change by <1 % FSR for a 5% deviation from the selected supply frequency   |  |

### SERVICE & SUPPORT

For new installations and replacement of older Servomex and competitor products, we will work with you to develop a bespoke service and support package, ensuring full measurement availability and plant operation within your timescales and budget.



#### SERVOSPARES

To ensure the integrity and optimum performance of your Servomex product, we recommend fitting only factory authorised spare parts. This is particularly important for all hazardous area certified products.



#### SERVOSURE

Ensure your Servomex analyser is properly commissioned and delivers optimum performance with a maintenance contract, service programme and extended warranty.



#### SERVOTECH

Make the most of your Servomex gas analyser by attending a training course at one of our training centres in Europe, USA or Asia or on your own site.



#### SERVOHELP

Whether you have a simple question or complex process challenge, our local offices and global support network are here to help you.

# SERVOTOUGH

## Oxy

### DESCRIPTION

|                                 |  |  |
|---------------------------------|--|--|
| Analysers certification:        | 4 certified versions of the Oxy analyser are available   | <input type="checkbox"/> Atex<br><input type="checkbox"/> IECEx<br><input type="checkbox"/> CSA <sub>US</sub><br><input type="checkbox"/> TIIS |
| Supply voltage:                 | 2 versions of supply voltage are available   | <input type="checkbox"/> 100-120V<br><input type="checkbox"/> 220-240V   |
| Measurement:                    | Stainless Steel pipework with Viton® seals<br><br>Stainless Steel pipework with Chemraz® and PTFE seals allowing enhanced solvent resistance   | <input type="checkbox"/> Standard<br><input type="checkbox"/> Solvent resistant  |
| Sample flow:                    | Standard flow option of 250ml/min<br><br>An internal by-pass allows inlet flows of up to 1l/min  | <input type="checkbox"/> 250ml/min<br><input type="checkbox"/> 1l/min  |
| Sample heating:                 | The measurement transducer in the Oxy is heated to approximately 65°C (149°F) for measurement stability. In this configuration sample gases must be supplied to the analyser at a dewpoint of at least 5°C (9°F) below that of ambient temperature<br><br>The measurement transducer in the Oxy and the full sample pipework including the sample inlet and outlet connections are heated to 60°C (140°F). This allows the gases up to a dew point of 50°C (122°F) to be sampled directly into the analyser  | <input type="checkbox"/> Sample heating not required<br><br><input type="checkbox"/> Sample heating fitted                                     |
| Internal pressure compensation: | The uncorrected gas measurement is directly affected by changes in atmospheric pressure and any sample vent back pressures on the sample outlet. A 1% change in pressure will directly affect the measurement by 1% of reading. This needs to be considered when looking at the measurement performance required<br><br>The fitting of the internal pressure transducer reduces the effect of pressure changes by a twentieth. A 1% change in pressure will result in a less than 0.05 % change in sample reading  | <input type="checkbox"/> Pressure compensation not required<br><br><input type="checkbox"/> Pressure compensation fitted                       |
| Flowcube internal flow sensor:  | The measurement of the analyser is highly reliable and has internal diagnostics to ensure correct operation, yet in low flow conditions the measurement accuracy may be affected and this cannot be diagnosed by the instrument without a flow sensor<br><br>Our Flowcube technology offers an internal solid state flow sensor fitted directly to the outlet of the measurement transducer, ensuring that the measurement gas is flowing through the transducer at all times for maximum reliability and safety<br><br>Flowcube technology offers one high and two low flow alarms which can be configured to be inactive or to indicate a fault or maintenance required status, via the instrument relay output and the digital communications. Flow level is also reported via the digital communications or the display, so flow trending and maintenance of systems elements can be scheduled. (Note: the flow sensor is currently not suitable for gas mixtures that contain hydrogen and/or helium at concentrations over 10% of the total mixture) | <input type="checkbox"/> Flow sensor not required<br><br><input type="checkbox"/> Flow sensor fitted   |

# SERVOTOUGH

## Oxy

### DESCRIPTION

#### Autovalidation/ calibration:

Autovalidation/calibration is not fitted

☐ Autovalidation  
not required

An option card is available that allows the instrument to control validation or calibration gases automatically (volt free single pole double throw relays: 30V dc 1A)  
This option can also be used for remote calibration of the analyser. Autovalidation using test gases allows the maximum confidence in the measurement to be gained on a regular basis without the expense of using personnel for routine validation. During autovalidation the analyser indicates that it is off line from the process with a service in progress relay contact and if it should detect that the measurement performance is outside preset tolerances it will indicate that maintenance is required through a second relay contact

☐ Autovalidation  
fitted

#### Digital communications:

This allows for the analyser to be fully maintained and configured remotely. It also allows for a greater level of remote diagnostics to be carried out above that supplied by the standard relay contacts

Modbus RTU (RS485)

☐ Modbus RTU  
(RS485)

Ethernet (Modbus TCP)

☐ Ethernet  
(Modbus TCP)

#### Sample inlet:

Allows the connection of 1/4" NPT male fittings directly to the analyser

☐ 1/4" NPT female

Allows the connection of 1/4" OD tube directly to the analyser

☐ 1/4" OD compression  
fitting

Allows the connection of 6mm OD tube directly to the analyser

☐ 6mm OD  
Compression fitting

#### Enclosure options:

IP66 Breather fitted as standard allows the pressure within the enclosure to be the same as the surrounding atmosphere

☐ Breather fitted

A 1/4" NPT female inert gas (normally instrument air or nitrogen) inlet fitting allows inert gas to be supplied to the analyser to prevent the build up of any corrosive gases within the sample compartment in environments where corrosive gases may be present, this will extend the operational life of the analyser in such environments

☐ Corrosive purge  
fitted

#### Gland/conduit entries:

As standard the analyser is supplied with 4 gland entries, 2 x 1/2" NPT female and 2 x 3/4" NPT female

☐ NPT

Adapters to M20 gland entries supplied

☐ Metric M20

Adapters to PG13.5 gland entries supplied

☐ PG 13.5

#### Operators manuals:

An Operators manual contains all the information needed to install and safely set up the analyser

☐ English

#### Service manual:

A Service manual (in English only) contains technical descriptions, fault diagnosis, parts removal, refitting and test instructions, tool and test equipment lists, and electrical drawings. It is intended for use by Servomex trained service personnel

☐ Not required  
☐ English

#### Functional safety manual:

International instructions for those planning, designing, installing, commissioning and maintaining Safety Instrumented Systems. Demonstrates analysers hardware compliance to SIL 2 of IEC 61508

☐ Not required  
☐ English

### OXY PACKS

We have developed Oxy Packs A to E covering all the main applications to enable a quick turnaround from specification to delivery.

|                           |   |
|---------------------------|---|
| A. Entry Pack:            | Suitable for general oxygen applications  |
| B. Hot Pack:              | Entry pack, plus fully heated sample cell for higher dewpoint samples   |
| C. Autoval Pack:          | Hot pack, plus autovalidation and autocalibration functions for highest levels of confidence and lowest levels of field support |
| D. Pressure and Flow Pack | Hot pack, plus internal pressure compensation and internal flow sensor for peace of mind and optimum measurement performance    |
| E. Complete Pack:         | The optimum package for all your measurement needs  |
| F. User Configured:       | All configurations not covered above  |

### QUOTATION FORM

|                    |       |                                  |       |
|--------------------|-------|----------------------------------|-------|
| Purchase Order No. | _____ | Delivery date:                   | _____ |
| Contact details:   | _____ |                                  |       |
|                    | _____ |                                  |       |
|                    | _____ | Fax back to Business Centre      |       |
|                    |       | (refer to fax numbers on page 8) |       |

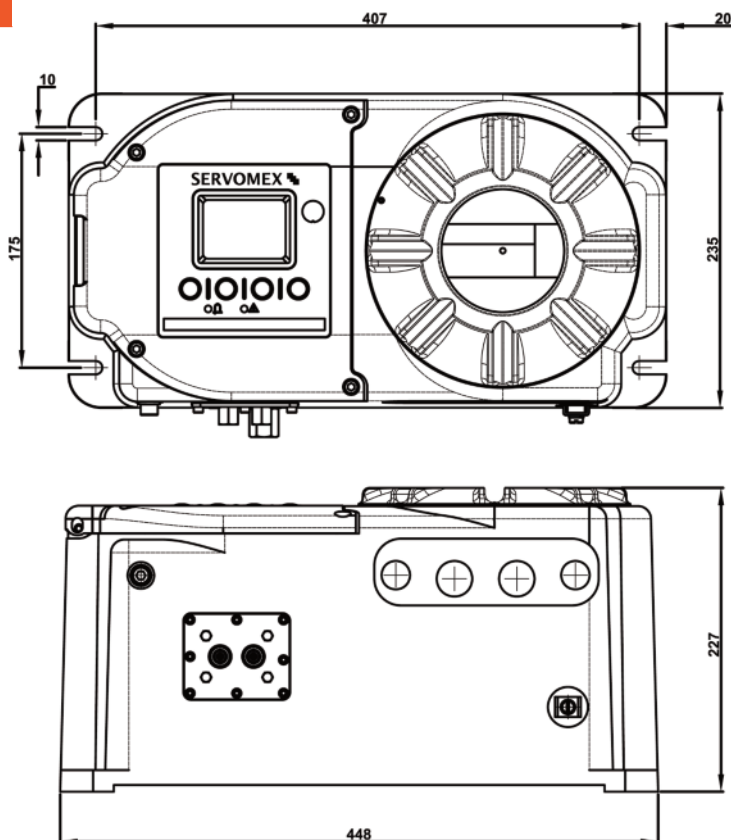
|                                |                                    | A | B | C | D | E | F |
|--------------------------------|------------------------------------|---|---|---|---|---|---|
| Analyser Certification         | ATEX                               |   |   |   |   |   |   |
|                                | IECEX                              |   |   |   |   |   |   |
|                                | cCSA <sub>US</sub>                 |   |   |   |   |   |   |
|                                | TIIS                               |   |   |   |   |   |   |
| Supply Voltage                 | 100 - 120V                         |   |   |   |   |   |   |
|                                | 220 - 240V                         |   |   |   |   |   |   |
| Measurement                    | Standard                           | ✓ | ✓ | ✓ | ✓ | ✓ |   |
|                                | Solvent resistant                  |   |   |   |   |   |   |
| Sample Flow                    | 250ml/min                          |   |   |   |   |   |   |
|                                | 1l/min                             |   |   |   |   |   |   |
| Sample Heating                 | Sample heating not required        |   |   |   |   |   |   |
|                                | Sample heating fitted              |   | ✓ | ✓ | ✓ | ✓ |   |
| Internal Pressure Compensation | Pressure compensation not required |   |   |   |   |   |   |
|                                | Pressure compensation fitted       |   |   |   | ✓ | ✓ |   |
| Internal Flow Sensor           | Flow sensor not required           |   |   |   |   |   |   |
|                                | Flow sensor fitted                 |   |   |   | ✓ | ✓ |   |
| Autovalidation                 | Autovalidation not required        |   |   |   |   |   |   |
|                                | Autovalidation fitted              |   |   | ✓ |   | ✓ |   |
| Digital Communications         | Modbus RTU (RS485)                 |   |   |   |   |   |   |
|                                | Modbus TCP (Ethernet)              |   |   |   |   |   |   |
| Sample Inlet                   | 1/4" NPT (F)                       |   |   |   |   |   |   |
|                                | 1/4" OD compression fitting        |   |   |   |   |   |   |
|                                | 6mm OD compression fitting         |   |   |   |   |   |   |
| Enclosure Options              | Breather fitted                    |   |   |   |   |   |   |
|                                | Corrosive purge fitted             |   |   |   |   |   |   |
| Gland Entries                  | NPT                                |   |   |   |   |   |   |
|                                | Metric M20                         |   |   |   |   |   |   |
|                                | PG 13.5                            |   |   |   |   |   |   |
| Operators Manual               | English                            |   |   |   |   |   |   |
|                                | French                             |   |   |   |   |   |   |
|                                | German                             |   |   |   |   |   |   |
| Service Manual                 | Not required                       |   |   |   |   |   |   |
|                                | English                            |   |   |   |   |   |   |
| Functional Safety Manual       | Not required                       |   |   |   |   |   |   |
|                                | English                            |   |   |   |   |   |   |

Tick the required box for each option



# SERVOTOUGH Oxy

## DIMENSIONS



Dimensions shown in millimetres  
Weight: 26kg nominal

## BUSINESS CENTRES

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A MEASURABLE ADVANTAGE

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SENSING TECHNOLOGY

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