

SERVOMEX

PROCESS ANALYSERS



SERVOTOUGH Oxy

The SERVOTOUGH Oxy offers reliability, flexibility and 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 to measure all others against.

FEATURES

- **Heated Sample Compartment** - eliminates condensation issues for samples with a dewpoint up to 50°C, significantly simplifying sample system requirements.
- **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.
- **Zone 1 Hazardous Area approved**
Atex Cat 2
IEC Ex Zone 1
CSA C/US Div 1 and 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 compliance** - 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.

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KEY FEATURES

Heated Sample

An innovative, fully heated sample compartment removes the requirement for a sampling conditioning system on all 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 the removal of 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.

Flow Sensor

Servomex's determination to deliver users the most safe, accurate and reliable levels of measurement remains at the forefront of our design philosophy – and a unique flow sensor manufactured by Servomex has been placed after the measurement outlet, guaranteeing accurate flow alarm settings for all applications including safety 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 discreet devices needed and eliminates 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 2G, Ex ia d IIC T4 (-10°C ≤ Ta ≤ +50°C)
(+14°F ≤ Ta ≤ +122°F)

IECEX: Ex d ia IIC T4 (-10°C ≤ Ta ≤ +50°C)
(+14°F ≤ Ta ≤ +122°F)

USA/Canada:  Class I, Div 1, Groups A,B,C,D T4
Class I, Zone 1, Ex ia d IIC T4
Class I, Zone 1, AEx ia d IIC T4
(-10°C ≤ Ta ≤ +50°C)
(+14°F ≤ Ta ≤ +122°F)

EC DIRECTIVE COMPLIANCE

The 1900 Digital complies with the following EC Directives:

Electromagnetic Compatibility Directive (89/336/EEC as amended by 92/31/EEC and 93/68/EEC)

Atex Directive (94/9/EC)

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SPECIFICATIONS

Gas Measured:	Oxygen
TECHNOLOGY:	Paramagnetic
HAZARDOUS AREA:	ATEX Cat. 2 IECEX Zone 1 North American (applied for)
PERFORMANCE:	
Measurement range:	0-21 % O ₂
Lower detection limit:	< ± 50ppm O ₂
Linearity error:	No measureable error
Repeatability error:	0.02% O ₂
Intrinsic error (accuracy):	< ±0.05% O ₂ (based on ± 95% confidence limits)
Response time (T ₉₀):	<6 seconds at 200ml/min <4 seconds at 1l/min
Zero drift per week:	<0.05% O ₂ /week
Span drift per week:	<0.05% O ₂ /week
Temperature	
Co-efficient zero:	±0.03% O ₂ /10°C
Sample vent pressure effects:	Pressure compensation not fitted: 1% change in sample vent pressure correspondence to a 1% change in reading Pressure compensation fitted: 1% change in sample vent pressure correspondence 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 <0.02% O ₂ and a span change of <0.2% 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 ₂
Alarms:	Two volt free single pole relays (30V dc at 1A)
Status signals:	Four volt free single pole relays (30V dc at 1A): instrument fault, maintenance required, service in progress and mA range indication
Digital communications:	Ethernet (Modbus TCP) Modbus RTU (RS485)
OPERATING ENVIRONMENT:	
Temperature:	Operating: -10°C to +50°C (+14°F to +122°F) Storage: -20°C to +60°C (-4°F to +140°F)
Relative humidity:	0-95% RH, non-condensing
Warm up time:	Typically <3 hours (at 20°C ambient (68°F) depending on application and environment
Operating altitude range:	-500 to 2000 metres

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SPECIFICATIONS

SAMPLE GAS:	The sample gas must be clean, non-corrosive and free from oil and condensates
Particulate size:	<3 µm
Dew point:	Unheated sample compartment: 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 internal bypass: 50 to 70l/hr (60l/hr recommended)
Sample connection:	1/8" 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, PTFE
CORROSIVE PURGE GAS:	
Recommended gas:	Instrument 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 optimum performance, Servomex recommend only fitting our own, high quality factory authorised spare parts.

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.

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 high 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 |

ORDER FORM

Tick the required box for each option

		A	B	C	D	E	F
Analyser Certification	ATEX						
	IEC Ex						
	North American						
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						
	Modbus TCP						
Sample Inlet	1/8 NPT						
	1/4 OD						
	6mm OD						
Enclose Options	Breather fitted						
	Corrosive Purge						
Gland Entries	NPT						
	Metric M20						
	PG 13.5						
Operators Manual	English						
	French						
	German						
Service Manual	Not Required						
	English						

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DESCRIPTION

Analysers certification:	3 certified versions of the Oxy analyser are available.	<input type="checkbox"/> Atex <input type="checkbox"/> IEC Ex <input type="checkbox"/> North American CSA
Supply Voltage:	2 versions of supply voltage are available.	<input type="checkbox"/> 100-120V <input type="checkbox"/> 220-240V
Measurement:	<p>Stainless Steel pipework with viton seals.</p> <p>Stainless Steel pipework with Chemraz seals allowing enhanced solvent resistance.</p>	<input type="checkbox"/> Standard <input type="checkbox"/> Solvent resistant
Sample Flow:	<p>Standard flow option of 250ml/min.</p> <p>An internal by-pass allows inlet flows of up to 1 l / min.</p>	<input type="checkbox"/> 250ml/min <input type="checkbox"/> 1l/min
Sample Heating:	<p>The measurement transducer in the Oxy is heated to 60°C (140°F) for measurement stability. In this configuration sample gases must be supplied to the analyser at least 5°C (9°F) below that of ambient temperature.</p> <p>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.</p>	<input type="checkbox"/> Sample Heating not required <input type="checkbox"/> Sample Heating
Internal Pressure compensation:	<p>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.</p> <p>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.</p>	<input type="checkbox"/> Pressure Compensation not required <input type="checkbox"/> Pressure Compensation fitted
Internal Flow Sensor:	<p>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.</p> <p>An internal solid state flow sensor is 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 .</p> <p>The flow sensor gives 2 stages of alarm: one for maintenance required and one for instrument fault allowing for preventative maintenance to be performed before an unplanned failure (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).</p>	<input type="checkbox"/> Flow Sensor not required <input type="checkbox"/> Flow Sensor fitted

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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. 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 at 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)

Modbus TCP (Ethernet).

Modbus TCP
(Ethernet)

Sample Inlet:

Allows the connection of 1/8th NPT male fittings directly to the analyser.

1/8th NPT (F)

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:

IP65 Breather fitted as standard allows the pressure within the enclosure to be the same as the surrounding atmosphere

Breather fitted

A 1/4" NPT (F) 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 Purged
fitted

Gland/Conduit Entries:

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

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
 French
 German

Service Manual:

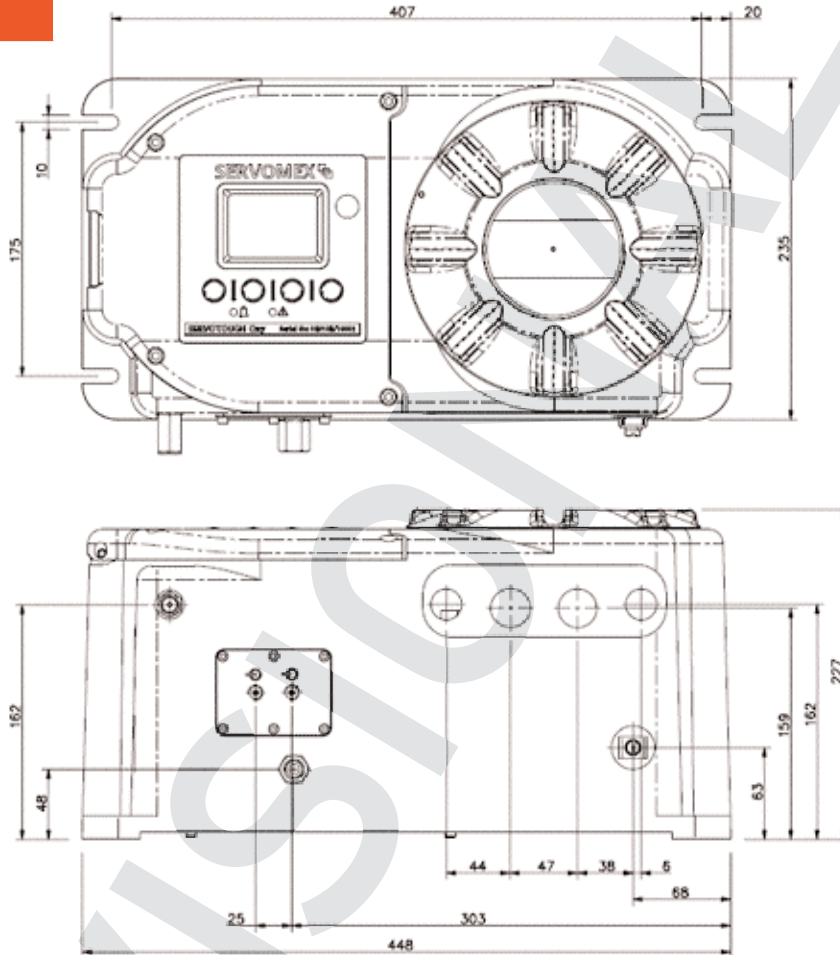
A Service Manual (in English only) contains technical descriptions, fault diagnosis, parts removal, refitting and test instructions, tool and test equipment lists, and electrical drawings. It is intended for use by Servomex trained service personnel.

Not required
 English

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DIMENSIONS



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