SERVOMEX
PROCESS ANALYSERS

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
  USA CSA_{us} Div 1, Zone 1 and Zone 21
- **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.

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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: Ⓔx II 2 GD,	Ex ia d IIC T4	(-10˚C ≤ Ta ≤ +50˚C)*
	Ex tb IIIC T90˚C	(-10˚C ≤ Ta ≤ +50˚C)*
IECEx :	Ex ia d IIC T4	(-10˚C ≤ Ta ≤ +50˚C)*
	Ex tb IIIC T90˚C	(-10˚C ≤ Ta ≤ +50˚C)*
USA CSA_{us}	Class I, Division 1, Groups A, B, C, D T4	(-10˚C ≤ Ta ≤ +50˚C)*
	Class II, Division 1, Groups E, F, G	(-10˚C ≤ Ta ≤ +50˚C)*
	Class III, (-10˚C Ta +50˚C)*	
	Class I, Zone 1, Ex ia d IIC T4	(-10˚C ≤ Ta ≤ +50˚C)*
	Class I, Zone 21, Ex tD T90˚C	
	Class I, Zone 1, AEx ia d IIC T4	(-10˚C ≤ Ta ≤ +50˚C)*
	Class I, Zone 21, Ex tD T90˚C	

* (+14˚F ≤ Ta ≤ +122˚C)

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: Gases and dusts:	ATEX Cat. 2 IECEx Zone 1 and Zone 21 USA CSA_{us} Div 1,Zone 1 and Zone 21
PERFORMANCE:	
Measurement range:	0-21 % O_2
Lower detection limit:	< ± 50ppm O_2
Linearity error:	No measurable 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 and 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 corresponds to a 1% change in reading 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_2 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_2)
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) Ethernet (Modbus TCP)
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 <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_2 *
Minimum detectable change:	1% of full scale
Response time (T_{63}):	<15 seconds
Ambient temperature co-efficient span:	<2% of full scale per 10°C
Calibration interval:	6 to 12 months

* For gases with higher molecular weights than N_2, the accuracy will be < ± 10% of full scale.

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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:	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)†	
Maximum inlet pressure:*	02.kPa (0.03psi) relative to sample vent pressure†	
	* The pressure and flow of sample gases must be externally regulated to meet the above requirements	
	† For the high flow internal bypass option, the maximum sample vent pressure and maximum sample inlet pressure are limited to: 122.8kPa (17.8psia) and 1.4kPa (0.2psi) relative to sample vent pressure respectively	
CORROSIVE PURGE GAS:		
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

Analyser certification:	3 certified versions of the Oxy analyser are available	❑ Atex ❑ IECEx ❑ USA CSA_{us}
Supply voltage:	2 versions of supply voltage are available	❑ 100-120V ❑ 220-240V
Measurement:	Stainless Steel pipework with Viton® seals	❑ Standard
	Stainless Steel pipework with Chemraz® and PTFE seals allowing enhanced solvent resistance	❑ Solvent resistant
Sample flow:	Standard flow option of 250ml/min	❑ 250ml/min
	An internal by-pass allows inlet flows of up to 1l/min	❑ 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	❑ Sample heating not required
	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	❑ 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	❑ Pressure compensation not required
	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	❑ 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	❑ Flow sensor not required
	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	❑ Flow sensor fitted
	Flowcube technology offers one high and twolow 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)	

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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 (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

SERVOTOUGH Oxy

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: ----------

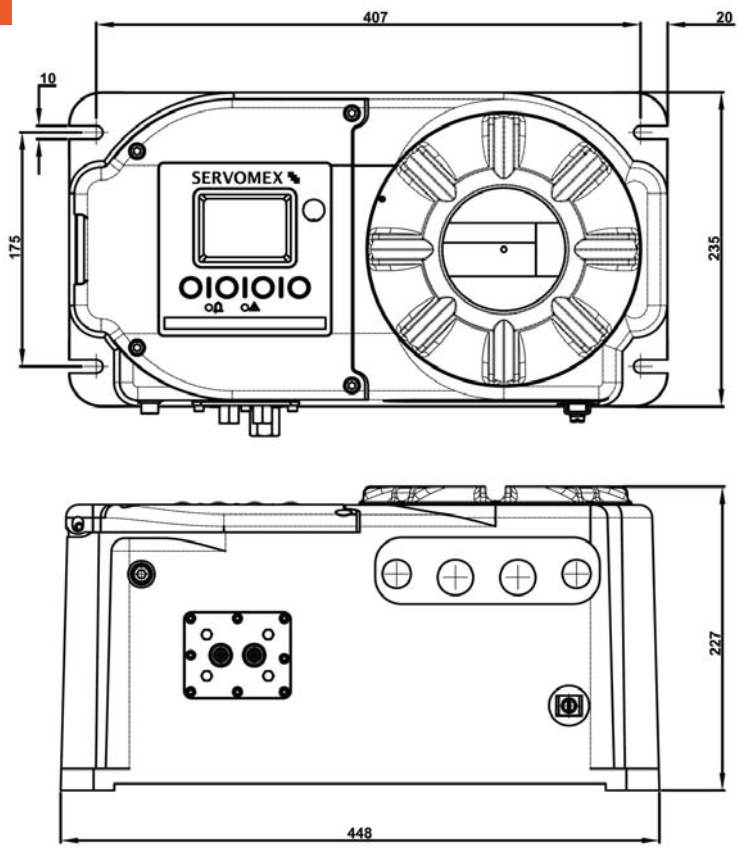
Fax back to Business Centre (refer to fax numbers on page 8)

		A	B	C	D	E	F
Analyser Certification	ATEX						
	IECEx						
	USA CSA_{us}						
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

EUROPE (Europe and Africa)
Tel: +31 (0)79 330 1581
Fax: +31 (0)79 342 0819
Toll Free : 00800 7378 6639

USA & CANADA
Tel: +1 281 295 5800
Fax: +1 281 295 5899
Toll Free: 1 800 862 0200

LATIN AMERICA/MEXICO
Tel: +55 11 5188 8166
Fax: +55 11 5188 8169

ASIA PACIFIC
Tel: +86 (0)21 6489 7570
Fax: +86 (0)21 6442 6498

INDIA AND MIDDLE EAST
Tel: +91 22 67100359/60
Fax: +91 22 66778896

TECHNICAL CENTRE

Servomex Group Limited
Crowborough
East Sussex, UK
TN6 3FB
Tel: +44 (0)1892 652181
Fax: +44 (0)1892 662253

SYSTEMS ENGINEERING CENTRES

Crowborough, UK	Tel: +44 (0)1892 652181
Houston, USA	Tel: +1 281 295 5800
Shanghai, China	Tel: +86 (0)21 6489 7570
Mumbai, India	Tel: +91 22 67100359/60

SERVOMEX
A MEASURABLE ADVANTAGE
www.servomex.com

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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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