SERVOTOUGH

OxyExact 2200

Product overview

Hazardous area

Gas	Measures	Application
Oxygen	Percent	Process control Process safety

SENSING TECHNOLOGY

Paramagnetic

High-spec process O_2 analyzer offers hazardous area control with up to six measurement transmitters

Unrivalled performance

- Uses industry-leading patented Paramagnetic technology for stable, non-depleting measurement
- Manufactured by Servomex - over 70 years' experience innovating and pioneering gas analysis, and thousands of units used in the field every year

Flexible

- Can be used in hazardous area rated locations including Zone 1 and Division 1
- Samples flammable gas mixtures up to 100% O_2
- High pressure variant allows the handling of samples at 45psia (max) (limited to 21% O_2 above 18psia)
- High temperature variant allows the handling of high dew point samples
- Digital communication options: Ethernet and RS485 Modbus

Benchmark compliance

- ATEX, UKEX, IECEx, CSA (Canada) and FM (USA) for Zone 1 and Division 1 approval

Easy to use

- Six transmitters can be linked to a single control unit, allowing easy device interaction and set-up
- Control unit enclosure allows integration of multiple option cards (four configurable)
- Internal pressure compensation option to monitor vent pressure variations coupled with high sample pressure option for flare stack applications
- Internal flow alarm option

Low cost of ownership

- No need for reference/purge gases during measurement in flammable samples
- Simplified transmitter interaction via intuitive control unit hazardous area model variants
- Rugged, resilient design helps ensure long operational life in harsh conditions
- Auto-validation and calibration

Key applications

- Oxidation control reactions
- Ethylene Oxide (EO), Pure Terephthalic Acid (PTA), and Ethylene Dichloride (EDC) production
- Catalyst regeneration
- Solvent recovery

For more information visit **servomex.com/contact**

SERVOTOUGH

OxyExact 2200

Product overview

Hazardous area

Unrivalled performance for the most demanding O_2 process monitoring

When you work in hazardous area process monitoring applications, a highly accurate, safe O_2 analytical solution that samples any flammable gas mixture up to 100% O_2 is crucial. No matter what your monitoring requirement, you need an analytical solution that offers operational flexibility, exceptional safety and the opportunity to reduce costs. We don't believe you should have to compromise.

A no compromise solution

The OxyExact's sophisticated, flexible design ethos ensures it can be precisely configured to a wide range of application environments. A single intuitive use controller situated in hazardous area, linking to up to six transmitters, permitting simplified set-up and ongoing maintenance through auto-validation and calibration procedures.

The OxyExact also features a three enclosure design that allows the flexibility to measure flammable gases for 0-100% O_2, helping to reduce costs by removing the need for purge gases.

Flexible performance you can depend on

The OxyExact uses patented Paramagnetic sensing technologies to deliver highly stable and accurate O_2 measurements. Safety-enhanced design and optional flow alarm and pressure compensation ensures sampling versatility - including flare stack applications - that is demanded by your application needs. In addition, Ethernet or RS485 Modbus protocols deliver enhanced communications capabilities. All these aspects combine to make the OxyExact an industry leading solution for O_2 analysis.

Useful links:

SERVOMEX SERVICE NETWORK

servomex.com/service

SERVOMEX SYSTEMS

servomex.com/systems

SERVOMEX EXPERT

servomex.com/expert-guidance

PBTDS OxyExact Rev.4 Date: 10/25

Technical data sheet

SERVOTOUGH OxyExact 2200 Transmitter

Specifications

TRANSMITTER	2223	2222H (high temperature)
Measurement compartment operating temperature	60°C	110°C
Gas measured	Oxygen O_2	
Technology	Paramagnetic	
Performance		
Measurement range	0-100% O_2 (0-21% O_2 high pressure variant)	0-100% O_2
Minimum recommended range	0-0.5%	0-1%
Intrinsic error (accuracy)	<0.02% O_2	<0.04% O_2
Zero drift per week	<0.02% O_2	<0.08% O_2
Span drift per week	<0.05% O_2	<0.10% O_2
Linearity error	<0.01% O_2	<0.02% O_2
Repeatability	0.02% O_2	0.03% O_2
Response time (T_{90})	<4 seconds at 250ml/min (standard flow range) <4 seconds at 1l/min (bypass option flow range)	
Output noise (within any 5 minute period)	<0.01% O_2 peak to peak	<0.02% O_2 peak to peak
Effect of ambient temperature changes	Zero change per 10°C (18°F) ambient change ± 0.02% max Span change per 10°C (18°F) ambient change ± 0.2% max	
Sample flow variations	A change in flow from 50-250ml/min (0.2-1.2l/min internal bypass option) will cause a change of 0.1% O_2 max	
Effect of barometric pressure or sample vent pressure	**Pressure compensation not fitted:** 1% change in pressure corresponds to a 1% change in reading **Internal pressure compensation fitted:** Internal sample pressure compensation option reduces the effect by a factor of 200 or +/-0.02% - whichever represents the least compensation	**Pressure compensation not fitted:** 1% change in pressure corresponds to a 1% change in reading
Effect of supply voltage variation of ±10%	<0.01% O_2 or 0.1% of reading, whichever is the greater	0.02% O_2 or 0.2% of reading whichever is the greater
Effect of supply interruptions	A single cycle interruption in electrical supply will have no effect on the analyzer	
Altitude sensitivity	Less than 0.01% O_2 per degree of tilt from altitude at time of calibration	
Zero suppression	The Zero may be suppressed in 0.01% steps to a maximum of 99.99% suppression	

Signal outputs/inputs	
Analog outputs	Single 'intrinsically safe' 0/4-20mA. Maximum impedance 600 Ω. The output can be made to jam high or low under fault conditions
Alarms & relays	Three 'transmitter signal outputs/inputs' volt free single pole contacts, allocated to NAMUR (fault, maintenance required, in calibration/service mode)
Analog inputs	Two 'intrinsically safe' 0/4-20mA linear inputs designed for external pressure compensation and background gas cross-interference correction. Two 'intrinsically safe' NAMUR flow sensor inputs
Digital inputs	Four 'intrinsically safe' inputs, customer assignable, for example, to manual calibration or validation of 4-20 mA inputs
Control unit connection	Single "intrinsically safe" twisted pair - refer to installation manual for details

The performance specification has been written and verified in accordance with the international standard IEC 61207-1:1994 "Expression of performance of gas analyzers"

Physical		
TRANSMITTER	2223	2222H (high temperature)
Ingress protection	IP66, NEMA Type 4X	
Weight	16kg (35.3lbs)	
Dimensions, WxDxH	432 (W) x 303 (H) x 210mm (D)	
Mounting	Wall mount	
Operating environment		
Temperature	Operation: -20°C to +50°C (-4°F to +122°F) Storage: -20°C to +70°C (-4°F to +158°F)	Operation: -10°C to +50°C (+14°F to +122°F) Storage: -20°C to +70°C (-4°F to +158°F)
Atmospheric pressure	76 to 112kPaa (11 to 16.2psia)	
Warm up time	Useable immediately, but typically 2 hours (from 20°C)	Typically 6 hours (from 20°C)
Relative humidity	0-95% non-condensing	
Max altitude	3,000m (9,842ft)	

Sample condition				
TRANSMITTER	2223	2223 (elevated sample pressure)	2222H (high temperature)	2222H (high temperature and elevated sample pressure)
Maximum measurable oxygen concentration	100%	21%	100%	21%
Inlet pressure	Max: 0.3kPa (0.04psig),relative to vent pressure	Max: 0.3kPa (0.04psig),relative to vent pressure	Max: 0.3kPa (0.04psig),relative to vent pressure	Max: 0.3kPa (0.04psig),relative to vent pressure
Sample pressure (maximum)	<18psia, <1.24bara	>18psia to <45psia, >1.24bara to <3bara	<18psia, <1.24bara	>18psia to <45psia, >1.24bara to <3bara
Inlet flow rate	250ml (air)/minute or 1l/min depending upon version	250ml (air)/minute or 1l/min depending upon version	250ml (air)/minute or 1l/min depending upon version	250ml (air)/minute or 1l/min depending upon version
Dew point	5°C (9°F) below lowest ambient temp	5°C (9°F) below lowest ambient temp	105°C max	105°C max
Temperature	-10°C to +50°C (+14°F to +122°F)	-10°C to +50°C (+14°F to +122°F)	-10°C to +105°C (+14°F to +221°F)	-10°C to +105°C (+14°F to +221°F)
Particulates	maximum 3µm	maximum 3µm	maximum 3µm	maximum 3µm
Inlet connection	1/8" NPT Female	1/8" NPT Female	1/8" OD Pipe	1/8" OD Pipe
Outlet connection	1/8" NPT Female	1/8" NPT Female	1/8" OD Pipe	1/8" OD Pipe
Condition	Clean, dry, free from oil and condensates	Clean, dry, free from oil and condensates	Clean, dry, free from oil and condensates	Clean, dry, free from oil and condensates

Utilities	
Supply voltage	100-120V ac, 50/60 Hz or 220-240V ac, 50/60 Hz 2223: 100VA 2222: 100VA

Sample wetted materials

TRANSMITTER	2223 (standard Viton®)*‡	2223/2222H high pressure (solvent resistant)*‡	Hastelloy pipework option (in addition)†	Internal flow alarm (in addition)	Internal pressure compensation (in addition)
316 stainless steel	•	•			
Borosilicate glass	•	•			
Electroless nickel	•	•			
Platinum	•	•			
Platinum/iridium alloy	•	•			
Viton®	•				
Chemraz® 555		•			
PTFE		•			
Hastelloy C-276†			•		•
Aluminia silicate glass				•	
Yttria stabilised zirconia				•	

* Special hydrogen resilient transducer option adds EPO-TEK® H72. Available as a special request only.
‡ Special chlorine resilient version replaces Viton®, Chemraz® 555 and PTFE (as appropriate) with Chemraz® 584. Available as a special request only.
† Hastelloy pipework option replaces stainless steel pipework and inlet /outlet connections. Transducer cell, optional flow alarm and pressure transducer remain stainless steel.

Compliance

Hazardous area approvals

TRANSMITTER	2223	2222H (high temperature)
ATEX (Europe)	Ⓔx II 2(I)GD Ex db ia [ia Ga] IIC T4 Gb Ⓔx tb IIIC T70°C Db IP66 (-20°C < Ta < +50°C)	Ⓔx II 2(I)GD Ex db ia [ia Ga] IIC T3 Gb Ⓔx tb IIIC T80°C Db IP66 (-10°C < Ta < +50°C)
UKEX (Great Britain)	Ⓔx II 2(I)GD Ex db ia [ia Ga] IIC T4 Gb Ⓔx tb IIIC T70°C Db IP66 (-20°C < Ta < +50°C)	Ⓔx II 2(I)GD Ex db ia [ia Ga] IIC T3 Gb Ⓔx tb IIIC T80°C Db IP66 (-10°C < Ta < +50°C)
FM (USA)	Class I, Division 1, Groups A,B,C and D Class II, Division 1, Groups E, F and G Class III, Division 1 T4, ambient temperature 50°C maximum	Class I, Division 1, Groups A,B,C and D Class II, Division 1, Groups E,F and G Class III, Division 1 T3, ambient temperature 50°C maximum
FM Zones (USA)	Class I, Zone 1 approval, AEx d ia IIC T4 (Ta = 50°C)	Class I, Zone 1 approval, AEx d ia IIC T3 (Ta = 50°C)
CSA (Canada)	Class I, Division 1, Groups A,B,C and D Class II, Division 1, Groups E,F and G Class III Type 4X, T4, ambient temperature 50°C maximum	Class I, Division 1, Groups A,B,C and D Class II, Division 1, Groups E,F and G Class III Type 4X, T3, ambient temperature 50°C maximum
CSA Zones (Canada)	Class I, Zone 1 approval, Ex d ia [ia] IIC T4 (Ta = 50°C)	Class I, Zone 1 approval, Ex d ia [ia] IIC T3 (Ta = 50°C)
IECEx (International)	Ex db ia [ia Ga] IIC T4 Gb Ex tb IIIC T70°C Db IP66 (-20°C ≤ Ta ≤ +50°C)	IEC Ex db ia [ia Ga] IIC T3 Gb Ex tb IIIC T80°C Db IP66 (-10°C ≤ Ta ≤ +50°C)
CML (Japan)	Ex db ia [ia Ga] IIC T4 Gb Ex tb IIIC T70°C Db IP66 (-20°C ≤ Ta ≤ +50°C)	Certification not available
EC directives	2223 & 2222 Transmitters comply with the EMC Directive, RoHS, and all other applicable directives.	
Electrical safety	Electrical safety to IEC 61010-1	

Options

Transmitter configuration	
Transmitter versions	There are two versions of the OxyExact 2200. The 2223 measurement compartment is controlled at 60°C, whilst the 2222H measurement compartment operates at 110°C. The higher sample compartment temperature of the 2222H results in some options not being available for this transmitter unit.
Transmitter certification	Six certified versions of the OxyExact analyzer are available for the 2233 transmitter version: European ATEX, Great Britain UKEX, International IECEx, American FM, Canadian CSA and Japanese CML. Japanese certification is not available for the 2222H. Refer to certification section for full details.
Supply voltage	Two versions of supply voltage are available: 100-120 and 220-240V ac.
User manual	An Installation manual that contains all of the information needed to install and safely set up the transmitter.
Service manual	A Service manual 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. The Service manual covers both the OxyExact 2200 control unit and transmitters.
Electrical entry option	As standard the transmitter unit is supplied with 5 gland entries, 3 x 1/2" NPT female and 2 x 3/4" NPT.
Sample pipework materials	As standard the transmitter sample pipework is stainless steel. Optionally for the 2223 version the internal pipework can be configured to be of Hastelloy construction for improved resistance to acidic or highly corrosive sample gases.
Sample cell type	The standard sample cell contains Viton® o-rings and is suitable for sample pressures up to 18psia (1.24bara) and oxygen concentrations up to 100%. The 'High pressure' solvent resistant cell utilises Chemraz® and PFTE o-rings and is suitable for sample gas pressures up to 45psia (3bara) with non-enriched oxygen samples (<21%) and 100% oxygen with sample gas pressures up to 18psia (1.24bara). A High Pressure Solvent Resistant and Hydrogen Resilient cell is also available and is reccomended when Hydrogen is >1% vol. The 2222H is only supplied with either the High Pressure Solvent Resistant cell or High Pressure Solvent Resistant Hydrogen Resilient cell options.
Sample flow	Standard flow option of 250ml/min (100 to 250ml/min). An internal bypass option allows sample gas inlet flows of up to 1l/min (0.8 to 1.2l/min).
Internal sample filter	Option to fit an internal 20micron filter within the sample gas inlet port to add additional protection to fine dust particles entering the precision paramagnetic cell. Use of the internal filter is always recommended. The inlet filter is not designed to be the primary protection of particulates in any associated sample system.
Flow alarm	The measurement of the analyzer is highly reliable and has internal diagnostics to ensure correct operation, yet in low flow conditions the measurement performance may be affected and this cannot be diagnosed by the instrument without a flow sensor. 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. *(Note: the flow sensor is not suitable for gas mixtures that differ significantly in thermal conductivity from that of Nitrogen. Sample gases containing hydrogen and/or helium at concentrations over 10% of the total mixture are not suitable).*
Pressure compensation	Effect of barometric pressure or sample vent pressure: The analysers measure the partial pressure of O_2 in the sample gas, therefore the reading (at constant pressure or O_2 content) is proportional to the ratio of cell pressure at the time of the analysis to that at the time of calibration unless the pressure compensation option is fitted and calibrated. 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. Internal pressure compensation reduces the effect due to vent pressure changes by a factor of 200, or ±0.02% O_2 whichever is the greater. Internal pressure compensation is not available as an option in the 2222H transmitter. Instead, if sample pressure compensation is required, a 4-20mA input is available for connection to a customer supplied sample external pressure signal (i.s barrier required) and external compensation parameters can be configured via the control unit menu system. This customer supplied external pressure compensation functionality can also be used on the 2223 transmitter if required.
Sample inlet adaptors	Allows the connection of 1/8" NPT male fittings directly to the analyzer as standard. Optionally, for the 2223 version only, adaptors can be configured to adapt the sample entries to:- 1/4" OD tube directly to the analyzer 6mm OD tube directly to the analyzer
Corrosive sample purge	A 1/4"OD inlet & outlet fitting allows inert gas to be supplied to the analyzer to prevent the build- up of any corrosive gases within the sample compartment. Purge gas should be clean dry air or an inert gas controlled to a flowrate no higher than 50ml/min. This will extend the operational life of the analyzer in such environments.
Functional safety SIL (Route 1H) requirement	This manual provides detailed information and instructions that will be needed in order to use the SERVOTOUGH OxyExact in safety instrumented systems, in respect of hardware safety integrity only (route 1H), according to IEC 61508 Edition 2.0 2010-04. It is aimed at those responsible for planning, designing, installing, commissioning, operating and maintaining safety instrumented systems using the SERVOTOUGH OxyExact.

Configuration

OxyExact 2223 variants:	We have four pre configured 2223 OxyExact builds (SV01, SV02, SV03 and SV04) to cover the most common chosen option configurations to enable a quick turnaround from specification to delivery.
Standard Variant 1 (SV01)	The pre-configured standard variant 1 base level configuration, including the high pressure solvent resistant transducer, for general oxygen measurement requirements.
Standard Variant 2 (SV02)	The pre-configured standard variant 2 mid level configuration, adding internal flow alarm to the SV01 build, covering mid level process measurement needs.
Standard Variant 3 (SV03)	The pre-configured standard variant 3 full configuration, adding pressure compensation to the SV02 mid level build, covering all your process measurement needs.
Standard Variant 4 (SV04)	The pre-configured standard variant 4 Hydrogen resilient base level configuration, including the high pressure solvent resistant Hydrogen resilient transducer, for general oxygen measurement in sample backgrounds containing Hydrogen.
User Configured (UC)	Other analyzer configurations not covered by one of the above standard variant configurations, including Hastelloy sample pipework and corrosive purge options.

OxyExact 2223 variant		SV01	SV02	SV03	SV04	UC
Transmitter certification	ATEX/UKEX Cat 2GD Z1-Z21 (Europe and Great Britain)	☐	☐	☐	☐	☐
	FM Class 1 Div 1 Zone 1 (USA)	☐	☐	☐	☐	☐
	CSA Class 1 Div 1 Zone 1 (Canada)	☐	☐	☐	☐	☐
	IEC Ex Zone 1 - Zone 21 (International)	☐	☐	☐	☐	☐
	CML Z1-Z21 (Japan)	☐	☐	☐	☐	☐
Supply voltage	100 - 120Vac	☐	☐	☐	☐	☐
	220 - 240Vac	☐	☐	☐	☐	☐
Operator manual	English	☑	☑	☑	☑	☑
Service manual	Not required	☐	☐	☐	☐	☐
	Required - English	☐	☐	☐	☐	☐
Electrical entry option	3/4" & 1/2" NPT (Standard option)	☐	☐	☐	☐	☐
	M20 adaptor kit	☐	☐	☐	☐	☐
	PG13.5 adaptor kit	☐	☐	☐	☐	☐
Sample pipework material	Stainless Steel	☑	☑	☑	☑	☐
	Hastelloy	■	■	■	■	☐
Sample cell type	Standard (Viton o-rings)	■	■	■	■	☐
	High pressure solvent resistant (Chemraz and PTFE o-rings)	☑	☑	☑	■	☐
	High pressure solvent resistant, Hydrogen resilient	■	■	■	☑	☐
Sample flow	250ml/min (100 minimum to 250ml/min maximum)	☑	☑	☑	☑	☐
	1l/min (0.8 minimum to 1.2l/min maximum)	■	■	■	■	☐
Internal sample inlet filter	Not required	■	■	■	■	☐
	Fitted	☑	☑	☑	☑	☐
Flow alarm‡	Not required	☑	■	■	☑	☐
	Fitted, internal	■	☑	☑	■	☐
Pressure compensation	Not required	☑	☑	■	☑	☐
	Fitted, internal	■	■	☑	■	☐
Sample inlet adaptor	Standard (1/8" NPT (F))	☐	☐	☐	☐	☐
	1/4" OD adaptor	☐	☐	☐	☐	☐
	6mm OD adaptor	☐	☐	☐	☐	☐
Corrosive sample purge	Not required	☑	☑	☑	☑	☐
	Fitted	■	■	■	■	☐
Functional safety/SIL2 (Route 1H) requirement	Not required	☐	☐	☐	☐	☐
	Required - English safety manual	☐	☐	☐	☐	☐
Label tag no.	Not required	☐	☐	☐	☐	☐
	Required	☐	☐	☐	☐	☐
Label tag characters	Customer transmitter tag number up to 16 characters					

Tick a single box for each selectable option

☐ Option selectable

■ Option not available in that variant

☑ Pre-selected option

‡ Not suitable for sample gas composition with hydrogen / helium >10% vol. Option is inhibited if hydrogen resilient transducer option is selected. Consult Servomex if required.

Configuration	
OxyExact 2222H variants:	We have three pre-configured 2222H OxyExact builds (SV01, SV02 and SV03) to cover the most common chosen option configurations to enable a quick turnaround from specification to delivery.
Standard Variant 1 (SV01)	The pre-configured standard variant 1 base level configuration, including the high-pressure solvent resistant transducer, for general oxygen measurement requirements.
Standard Variant 2 (SV02)	The pre-configured standard variant 2 mid-level configuration, adding internal flow alarm to the SV01 build, covering mid to high level process measurement needs.
Standard Variant 3 (SV03)	The pre-configured standard variant 3 Hydrogen resilient base level configuration, including the high pressure solvent resistant Hydrogen resilient transducer, for general oxygen measurement in sample backgrounds containing Hydrogen.
User Configured (UC)	Other analyzer configurations not covered by one of the above standard variant configurations, including corrosive purge options.

OxyExact 2222H variant		SV01	SV02	SV03	UC
Transmitter certification	ATEX/UKEX Cat 2GD Z1-Z21 (Europe and Great Britain)	☐	☐	☐	☐
	FM Class 1 Div 1 Zone 1 (USA)	☐	☐	☐	☐
	CSA Class 1 Div 1 Zone 1 (Canada)	☐	☐	☐	☐
	IEC Ex Zone 1 - Zone 21 (International)	☐	☐	☐	☐
Sample temperature	110°C set point (T3 rating)	☑	☑	☑	☑
Supply voltage	100 - 120Vac	☐	☐	☐	☐
	220 - 240Vac	☐	☐	☐	☐
Operator manual	English	☑	☑	☑	☑
Service manual	Not required	☐	☐	☐	☐
	Required - English	☐	☐	☐	☐
Electrical entry option	3/4" & 1/2" NPT (Standard option)	☐	☐	☐	☐
	M20 adaptor kit	☐	☐	☐	☐
	PG13.5 adaptor kit	☐	☐	☐	☐
Sample pipework material	Stainless Steel	☑	☑	☑	☑
Sample cell type	High pressure solvent resistant (Chemraz and PTFE o-rings)	☑	☑	■	☐
	High pressure solvent resistant, Hydrogen resilient	■	■	☑	☐
Sample flow	250ml/min (100 minimum to 250ml/min maximum)	☑	☑	☑	☐
	1l/min (0.8 minimum to 1.2l/min maximum)	■	■	■	☐
Internal sample inlet filter	Not required	■	■	■	☐
	Fitted	☑	☑	☑	☐
Flow alarm‡	Not required	☑	■	☑	☐
	Fitted, internal	■	☑	■	☐
Sample inlet adaptor	1/8" OD tubes	☑	☑	☑	☑
Corrosive sample purge	Not required	☑	☑	☑	☐
	Fitted	■	■	■	☐
Functional safety/SIL2 (Route 1H) requirement	Not required	☐	☐	☐	☐
	Required - English safety manual	☐	☐	☐	☐
Label tag no.	Not required	☐	☐	☐	☐
	Required	☐	☐	☐	☐
Label tag characters	Customer transmitter tag number up to 16 characters				

Tick a single box for each selectable option

☐ Option selectable

■ Option not available in that variant

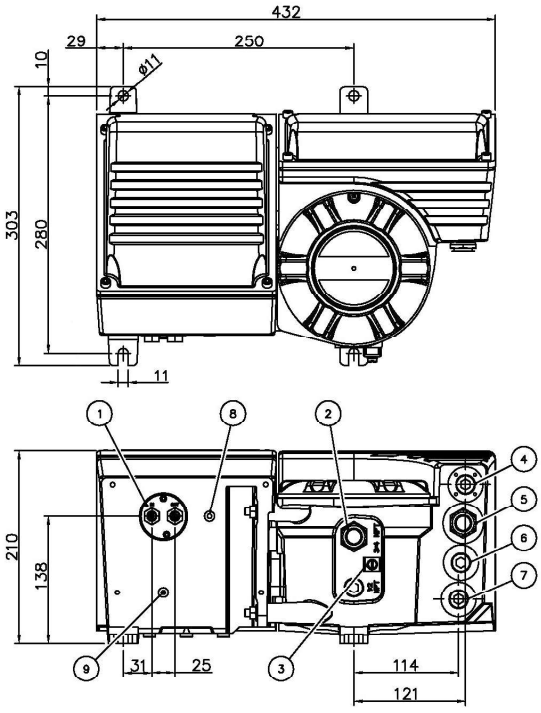
☑ Pre-selected option

‡ Not suitable for sample gas composition with hydrogen / helium >10% vol. Option is inhibited if hydrogen resilient transducer option is selected. Consult Servomex if required.

Dimensional drawings

Transmitter unit

SERVOTOUGH OxyExact 2223 Transmitter

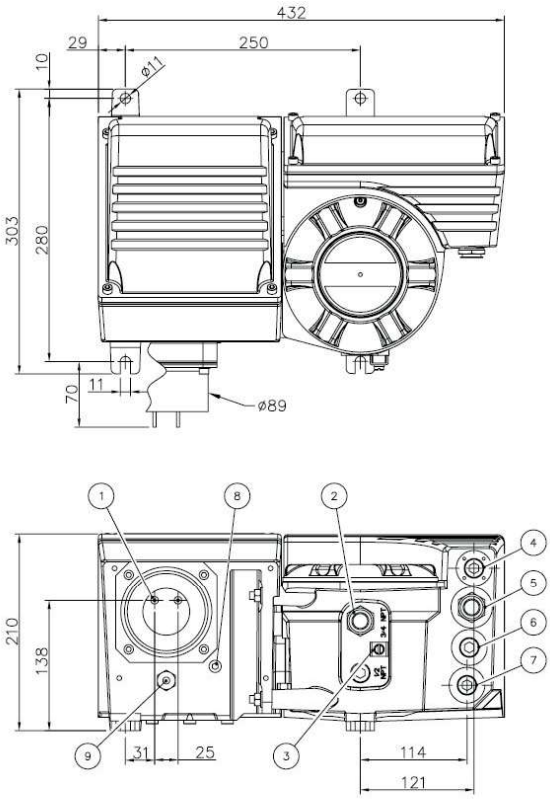


1. Sample gas connections
2. Power cable entry
3. Functional (EMC) earth/ground terminal
4. Signal cable entry
5. Signal cable entry
6. Signal cable entry
7. Signal cable entry
8. Corrosive purge gas outlet*
9. Corrosive purge gas inlet*

* If option fitted

Dimensions shown in millimetres

SERVOTOUGH OxyExact 2222H Transmitter



1. Sample gas connections
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7. Signal cable entry
8. Corrosive purge gas outlet*
9. Corrosive purge gas inlet*

Technical data sheet

SERVOTOUGH OxyExact 2200 Control Unit

Specifications

Performance	
Display resolution	User configurable with maximum 4 decimal places
Control Unit mA output resolution	Whichever is the greater: 0.001% oxygen or 0.002% of mA output span
Digital communications	
Modbus communications protocol	Modbus RTU (RS485) provided as standard or optionally Ethernet Modbus TCPIP (standard RJ45 connection)
Signal interface cards options	*A maximum of four signal interface cards may be installed in any combination*
MilliAmp output card	Two mA outputs and two 'low power' relays per card Two isolated 0-20mA/4-20mA outputs with full configuration of zero and span. The user may define a second range and invoke it by means of an external output contact closure. Maximum impedance for each output is 1KΩ. All outputs may be configured in 'reverse' and the maximum current for all outputs is 21.5mA. Two 'low power' relays rated 30V ac/dc @ 1Amp, customer assignable to 'NAMUR' status alarms, alarm, auto-calibration or remote range change functions. The mA output can be made to 'Jam' high or low on a fault condition in accordance with NAMUR 43.
Relay output card	Four 'high power' relays per card Four 'high power' relays per relay option card rated at 240V ac/30V dc @ 1.0Amp, customer assignable to NAMUR status alarms, measurement alarm, fault or auto-calibration functions.
Digital input card	Eight digital inputs per card Eight digital inputs per option card, customer assignable Potential use: • Autocalibration initiation • Remote range change • Validity of mA inputs • Digital flow sensors
Features	
Display	Graphics LCD display with LED backlight and integral keypad (seven button)
User interface	Software has multi-language menu capability (English, French and German languages) with standard status pane icons User interface is has six user configurable measurement display pages with up to six measurements displayed on each page
Security	Four level user configurable password protection as standard
Transmitter connection	Up to six transmitters can be connected to a single control unit
Transmitter separation	Maximum permissible separation between a single transmitter and control unit is 1,000m. Please consult Servomex for the maximum separation between multiple transmitters and a single control unit

Operating environment	
Temperature	Operation: -10 to +50°C (+14°F to +122°F) in sheltered location Storage: -20°C to +70°C (-4°F to +158°F)
Atmospheric pressure	76 to 112 kPaa (11 to 16.2psia)
Warm up time	Useable immediately, but typically 2 hours from cold start at 20°C
Relative humidity	0-95% non-condensing
Max altitude	3,000m (9,842ft)

Physical		
CONTROL UNIT	2210	2213
Ingress protection	IP66, NEMA Type 4X	
Weight	10kg (22 lbs)	25kg (55.1 lbs)
Dimensions, WxDxH	280 (W) x 300 (H) x 250mm (D)	505 (W) x 325 (H) x 255mm (D)
Mounting	Wall mount	

Utilities	
Supply voltage	100-120V ac, 50/60 Hz or 220-240V ac, 50/60 Hz 2210: 30VA 2213: 50VA

Compliance

Hazardous area approvals		
CONTROL UNIT	2210	2213
ATEX (Europe) UKEX (Great Britain)	Ⓔx II 3(1)GD Ex ic ec nC [ia Ga] IIC T4 Gc Ⓔx tc IIIC T70°C Dc IP66 (-20°C < Ta < +50°C)	Ⓔx II 2(I)GD Ex db ia [ia Ga] IIC T4 Gb Ⓔx tb IIIC T70°C Db IP66 (-20°C < Ta < +50°C)
FM (USA)	Class I, Division 2, Groups A,B,C,and D Class II, Division 2, Groups F and G Class III, Division 2 T4, ambient temperature 50°C maximum	Class I, Division 1, Groups B,C and D Class II, Division 1, Groups E, F and G Class III, Division 1 T4, ambient temperature 50°C maximum
FM Zones (USA)	Class I, Zone 2 approval, IIC T4 (Ta = 50°C) with IS outputs	Class I, Zone 1 approval AEx d ia [ia IIC] IIB + H2 T4 (Ta = 50°C)
CSA (Canada)	Class I, Division 2, Groups A,B,C and D Class II, Division 2, Groups E,F and G Class III Type 4X, T4, ambient temperature 50°C maximum	Class I, Division 1,Groups B,C and D Class II, Division 1,Groups E,F and G Class III Type 4X, T4, ambient temperature 50°C maximum
CSA Zones (Canada)	Class I, Zone 2 approval, Ex nA nL nC ia [ia] IIC:T4	Class I, Zone 1 approval, Ex d ia [ia] IIB + H2, T4 (Ta = 50°C)
IECEx (International)	Ex ic nA ec [ia Ga] IIC T4 Gc Ex tc IIIC T70°C Dc IP66 (-20°C ≤ Ta ≤ +50°C)	Ex db ia [ia Ga] IIC T4 Gb Ex tb IIIC T70°C Db IP66 (-20°C ≤ Ta ≤ +50°C)
CML (Japan)	Certification not available	Ex db ia [ia Ga] IIC T4 Gb Ex tb IIIC T70°C Db IP66 (-20°C ≤ Ta ≤ +50°C)

EC directives	2210 & 2213 Control Units comply with the EMC Directive, RoHS, and all other applicable directives
Electrical safety	Electrical safety to IEC 61010-1

Control unit configuration	
Control unit versions	There are two versions of the OxyExact 2200 control unit. The 2210 is a single compartment build and is certified for Zone 2 / Class 1 Div 2 installations whilst the 2213 uses an Exd compartment with separate intrinsically safe section for the screen and keypad to raise the certification to Zone 1 / Class 1 Div 1.
Controller certification	Six certified versions of the OxyExact analyzer are available for the 2213 controller version: European ATEX, Great Britain UKEX, International IECEx, American FM, Canadian CSA and Japanese CML. Japanese certification is not available for the 2210. Refer to certification section for full details.
Supply voltage	Two versions of supply voltage are available: 100-120 and 220-240V ac.
User manual	An Installation and Operator manual that contains all of the information needed to install and safely set up the analyzer.
Service manual	A Service manual 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. The Service manual covers both the OxyExact 2200 control unit and transmitters.
Electrical entry option	As standard the controller unit is supplied with: 2210 controller - 7 gland entries, 2 x 1/2" NPT female and 5 x 3/4" NPT 2213 controller - 8 gland entries, 3 x 1/2" NPT female and 5 x 3/4" NPT Adaptors to M20 gland entries supplied (optional) Adaptors to Pg13.5 gland entries supplied (optional)
Slot module option 1 Slot module option 2 Slot module option 3 Slot module option 4	Four option slots exist that can be configured with any combination of boards from the list below. All outputs and inputs are software configurable via the control unit user interface. • mA output card – two 4-20mA outputs and two low voltage relays with changeover contacts. • Relay output card – four relays with changeover contacts • Digital input card – eight channels
Data communication	This allows for the analyzer 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 relay contacts. As standard the controller is configured with RS485 Modbus protocol output. Optionally the control unit can be configured with Modbus Ethernet TCPIP protocol.
Enclosure options	As standard the enclosure is fitted with a breather vent. Optionally a blanked vent can be configured to allow the complete enclosure in the case of the 2210 controller, or the intrinsically safe section. The breather vent allows the complete enclosure to vent to atmosphere in the case of the 2210 controller , or the intrinsically safe section, for the 2213 controller. Servomex only recommend the use of the blanked vent option in indoor, temperature controlled installations.
Controller mounting	The OxyExact 2200 controller is available in a wall mount option only.

Configuration			
OxyExact 2210 variants:	We have one pre-configured 2210 OxyExact build (SV01) to cover the most common chosen option configurations to enable a quick turnaround from specification to delivery.		
Standard Variant 1 (SV01)	The pre-configured standard variant 1 base level configuration, including the mA output and relay option card, for general controller requirements.		
User Configured (UC)	Other analyzer configurations not covered by one of the above standard variant configurations, including corrosive purge options.		
OxyExact 2210 variant		SV01	UC
Controller certification	ATEX/UKEX Cat 2GD Z2-Z22 (Europe and Great Britain) FM Class 1 Div 2 Zone 2 (USA) CSA Class 1 Div 2 Zone 2 (Canada) IEC Ex Zone 2 - Zone 22 (International)	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
Supply voltage	100 - 120Vac 220 - 240Vac	☐ ☐	☐ ☐
Operator manual	English	☑	☑
Service manual	Not required Required - English	☐ ☐	☐ ☐
Electrical entry option	3/4" & 1/2" NPT (Standard option) M20 adaptor kit PG13.5 adaptor kit	☐ ☐ ☐	☐ ☐ ☐
Slot 1 module option	Not required mA output board Relay board Digital input board	■ ☑ ■ ■	☐ ☐ ☐ ☐
Slot 2 module option	Not required mA output board Relay board Digital input board	■ ■ ☑ ■	☐ ☐ ☐ ☐
Slot 3 module option	Not required mA output board Relay board Digital input board	■ ■ ■ ■	☐ ☐ ☐ ☐
Slot 4 module option	Not required mA output board Relay board Digital input board	■ ■ ■ ■	☐ ☐ ☐ ☐
Data communication	Modbus protocol (RS485) Modbus protocol Ethernet	☑ ■	☐ ☐
Enclosure option	Blanked Breather	■ ☑	☐ ☐
Controller mounting	Wall	☑	☑
Label tag no.	Not required Required	☐ ☐	☐ ☐
Label tag characters	Customer transmitter tag number up to 16 characters		

Tick a single box for each selectable option

☐ Option selectable

■ Option not available in that variant

☑ Pre-selected option

Configuration	
OxyExact 2213 variants:	We have one pre-configured 2213 OxyExact build (SV01) to cover the most common chosen option configurations to enable a quick turnaround from specification to delivery.
Standard Variant 1 (SV01)	The pre-configured standard variant 1 base level configuration, including the mA output and relay option card, for general controller requirements.
User Configured (UC)	Other controller configurations not covered by one of the above standard variant configuration, including digital input option card and ethernet communications option.

OxyExact 2213 variant		SV01	UC
Controller certification	ATEX/UKEX Cat 2GD Z2-Z22 (Europe and Great Britain)	☐	☐
	FM Class 1 Div 2 Zone 2 (USA)	☐	☐
	CSA Class 1 Div 2 Zone 1 (Canada)	☐	☐
	IEC Ex Zone 2 - Zone 22 (International)	☐	☐
	CML Z1 – Z21 (Japan)	☐	☐
Supply voltage	100 - 120Vac	☐	☐
	220 - 240Vac	☐	☐
Operator manual	English	☑	☑
Service manual	Not required	☐	☐
	Required - English	☐	☐
Electrical entry option	3/4" & 1/2" NPT (Standard option)	☐	☐
	M20 adaptor kit	☐	☐
	PG13.5 adaptor kit	☐	☐
Slot 1 module option	Not required	■	☐
	mA output board	☑	☐
	Relay board	■	☐
	Digital input board	■	☐
Slot 2 module option	Not required	■	☐
	mA output board	■	☐
	Relay board	☑	☐
	Digital input board	■	☐
Slot 3 module option	Not required	■	☐
	mA output board	■	☐
	Relay board	■	☐
	Digital input board	■	☐
Slot 4 module option	Not required	■	☐
	mA output board	■	☐
	Relay board	■	☐
	Digital input board	■	☐
Data communication	Modbus protocol (RS485)	☑	☐
	Modbus protocol Ethernet	■	☐
Enclosure option	Blanked	■	☐
	Breather	☑	☐
Label tag no.	Not required	☐	☐
	Required	☐	☐
Label tag characters	Customer transmitter tag number up to 16 characters		

Tick a single box for each selectable option

☐ Option selectable

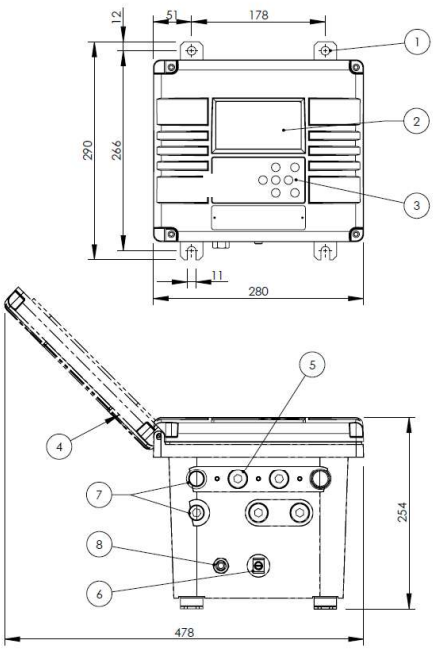
■ Option not available in that variant

☑ Pre-selected option

Dimensional drawings

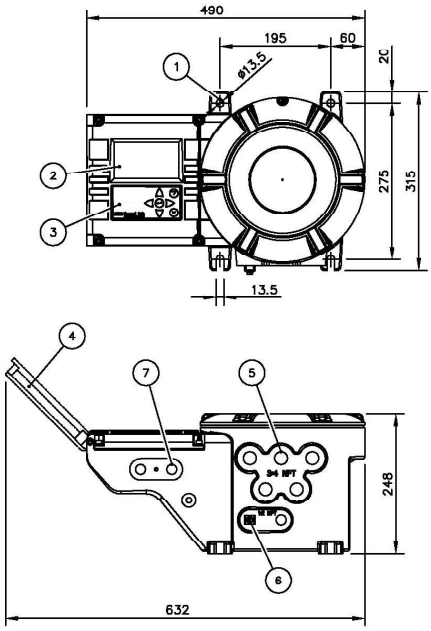
Control unit

SERVOTOUGH OxyExact 2210 Control Unit



1. Surface mount fixing hole
2. Display window
3. Keypad
4. Door, in open position
5. Power and signal cable entries
6. Functional (EMC) earth/ground terminal
7. Transmitter connection cable entries
8. Plug or breather fitted

SERVOTOUGH OxyExact 2213 Control Unit



1. Surface mount fixing hole
2. Display window
3. Keypad
4. Door, in open position
5. Power and signal cable entries
6. Functional (EMC) earth/ground terminal
7. Transmitter connection cable entries

Dimensions shown in millimetres

We're ready to help

Whatever your gas analysis requirements, wherever you are.

These analyzers are not intended for any form of use on humans and are not medical devices as described in the Medical Devices legislation or regulation.

Please note: Whilst every effort has been made to ensure accuracy, no responsibility can be accepted for errors and omissions. Data may change, as well as legislation, and you are strongly advised to obtain copies of the most recently issued regulations, standards and guidelines.
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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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