



Gas	Measures	Application
Oxygen	Percent	Process control
Moisture	Trace ppm Ultra Trace ppb	Quality



SENSING TECHNOLOGY

Coulometric



Paramagnetic



Aluminum Oxide \*



### Key applications

- Industrial gas manufacturing
- Tanker transfil
- Specialty gas blending

## Next generation coulometric oxygen analyzer designed specifically for use in a diverse range of industrial applications

### Unrivalled performance

- MonoExact DF310E O<sub>2</sub> LDL  
0-100HR: 3 ppb  
0-100: 50 ppb  
0-1000: 250 ppb  
0-10,000: 2.5 ppm  
0-25% paramagnetic: ± 0.1%
- Up to 5-year coulometric sensor warranty
- Non-depleting coulometric and paramagnetic sensors

### Flexible

- Compatible with DF-310E platform, including hardware wiring inputs and gas inlets
- Analog and digital outputs 4-20mA & 0-10 VDC, RS232, RS485 (Modbus) and advanced digital communication including Modbus Ethernet TCP/IP and PROFIBUS<sup>†</sup>
- Third-party integration of external aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) moisture sensor probe to allow for two measurements with one analyzer\*
- Battery and pump options available but, not in same analyzer

‡ Certain background gases must be configured with stainless steel inlet and outlet plumbing, consult Servomex applications

† Configuration dependent

\* Contact Servomex for details

### Easy to use

- Plug and play sensors
- Large library of compatible gases<sup>‡</sup>
- Intuitive icon driven touchscreen user-interface

### Low cost of ownership

- Field upgradable relay, alarm and communication protocols
- Downloadable system file log and diagnostics means we can assess issues and upgrade remotely
- Product can be upgraded in the field as your operational needs change
- Minimal training requirements

### Benchmark compliance

- In compliance with Low Voltage, EMC, CE and CSA applicable directives
- European and US Pharmacopeia compliant (coulometric and paramagnetic)
- Manufactured by Servomex - over 70 years' experience innovating, and pioneering gas analysis and thousands of units used in the field every year

For more information visit [servomex.com/contact](http://servomex.com/contact)

# SERVOPRO

## MonoExact DF310E

## Product overview

Safe area

### The definitive solution for IG gas production and bottling and blending

The MonoExact DF310E has been designed specifically to accurately measure oxygen in various industrial gas (IG) applications including nitrogen, argon and hydrogen production, tanker transfil, specialty gas blending and electronic gases production. Combining Servomex's latest advances in sensing technology and analyzer design into an advanced new platform, the DF310E is easy to operate and integrate into a wide range of systems.

### Simple maintenance and reduced ongoing costs

Built around the latest innovations in sensing technology combined with advance software and hardware - including a non-depleting paramagnetic and digital coulometric oxygen sensor - MonoExact DF310E builds on the original DF-310E with touchscreen operation, features to aid in commissioning and self-diagnostics monitoring benefits that improves user control and reduces cost of ownership. Updating firmware, downloading diagnostic files and copying the analyzer setup to transfer to another unit of identical configuration takes just a few clicks.

### A no compromise solution

Offering comprehensive analog and digital communication options for simple integration into a wide range of systems. Includes a Flat Line Alarm that monitors sensor measurements at LDL thresholds.

MonoExact DF310E is backward-compatible with existing DF-310E installations, ensuring it complies with existing standards and customer agreements without the need for re-testing or re-qualification.

#### Useful links:



[servomex.com/service](https://servomex.com/service)



[servomex.com/systems](https://servomex.com/systems)



[servomex.com/expert-guidance](https://servomex.com/expert-guidance)



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.

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### Specifications

<b>Technology</b>	Coulometric electrochemical cell and paramagnetic with third-party Al <sub>2</sub> O <sub>3</sub> moisture probe				
<b>Performance</b>					
<b>Gas measured</b>	O <sub>2</sub> trace (ppm)				O <sub>2</sub> control (%)
<b>Sensor technology</b>	Coulometric				Paramagnetic
<b>Sample gases</b>	H <sub>2</sub> , He, CH <sub>4</sub> , CO, N <sub>2</sub> , Ar and a host of fluorocarbons and slightly acidic HP gases**				Various gases except for H <sub>2</sub> , CH <sub>4</sub> , or CO*
<b>Range</b>	0-100 High Resolution, 0-100, 0-1000 or 10,000ppm				0-25%
	High Resolution 0-100ppm	0-100ppm	0-1000ppm	0-10,000ppm	
<b>Intrinsic error (accuracy)</b>	±3% of the reading or ± 10ppb whichever is larger	±3% of the reading or ± 50ppb whichever is larger	±3% of the reading or ± 250ppb whichever is larger	±3% of the reading or ± 2.5ppm whichever is larger	±0.1% O <sub>2</sub>
<b>Response time (T<sub>90</sub>)</b>	~30 seconds at 0.50l/min				<10 seconds at 0.2l/min
<b>Zero drift/month</b>	Negligible				±0.05% O <sub>2</sub> /week
<b>LDL</b>	3ppb	50ppb	250ppb	2.5ppm	±0.1%
<b>Signal outputs/inputs</b>					
<b>Analog outputs</b>	Isolated 4-20mA DC output or isolated 0-10V DC output, which jam at 0, 2, 4 or 21.5mA				
<b>Output range</b>	Coulometric and Paramagnetic output parameters: adjustable across full sensor range				
<b>Alarms</b>	Up to 8 sensor specific alarms: concentration (high/low), flow, temperature and span/zero reference; also as electrolyte reminder can be set on a timer†				
<b>Fault status signals</b>	Over 30 different fault statuses being self-monitored which are recorded within the system files and report if tripped to the analyzers home screen				
<b>Digital communications</b>	RS232, RS485 (Modbus) and advanced digital communication including Modbus Ethernet TCP/IP and PROFIBUS†				
<b>Relay contacts</b>	Up to 16 independently assigned contacts rated at 1.0 amp and up to 30V DC or AC†				
<b>Sample condition</b>					
<b>Gas</b>	Sample must be oil free, non-corrosive and non-condensing (can handle slightly acidic gases)				
<b>Gas temperature</b>	0°C to +45°C (+32°F to +113°F)				
<b>Particulate size</b>	Filtered to 2µm				
<b>Maximum dew point</b>	+5°C/+9°F below minimum ambient				
<b>Zero gas</b>	5 or 5.5 9s pure N <sub>2</sub> is preferable				
<b>Span gas</b>	Optimal linearity achieved when calibrated to 40-80% of full range				
<b>Sample pressure</b>	Flow driven: 1.4 - 6.9 kPa; 0.014 - 0.07 bar; 0.2 - 1 psig Pressure driven: 172.36-310.26 KPa; 1.72-3.10 bar; 25-45 psig Max sensor cell: 34.5 kPa; 0.35 bar; 5 psig				

\* Consult the manual for full list of gases supported

\*\* Consult with Servomex for other gases not listed

‡ Certain background gases must be configured with stainless steel inlet and outlet plumbing, consult Servomex applications

† Configuration dependent

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

<b>Operating environment</b>	
Temperature	0°C to +45°C (+32°F to +113°F)
Relative humidity	95% relative humidity, must be a non-condensing environment
Warm up time	New electrolyte 60 min, after that only the residence time for sample to reach sensor
Max altitude	6,500 ft. or 2,000m above sea level
<b>Physical</b>	
Size	205mm (8.0") Wide x 193mm (7.6") Height x 240mm (9.5") Deep (without handle and feet)
Weight	4.3kg (9.5lbs)
Mounting	Benchtop, panel mount, 19" rack mount, dual 19" rack mounting
Supply voltage	100-120Vac or 220-240Vac, 50/60Hz
Storage temperature	0°C to +45°C (+32°F to +113°F)
Sensor storage conditions	We recommend that the analyzer be operated as intended, within 6 months of delivery

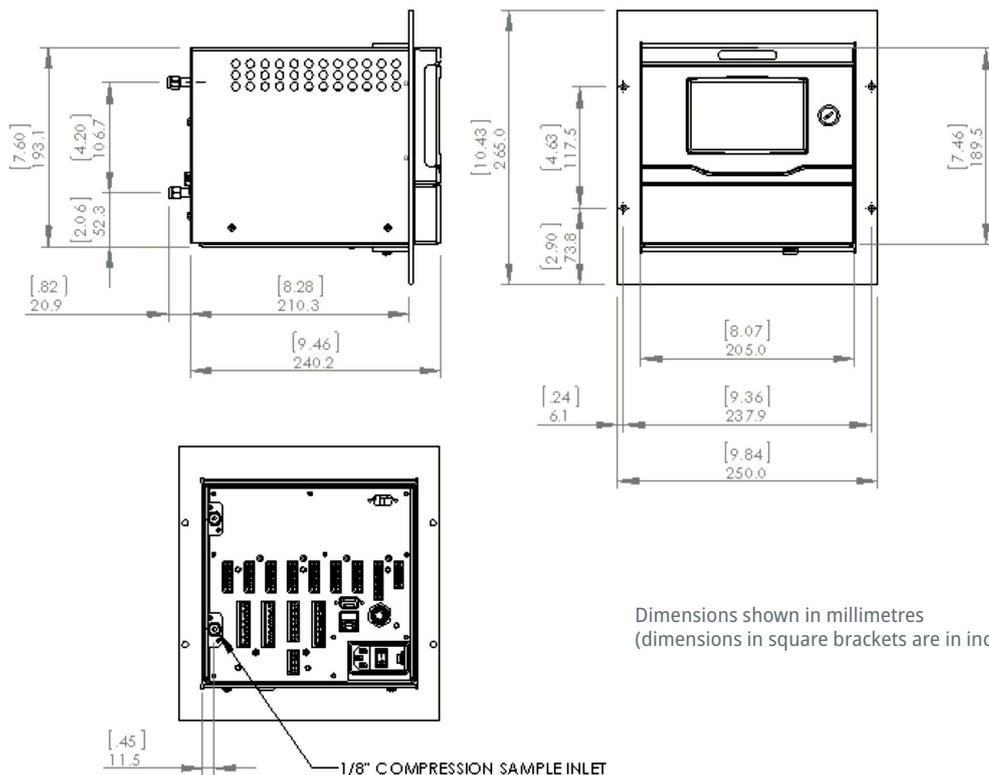
## Sample wetted materials

<b>Analyzer fitted with</b>	316L stainless steel, PFA and Acrylic
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## Compliance

<b>EC directives</b>	This product complies with the EMC Directive, the Low Voltage Directive, and all other applicable directives
<b>Electrical safety</b>	Electrical safety to IEC 61010-1 and CSA Certified; EU EMC and Low Voltage Directive Rated for "Overvoltage Category II" and "Pollution Degree 2"

## Dimensional drawings



Dimensions shown in millimetres  
(dimensions in square brackets are in inches)

Configuration			
Standard Variant (SV02)	The pre configured standard variant (SV02) covers the most common applications and frequently ordered options.		
User Configured (UC)	Other analyzer configuration options not covered by the above standard variant, including some communications protocols and corrosion prevention purge options.		
DF310E variants		SV02	UC
Built to stock		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Type	Dual rack mount No bench mount Panel mount Single rack mount Bench top unit	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Channel 1			
Gas	O <sub>2</sub>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Measurement Range	0-100 ppm high res (ME) 0-100 ppm 0-1000 ppm 0-10000 ppm 0-25% V/V non-flammable	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Transducer Type	Coulometric w/SS sample lines Paramagnetic - O <sub>2</sub> control	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Options	Flow driven Flow driven w/flow switch Pressure driven (orifice) Pressure driven (orifice) w/flow switch Pump driven Pump driven w/flow switch	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Hardware options			
Power cord	None USA Europe UK	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Stainless steel tags	None Required	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Battery backup	None Required	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Pump (O <sub>2</sub> )	None Required	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Pressure regulator (O <sub>2</sub> )	None Standard High purity regulator	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Stainless steel filter (O <sub>2</sub> )	None Required	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
VCR adapter (O <sub>2</sub> )	None Required	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Adapter 1/4" (O <sub>2</sub> )	None Required	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Adapter 3/4" (O <sub>2</sub> )	None Required	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Extra option board	None Required	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Tick a single box for each selectable option			

- Option selectable
- Option not available in that variant
- Pre-selected option

Configuration continued			
DF310E variants		SV02	UC
Software options			
Serial communications	None	<input type="checkbox"/>	<input type="checkbox"/>
	RS232 communication	<input type="checkbox"/>	<input type="checkbox"/>
	RS485 communication with Modbus	<input type="checkbox"/>	<input type="checkbox"/>
	RS232 & RS485 communication combo	<input type="checkbox"/>	<input type="checkbox"/>
	Profibus	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Modbus TCP/IP	None	<input type="checkbox"/>	<input type="checkbox"/>
	Required	<input type="checkbox"/>	<input type="checkbox"/>
Configurable alarms	None	<input type="checkbox"/>	<input type="checkbox"/>
	Two alarms	<input type="checkbox"/>	<input type="checkbox"/>
	Four alarms	<input type="checkbox"/>	<input type="checkbox"/>
	Eight alarms	<input type="checkbox"/>	<input type="checkbox"/>
	Sixteen alarms	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Isolated output	None	<input type="checkbox"/>	<input type="checkbox"/>
	Isolated 4-20mA	<input type="checkbox"/>	<input type="checkbox"/>
	Isolated 2-20mA	<input type="checkbox"/>	<input type="checkbox"/>
Autocal	None	<input type="checkbox"/>	<input type="checkbox"/>
	Required	<input type="checkbox"/>	<input type="checkbox"/>
Relay contacts	None	<input type="checkbox"/>	<input type="checkbox"/>
	2 relay contacts	<input type="checkbox"/>	<input type="checkbox"/>
	4 relay contacts	<input type="checkbox"/>	<input type="checkbox"/>
	8 relay contacts w/connectors	<input type="checkbox"/>	<input type="checkbox"/>
	16 relay contacts w/connectors	<input type="checkbox"/>	<input type="checkbox"/>
Gas scale factor	Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Advanced	<input type="checkbox"/>	<input type="checkbox"/>
Certificate of Calibration	Not required	<input type="checkbox"/>	<input type="checkbox"/>
	Required	<input type="checkbox"/>	<input type="checkbox"/>
Coulometric cell warranty	1 year standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	5 year extended	<input type="checkbox"/>	<input type="checkbox"/>

Tick a single box for each selectable option

- Option selectable
- Option not available in that variant
- Pre-selected option

# We're ready to help

Whatever your gas  
analysis requirements,  
wherever you are.

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Analysis that **empowers**

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