**Performance**

**Accuracy:** (at constant conditions)
- **Standard Models:** the greater of +/-3% Reading or 0.5% of Range
- **High Resolution Models:** the greater of +/-3% of Reading or 0.02% of Range (except for 310E-H00100: +/-3% Reading or 50 ppb)

**Oxygen Sensitivity:**
- Minimum Detectable Change 3 ppb (310E-H0050M model)
- Low Detection Limit 3 ppb (310E-H0050M model)

**Response Time**
- Responds instantaneously to O2 change. Typically less than 10 seconds to read 90% of a step change.
- (Equilibrium time depends on specific conditions.)

**Range:**
- Ranges are available from 0.5ppm to 25%

**Ambient Operating Temperature:**
- 32º to 113°F (0º to 45°C)

**Background Gas Compatibility**
- **Basic Sensor:**
  - All inert and passive gases including N₂, H₂, CO, freons, hydrocarbons, etc.
- **Sensor with Stab-EL Option:**
  - Neutralizes trace contaminants including acids such as CO₂, H₂S, Cl₂, NOₓ, SOₓ, etc. (Consult Delta F for concentration limits)

**Gas Sample Conditions**

**Sample Pressure**
- Operating Limits:
  - 0.2 to 1.0 psig (1.03 to 1.08 BarA) - Standard
  - 15-25 psig with welded sample inlet (orifice restricted)
  - 2.0 psi vacuum to 0.2 psig (0.88 to 1.03 BarA) use pump
  - 1.0 to 10 psig (1.08 to 1.7 BarA) use valve (optional) or regulator (optional)
  - Above 10 psig (1.7 BarA) use regulator
- **Sensor overpressure damage limit:** 10 psig (1.7 BarA)

**Return Pressure:**
- Atmospheric Vent (optional)
- **Limits:** +5 psig (1.36 BarA) to -5 psig (0.67 BarA)

**Flow Rate:**
- 1.0 to 3.0 SCFH (0.5 to 1.5 slpm)

**Temperature (Gas Sample):**
- 0º to 150º F (-17.8º to 66ºC)

**Moisture:**
- No limits (avoid condensation)

**Oil/Solvent Mist:**
- <0.5 mg/ft³ (standard)
- >0.5 mg/ft³ - use filter

**Solid Particles:**
- <2 mg/ft³ (standard)
- >2 mg/ft³ - use filter

**Gas Flow System**
- **Construction Materials:** 300 Series stainless steel
- **Gas Connections:** 1/8” compression tube fittings
- 1/4” VCR compatible (optional except standard for 310E-H0050M)

**Construction**

**Enclosure:**
- NEMA 1 - General Purpose
- Remote NEMA 4, NEMA 7 or sensor bracket (optional)

**Weight:**
- 10 lbs. (4.52 kg) (NEMA 1)

**Dimensions:**
- 8.32” W x 7.75” H x 7.91” D

**Electrical**

**Power Input:**
- 22-28 VDC, 1 Amp (max) or 110 VAC or 220

**Output Signals:**
- Isolated 0-5, 10 VDC
- Isolated 4 to 20 mADC (optional)

**Response Time**
- User adjustable to 10% of Full Scale to Full Scale (Std Res)
- User selectable Output Freeze during Calibration

**Alarms, audible/visual:**
- 4 Oxygen (optional)
- (adjustable set-point)

**Ambient Operating Temperature:**
- Electrolyte Condition (standard)
- Low Flow (optional)

**Alarm Relays:**
- 4 independently assignable to Alarms, In-Calibration, Sensor Off and Expanded Range Scale

**Alarm Relay Rating:**
- 0.3 Amps at 30 VDC
- Failsafe Action

**Back Lighted Display:**
- Supertwist LCD graphics

**Certifications:**
- CE Conformance
DF-310E Process Oxygen Analyzer
Configurations and Options

Build your analyzer by selecting one option from numbers 1-4, then ad on part numbers for all additional options.

- **Range Options**

<table>
<thead>
<tr>
<th>PPM Ranges</th>
<th><strong>MODEL NUMBERS</strong></th>
<th>Standard Resolution</th>
<th>Price</th>
<th>High Resolution</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPM Range</td>
<td>S10000</td>
<td>H10000</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>0 to 10,000</td>
<td>S05000</td>
<td>H05000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 5,000</td>
<td>S01000</td>
<td>H01000</td>
<td></td>
<td></td>
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<tr>
<td>0 to 100</td>
<td>S00500</td>
<td>H00500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 50</td>
<td>S00000</td>
<td>H00050</td>
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</tbody>
</table>

- **Percent Ranges**

<table>
<thead>
<tr>
<th>% Ranges</th>
<th>Standard Resolution</th>
<th>Price</th>
<th>High Resolution</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 25%</td>
<td>S00P25</td>
<td>H00P25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 10%</td>
<td>S00P10</td>
<td>H00P10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 5%</td>
<td>S00P05</td>
<td>H00P05</td>
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</tbody>
</table>

- **Sensor Options**

**Basic Sensor**

- S Stab-El Sensor System
  Enables operation with trace levels of acid gas or any ionic contamination (within limits consult factory for guidelines)

**Sensor Mounting Options**

- LS Local Sensor in Benchtop Cabinet
- NB Remote Sensor with Baseplate Bracket (NO flowmeter)
- RB Remote Sensor on Wall Mount Bracket with flowmeter
- R4 Remote NEMA 4 Sensor with flowmeter
- R7 Remote NEMA 7 Sensor with flowmeter
  (H2 Rated Flame Arrestors)

- **Power Input Options**

<table>
<thead>
<tr>
<th>024</th>
<th>22-28 VDC Input, 1Amp (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>110 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>220</td>
<td>220 VAC, 50/60 Hz</td>
</tr>
</tbody>
</table>

- **General Purpose Cabinet Mounting**

- 310-PM Panel Mount (9.97"Wx8.71"Hx6.58")
- 310-PM-R Panel Mount for DF-350 (POA) cutout
- 310-RM 19" Rack Mount (19"Wx8.71"Hx6.58")
- 310-DRM 19" Rack Mount for two DF-310’s
- 310-KL Key Lock

- **Outputs**

- 310-RS232 RS232 Two-Way Serial Communications
- 310-SC485 RS485 Two-way Serial Communications
- 310-4-20 Isolated 4-20mA DC output
- 310-2-20 Isolated 4-20mA DC output with a live zero
  at 4 mA and sensor off or disconnected at 2mA
- 310-ERS-OUT Expanded Range Scale
  Additional user selectable range scale for analog output once primary range is exceeded. (Requires optional relay contact for Range ID)

- **Notes:**
  1. Remote sensors not available with CE Certification
  2. Recommended when measuring combustible gases, such as H2
  3. For use with system status indicators and optional alarms
  4. Not available with on-board pump, 310-P

**Alarms (Audible/Visual only)**

- 310-OA2 Two Oxygen Alarms
- 310-OA4 Four Oxygen Alarms
- 310-FA Low Flow Alarm
- 310-TA Temperature Alarm

- **Relay Contacts**
  (Independently assignable)

- 310-RLY1 One SPDT Relay Contact
- 310-RLY2 Two SPDT Relay Contacts
- 310-RLY3 Three SPDT Relay Contacts
- 310-RLY4 Four SPDT Relay Contacts

**Plumbing**

- 310-P Pump w/ Down Stream Control Valve
  Diaphragm pump for negative pressures to 2.0 psi vacuum (0.88 Bar), or outlet vent back pressure to 3.0 psig (1.2 Bar)
  (not compatible with NT-SSOL)

- 310-PR Pressure Regulator
  Outboard 316L Stainless Steel Pressure Regulator, 3000 psig inlet capacity, 28 in Hg vac-15 psig adjustable outlet pressure

**Miscellaneous**

- 310-WSI Welded Sample Inlet w/VCR compatible fittings
  (standard on 310-H0050M Range)
- 310-FH Stainless Steel Filter
  (Not available with 310-WSI)
- 310-FCV Upstream Flow Control Valve
  (Not available with 310-H0050M or with 310-WSI)

- **Power Factor**

- 310-BSL Stainless Steel Outlet Line
- 310-FH Stainless Steel Filter
- 310-FCV Upstream Flow Control Valve
  (NT-SSOL Required with this option; not compatible with 310-PM)
- 310-F2R Standard Filter Element (particle size >1 micron)
  Enables use in Class I/II, Div. 2 areas (Use with N4 only)
  at 4 mA and sensor off or disconnected at 2mA

- 310-ERS-OUT Expanded Range Scale
  Additional user selectable range scale for analog output once primary range is exceeded. (Requires optional relay contact for Range ID)

- **Notes:**
  1. Remote sensors not available with CE Certification
  2. Recommended when measuring combustible gases, such as H2
  3. For use with system status indicators and optional alarms
  4. Not available with on-board pump, 310-P