**DF-110E Oxygen Analyzer**

**Standard Features & Specifications**

### Performance

**Accuracy:** (at constant conditions)
The greater of +/- 3% Reading or 0.5% of Range Below 2.5 ppm

**Response Time**
Responds instantaneously to O2 change
Typically less than 10 seconds to read 90% of a step change

**Range**
Ranges are available from 0-10 ppm to 25%

**Ambient Operating Temperature**
32º to 120º F (0º to 50º C)

**Background Gas Compatibility**
Standard 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 Bar) - Standard
2.0 psi vacuum to 0.2 psig (.88 to 1.03 Bar) use pump
1.0 to 10 psig (1.08 to 2.72 Bar) use valve or regulator
Above 10 psig (2.72 Bar) use regulator
Sensor overpressure damage limit: 10 psig (1.7 BarA)

**Return Pressure:** Atmospheric Vent (optimal)
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:** 304 and 316 SS

**Gas Connections:** 1/8” compression tube fittings

### Construction

**Weight:** 6 lbs. (7 kg.)

### Electrical

**Power Input**
115 VAC, 50/60 Hz or 230 VAC, 50/60 Hz

**Output Signal**
0-10 VDC (standard)
OR 0-1, 0-2, 0-5 VDC (optional)
Isolated 4-20 mADC (optional)

**Alarm Visual**
Electrolyte Condition (standard)

**Alarms, optional**
Low Oxygen and/or High Oxygen
(adjustable set-point, relay contacts only)

**Alarm Relay Rating**
SPDT - 5 amps at 110 or 220 VAC
Failsafe Action

**Indicators, optional**
Sensor Off, Remote Range
Low Flow (contacts only)
No Failsafe Action

**Indicator Contact Rating**
SPST – 0.5 amps at 24 VDC
or SPTT – 0.5 amps at 24 VDC

**Display:**

<table>
<thead>
<tr>
<th></th>
<th>3.5 Digit LCD</th>
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<tbody>
<tr>
<td></td>
<td>4.5 Digit LCD (range dependent)</td>
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</table>

### Analyzer Components
DF-110E Oxygen Analyzer

Optional Equipment

### Single Range Analyzers

<table>
<thead>
<tr>
<th>PPM Range</th>
<th>DF-110E Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5,000</td>
<td>111E-5000</td>
</tr>
<tr>
<td>1,000</td>
<td>111E-1000</td>
</tr>
<tr>
<td>500</td>
<td>111E-500</td>
</tr>
<tr>
<td>100</td>
<td>111E-100</td>
</tr>
<tr>
<td>50</td>
<td>111E-50</td>
</tr>
<tr>
<td>10</td>
<td>111E-10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Ranges</th>
<th>DF-110E Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 25%</td>
<td>111E-P25</td>
</tr>
<tr>
<td>10%</td>
<td>111E-P10</td>
</tr>
<tr>
<td>5%</td>
<td>111E-P5</td>
</tr>
<tr>
<td>1%</td>
<td>111E-P1</td>
</tr>
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</table>

### Three Range Analyzers

<table>
<thead>
<tr>
<th>PPM Ranges</th>
<th>DF-110E Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/1,000/10,000</td>
<td>113E-10000</td>
</tr>
<tr>
<td>50/500/5,000</td>
<td>113E-5000</td>
</tr>
<tr>
<td>10/100/1,000</td>
<td>113E-1000</td>
</tr>
<tr>
<td>5/50/500</td>
<td>113E-500</td>
</tr>
<tr>
<td>1/10/100</td>
<td>113E-100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Ranges</th>
<th>DF-110E Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25/2.5/25 %</td>
<td>113E-P25</td>
</tr>
<tr>
<td>0.1/1/10 %</td>
<td>113E-P10</td>
</tr>
<tr>
<td>0.05/0.5/5 %</td>
<td>113E-P5</td>
</tr>
</tbody>
</table>

### Base Models

**Base Options**

- **110-S** Stab-El Acid Gas System
- **110-220** 220 VAC Line Voltage (110 VAC is standard)

**Remote**

- **110-RPC** Remote Pump Control
  Enables switch bank control of user supplied external pump
  Power Capacity: 5W @ 110VAC (Remote Pump not included)

- **110-RCOBP** Remote Control of On Board Pump
  Permits control of on-board pump via external, user supplied, switch or
  Analyzer front panel. Switch Rating: 5W @ 110 VAC
  (On-board pump, 110-P, must be ordered separately)

- **110-N4RS** NEMA 4 Remote Sensor
  Includes remote sensor and flowmeter mounted in a NEMA4 enclosure

- **110-N7RS** NEMA 7 Remote Sensor
  Includes remote sensor mounted in a NEMA7 housing with an external
  flowmeter, H2 Rated Flame Arrestors

- **110-RSH** Remote Sensor Heater

**Plumbing**

- **110-P** Pump with Down Stream Control Valve
  Diaphragm pump mounted on remote sensor bracket for negative
  pressures to 2.0 psi vacuum (0.88 Bar), or outlet vent back pressure to
  3.0 psig (1.2 Bar)

- **110-GPR** Gauge Pressure Regulator
  Out-board 316 Stainless Steel Pressure Regulator, 3000 psig (208 Bar)
  inlet capacity; 0-10 psig (2.7 Bar) adjustable outlet pressure. Requires
  5 psig (1.36 Bar) minimum inlet pressure

- **110-APR** Absolute Pressure Regulator
  Vacuum to 500 psig (35.5 Bar) inlet capacity; 4 psia to 25 psia (-10 to
  +10 psig) (0.32 Bar to 2.7 Bar) adjustable outlet pressure

- **110-FCV** Flow Control Valve
  Up stream control for pressures less than 10 psig (2.7 Bar)

- **110-FH** Filter Housing
  (Includes Standard Filter Element, SFE)

**Alarms**

- **110-OAL** Oxygen Alarm – Low (SPDT relay contacts)
- **110-OAH** Oxygen Alarm – High (SPDT relay contacts)
- **110-2OAL** Oxygen Alarms – Low-Low (Two 110-OAL)
- **110-2OAH** Oxygen Alarms – High-High (Two 110-OAH)
- **110-OALH** Oxygen Alarms – Low-High (110-OAL & 110-OAH)

**Indicators**

- **110-SOI** Sensor Off Indication (SPST contacts only)
- **110-RRI** Remote Range Indication (SPTT contacts only)

**Outputs**

- **110-SAOA** Special Analog Output 0 to 1 VDC
- **110-SAOB** Special Analog Output 0 to 2 VDC
- **110-SAOC** Special Analog Output 0 to 5 VDC
- **110-420** 4 to 20 mA Isolated Output

**Miscellaneous**

- **110-AD** Add Display (Includes LCD Display and 10 foot cable)
- **110-GSF** Gas Scale Factor
  Permits meter read-out of O₂ in background gases having significantly
  different diffusivities compared to nitrogen, such as, He, H₂, or C₃ and
  heavier hydrocarbons

  - **SFE** Standard Filter Element ( > 1 micron )
  - **FFE** Fine Filter Element ( <1 micron )
  - DF E-Lectrolyte Blue Electrolyte
  - DF RSA Replenishment Solution