DF-320E Class 1 Div. 2 (Zone 2) Process Oxygen Analyzer

Standard Features & Specifications

**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 320E-H00100: +/-3% Reading or 50 ppb)

**Oxygen Sensitivity:**
- Minimum Detectable Change: 3 ppb (320E-H0050M model)
- Low Detection Limit: 3 ppb (320E-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 113ºF (0º to 45ºC)

**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)

**Construction**

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

**Weight:**
- 10 lbs. (4.52 kg) (NEMA 1)
- 0.02% of Range (except for 320E-H00100: +/-3% Reading or 50 ppb)

**Dimensions:**
- 8.32" W x 7.75" H x 7.91" D (21.1 cm W x 19.7 cm H x 20.1 cm D)

**Electrical**

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

**Output Signals:**
- Isolated 0-5, 10 VDC (optional)
- Isolated 4 to 20 mA (DC) (optional)
- User adjustable to 10% of Full Scale to Full Scale (Std Res)
- User adjustable to 1% of Full Scale to Full Scale (High Res)

**Alarms, audible/visual:**
- 4 Oxygen (optional)
- (adjustable set-point)
- Electrolyte Condition (standard)
- Temperature (optional)
- 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 Lited Display:** Supertwist LCD graphics

**Certifications:**
- Class 1, Division 2, Groups A, B, C, D
- CSA Certification (Internal Sensor Only)
- CE Conformance
- Suitable for use in Zone 2 hazardous areas in Europe in accordance with the ATEX directive

**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 320E-H0050M)

**Dimensions**

**General Purpose - NEMA 1 Enclosure**

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**THE DIFFERENCE**

**DISCONNECT SUPPLY**

**BEFORE SERVICING**

**SENSOR**

**OUTLET**

**INLET**

**SENSOR**

**DELTA F CORPORATION**

**HAZARDOUS LOCATION**

**CLASS 1 DIV 2**

**GROUPS ABCD**

**AC INPUT**

10 0-240 V , 1.3A 50/60 Hz

**FUSE**

~ 250V, TYPE T, 2.5A~

**DC INPUT**

24V DC, 1A 25 W ATTS

**SERVICING**

**DISCONNECT**

**BEFORE**

**SUPPLY**

**SECONDARY WIRING INLET**

**PRIMARY WIRING INLET**

**CUSTOMER PROVIDED CABLE**

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**1/8” COMPRESSION SAMPLE OUTLET**

**SAMPLE INLET**

(Optional 1/4” VCR compatible MALE)

**SECONDARY WIRING INLET**

**PRIMARY WIRING INLET**

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DF-320E Class 1 Div. 2 (Zone 2) Process Oxygen Analyzer

Configurations and Options

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

### Range Options

**PPM Ranges**

| **MODEL NUMBERS** |
|-------------------|-------------------|-------------------|-------------------|
| PPM Ranges        | Standard Resolution | High Resolution | Price |
| 0 to 10,000 PPM   | S10000             | H10000           |        |
| 0 to 5,000 PPM    | S05000             | H05000           |        |
| 0 to 1,000 PPM    | S01000             | H01000           |        |
| 0 to 500 PPM      | S00500             | H00500           |        |
| 0 to 100 PPM      | S00100             | H00100           |        |
| 0 to 50 PPM       | S00050             | H00050           |        |

**Percent Ranges**

| **MODEL NUMBERS** |
|-------------------|-------------------|-------------------|-------------------|
| % Ranges          | Standard Resolution | High Resolution | Price |
| 0 to 25%          | S00P25             | H00P25           |        |
| 0 to 10%          | S00P10             | H00P10           |        |
| 0 to 5%           | S00P5              | H00P5            |        |

### Sensor Options

(Choose Only 1 Option)

- **B** 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

(Note 1 & Choose only 1 option)

- **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

### Power Input Options

- **22-28 VDC Input, 1Amp (max)**
- **110 VAC, 50/60 Hz**
- **220 VAC, 50/60 Hz**

### General Purpose Cabinet Mounting

- **320-PM** Panel Mount (9.75"x6.71"x6.58")
- **320-PM-R** Panel Mount for DF-350 (POA) cutout
- **320-RM** 19" Rack Mount (19"x8.71"x6.58")
- **320-DRM** 19" Rack Mount for two DF-320's
- **320-KL** Key Lock

### Outputs

- **320-RS232** RS232 Two-Way Serial Communications
- **320-RS485** RS485 Two-Way Serial Communications
- **320-4-20** Isolated 4-20mA DC output
- **320-2-20** Isolated 4-20mA DC output with a live zero at 4 mA and sensor off or disconnected at 2 mA
- **320-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)

### Alarms

(Audible/Visual only)

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

### Relay Contacts

Note 3 (Independently assignable)

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

### Plumbing

- **320-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)
- **320-PR** Pressure Regulator
  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)
- **320-HPR** High Purity Pressure Regulator
  Welded tube assembly and bracket for mounting 320-HPR regulator to analyzer cabinet
- **320-WSI** Welded Sample Inlet w/VCR compatible fittings
  (standard on 320-H0050M Range)

### Miscellaneous

- **320-Y04** Scale Factor
  Required for accurate read-out of oxygen in background gases other than N2, such as HE, H2, hydrocarbons or mixtures
- **320-PASS** Password Protection
- **320-BAT** Supplemental Battery Input Power
- **320-N2CP** Case Purge for Combustible Applications
  (NT-SSOL Required with this option; not compatible with 320-PM)
- **320-ZPK** Type Z Purge Protection System for R4 Option
  Enables use in Class III, Div. 2 areas (Use with N4 only)
- **320-F2R** Standard Filter Element (particle size >1 micron)
  at 4 mA and sensor off or disconnected at 2 mA
- **320-F2R-B** Fine Filter Element (particle size <1 micron)
  at 4 mA and sensor off or disconnected at 2 mA

**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