



DF-310E Process Oxygen Analyzer

Standard Features & Specifications

Effective: April 13, 2007

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:
 32° to 113°F (0° 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, NO_x, SO_x, 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 (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): 0° to 150° F (-17.8° to 66°C)
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
 (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

Output Signals: Non-Isolated 0-5, 10 VDC
 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)
 User selectable Output Freeze during Calibration

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

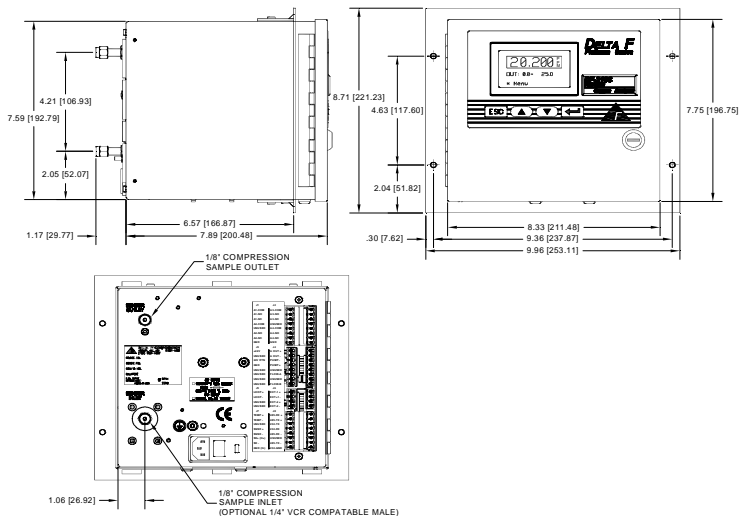
Alarm Relay Rating: 0.3 Amps at 30 VDC
 Failsafe Action

Back Lighted Display: Supertwist LCD graphics

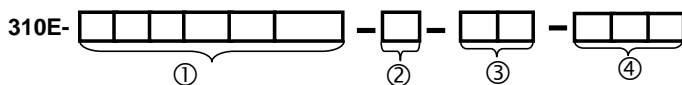
Certifications: CE Conformance

Dimensions

General Purpose - NEMA 1 Enclosure



DF-310E 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.

① Range Options

PPM Ranges

****MODEL NUMBERS****

PPM Range	Standard Resolution	Price	High Resolution	Price
0 to 10,000	S10000		H10000	
0 to 5,000	S05000		H05000	
0 to 1,000	S01000		H01000	
0 to 500	S00500		H00500	
0 to 100	S00100		H00100	
0 to 50	S00050		H0050M	

Percent Ranges

****MODEL NUMBERS****

% Ranges	Standard Resolution	Price	High Resolution	Price
0 to 25%	S00P25		H00P25	
0 to 10%	S00P10		H00P10	
0 to 5%	S000P5		H000P5	

② 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)

③ 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

(H2 Rated Flame Arrestors)

④ Power Input Options

024 22-28 VDC Input, 1Amp (max)

110 110 VAC, 50/60 Hz

220 220 VAC, 50/60 Hz

General Purpose Cabinet Mounting

310-PM Panel Mount (9.97"Wx8.71"Hx6.58"D)

310-PM-R Panel Mount for DF-350 (POA) cutout

310-RM 19" Rack Mount (19"Wx8.71"Hx6.58"D)

310-DRM 19" Rack Mount for two DF-310's

310-KL Key Lock

Outputs

310-RS232 RS232 Two-Way Serial Communications

310-RS485 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
5. Not available with 310-BAT

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 ^{Note 3} (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

Out-board 316L Stainless Steel Pressure Regulator, 3000 psig inlet capacity; 28 in Hg vac-15 psig adjustable outlet pressure

310-HPR High Purity Pressure Regulator

310-HPR-MNT High Purity Regulator Mounting

Welded tube assembly and bracket for mounting 310-HPR regulator to analyzer cabinet

310-WSI Welded Sample Inlet w/VCR compatible fittings

(standard on 310-H0050M Range)

310-SSOL Stainless Steel Outlet Line ^{Note 2,4}

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)

Miscellaneous

310-Y04 Scale Factor

Required for accurate read-out of oxygen in background gases other than N2, such as HE, H2, hydrocarbons or mixtures

310-PASS Password Protection

310-BAT Supplemental Battery Input Power

Permits portable operation independent of AC power

310-XTC-RS Extension Cable per foot (for remote sensors)

310-SSTAG Stainless Steel Tags

310-RSH Remote Sensor Enclosure Heater

310-EXT-SNSROFF External Control of Sensor On/Off

310-EXT-PUMPOFF External Control of Pump

310-N2CP Case Purge for Combustible Applications ^{Note 5}

(NT-SSOL Required with this option; not compatible with 310-PM)

310-ZPK Type Z Purge Protection System for R4 Option

Enables use in Class I/II, Div. 2 areas (Use with N4 only) ^{Note 5}

310-SFE Standard Filter Element (particle size >1 micron)

310-FFE Fine Filter Element (particle size <1 micron)

DF E-lectrolyte Blue

DF-RSA Replenishment Solution