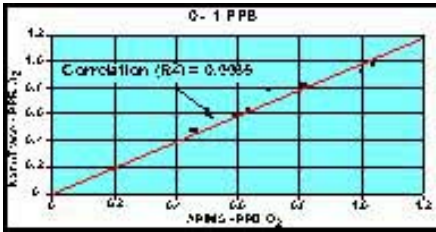# NanoTrace
DF-550 UltraTrace Oxygen Analyzer

NanoTrace provides a reliable Low-detection-level of 200 ppt in a compact, easy to use analyzer. The superior NanoTrace performance has been verified by a host of independent third parties such as Air Products and Chemicals Inc.

Part of the extensive APIMS testing is shown. Every NanoTrace is manufactured under ISO 9001 control and is calibrated and operated for five weeks to ensure a fast and accurate start-up at your site.

Configuration and Installation

Delta F provides comprehensive assistance for a broad variety of application problems including measurements of semiconductor specialty gases. Depending on the model, Delta F analyzers can be configured to provide a wide choice of outputs for data collection and process control systems. Contact your Delta F representative for an Applications Data Sheet and pricing information.

Superior Performance
- The low LDL provides a large "Analytical Headroom" for dependable measurements.
- Fast response provides sensitive and dependable process monitoring.
- Quick upset recovery avoids "running blind" when process problems occur.

Low Maintenance
- Very low drift makes the need for frequent calibrations unnecessary.
- The zero purifier is used only for calibration and not to scrub the electrolyte as is common in other analyzers. Expensive and disruptive purifier replacements are not required.

Selection of Configurations
- The Automatic Calibration system can be initiated at the front panel or via digital interconnect.
- The Manual Calibration system can be included for "hand carry," portable operation.
- The NiCAD Battery and Isolation Valve options enable truly portable operation.

For more information about the DF-550 NanoTrace analyzer, ask for the Delta F UltraTrace Compendium.

DF-550 Performance

Lowest Detection Level (LDL)	200 ppt
Analyzer Resolution	100 ppt
Response Time	< 20 seconds
Accuracy (Constant Conditions)	0.5 ppb or ±3% of Reading
Upset Recovery	<15 min from high ppm upset
Output Range (Lowest)	0 to 20 ppb

Specifications

Sample Pressure	15 to 25 psig
Sample Flow	1 to 3 scfh
Gas Compatibility	All inerts and passive gases including N_2, He, H_2, Ar, light hydrocarbons, halocarbons, etc.

Options
Automatic Calibration System
Manual Calibration System
4 – 20 mADC Output Isolation
RS-232 and RS-485
Up to 4 Assignable Alarm Relays
N_2 Case Purge
NiCAD Batteries
Flow Alarm

THE DIFFERENCE
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NanoTrace Configuration Guide
DF-550
Optional Equipment

Base Model

PNT-0010   *NanoTrace Oxygen Analyzer*

-S (added to model number) *Stab-El Sensor System*

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

-V (added to model number)
230 VAC/50-60 Hz Input Power

Plumbing

NT-PR1-5V [NOTE 1]   *High Purity Pressure Regulator*

3000 psig inlet capacity; 0-15 psig adjustable outlet pressure; requires 5 psig minimum inlet pressure (1/4 inch VCR compatible fittings)

NT-PR1-5V-MNT   *Regulator Mounting*

Welded tube assembly and bracket for mounting NT-PR1-5V regulator to analyzer cabinet

NT-FCV-UHP   *High Purity Flow Control Valve*

Ultra high purity bellows valve for upstream isolation shut-off and flow control (1/4" VCR compatible fittings)

NT-ISO-DSV   *Downstream Isolation Valve*

NT-SSOL [NOTE 2]   *Stainless Steel Outlet Line*

Calibration

NT-CAL-A-CD   *Automated Calibration System*

Provides menu driven automatic zero and span valve switching, pneumatic diaphragm valves and zero purifier in a small on-board package, only 12.5" depth behind location of optional panel (requires 70-100 psig pneumatic supply.)

NT-CAL-EXT   *Auto Control of User-Cal Components*

Software with switched AC power for control of external, span/zero solenoids and valves.
(Switched 6 VDC if equipped with NT-CE)

NT-CAL-M   *Manual Calibration System*

Provides manual quarter-turn springless diaphragm valves and zero purifier in an orbital butt welded assembly that is compactly integrated on the rear panel of the analyzer to optimize portability.

-HCP [NOTE 3]   *High Capacity Purifier*
(Substitute for Standard Purifier)

Recommended for applications where source gas purity can be > 10 ppb or sample sources are frequently switched, such as in all portable applications. Provides 30 times higher capacity than the standard purifier.

Alarms (Audible/Visual)

NT-FLALM   *Low Flow Alarm*

Cabinet

NT-N2CP-FS [NOTE 2] *N_2 Case Purge w/ Power Interlock*
(not compatible with NT-PNL)

NT-RMNT   *Rack Mount* (19"Wx10.5"Hx10.1"D)

NT-PNL   *Panel Mount* (13.9"Wx9.9"Hx10.1"D)

NT-KYLK   *Key Lock*

Relay Contacts [NOTE 4] (Independently assignable)

NT-RLY1   *One Relay Contact*

NT-RLY2   *Two Relay Contacts*

NT-RLY3   *Three Relay Contacts*

NT-RLY4   *Four Relay Contacts*

Outputs

NT-4-20I   *Isolated 4-20 mADC Output*

NT-RS232   *Two-way Serial Communications*

NT-RS485   *Two-way Serial Communications*

Miscellaneous

NT-NiCAD   *Supplemental Battery Input Power*

Permits portable operation independent of AC power

NT-XTC-RS232   *Serial Port Adapter Cable (10 ft.)*
Analyzer RS232 Port to 9-pin D-sub connector (10 ft.)

NOTES:
1. Requires NT-PR1-5V-MNT or external support by user. External support not required when an Auto or Manual Calibration System is ordered.
2. Required when monitoring combustible samples such as H_2.
3. Add "-HCP" to either the NT-CAL-A-CD or NT-CAL-M option.
4. Used with Optional or Standard Alarms or Status Indicator

Standard Features & Specifications

Performance

Lowest Detection Level	200 ppt

Resolution

Analytical (Sensitivity-smallest detectable change)	100 ppt
Display	100 ppt
Analog Output	10 ppt
Accuracy (greater of)	±3% of reading
	or ±0.5 ppb
	(Constant Conditions)
Response Time	<20 seconds
Time to reach 90% of final reading	
Upset Recovery Time	<15 minutes

Time from high ppm upset to within 10 ppb of the previously stable reading

Range (Output Scale)	0-20 ppb (min)
	0-10 ppm (max)
Ambient Operating Temperature	32º to 110º F (0º to 45º C)

Background Gas Compatibility

All inert and passive gases including N_2, He, H_2, Ar, light hydrocarbons, halocarbons, etc.

Gas Sample Conditions

Sample Pressure

Operating limits:	15 to 25 psig (2.03 to 2.72 bar)
	Regulated by a critical orifice
	For over 25 psig – order option NT-PR1-5V
Sensor overpressure damage limit:	5 psig (1.36 bar)
Return Pressure	Atmospheric Vent (optimal)
For H_2 and He	Maximum limit: ± 1psig
For N_2, Ar, and all other background gases	Maximum limit: ± 2 psig
Flow Rate:	1.0 to 3.0 scfh (0.5 to 1.5 slpm)
Temperature (Gas Sample)	32º to 122º F (0º to 50º C)
Moisture	No limits (avoid condensation)

Gas Flow System

Construction Materials	300 Series stainless steel
Gas Connections	¼ inch VCR compatible inlet fitting
	Orbital butt welded sensor inlet assembly
	1/8 inch compression outlet fitting

Calibration System Components

Pneumatically or manually actuated springless diaphragm
  valves, orbital butt welded assembly
Oxygen scrubber provides <0.1 ppb oxygen-free zero gas
¼ inch VCR compatible span inlet fitting
1/8 inch compression fittings for pneumatic actuator gas

Construction

Enclosure:	NEMA 1 standard
Weight:	18 lbs. (8 kg.)
	40 lbs. (18 kg.)
	with calibration system

Electrical

Display	2.5" x 3.75" SuperTwist LCD graphics

Audible/Visual Alarm Status Indicators
(Output relays available – See Options – Relay Contacts)
4 oxygen levels, temperature and electrolyte condition (standard)
Loss of flow alarm indicator (optional)

Relays (Optional)
(Failsafe action upon loss of power to alarm condition)
Up to 4 non-latching, independently assignable to alarms or calibration-in-process indicator. SPDT contacts rated for 5 amps at 125/240 VAC. CE version contacts rated 5 amps at 30 VDC/VAC.

Power Requirements
100-120 VAC, 50/60 Hz (standard); 200-240 VAC, 50/60 Hz (optional); NiCAD battery (optional)

Output Signals
Analog Outputs:
Menu scaleable single output range of 0-20 ppb up to 0-10 ppm

4-20 mADC, 0-100 mVDC, 0-1, 0-5 VDC, or 0-10 VDC (standard)

Isolated 4-20 mADC (optional)

Expanded Range Scale (standard)
(requires an optional relay for remote range identification)

User selectable secondary analog output range for re-scaling the output once the primary range is exceeded

Digital Output:
2-Way RS232 or RS485 (optional)

Calibration Control
Calibration-In-Process indication (requires an optional relay contact)
Analog output freeze control during calibration

Certifications	CE Conformance