TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

MANUAL ADDENDUM

ULTRA SENSITIVITY MODEL
M200EU

NO/NO_2/NOx ANALYZER

(Addendum to M200E Manual PN 04410)

Teledyne Advanced Pollution Instrumentation
9480 Carroll Park Drive
San Diego, CA 92121-5201
USA

Toll-free Phone: 800-324-5190
Phone: 858-657-9800
Fax: 858-657-9816
Email: api-sales@teledyne.com
Website: http://www.teledyne-api.com/

05385 Rev C
DCN 5731
14 May 2010

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1. OVERVIEW

The model M200EU is a close derivative of the Model 200E NOx Analyzer. The main differences are as follows.

- The M200EU is more sensitive at low NOx levels than a standard 200E. The instrument has a user selectable full scale range of 0-5 PPB to 0-2000 PPB of NOx.
- The reaction cell is gold plated. In addition, there is a pre-reactor, which allows the measurements of any hydrocarbon interferents in the sample stream.
- The sample flow is about 1000 cc/min.
- The M200EU is equipped with a high performance pump, capable of producing a reaction cell pressure of less than 5 Inch Hg absolute.

In addition to the contents of this M200EU Addendum, you must use the M200E manual.

CAUTION!
The following procedures apply only to the External Zero Air Scrubber and NOT to the inline exhaust scrubber cartridge that is part of the pump pack assembly.

NOTE
The M200EU has equivalency approval, and may be used for EPA monitoring.

2. SPECIFICATIONS, AGENCY APPROVALS, AND WARRANTY

Min/Max Range (Physical Analog Output)	Min: 0-5 ppb of Full Scale Max 0-2000 ppb of Full Scale
Measurement Units	ppb, ug/m^3 (user selectable Single, independent or auto ranges)
Noise at Zero[1]	<25 ppt RMS
Noise at Span[1]	<0.25% RMS of reading above 50 ppb
Lower Detectable Limit[1]	50 ppt RMS
Zero Drift[2]	<0.1 ppb / 24 hours <0.2 ppb / 7 days
Span Drift[2]	<0.5% of reading or 50 ppt RMS whichever is greater / 24 hrs <1% of reading or 100 ppt RMS whichever is greater / 7 days
Linearity	1% of full scale or ± 0.1 ppb whichever is greater
Precision	0.5% of reading above 50 ppb
Lag Time[1]	20 sec
Rise / Fall Time[1, 3]	95% in <50 sec
Sample Flow Rate	1000 cc/min. ± 10%
Temperature Range	20-30°C within drift and noise specifications, and operating with EPA equivalency 5-35°C safe operating range
Humidity	0-95% RH non-condensing
Hydrocarbon Interference	Propylene rejection ratio > 20,000:1 Ethylene rejection ratio > 40,000:1
Voltage Coefficient	< 0.1% per V
Dimensions H x W x D	7" x 17" x 23.5" (178mm x 432 mm x 597 mm)
Weight, Analyzer	18 kg (40 lbs)
Weight, Ext Pump Pack	9.5 kg (21 lbs)
Power, Analyzer	100V~ 50/60 Hz, 120V~ 60 Hz, 230V~ 50 Hz, 2.5A, 125 watts
Power, Analyzer[4]	230V~ 50 Hz, 2.5A
Power, Ext Pump	110V~ 60 Hz, 220V~ 50 Hz, 240V~ 50Hz, 150 watts
Power, Ext Pump[4]	230V~ 50 Hz, 2.2A
Analog Outputs	Four (4) Outputs
Analog Output Ranges	All outputs: 100 mV, 1, 5, 10V Three outputs convertible to 4-20 mA isolated current loop All ranges with 5% under/over range
Analog Output Resolution	1 part in 4096 of selected full-scale voltage
Status Outputs	8 Status Outputs from opto-isolators, 7 defined, 1 spare
Control Inputs	6 Control Inputs, 4 defined, 2 spare

Serial I/O	COM 1: RS-232; COM 2: RS-232 or RS-485 (Ethernet interface available) Baud Rate: 300-115200
Environmental[4]	Installation Category (Over-voltage Category) II, Pollution Degree 2
Certifications	US EPA: Reference Method Number RFNA 1194-099 CE: EN61326 (1997 w/A1:98) Class A, FCC Part 15 Subpart B Section 15.107 Class A, ICES-003 Class A (ANSI C63.4 1992) & AS/NZS 3548 (w/A1 &A2;97) Class A

(1) As defined by the USEPA
(2) At constant temperature and voltage
(3) With adaptive filter, > 20 ppb change
(4) Electrical rating for CE mark compliance

3. PNEUMATICS

Refer to the following pneumatic diagram. It shows the internal pneumatics of the M200EU in its standard configuration, along with the optional Zero/Span valves. The sample flow is about 1000 cc/min. Also during Auto Zero mode, the sample gas is routed through a pre-reactor before the mixture goes through the reaction cell. Since the reaction rate constant between NO and ozone is several time faster than the reaction rate constant between hydrocarbons and ozone, this mechanism helps to eliminate the interference effects of hydrocarbons in NOx measurements. In addition, the M200EU is equipped with a high performance pump, capable of producing a reaction cell pressure of less than 5 Inch Hg absolute.

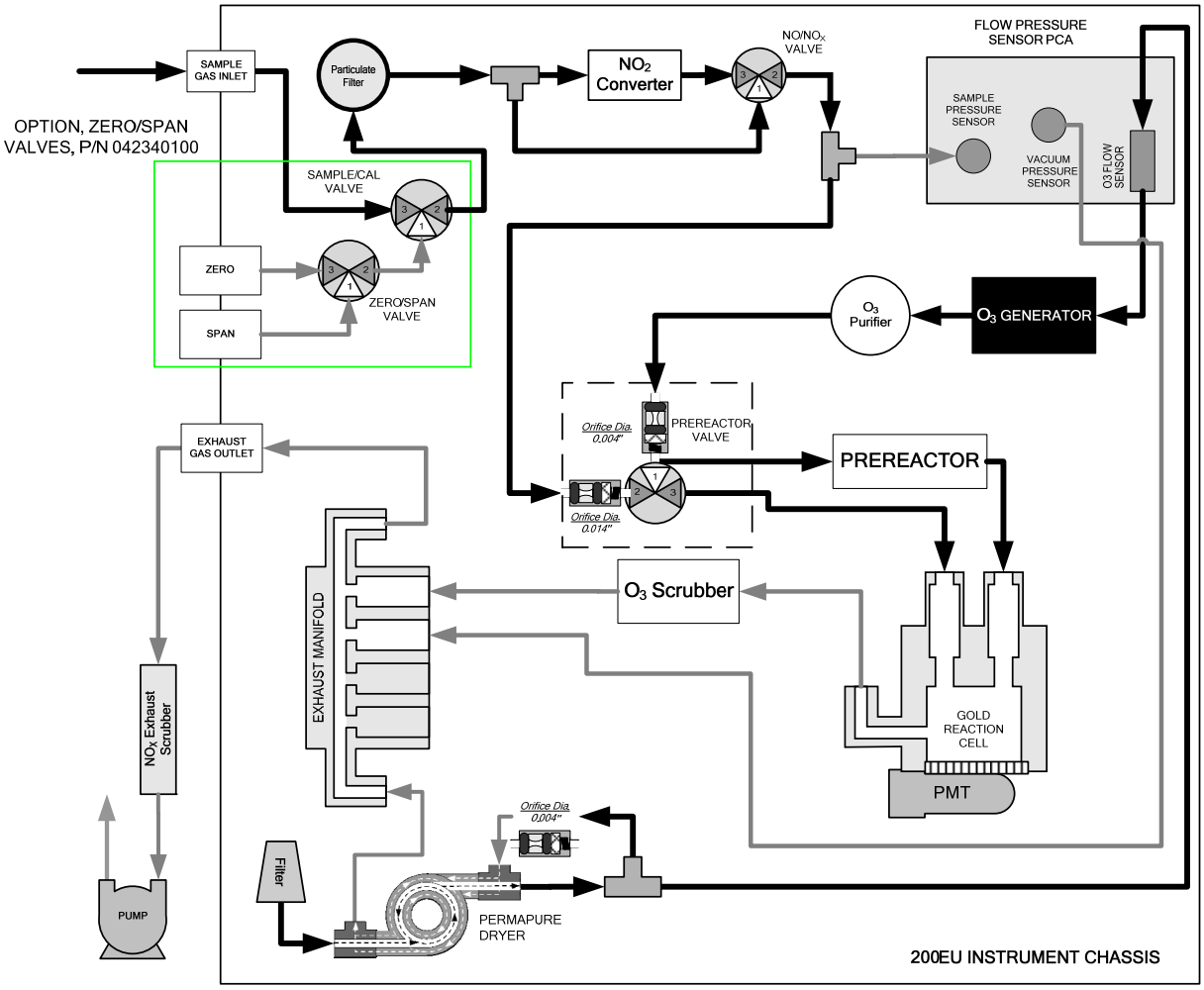

Figure 3-1: Pneumatic Diagram With Zero/Span Option

4. SPARE PARTS LIST

Note: Only parts different from M200E are listed below. Refer to the M200E users manual for the common spare parts.

Part Number	Description
011340800	Assy, Sensor, M200EU
024600100	Assy, Prereactor NO/NOx valve, M200EU
011420700	Assy, NOx cell, Gold plated, M200EU
011440200	Assy, PMT, M200AU/EU
041800600	PCA, PMT Preamp, VR, M200EU
001270001	Manifold, Gold Plated, NOx
001330001	Sleeve, Gold Plated, NOx
001350001	Nozzle, Outer, Gold Plated
014080200	Assy, HVPS, M200AU/EU
022880000	Assy, HVPS, Low Leak Current, M100EU/M200EU