SPECIFICATIONS: CARBON MONOXIDE ANALYZER

A: Analyzer Section

1. Measurement Method: Microprocessor controlled IR absorption using Gas filter Correlation.

2. Must have an operating temperature range of 5-40^{o}C
Must be U.S. EPA or TUV certified over 10-40^{o}C temperature range..

3. Ranges shall be user selectable from 0 -1 ppm to 0 -1,000 ppm in increments of 1 ppm, with

4. Minimum Detectable Limit: <0 .04 ppm. (RMS)

5. Zero Noise: <0.02 ppm. (RMS)

6. Span Noise: 0.5% of Reading (RMS) above 5 ppm

7. Precision: 0.5% of Reading

8. Linearity: 1% of Full Scale

9. Zero Drift: <0.1 ppm/24 hrs
<0.2 ppm/7 days

10. Span Drift: <1%/7 days

11. Rise and Fall time (to 95%): <60 seconds

12. Sample flow rate shall be less than 1 LPM.

13. Outputs: Three (3) separate analog outputs for a recorder and a datalogger. Outputs can be independently set to be ± 100 mv, ± 1 V, ± 5 V, ± 10 V.

14. Field and objective mirrors shall be monolithic. Adjustment screws shall not be required and adjustment not be required even after cleaning.

15. GFC wheel shall be temperature stabilized and have a 5 year warranty against leaks.

16. Remote Technical Support available at No Charge for the life of the analyzer.

17. Particulate filter shall be front panel accessible with ability to view filter condition without disassembly.

18. Pump shall be internal to the analyzer.

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19. Flow rate through the analyzer controlled by critical orifice and be displayed using front panel display

20. Measurement shall be temperature and pressure compensated.

21. Unit to be supplied with a complete instruction and maintenance manual.

22. Warranty shall be two years. Manufacturer shall guarantee gas filter correlation wheel and CPU for a period of five years.

23. Shall contain internal datalogging capability with capacity to log a minimum of 900,000 data values.
    1. to log five years worth of 5 minute averages for CO along with calibration factors, flow and pressure data.
    2. Ability to log data at a selectable frequency or upon occurrence of a defined event.
    3. Ability to log averages, instantaneous or min-max values.

24. All printed circuit boards shall be contained in the analyzer. All circuit boards shall use surface mount technology for durability. The analog input digitizing card and the computer card shall be separate cards to facilitate servicing.

25. Shall provide Diagnostic warning messages in case of out of tolerance of key parameter:
    - -System Reset
    - RAM Initialized
    - Source Warning
    - Bench Temp Shutdown
    - Mirror Temp Shutdown
    - Sample Flow Warning
    - Sample Pressure Warning
    - Sample Temp Warning
    - Box Temp Warning
    - Bench Temp Warning
    - Cannot DYN Zero
    - Cannot DYN Span
    - V/F Not Installed

26. In addition to CO concentrations, the instrument shall be able to view the following parameters in real time without disrupting data collection
    - RS232 HELP Screen on external computer
    - Summary of all TEST's
    - Current CO Reading
    - Current CO Measure Reading
    - Current CO Reference Reading
    - Sample Pressure
    - Sample Flow Rate
    - Sample Temperature
    - Optical Bench Temperature
    - Optical Mirror Temperature
    - Internal Box Temperature
    - DC Power Supply Output
    - Current Time of Day

B: Zero/Span Check: (Option)

1. Zero and span check shall be accomplished manually from the front panel, remote contact closure, RS-232, Ethernet or on a timed basis using built-in zero and span valves with CO cylinder shut-off valve.

2. Internal zero air systems shall be generated using long life catalyst with a 5 year life.

C: RS232 and Status Output

1. Shall provide bi-directional RS232 interface capability to accommodate both printers and host computers/terminals.

2. Any function that can be accomplished from keyboard shall be capable of being performed through the RS232.

3. RS232 message types shall include:
    - DAS Reports (R)
    - Warning Messages
    - Analyzer Control/Status Reports
    - Diagnostics Commands/Reports
    - Test Measurements
    - Instrument Variables: Monitoring/Modifying

4. Status output shall provide isolated contact closures for zero cal, span cal, flow, temperature, system warning, and when in diagnostic mode
5. Analyzer shall have ability to connect to an Ethernet and shall support a unique IP address for access from anywhere on the network.

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