

EQUIPMENT SPECIFICATIONS

PURE AIR GENERATOR SYSTEM

Revision Date: Jan 27, 2011

These specifications describe the minimum acceptable quality and/or performance level of the equipment to be purchased. Superior alternatives will be considered as compliant to the specifications. Unless otherwise defined in these specifications, technical terms and testing procedures shall be interpreted as defined in Title 40 of the Code of Federal Regulations (CFR), Part 53.23.

A. GENERAL SPECIFICATIONS

1. Equipment Description:

The pure air generator system shall be capable of continuous delivery of 30 standard liters per minute (SLPM) at 35 pounds per square inch (PSI) of dry, contaminant-free air. The air shall be suitable for use as: a zero reference calibration gas, ultra-pure combustion air for flame ionization detectors, and service air for pneumatically operated valves. The pure air generator system shall be capable of delivering air free from water vapor, particulates, sulfur dioxide (SO₂), Hydrogen Sulfide (H₂S), Oxides of Nitrogen (NO), Nitrogen Dioxide (NO₂) Ozone (O₃), Carbon Monoxide (CO), Hydrocarbons (CH₄) and non-methane organic compounds (NMOC).

2. Operating and Service Manuals:

Two copies of the operating and service manual shall be provided for each pure air generator. Each manual shall contain installation, operation and maintenance procedures, detail flow schematics, and complete electrical drawings. Each manual shall also contain a complete list of spare parts and recommended spare parts storage levels. The manuals shall give detailed instructions for the use of the delivered generators with all options. The manuals shall be of the same quality as required by the U.S. EPA for reference and equivalent air quality analyzers.

3. Shipment:

The vendor shall ship the equipment no later than 120 days after receipt of a purchase order. Shipment shall be to the State Air Resources Board, 1927 – 13th Street, alley entrance, Sacramento, California 95814.

4. Acceptance Test:

Within ten days after equipment delivery, the acceptance test shall be initiated. The acceptance test shall consist of checking the equipment for compliance with the requirements listed above and with those listed under "PHYSICAL SPECIFICATIONS" and "PERFORMANCE SPECIFICATIONS". The duration of the acceptance test shall be eight days minimum and 60 days maximum.

If the equipment does not meet the specifications listed, the vendor will have one opportunity to repair or replace the equipment to correct all defects. The equipment will be returned to the vendor freight collect. The vendor will have 30 days after the original receiving date or 30 days after being informed of any defect (whichever is later) to deliver acceptable units. The vendor will be responsible for repair of all defects whether or not the defects were declared by the purchaser.

After the vendor has repaired or replaced the equipment to eliminate the cause for failure, acceptance testing will again be initiated. Should the equipment again fail to comply with the specifications listed herein, the equipment will be rejected. The Purchaser may proceed under the General Provisions of the bid and Contract Rights and Remedies of the State for default.

5. Payment:

Upon presentation of the invoice and after passing the acceptance test, equipment payment will be made. Any credit for prompt payment will be based on the date of acceptance or the date the invoice is received, whichever is later.

6. Guaranty:

The vendor shall provide a written guaranty covering the equipment, including components, parts and field service. The guaranty period shall be one year and two year warranty for the internal pump and shall begin on the date acceptance testing is successfully complete.

In the guaranty, the vendor shall agree to the following conditions:

- a. The equipment shall comply with all the specifications listed herein.
- b. If failure of the equipment occurs during the guaranty period, and application of routine troubleshooting procedures described in the operating and service manual identifies the malfunctioning component or part, the vendor shall ship the replacement component or part at no cost and within 72 hours of notification.

- c. In the event equipment develops a malfunction during the guaranty period which cannot be solved by the application of routine troubleshooting procedures described in the operating and service manual or by component or part replacement, the vendor shall send trained service personnel to repair the equipment at the original delivery point. The purchaser shall have the option of returning the equipment, at vendor's expense, to the vendor's repair facility. In either case, the vendor shall deliver the equipment to the purchaser within 21 days after the initial date of notification, or provide operational, equivalent equipment within the same 21 day period, for use as a substitute until the original equipment has been repaired.
- d. The vendor shall agree to supply spare parts for the equipment for at least seven years following the date of acceptance. The vendor shall agree to ship replacement parts to the purchaser within 30 days after receiving a parts order.
- e. The vendor shall guarantee all replacement parts to be of equal or superior quality to parts in the original unit.
- f. The vendor shall pay for shipment of replacement or defective components, parts, or equipment to and from the vendor's repair station during the applicable guaranty period.

7. Pre-Purchase Inspection:

Prior to issue of the purchase order the proposed vendor shall, at the option of the purchaser, deliver to the Air Resources Board a working unit for inspection and test. The vendor shall have 30 days to deliver the unit after written request. The unit delivered for inspection shall be the same as the bid unit(s) with all specified options. The pre-purchase inspection shall not exceed 30 days.

B. PHYSICAL SPECIFICATIONS

These specifications describe the minimum acceptable quality or performance level of the equipment. Superior alternatives will be considered as compliant to the specifications.

- 1. Each pure air generator system shall be of a modular design allowing easy access for servicing. It shall be supplied in a cabinet and fitted with all the necessary hardware, including slides and brackets necessary for mounting in a 19" wide by 25" deep equipment rack.

2. All components shall be constructed so that they can be quickly and easily removed, serviced and reinstalled. All units and sub-units shall be interchangeable and shall be of modular construction with each sub-unit capable of being replaced within a maximum service time of 30 minutes.
3. The AC input power cord shall be three conductor, minimum 8' in length with a three-prong connector plug. The AC input to each generator shall be at the rear of each unit. The connectors shall be wired so that the "hot" terminal (black wire) is connected to the brass terminal throughout. The supply voltage shall be nominally 115 +/- 10 VAC, 60 +/- 3 Hz.
4. All electrical connectors except power cords shall be Amphenol, Molex, or Cannon type with retainers, or equivalent.
5. Gas inlet and outlet connectors shall be made of brass or stainless steel and shall be located at the rear of the cabinet. To reduce light-end hydrocarbons, the following is highly recommended:
 - a.) The use of stainless steel fittings at the scrubbers and output final filter.
 - b.) Teflon O-ring in the final filter.
6. The maximum weight shall not be greater than 70 pounds with all options installed.
7. Rack Mounting: Standard 19" wide by 25" deep equipment rack.

C. PERFORMANCE SPECIFICATIONS

These specifications describe the minimum acceptable quality or performance level of the equipment. Superior alternatives will be considered as compliant to specifications.

1. Pump and Pure Air Generator: Shall deliver 1-30 standard liters per minute of ultra pure, dry air at 35 psig with the following upper limits on impurities:

<0.025 ppb SO_2
 < 0.1 ppb H_2S
 <0.025 ppb NO
 <0.025 ppb NO_2
 <0.3 ppb O_3
 <10 ppb CO
 <0.25 ppb THC (expressed as methane)
 <1.0 PPB NMOC

2. The dew point of the clean zero air delivered by each generator shall be -40°C at or under 30 LPM. Indicator(s) shall be provided on the front panel to warn the operator when the dew point is greater than -15°C .
3. Temperature Range: Each generator shall meet all specifications listed herein while experiencing ambient temperature variations from 15°C to 35°C . Each generator shall not be damaged by exposure to ambient temperature variations from 4°C to 44°C .
4. Supply Voltage: Each generator shall operate on 115 VAC at 60 Hz.
5. Power Consumption: The maximum power consumption shall not be greater than 400 watts when operated with a flow demand of 30 liters per minute at 35 pounds pressure.
6. Power Line Variation: Each pure air generator system shall meet all specifications listed herein while experiencing input line voltage variations from 105 to 125 VAC.
7. Warm-up Time: Each clean air generator system shall be ready for operation within 30 minutes after connection to a source of power.
8. Power Failure: In the event of a power failure, each pure air generator system shall automatically restart after power restoration.
9. Vibration: Each clean air generator system and component parts shall be unaffected by ordinary vibrations during transport or use.
10. Duty Cycle: Each clean air generator system shall operate unattended for a period in excess of 168 hours, and shall not require major maintenance more often than once per twelve months.
11. Attitude: Each clean air generator system shall maintain all flows and pressures within specifications while undergoing attitude changes of up to 45 degrees.
12. Atmospheric Pressure: Each pure air generator system shall operate within specifications at altitudes up to 8000 feet above sea level.
13. Operating the air generator unconnected (open to atmosphere) shall NOT affect the dew point.
14. Each pure air generator system shall operate by pressure sensing circuitry, not solely via externally applied voltage command. It must also be able to be operated directly from the front panel.