

Model 560 Compliance Opacity Specification

The following general specification can be used to solicit 40CFR60 Proposed PS-1 and ASTM D6216 Compliance Opacity monitors. These specifications ensure a quality opacity monitor is procured:



- The monitor shall be designed to meet all of ASTM D6216; Amendments to PS-1 of 40CFR60 Appendix B. If requested, the manufacturer shall share its test results proving that its design and performance has met or exceeded all of the new design and performance specifications listed in ASTM D6216
- The monitor shall have a single LED light source technology. The supplier must warrant the light source for a minimum of 8 years
- The LED light source must be of narrow band with a peak-spectrum response of 550 nm. Multiple LED and Broadband solid-state light sources are not acceptable.
- Vendor shall have a solid proven history of operation on their monitor; requiring at least 500 units of the same Model # in operation for over a year in the USA power plant market or industrial sector.
- The monitor housings shall be NEMA 4X aluminum investment grade castings with all stainless steel fasteners, clamps and hinges. The weatherhood shall be fully enclosed and be of lift-off design.
- Aluminum weatherhoods with stainless steel clamps and hinges shall be provided that cover the optical head and blower and the retro-reflector and second blower (if provided)
- The housing and weatherhoods should be anodized and painted with two coats of acid-resistant enamel paint for corrosion resistance
- The optical head and retro-reflector should include stainless steel ball and socket mounting hardware for easy adjustment and alignment
- The optical head and retro-reflector shall include 2" mounting pipes and 2" 150# flanges for easy installation
- Single or dual TEFC (totally enclosed fan-cooled) 42CFM blowers shall be provided to provide purge air for both the optical head and retro-reflector
- Passive fail-safe shutters, with no electro-mechanical moving parts, shall be provided to provide isolation from hot/wet flue gas in the event of blower or power failure. Electro-mechanical shutters are not acceptable.
- Differential pressure switches shall be provided to monitor purge air from the purge blowers
- The retro-reflector shall be a corner cube no more than 7mm in diameter (at path lengths less than 20') and shall be constructed of polished glass with a black anodized film adhered to the back side of the corner cube to reduce the impact of condensed water

- No junction box for the optical head nor electro-mechanical shutters shall be provided on the stack to minimize components
- The optical head shall be designed so the LED and circuit board housing is easily removed from the stack to conduct annual off-stack zeros. The optical head subassembly should not need any additional hardware to conduct the off-stack zero
- The optical head and retro-reflector shall be designed so they are vertically self-aligned when set on a test bench without the need for external test stands
- The calibration mechanism shall be no more than a single moving part and shall utilize a servo motor and optical encoder for long term operation and precise positioning
- The calibration mechanism shall include zero and upscale filter assemblies that are easily changed and field adjusted with irises
- A spare optical head shall be universal in design; thereby being able to be used as a plug-and-play optical head for any different pathlength
- An external simulated zero check device shall be provided for each monitor along with one set of four NIST filters
- The optical head shall have the independent capability of providing at least two analog outputs; two digital inputs; and two dry contacts if a remote display is not used
- A keypad interface shall be included on the optical head to provide on-stack access to measured parameters, test points, I/O configuration, alarm levels, etc. No external hand-held calibrators will be accepted
- A single pair of wire shall be utilized for communication between the optical head and the enhanced remote display
- The remote display (located in the control room) shall include at least four isolated analog outputs; eight isolated digital inputs; and eight dry contacts
- The remote display shall have RS232C, RS422 and RS485 serial communication capability, all operating in a “polled” and “broadcast” mode.
- The Enhanced Remote Panel shall include an RJ-45 Jack and support Ethernet capability. It shall be browser compatible and support Modbus TCP
- The remote display shall be able to graph at least six measured variables and at least 100 discrete readings of each variable
- The remote display shall include software that has both alarm and fault event logs. The logs shall be capable of archiving at least the last twenty alarms and faults complete with a time stamp, error code and current status indicator
- The optical head and retro-reflector shall both have security protection via passwords or key lock systems