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ML ® 660 Continuous Emission Monitoring System

THEORY OF OPERATION

The ML®660 or 660 ®Open Architecture (OA) is a pre-engineered Continuous Emissions Monitoring System (CEMS) designed for use in EPA 40 CFR Part 60 and Part 75, International Directives, compliance applications and for process control. This system can be configured to accurately measure SO_2, NO_x, NH_3, CO, CO_2, and /or O_2 on a dry basis.

Both configurations of the ML®660 CEMS consist of a heated probe, heated sample umbilical, and single bay cabinet. Each system includes analyzers, control equipment, and a sample conditioning package. Using conventional extractive principles, a vacuum pump draws unconditioned, temperature controlled (above dew point) stack gas through the filtered probe, heated sample line, and into the sample conditioner where moisture and fine particulate are removed. The now dry, cool stack gas is delivered to a sample manifold for distribution to each analyzer.

A controller performs all automatic sequencing of the sample cycle, daily calibration cycle, and backpurge cycle. During calibration mode, zero and span gases are injected into the probe head to comply with EPA calibration requirements. Backpurge air is delivered to the probe on a periodic basis to clean the heated probe filter, providing months of continued operation without maintenance.

In addition, the controller has the ability to log fuel flows and provide the required analog outputs in units of diluent corrected ppm concentrations (ppmc), Lbs/MBTU, Lbs/Hr and metric units. Standard relay outputs that signal system status and fault information are also generated from the controller. A RegPerfect® Data Acquisition System (DAS) may be attached to the controller via Ethernet to provide long term data collection, compliance report generation, remote control and diagnostic information.

The ML®660 is a self-contained system requiring single point attachment for power, instrument air, and calibration gases. All utility distributions are routed through the ML®660 internally. No duplication of utilities is required on the stack.

ML ® 660 FEATURES

- EPA certifiable for all 40 CFR 60 and 40 CFR 75 applications.
- This system is well suited to generate reliable and accurate process control information. Typical applications include gas turbines, industrial sources, and power boilers.
- State of the art TML T-Series® analyzers are utilized for pollutant monitoring. This allows a single source for system as well as analyzer support.
- Automatic, local and remote initiation of any system sequence is available. This includes the ability to zero and span a single analyzer both through the entire sampling train or directly at the analyzer to diagnose sampling system anomalies.
- Minimal maintenance is required. Weekly manual calibrations, quarterly probe checks, and quarterly filter changes are typically all the system requires to achieve uptime of 95% or greater, and
- Self-diagnosing alarm package. The ML®660 will alarm the user for sample train heater failures, sample conditioning failures, probe and sample line pluggage, and analyzer faults. This system is smart enough to protect itself during a fatal fault condition thereby eliminating the possibility of moisture contamination.

SPECIFICATIONS

PROBE:
Standard 316L Stainless Steel or Hastelloy probe straw
EPA approved lengths
2 micron filter standard, other sizes available
Heated probe filter maintained above 250°F [121°C]
Insulating jacket provided

PROBE SUPPORT BUNDLE:
¼" [.95 cm] Teflon calibration line
½" [0.64 cm] Polyethylene backpurge line
14 AWG triad for probe heater power
Fire retardant jacket

HEATED SAMPLE LINE:
3/8" [0.95 cm] Teflon or 316 Stainless Steel sample tube
Recommended maximum length 250 feet [76.2 meter]
Line temperature controlled to 300°F [148°C]
Low temperature alarm provided to Controller
Insulated fire retardant jacket

SAMPLE CONDITIONER:
Thermo-electric cooler
Negligible loss of NO_2 and SO_2
Teflon diaphragm pump
Peristaltic moisture drain pump
2 micron Teflon sample filter
Water slip alarm, sample dew point alarm
Probe and sample line vacuum alarm

CABINET VERSION:
Single bay, 19" [48.3 cm] Rack Mount
Standard NEMA 12 with fan ventilation or HVAC.
Other NEMA ratings are available.
Dimensions 81"H x 25"W x 39"D [2.0 x 0.6 x 1.0 meter] Approx. 400lbs.[181Kg]
Front door and rear doors, removable side panels, sight glass available
Lifting lugs and/or castors can be provided

OPEN ARCHITECTURE VERSION:
Open rack with optional desk.
Dimensions 80"H x 63"W x 30"D [2.0 x 1.6 x 0.8 meter] Approx. 300lbs. [136Kg]
Sample Conditioning Plate.
28"H x 24"W x 9"D [0.7 x 0.6 x 0.2 meter] Approx. 60 lbs. [27Kg]

SYSTEM CONTROLLER:
C3i/o or Allen Bradley or GE Controller, provides data buffering, digital inputs, digital outputs, analog inputs, analog outputs, and Ethernet communications.
Optional HMI provided for manual system control.

GAS ANALYZERS:
Model Number T300, for CO
Model Number T200, for NO_x
Model Number T100, or SO_2
Model Number T201, for NH_3
Model Number T360, T801, T802, T803 for O_2/CO_2

RANGES:

CO	0-5000ppm
NO_x	0-5000ppm
SO_2	0-5000ppm
O_2	0-5/10/25%
CO_2	0-2000 to 0-3000, 0-10/15/20%
NH_3	0-20ppm

RELATIVE ACCURACY:
± 20% of Reference Methods for 40 CFR 60
± 7.5% (better than ± 10.0%) of Reference Methods for 40 CFR 75

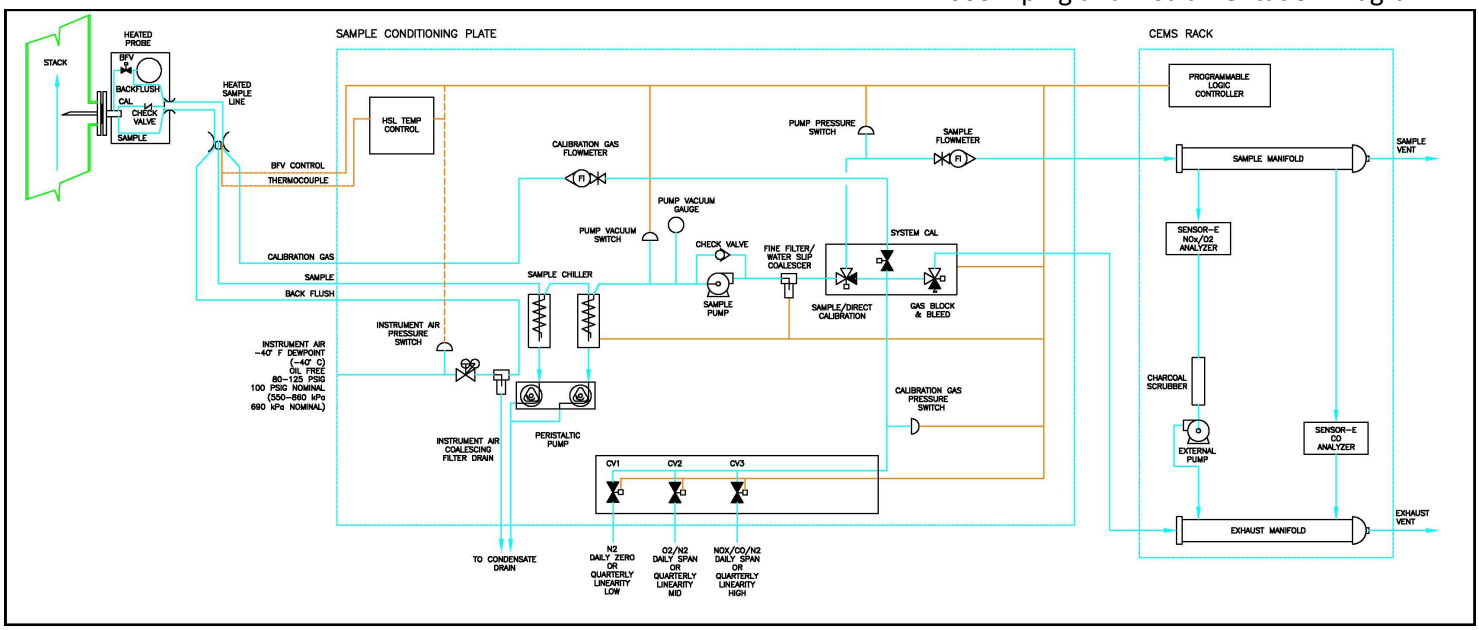
RESPONSE TIME:
Less than 90 seconds to 95% full scale from system inlet

CALIBRATION DRIFT:
Zero and Span
± 0.5% absolute for O_2/CO_2%
± 2.5% of full scale for CO, NO_X, NH_3, and SO_2 ppm

REPEATABLILITY: ± 1% of full scale
PROCESS: 80-1800°F [27-982°C] , up to 50% moisture
AMBIENT: Varies by Engineered Enclosure
SYSTEM UTILITIES: -40°F [-40°C] dew point instrument air, 80 psig [551.6 KPa] minimum, 0.5 SCFM [14 lpm] , Single point attachment of 240Vac, single phase, 60 hertz, 50 amp power

VALUE ADDED OPTIONS:
- Regulatory Consultation
- LightHawk® 560 Opacity Monitor integration
- LaserHawk® 360 Particulate Monitor integration
- Ultraflow 150 Ultrasonic Stack Flow integration
- Automatic Linearity's
- RegPerfect® Data Acquisition System
- Training
- Installation supervision
- Startup
- EPA Certification
- Maintenance Contracts

ML®660 Piping and Instrumentation Diagram



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