

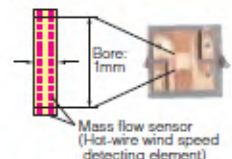
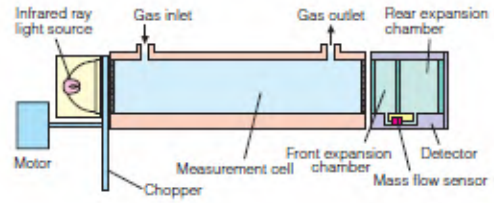
PROPOSED CONTINUOUS EMISSIONS MONITORING INSTRUMENTATION

a. Continuous Carbon Monoxide / Oxygen for Emissions Monitoring and Reporting

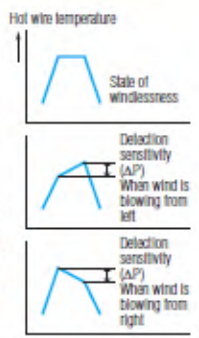


4 -component analyzer
Type: ZRJ
single-beam

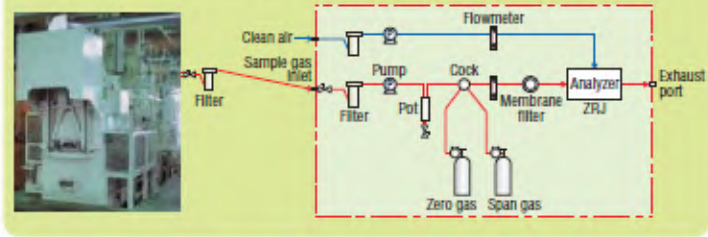
Principle The amount of infrared ray absorbed in the measurement cell is detected with a mass flow sensor.



<Mass flow sensor>
The low impedance sensor has high noise immunity. The sensor with no movable parts has high resistance to vibration, and thus can be used semipermanently. Infrared ray absorption by measured gas component is converted into electric signals.



Example of gas sampling system configuration
(For measurement of ambient gas of heat treat furnace)



Zirconia type O₂ Sensor
Type : ZFK7



General Specifications

Measurement principle	NO _x , SO ₂ , CO, CO ₂ , CH ₄ Non-dispersive infrared ray system (single-beam) O ₂ : Paramagnetic type (built in), galvanic cell type (built in), or zirconia type (Type ZFK7, Separately installed)
Measured component	NO: 0 to 500ppm.....5000ppm SO ₂ : 0 to 500ppm.....5000ppm CO: 0 to 200ppm.....100% CO ₂ : 0 to 500ppm.....100% CH ₄ : 0 to 1000ppm.....100% O ₂ : 0 to 5%25% (2-range switching, Maximum range ratio 1:5, O ₂ excluded)
Repeatability	±0.5%FS
Linearity	±0.1%FS or lower
Zero drift	±2.0%FS or lower/week
Span drift	±2.0%FS or lower/week
Gas extraction volume	1L/min. ±0.5L/min.
Response time	90% response from gas inlet: 15 sec. or shorter (2-component measurement)
Output signal	4 to 20mA DC or 0 to 1V DC (Max. non-insulated output point: 8) Instantaneous output value (measured gas concentration of each component) Instantaneous output value after O ₂ correction, Average output value after O ₂ correction, Average O ₂ output Permissible load resistance: 550Ω or lower (4 to 20mA DC), 100kΩ (0 to 1V DC)

External contact input	No voltage contact Auto calibration start, Average value reset, Range selection, Output hold
Contact output	Range identification of each component, Instrument error, Calibration error, Auto calibration in progress, CO peak count alarm, Instantaneous value concentration alarm for each component, Pump ON/OFF
Communication function	RS-232C (MODBUS) option
Auto calibration function	Auto zero and span calibration (Calibration cycle settable)
Display	LCD with backlight Instantaneous value of each component, Instantaneous value after O ₂ correction, Average value after O ₂ correction, Average O ₂ value, CO peak count Parameter setting display (English or Japanese can be selected.)
Outside dimension, weight	177 (H) × 483 (W) × 493 (D) mm, About 10kg
Power supply voltage	100 to 240V AC, 50/60Hz, 70VA

Standard measured gas conditions for gas analyzer

Temperature	0 to 50°C
Pressure	10kPa or lower (The gas outlet should be at atmospheric pressure.)
Dust	100μg/Nm ³ or lower with particle size of 1μm or lower
Mist	No mist allowed.
Moisture	Saturated at 2°C (No condensation allowed.)
Corrosive component	1ppm or lower



b. Continuous Oxygen Monitoring for Process Control



IN-SITU ZIRCONIA OXYGEN ANALYZER

DATA SHEET

ZFK8, ZKM, ZTA

This oxygen analyzer is used to continuously measure oxygen concentration in combustion exhaust gas of industrial boilers or furnaces, and is ideally suited for combustion management and control.

The analyzer system is comprised of the detector and converter coupled together as a complete system. Detector setting configuration includes the detector flow guide tube and detector sensor. The flow guide tube is inserted directly into the gas and directs gas to the sensor for measurement. The converter (ZKM) is comprised of the signal processor, input/output and communications, display and system controls.

The converter is equipped with advanced functionality such as performing the sensor diagnostics and sensor recovery function, so the detector can be used within long term stability.



FEATURES

- Gas sampling device is unnecessary**
For quick response, insert the detector directly into the flue Gas sampling functions such as a gas aspirator and a dehumidifier are not required.
- Easy maintenance**
The sensor equipped with the detector, has unit construction, it is easy to replace.
By separating the detector and the flow guide tube, filter replacement is easy.
- More reliable than sensor diagnosis, sensor recoverable function**
Depending on the concentration of the measurement gas, the power of the sensor might deteriorate. The equipment includes sensor recovery function electronically, checking the deterioration status of the sensor depletion.
Therefore, it has high reliability and long-lasting stability.
- Safe and secure**
System detects thermocouple break for heater control on the sensor side. Safety functions of isolating power supply to the detector or isolating power via external contact input are also.
- Easy operation**
The operation and setting for the converter can be performed interactively, and available as English, Japanese or Chinese for language display.

SPECIFICATIONS

General Specifications

Measuring object:	Oxygen in noncombustible gas
Measuring method:	Directly insert type zirconia system
Measuring range:	0 to 2 ... setting range at option 2 in 50 vol% O ₂ (in 1 vol% O ₂ steps)
Repeatability:	Within ±0.5%FS
Linearity:	Within ±2%FS
Response time:	Within 4 to 7 sec, for 90% (from calibration gas inlet)
Warmup time:	More than 10 min
Analog output:	4 to 20mA DC (allowable load resistance less than 500Ω) or 0 to 1V DC (output resistance more than 100Ω)
Power supply:	Rated voltage; 100 to 120V AC (operating voltage 90 to 132V AC) 200 to 240V AC (operating voltage 190 to 264V AC) Rated frequency; 50/60Hz
Power consumption:	Maximum 240VA (Detector: approx. 200VA, Converter: approx. 40VA) Normal 70VA (Detector: approx. 50VA, Converter: approx. 20VA)



c. Continuous Particulate Measurement for Emissions Monitoring and Reporting

TECHNOLOGY

SYSTEM DESCRIPTION

The PCME LEAK ALERT 65-02 is particularly suitable for use with dust collectors. It provides reliable and robust monitoring of particulate dust levels and leaks from faulty filter media in baghouses. The sensor, installed after the filter, conditions, amplifies and analyses the dust signal and communicates a secure digital signal to the remotely located control unit, where instrument set-up, configuration, local display, and 4-20mA output signals functionality are provided.

The PCME LEAK ALERT 65-02 benefits from ENVEA's unique *ElectroDynamic™* Probe Electrification technology. Advanced unique features enable configuration for bagfilters irrespective of cleaning sequence. The external display, keypad and patented self-check options provide ease of use and added Quality Control.

PROCESS APPLICATION CONDITIONS



© Lubr Filter. Baghouse image reproduced with kind permission.

The PCME LEAK ALERT 65-02 is the ideal solution for continuous monitoring of fabric filter dust collectors. Applications include:

Stack flue gas temperatures up to 400°C at monitoring point

Duct diameters to 4 metres

Dry and humid applications. Up to 95% relative humidity, non-condensing

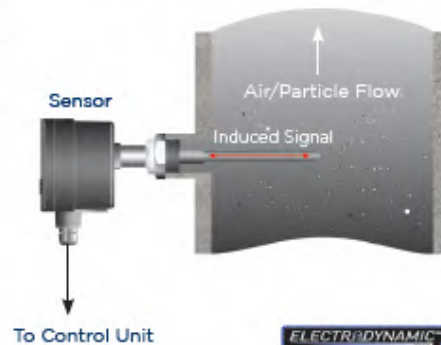
Online or Offline bag cleaning sequences

Acid gas environments

PRINCIPLES OF OPERATION

The PCME LEAK ALERT 65-02 uses ENVEA's unique and patented *ElectroDynamic™* Probe Electrification technology. Particulates in the airstream interact with the sensing rod to induce a charge signature. The resulting signal is filtered electronically to reject signals outside a defined frequency range (rejecting the DC Triboelectric signal), making the instrument less susceptible to changes in particle velocity and eliminating the effect of any particulate contamination on the sensing rod (affecting Triboelectric dust monitors). *ElectroDynamic™* technology does not rely on particles colliding with the probe, and therefore measures a more representative area of the stack and does not require long sensor probe rods. The rod can be fully insulated to provide a reliable solution for high-humidity applications (patented option).

- ⇒ Not affected by contamination on the sensor rod (unlike Triboelectric systems).
- ⇒ Not affected by velocity variations within typical bagfilter velocity ranges (unlike Triboelectric systems).
- ⇒ Provides stable results and calibrations. Drift due to electrostatic charging is avoided when standard probes are used in dry applications.



INSTRUMENT SELF-CHECKS

Probe Check (Insulator Short-Circuit Check) for detection of insulator contamination (patented option)

ElectroDynamic™ sensors are tolerant to dust contamination on the sensor rod (unlike Triboelectric systems) due to the non-contact measurement principle, however, build-up of conductive material across the insulator at the base of the rod can lead to error (as with all Probe Electrification systems).

The Probe Check (Insulator Short-Circuit Check) provides a reliable method for detecting insulator contamination, and hence improved Quality Assurance.

The probe check tests for contamination between the sensor rod and the base of the rod. If the Probe Check fails then the probe should be inspected and cleaned, as interference to the dust signal is likely. The probe check can be configured to be activated manually or run automatically.

Electronic Zero and Reference drift detection

Electronic and signal measurement malfunctions are detected. This Quality Assurance feature is required by European and ASTM (US) performance standards for Filter Leak monitors.

The Zero Self-Check tests that the electronics read zero when no external signal is present and hence checks for electronic drift.

The internal Reference Self-Check (Span or Upscale Check) tests the correct electronic response to a known input signal. The signal is applied directly to the sensor so any malfunctions in the sensor, cabling or Control Unit are detected (unlike other Triboelectric systems).

