$CO_{Low}$ $CO_{High}$ $CO_{Low/H_2comp}$ NO $NO_x$ • $NO_2$ $SO_2$ $H_2S$ $SO_2$ $C_xH_y$

LAND


# Portable Flue Gas Monitoring

# LANCOM 4


www.lancom4.com

An AMETEK® Company

# LANCOM 4

The Lancom 4 is the most accurate, robust and flexible portable flue gas analyser currently available.

In excess of two thousand Lancom analysers are in use today, in a wide range of applications - all subjected to very different measurement conditions.

| Features | Benefits |
|---|---|
| Monitoring of up 17 measurement parameters | One instrument to meet all requirements |
| Up to 9 simultaneous gas measurements in a single instrument | User selectable |
| Weighs only 6 kg (13 lbs) | Easily carried around plant |
| Robust, industrial design | For daily use in the harshest plant environments |
| Wake and Sleep, semi-continuous operation mode | For periodic unattended operation |
| Range of user selectable options | Ideally matched to application requirements |
| Data acquisition & analysis software | Capture, manipulate, and report data on your PC |
| Simple field upgrade | Add features and options as and when required |
| Meets ASTM D-6522 with Dry Sampler probe | Report generation to recognised standards |
| USB Communications Support | Simple interface to PC and data transfer - supports USB memory sticks |


CO Low

CO Low $H_2$ Comp

$SO_2$

$C_xH_y$

$NO_2$

$O_2$

$CO_2$

**The world's most versatile portable flue gas analyser**

$NO_x$

NO

CO High

$H_2S$


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## Convenient catchpot - visible and accessible

The side-mounted catchpot is both fully protected and highly visible for rapid checking, removal and emptying.

## Clip-in filters - visible and quick to change

The chemical and particulate filters are mounted on the side of the instrument. Visible inspection and replacement is straightforward. The rugged case design protects all components from damage.

## High Colour Display

New high resolution colour display supports a multi-lingual, simple user interface.

## Straightforward servicing

Service is simple via the menu driven software.

Self diagnostic checks are run continuously on calibration status and battery life.

## Flue gas & ambient temperature

The analyser takes a direct thermocouple temperature measurement of the flue gas, and has an ambient temperature sensor fitted.

These are required for making accurate combustion efficiency calculations.

## Setup and measure within minutes

Simply switch on, an automatic zero calibration is performed by the analyser. Plug in the sample probe and take real-time gas readings in a matter of minutes.

## Easy access sensors

Each sensor is installed in its own unique position. Replacing a sensor is a simple process and takes only a few minutes. Unclip the side panel for access, swap the sensor and re-calibrate.


## Direct $CO_2$ Measurement capability

The infrared sensor used in the Lancom 4 enables direct measurement of $CO_2$ in flue gas.

The combination of this $CO_2$ sensor with the measurement capability offered by the flow probe, can give quantitative information on greenhouse gas emission.

## Data Logging

Internal data logging makes it easy to record measured gas concentration. After a measurement run, simply download the data to a USB memory stick to transfer to PC. The 64MB of available memory means an almost unlimited number of log records can be stored.

## Long life rechargeable battery

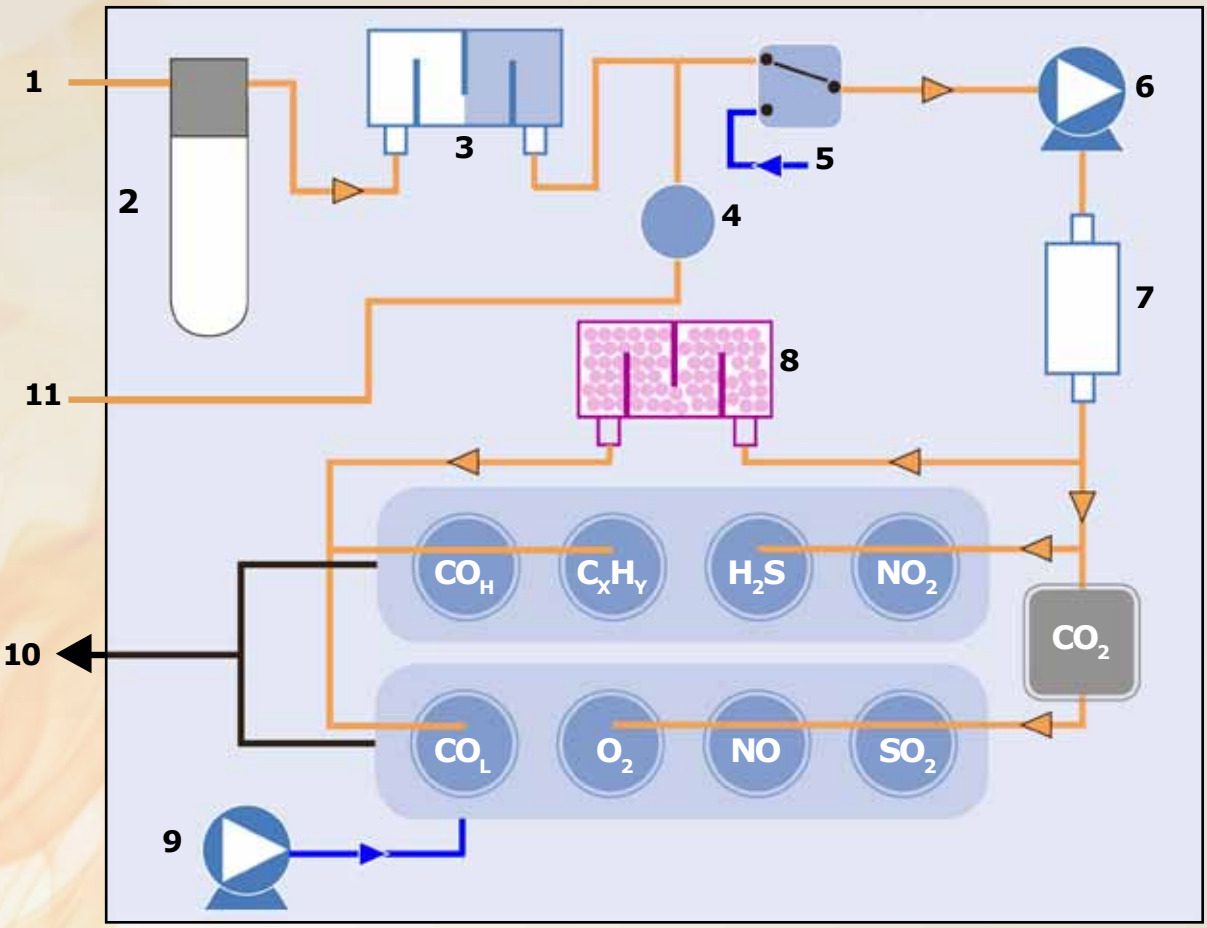
Rechargeable batteries give up to 8 hours continuous operation. A power supply cable is is supplied for battery recharging.

## Automatic Sensor Protection

Auto Purge of sensors on system shutdown clears system of corrosive flue gases.

CO overrange protection Automatically purges low CO sensor and switches to high range measuring mode, if high levels of CO are encountered.

## How the analyser works




**Key**

1. Sample Gas Inlet
2. Catchpot for condensate
3. Particulate Filter
4. Pressure Sensor
5. Air Input
6. Sample Pump
7. Expansion Chamber
8. Chemical Filter
9. Purge Pump
10. Exhaust
11. Flow Probe Inlet

*View showing measurement sensors*

**Integral sample conditioning**

The gas sample is drawn into the analyser via a sample probe and hose connected to the input connection on the side panel of the analyser. The sample enters the water catchpot where residual water is removed. The sample gas is then passed through a 0.1 micron particulate filter.

**Filtering out damaging chemicals - prolonging sensor life**

The sample gas is routed to the sensor manifolds, after removing flow and pressure variations. To ensure that the CO and $C_XH_Y$ sensors are not poisoned by other gases the sample gas is fed through a chemical filter prior to being routed to these sensors. This action ensures prolongs sensor life and improves measurement accuracy.

**Automatic Sensor protection**

To protect the CO Low sensor from excessive levels of CO (normally levels >2000ppm), the system automatically switches to the high range CO sensor (up to 4000ppm). The CO low sensor is then automatically purged using a dedicated pump which blows ambient air to protect the sensor, ensuring rapid recovery time and maximum sensor life.

**Sensor accuracy and longevity**

The Lancom 4 performs a zero calibration every time it is switched on, and purges the sensors with ambient air before switching off. This ensures maximum accuracy and sensor longevity.

## Selecting the analyser


The following features are standard on all instruments:

- **Standard Sample Probe**
- **Data Logging**
- **RS 232 or RS 422 Serial Communications Interface**

The user selects which gases (between 3 and 9) and then the options that are required for their application. (See list below)

| Options | Description |
|---|---|
| Draft Measurement | Internal stack pressure in hPa or inches water gauge |
| Flow Measurement | Flue gas velocity, flow rate and mass emissions rate |
| Smoke Measurement | Readings of Smoke spot number (Bacharach Smoke scale) |
| Range of Sample Probes | Smoke, Flow, DrySampler* and High Temperature |
| Insight Data Acquisition Software system | Simple-to-use Windows™ reporting software |
| Analogue outputs | (16 current loops, independently user configurable) |
| Wake and Sleep facility (Semi-continuous monitoring) | Takes gas measurement at user defined intervals (see below) |
| Language display options | English, French, German, Italian, Spanish & Chinese |

*US Patent No. 6782767 **Bacharach scale

## Sample Probes

A wide range of sample probes suitable for specific application and measurement requirements are available.

***Request Information ref. PDS 198***


## Semi-continuous Monitoring

Wake and Sleep monitoring takes gas measurements at user defined intervals. This is achieved by cyclically sampling and logging gas concentrations over a period of time. (alternate 'wake' and 'sleep' phases). User settings include wakeup interval, number of samples between wakeup, sample interval and first wakeup.

**leading the way in portable flue gas monitoring**

## Measurement Specifications

| Sensor | Minimum Range | Maximum. Range# | Accuracy % of range | Resolution |
|---|---|---|---|---|
| $O_2$ | 25% v/v | 30% v/v | ±1% | 0.1% v/v |
| CO (low) | 100 ppm | 10000 ppm | ±2%* | 0.1 ppm |
| CO ($H_2$ compensated) | 100 ppm | 4000 ppm | ±2%* | 0.1 ppm |
| CO (high) | 4000 ppm | 10 % v/v | ±2%* | 0.1 ppm |
| $SO_2$ | 100 ppm | 5000 ppm | ±2%* | 0.1 ppm |
| NO | 100 ppm | 5000 ppm | ±2%* | 0.1 ppm |
| $NO_2$ | 100 ppm | 1000 ppm | ±2%* | 0.1 ppm |
| $CO_2$ ** | 10% v/v | 25% v/v | ±3%* | 0.1% v/v |
| Hydrocarbons ($C_xH_y$) | 5% v/v | 5% v/v. | Application dependent | 0.1% v/v |
| Flue Gas/Ambient Temperature | Measured | | | |
| Draft | ± 50 h Pa / 20 " Water Gauge *** | | | |
| Flow (velocity) | 1 to 50 m/s | | | |

*Note: Special ranges are available*
**Calibration per ASTM D-6522 or LAND factory procedure*
***True measurement if sensor fitted (calculated if not)*
****Reduced to ± 25 h Pa / 10 " Water Gauge when used with flow probe*
*#Operating at maximum possible range may affect sensor life and accuracy*

## Combustion & Environmental calculations

- **Combustion efficiency**
- **Loss**
- **Excess Air**
- **$CO_2$ (where no sensor fitted)**
- **Oxygen normalisation**
- **Total $NO_x$**
- **Wet or dry basis**
- **Automatic conversions - ppm, mg/m³, lb/mmBtu, ng/J**

## Sensor Types

Lancom analysers use the following sensors in order to measure gas concentration levels.

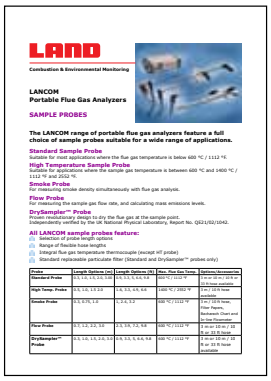
| Sensor Type | Gas |
|---|---|
| Electrochemical, | CO Low, CO High, CO Low $H_2$ compensated, $O_2$, NO, $NO_2$, $SO_2$ and $H_2S$ |
| Infrared | $CO_2$ |
| Pellistor/Catalytic | $C_xH_y$ |

**capable of monitoring up to 9 different gases simultaneously**

## Specifications - LANCOM 4

| | |
|---|---|
| Display: | Full function colour LCD with backlight, wide QVGA display |
| Keypad: | Tactile membrane (integral with display) function keys and cursors |
| Indicators: | LED type for ON (Power), Stand-by, Charge, Low Batt., Fault |
| Power Supply | 95-265 V a.c. ±10%, 50-60 Hz, 30 Watts. Battery, rechargeable lead-acid (internal). Typical 8 hour operation, dependent on options fitted |
| Ambient Temperature: | -5 °C to 45 °C (+23 °F to 113 °F) |
| Case: | Medium density blended polyethylene |
| Dimensions: | 453 x 120 x 245 mm (17.8" x 4.7" x 9.6 inches) |
| Weight: | 6 kg (13 lb) |
| Standard Accessories: | Integral water catchpot and filters, Rechargeable lead acid battery (internal),<br>Battery Charger supply, Probe handle, Hose and Probe pipe (Lengths listed below under options),<br>Data logging |
| Options: | Min of 3 to max 9 gases in total, from a selection of 9 gases<br>Probe length options - 0.3, 1.0, 1.5, 2.0, 3.0m/1, 3.3, 5, 6.5, 10ft<br>Alternative probes available - Refer to Data Sheet Reference PDS198 for details<br>Hose length options - 3 m/10 ft or 10 m/33 ft<br>Draft Measurement<br>Flow Measurement, probe length options - 0.7, 1.2, 2.2, 3.0 m/2.3, 3.9, 7.2, 9.8 ft<br>Smoke Measurement, probe length options - 0.3, 0.75, 1.0 m/1, 2.4, 3.2 ft<br>Insight Data Acquisition Software system - Refer to Data Sheet Reference PDS205 for details<br>Analogue outputs (16 current loops, independently configurable)<br>Wake and Sleep facility (Semi-continuous monitoring)<br>Language display options - English, French, German, Italian, Spanish & Chinese, others available |

### Other related data sheets




**Lancom Sample Probes - further information**


**Insight Data Acquisition System - further information**


**Combustion & Environmental Monitoring**

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