

APPLICATIONS

The Mercury Tracker 3000 serves for measurement of the mercury concentration in air and other gases. It has multiple applications including:

- mercury surveys
- mercury spills screening
- work place monitoring to avoid mercury exposure
- ground air screening
- investigation of contaminated sites
- hazardous waste inspection

MEASURING PRINCIPLE

The mercury concentration is measured in an optical cell entirely made of a high purity grade fused silica. A maintenance-free membrane pump continuously feeds the sample gas to the optical cell where light absorption measurement takes place at a wavelength of 253.7 nm. This so-called "cold vapor" measuring method is extremely sensitive for mercury determination and has been used successfully for many years.

ANALYTICAL PERFORMANCE

The Mercury Tracker 3000 uses a high-frequency driven electrodeless Hg low pressure (EDL) lamp as UV source. It generates emission lines of an extremely narrow bandwidth which are congruent with the absorption lines of the Hg atoms. Cross-sensitivities are thus minimized.



Unlike the gold film based systems measurements are not interfered by H₂S. The extremely high stability of the UV source is a result of the reference beam method which is applied in the Mercury Tracker 3000. Total background noise is less than 0.1 µg/m³. To prevent temperature drift both the lamp unit and the detectors are temperature-stabilized. The instrument is calibrated before delivery and keeps the calibration for a long period of time. For quality control a test screen is included in the delivery allowing the user to check calibration.

SPECIAL FEATURES

- Rugged aluminium case
- Comfortable shoulder strap
- Wand with grip and sample tubing
- Operates up to six hours on fully charged batteries
- Membrane pump with long service life
- Sample input filter with teflon membrane
- Unsurpassed stable optical bench
- Factory-calibration with long-term stability



EASY TO OPERATE

The user controls the Mercury Tracker 3000 by menu-guided inputs via a waterproof membrane keypad. After switch-on the light source is stabilized (approx. 1 - 5 minutes). Measurement starts automatically, continuously indicating the measured mercury concentration of the sample air as a numerical value and a graphic bar. The zero point is automatically adjusted by the auto zero function. Following settings can be entered in the parameters menu: duration and repeat interval of the zero adjustment, selection of the concentration unit ($\mu\text{g}/\text{m}^3$ or ppb), measuring range (0-100, 0-1000, 0-2000 $\mu\text{g}/\text{m}^3$), input of three different alarm levels, calculation of a mean value over three freely selectable time intervals, printer activation.

DISPLAY AND OUTPUT OF MEASUREMENTS

The result of the measurement is displayed on an LCD in real time, both numerically and graphically and is output as an electrical signal of 4-20 mA. The Mercury Tracker 3000 has outputs for alarm, status and measurement values for recording or full integration in plant control systems. The device also has a serial interface (RS 232) for data transfer to a PC.

SELF DIAGNOSIS SYSTEM

If an important component of the Mercury Tracker 3000 malfunctions the user is warned via the display (blinking messages: clean cell, lamp, low battery, alarm) and via output signals.

MOBILE USE

The Mercury Tracker 3000 has a built-in rechargeable battery with a capacity for six hours operation. For longer employments the battery pack can quickly be exchanged for fully charged spare batteries. A microprocessor controlled charger unit comes with the instrument. With an optionally available cigarette lighter adaptor cable the instrument can be operated by the car battery. The instrument can be carried with an ergonomically shaped shoulder strap. The wand connected to the sample inlet allows to check spots or to screen areas for mercury concentrations. The comparatively low sample flow rate minimizes influences of the instrument itself on the mercury concentration over hot spots.

DATA LOGGER FUNCTION

The Mercury Tracker 3000 features a built-in data logger. Up to 30000 readings can be stored in the data memory. The logging interval can be set from 1 to 16 seconds giving a total recording capacity of 4-60 hours. The stored data can be read out with a PC using the serial interface of the Mercury Tracker 3000 according RS232 standard.



Specification

Measuring principle	UV-Absorption
Wavelength	253,7 nm
UV source	Electrodeless low-pressure mercury lamp
Stabilization	reference beam and thermal
Optical cell	fused silica (Suprasil), ca. 230 mm length
Measuring range	0...100 $\mu\text{g}/\text{m}^3$; 0...1000 $\mu\text{g}/\text{m}^3$; 0 - 2000 $\mu\text{g}/\text{m}^3$
Sensitivity	<0.1 $\mu\text{g}/\text{m}^3$
Response time	1 sec
Computation of mean value	autom.via three freely selectable time intervals
Alarm	status contacts and optical, when concentration is exceeded, 3 levels are programmable
Status alarms	measuring cell soiled, battery state, UV source exhausted
Control pad	waterproof membrane keypad
Measurement display	Graphic display with background lighting
Signal outputs	4...20 mA for recorder; RS 232 bidirectional for PC, parallel for printer
Pump	membrane pump, approx. 1,5 L / min.
Filter	PTFE, 1 μ , 47-50 mm diameter
Power supply	built-in rechargeable batteries, external 12 V DC sources, 110 ... 240 V/(50/60 Hz) with included power supply
Dimensions	425 x 150 x 340 mm (W x H x D)
Weight	approx. 9 kg