Figaro sensors for Toxic gases in Industrial Safety applications

In industrial safety, detection of toxic gases such as carbon monoxide (CO), hydrogen sulphide (H_2S), nitrogen dioxide (NO_2), and ammonia (NH_3) is driven by the need to protect personnel from acute and chronic exposure, in line with workplace exposure limits and standards such as EN 62990-1. Typical applications include confined space entry, wastewater treatment, chemical processing plants, confined space entry, combustion environments and refrigeration systems , where toxic gases can accumulate rapidly. These applications require sensors with high sensitivity at low ppm levels, fast response, strong selectivity, and long term stability, ensuring reliable alarm activation and compliance with safety regulations. Within this context, Figaro Engineering Inc. offers a range of electrochemical sensors suited to these requirements:

The **Figaro TGS 5042** is well suited to **carbon monoxide detection** in applications such as **boiler rooms and combustion processes.** low cross sensitivity, Its long operational life (up to 10 years) and alignment with **EN 62990-1** requirements by providing the high linearity and environmental stability necessary for Type SM (Safety Monitoring) industrial applications. Its typical response time of under 60 seconds and linear output deviation of less than ±5% across a 0–500 ppm range ensure it meets the standard's core performance thresholds for reliable alarm triggering. Furthermore, its ability to maintain stable operation across a broad temperature range and its low baseline drift support the rigorous durability and environmental stress testing mandated for industrial gas detection equipment.

The **Figaro FECS40-1000** is specifically designed for industrial safety **CO monitoring**, particularly **in confined spaces and process environments** where precise low-level detection is required. It provides a detection range of 0–1000 ppm with 1 ppm resolution, combined with a fast response time (<30 seconds T90), enabling rapid detection of hazardous conditions. Its high selectivity to CO and minimal cross sensitivity to gases such as CO_2, H_2S, NO_2, and NH_3 ensures accurate readings in mixed gas environments. Additional features such as low baseline drift (<5% per year) and stable output support long term reliability in demanding industrial applications.

The **Figaro FECS44-series** includes four sensors, each optimised for different **ammonia** concentration ranges, making them ideally suited to applications such as **wastewater treatment, fertiliser production, and refrigeration systems.** In these environments, ammonia presents both toxic and corrosive risks, requiring high sensitivity at low ppm levels, fast response, and strong selectivity. The FECS44-series delivers rapid response, linear output, and stable baseline performance, supporting reliable detection in line with occupational exposure limits. Its leak-proof design and excellent resistance to interference gases, exceeding that of many comparable electrochemical sensors, ensure dependable operation in harsh industrial conditions, where early and accurate detection is essential to protect both personnel and equipment.

The **Figaro FECS42-20** is optimised for **nitrogen dioxide detection** in applications such as **power generation, chemical processing, and manufacturing environments**. As NO_2 is highly toxic even at very low concentrations, these applications require fast response and high selectivity at ppm and sub-ppm levels. The FECS42-20 is among **the fastest responding sensors in its class,** enabling rapid detection and timely alarm activation. Combined with its linear output and stable baseline, it delivers accurate and reliable performance. The sensor's high accuracy for NO_2 and low susceptibility to interference make it perfect for challenging environments.

The **Figaro FECS50-100** is specifically developed for **hydrogen sulphide detection** in demanding environments such as **oil and gas facilities, wastewater treatment plants, and biogas systems,** where H_2S poses an immediate toxicity risk even at low concentrations. In these applications, multiple toxic gases are often present, making it essential to measure each gas accurately and independently to ensure compliance with exposure limits and to trigger the correct safety response.

A key advantage of the FECS50-100 is its exceptionally low cross sensitivity, outperforming many comparable sensors by significantly reducing the influence of interfering gases on measurement accuracy. This ensures high confidence in H_2S readings, even in complex mixed-gas environments. Combined with its fast response, high sensitivity at low ppm levels, and stable output, the sensor enables rapid and

reliable alarm activation. Its robust design also supports consistent performance in humid and contaminated conditions, where H_2S is commonly encountered.

For further information on sensors:
TGS5042 product information
FECS40-1000 CO product infromation
FECS44-100/200 low concentration ammonia product information
FECS44-1000/5000 high concentration ammonia product information
FECS42-20 NO2 product information
FECS50-100 H2S product infromation