



| Understanding gas detection |

What is a T90 response time, and why is it important?

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In the world of gas detection, speed is everything. A few seconds can separate a safe outcome from a serious incident. Whether it's hydrogen sulfide, carbon monoxide, oxygen deficiency or combustible gases, knowing how quickly a gas monitor can respond is critical. That's where T90 comes in – a small piece of technical jargon with big safety implications.



First, we need to understand T90. It refers to the time it takes a gas sensor to reach 90% of its final reading after being exposed to a gas sample. It's one of the most important performance indicators for any gas detection instrument because it tells you how fast the sensor can detect a change and alert the user.

For example, if a monitor has a T90 response time of 20 seconds for hydrogen sulfide, it means that within 20 seconds of exposure, the reading will reach 90% of the true concentration. The remaining 10% of the signal will typically stabilize shortly after, but that 90% threshold is the standard benchmark for sensor performance across the industry.

Why does it matter?

T90 represents how quickly your instrument can protect you. Gas hazards don't wait. Leaks can spread rapidly, especially in confined spaces or enclosed areas. A detector with a fast T90 can trigger an alarm almost immediately, giving workers precious time to respond

or evacuate. A slower T90 doesn't necessarily mean the instrument is inaccurate, but it can delay warnings long enough for a worker to be exposed before the alarm activates. In an environment with toxic or explosive gases, those few extra seconds can be the difference between a near miss and an incident.

Several factors can influence the T90 response. Sensor type plays a big role. For instance, electrochemical sensors used for hydrogen sulfide, carbon monoxide and O₂ typically respond within 15 to 30 seconds under normal conditions. Catalytic bead sensors, commonly used for combustible gases (lower explosive limit, or LEL), may take slightly longer depending on diffusion

rate and gas composition. Infrared sensors, which are another option for LEL detection, often provide rapid and stable responses but may behave differently in oxygen-deficient environments.

Environmental conditions also matter. Temperature, humidity, pressure and wind speed can affect how gas molecules reach the sensor surface. Also take into consideration the age and condition of the sensor. If you have a sensor that's close to the end of its service life, the response time may be slower than it was at the beginning of its service life.

Always maintain your gas monitors by following the guidelines for calibrations, regular maintenance and bump testing. This will help your monitor maintain

its T90 performance. A bump test will quickly verify the sensor and alarms respond as they're expected to, and calibration makes sure that it's accurate over time. Neglecting to bump test or calibrate can cause sensors to drift or have a slower response time than is suggested.

When making informed decisions on what monitors to use, it's easy to focus on the gases they detect or how long the battery lasts. Understanding specifications such as the T90 response time provides valuable insight into how the instrument performs in real-world situations. Fast response times, combined with proper maintenance and calibration, ensure workers get the earliest possible warning of danger.

T90 isn't just a specification on a datasheet – it's a real measure of protection. It tells you how quickly your detector can react when it matters most. In any environment where hazardous gases may be present, every second counts. T90 helps ensure those seconds are on your side.