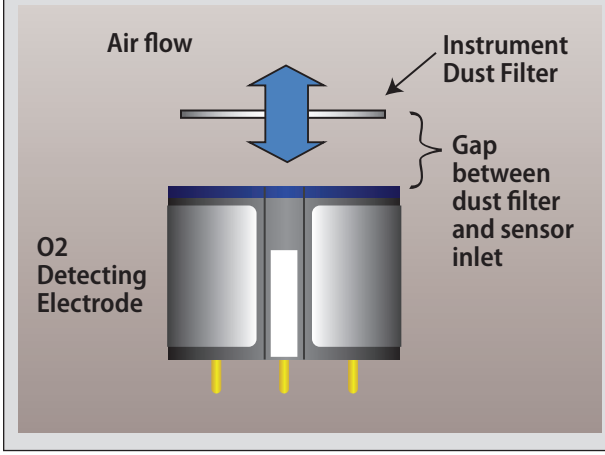
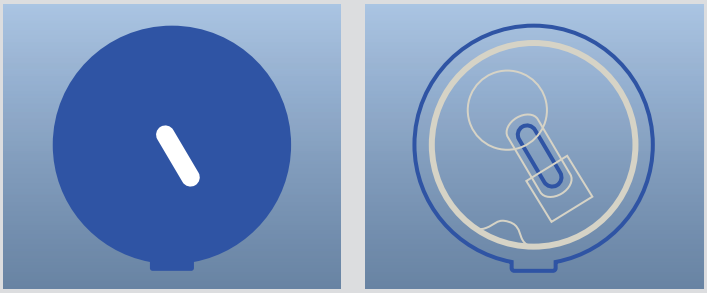
MSA XCell® Pulse Technology
Flow Check – Exhalation Test

Technical Brief



Top View of Sensor

Note – Single slot provides flow path to target gas and O2 channels



FLOW CHECK – EXHALATION TEST

MSA's XCell Pulse Technology provides a bump test method that does not require use of calibration accessories or bottled calibration gas. Sensors with this technology include an embedded oxygen (O_2) electrode that enables the flow path from the ambient environment to the sensor to be evaluated as part of this bump test method. An electronic pulse check is applied; the user then exhales into the instrument when prompted in order to check the flow path. This innovative new flow check method allows MSA portable instrument users to conduct daily bump checks without need for calibration accessories or bottled gas. This yields significant cost and time savings. Customers can rest assured workers are in compliance with industry safety best practices and that gas is able to reach the sensor for response.

HOW THE FLOW CHECK WORKS

The goal of the flow check is to ensure that target gas is able to reach the sensor. MSA's patented technology uses a flow check to measure sensor response to air flow to an embedded O_2 electrode. As the user exhales, the embedded O_2 electrode that is active only during the flow check detects the drop in oxygen concentration contained within exhaled breath. The rate at which gas diffuses across the sensor barrier is calculated and used to determine sensor functionality; that is, gaseous transport to the sensor falls within predetermined limits and no flow elements are blocked. As shown in the graphic above, the sensor inlet is a single slot that covers both oxygen and target gas electrodes, as opposed to two individual openings. It is therefore impossible to block flow to one electrode while leaving flow open to the other, ensuring that the flow check can identify blockage to the target gas electrode.

Figure 1 shows an example of flow rate in and out of the sensor face. If the sensor is blocked, the rate at which breath enters the sensor face will be measurably slower than that of an unobstructed sensor.

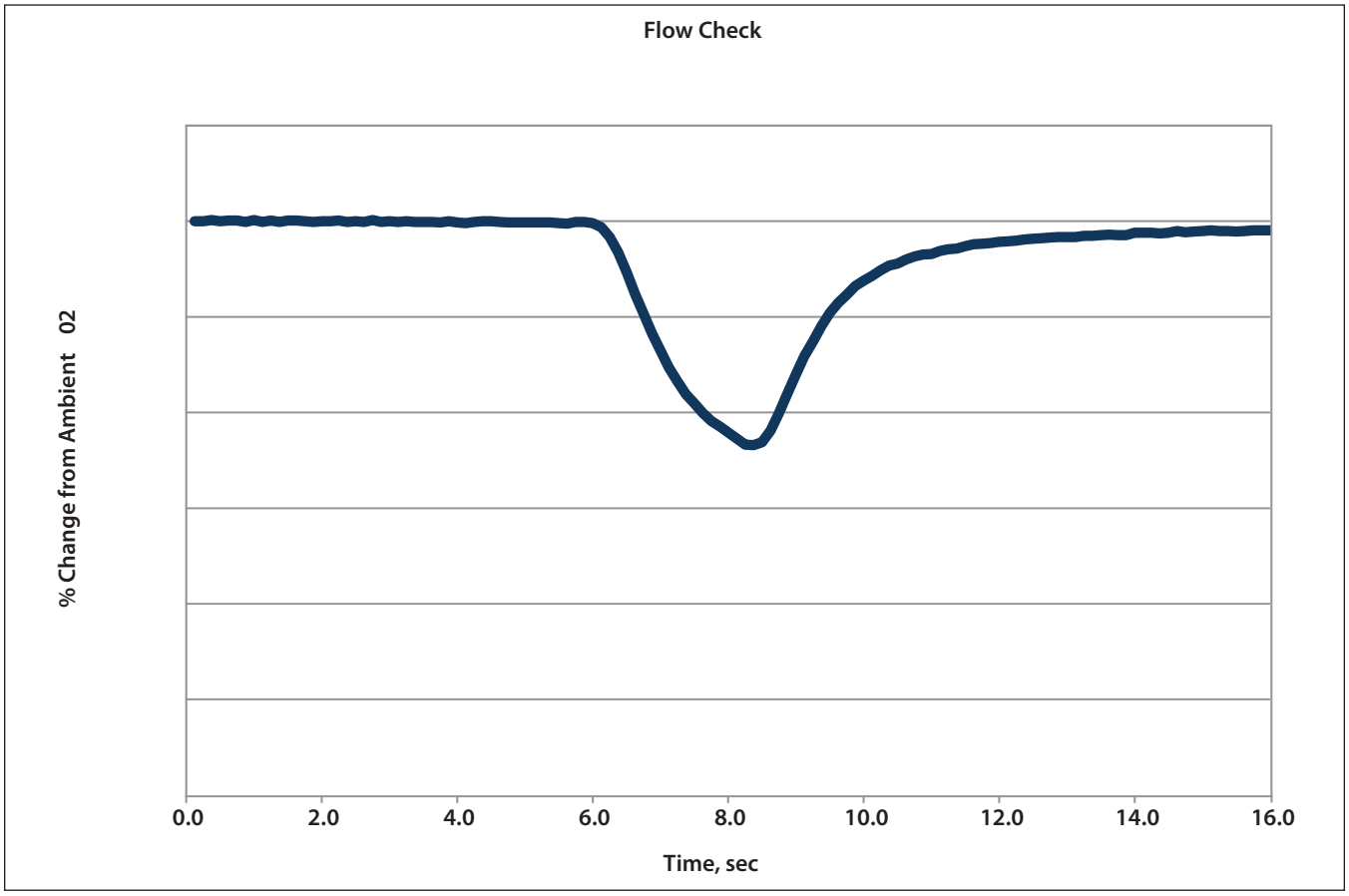


Figure 1

MSA's H_2S sensor with XCell Pulse Technology is **not** a combined H_2S/O_2 sensor; rather, the sensor is a single H_2S sensor that uses an O_2 electrode only for this flow check. This device **cannot** be used as an O_2 sensor, as that function operates only during bump test procedures.

Use of an electronic pulse check and flow check as the daily bump test creates cost saving benefits through a reduction in required bottled gas and calibration accessories. This process also enhances worker productivity, as bump testing can be performed anywhere, and bump test coordination is reduced.

MSA sensors with XCell Pulse technology and on-board ASIC (application-specific integrated circuit) provide fast, simple and positive indication of instrument functionality in accordance with industry best practices.

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