

### Oxygen Probe Troubleshooting Guide

This guide will explain some commonly asked questions and possible remedies or solutions.

#### “My Detector is Reading a High O<sub>2</sub> Level”

##### 1) The gas pressure increases:

When the process pressure increases, the oxygen reading will be higher. Certain steps should be taken to ensure proper measurement:

- Can a facility improvement be made so that the pressure change does not occur?
- Can the probe be calibrated at process pressure?
- Change the oxygen probe to a pressure compensating model.

##### 2) Moisture content in a reference gas changes (increases) greatly:

If ambient air at the detector installation site is used for the reference gas (convection sourced), a large change in moisture in the air may cause an error in the measured oxygen concentration value (vol% O<sub>2</sub>). When this is the case, use a gas in which moisture content is constant, for example, a clean, dry instrument air or a bottled gas source such as 21% O<sub>2</sub> balanced in nitrogen.

##### 3) Calibration gas (span gas) is mixing into the cell due to leakage:

If the span gas is mixing into the cell due to leakage as a result of a failure of the valve in the calibration gas tubing system, the measured value is higher than normal.

Check valves such as needle valves, check valves, solenoid valves for automatic calibration, etc. in the calibration gas tubing system for leakage. For manual valves, check them after confirming that they are fully closed. In addition, check the tubing joints for leakage.

#### **4) The reference gas is mixing into the process gas and vice versa:**

Since the difference between oxygen partial pressures on the cell anode and cathode sides becomes smaller, the measured value is higher.

Process gas and/or the reference gas may be leaking. Visually inspect the cell. If a crack is found, replace the cell assembly with a new one.

### **“My Detector is Reading a Low O<sub>2</sub> Level”:**

#### **1) The gas pressure decreases:**

When the process pressure decreases, the oxygen reading will be lower. Certain steps should be taken to ensure proper measurement:

- Can a facility improvement be made so that pressure change does not occur?
- Can the probe be calibrated at process pressure?
- Change the oxygen probe to a pressure compensating model.

#### **2) Moisture content in a reference gas changes (decreases) greatly:**

If ambient air at the detector installation site is used as the reference gas (convection sourced), a large change in moisture in the air may cause an error in the measured oxygen concentration value (vol% O<sub>2</sub>). When this is the case, use a gas in which moisture content is constant, for example, clean dry instrument air or a bottled gas source such as 21% O<sub>2</sub> balanced in nitrogen.

#### **3) Calibration gas (zero gas) is mixed into the cell due to leakage:**

If the zero gas is mixed into the detector due to leakage as a result of a failure of the valve provided in the calibration gas tubing system, the measured value is lower than normal. Check valves such as needle valves, check valves, solenoid valves for automatic calibration, etc. in the calibration gas tubing system for leakage. For manual valves, check them after confirming that they are fully closed.

#### 4) Combustible components exist in the measured gas:

Clogging at the cell can occur if residual combustibles are present (carbon build-up). If combustible components exist in the measured gas, they burn in the cell, and thus oxygen concentration decreases. Remove the probe and clean the cell. Check that there are no combustible components.

### Other Abnormal Values and Causes

#### 1) Noise may be mixing in with the converter from the detector output wiring:

- Check whether the equipment is securely grounded.
- Check whether the signal wiring is installed along with heater cables or other power cords.

#### 2) The converter may be affected by noise from the power supply:

Check whether the converter power is supplied from the same outlet, switch, or breaker as other power machines and equipment.

**OpreX™** Through the comprehensive OpreX portfolio of products, services, and solutions, Yokogawa enables operational excellence across the enterprise.

Trademarks Co-innovating tomorrow, OpreX and all product names of Yokogawa Electric Corporation in this bulletin are either trademarks or registered trademarks of Yokogawa Electric Corporation. All other company brand or product names in this bulletin are trademarks or registered trademarks of their respective holders.

**YOKOGAWA ELECTRIC CORPORATION**  
World Headquarters  
9-32, Nakacho 2-chome, Musashino-shi, Tokyo 180-8750, JAPAN

<http://www.yokogawa.com>



**YOKOGAWA CORPORATION OF AMERICA**  
**YOKOGAWA EUROPE B.V.**  
**YOKOGAWA ENGINEERING ASIA PTE. LTD.**  
**YOKOGAWA CHINA CO., LTD.**  
**YOKOGAWA MIDDLE EAST & AFRICA B.S.C.(c)**

<http://www.yokogawa.com/us/>  
<http://www.yokogawa.com/eu/>  
<http://www.yokogawa.com/sg/>  
<http://www.yokogawa.com/cn/>  
<http://www.yokogawa.com/bh/>

Subject to change without notice.  
All Rights Reserved, Copyright © 2021, Yokogawa Electric Corporation