Comprehensive Certification of Belimo 22G Series Gas Monitors: Full Compliance with UL 2075 and ULC-S588 Standards

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Abstract

Recent updates to the UL 2075 and ULC-S588 standards set more rigorous benchmarks for gas detection systems, reflecting a stronger regulatory emphasis on durability, accuracy, and device end-of-life signaling. Belimo's 22G series gas monitors meet these elevated demands with full-system compliance under both UL and ULC standards. This whitepaper examines how Belimo's certified gas monitors support reliable air quality monitoring for facilities that take safety seriously.

1. Introduction

Indoor air quality is a critical aspect of creating safe and healthy environments, especially in spaces where vehicles operate or are stored, such as garages, tunnels, and maintenance facilities. Carbon monoxide (CO) and nitrogen dioxide (NO_2) are two of the most harmful gases in these environments, posing serious health risks to occupants at elevated levels. Accurate and dependable monitoring of these gases is imperative to protect health and safety.

The updated UL 2075 and ULC-S588 standards introduce more stringent performance and durability requirements for gas detection systems in enclosed environments where gases can accumulate.

In the gas detection industry, it's common for manufacturers to obtain UL 2075 certification solely for their sensor elements, rather than for the entire gas monitoring device. On the contrary, Belimo's 22G series, which includes the 22G02 CO, 22G14 NO_2, and 22G0214 combo CO + NO_2 gas monitors, has achieved full compliance with UL 2075 and ULC-S588 standards. This is a comprehensive certification which ensures that every single component adheres to the full scope of these standards, from the sensors to the alarms. Belimo's commitment to full-system certification provides facility

managers and occupants with a dependable, standards-aligned solution for accurate gas monitoring in potentially hazardous environments. [1][2][3]

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2. Background on UL 2075 and ULC-S588 Standards

2.1 UL 2075

The UL 2075 standard, titled **Standard for Safety: Gas and Vapor Detectors and Sensors**, establishes rigorous safety requirements specifically for carbon monoxide (CO) and nitrogen dioxide (NO_2) detectors. It mandates that devices function reliably across environmental stresses, while also emphasizing end-of-life signaling to alert users when the device or its components reach the end of their operational lifespan.[4] The UL 2075 protocols for testing the sensitivity and resilience of gas monitors in varying conditions, such as fluctuations in temperature, humidity, and voltage, reinforce the suitability of these devices in real-world applications. [5]

The International Building Code (IBC) requires that buildings use UL 2075 Listed CO monitors, detectors, and sensors. [6] In 2018, the International Mechanical Code (IMC) mandated that all carbon monoxide and nitrogen dioxide monitors, detectors, and sensors in enclosed parking structures be UL 2075 Listed. [7] The International Fire Code (IFC) specifically states that CO detectors shall be listed in accordance with UL 2075. [8]

Products that achieve the designation of "**UL Listed**" have undergone rigorous testing and evaluation by an independent Nationally Recognized Testing Laboratory (NRTL) to ensure they meet the specified performance criteria and safety standards. While some products on the market may be labeled as "UL Recognized" or "UL Approved," only the designation of "UL Listed" indicates the product was independently reviewed and deemed to be in full compliance with the standard.

2.2 ULC-S588

The Canadian ULC-S588 standard aligns closely with UL 2075, established by Underwriters Laboratories of Canada (ULC). It sets forth similar standards and requirements for gas and vapor monitors, detectors, and sensors, ensuring that products meet the necessary safety and performance criteria in Canadian jurisdictions.

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3. Full Certification of the Belimo 22G Series: Safety and Reliability Advantages

Belimo's 22G series monitors, covering CO and NO_2 detection, have achieved complete certification under both UL 2075 and ULC-S588 standards. This full-system compliance includes all components, from gas sensors to power and alarm systems, confirming they meet rigorous performance and reliability requirements. The UL 2075 standard specifies functionality across a range of environmental variations, ensuring reliability under real-world stresses. [5] Belimo's comprehensive certification eliminates the gaps found in partial certifications, where unverified components may compromise safety, and prioritizes precise sensitivity calibration to ensure accurate detection. [9] This provides facility managers with confidence that these monitors reliably detect CO and NO_2.

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4. Features and Benefits of Belimo 22G Series Gas Monitors

4.1 Intelligent Communication Protocol

Belimo gas monitors offer an intelligent peer-to-peer communication protocol that provides users the flexibility to configure and install a complete ventilation control system with only one monitor or multiple monitors operating in several ventilation zones. All monitors feature BACnet communication, which allows seamless integration with a Building Management System (BMS), enabling centralized control and coordination of ventilation schedules and system-wide monitoring. In addition to BACnet, these monitors feature CAN bus communication, which is particularly strong in applications that call for robust, reliable, and fast data communication, such as in safety-critical scenarios. CAN bus provides a secure and independent network for gas monitors, ensuring they continue to function as intended even if the BACnet system goes down. This redundancy effectively isolates the gas monitor network from disruptions in the BMS. The communication features of the 22G Series make it possible to design simpler systems, shorten installation times, increase reliability, and enhance occupant safety.

4.2 Dual Gas Monitoring

These monitors are factory calibrated and can monitor up to two gases at once, such as CO and NO_2. This allows for comprehensive air quality monitoring with just one device.

4.3 Alarm Systems

22G Series gas monitors are equipped with both audible and visible alarms that quickly alert occupants to dangerous gas levels even if the monitor is not in their direct line of sight.

4.4 Connectivity and Integration

Select Belimo gas monitor models are equipped with relays and analog outputs to control ventilation directly. These models also feature BACnet MS/TP, enabling integration with the BMS and allowing for centralized oversight of the system. This allows facility managers to achieve efficient ventilation control, while maintaining compatibility with other building systems.

4.5 Ease of Installation

The monitors can be easily assigned to groups for ventilation zoning on the same network, significantly reducing control wiring and installation time. All Belimo gas monitors are wired via daisy chain, simplifying installation and maintenance.

4.6 Ease of Maintenance

To ensure accuracy, manufacturer recommendations call for gas monitor sensor modules to be calibrated every 12 months, or even more frequently dependent on the application. Belimo sensor modules can be re-calibrated in the field, or, for added convenience, factory-calibrated field-replaceable sensor modules are available, allowing for quick swap-outs without the need for on-site calibration.

4.7 Warranty

All Belimo gas monitors are backed by a five-year warranty, reflecting the company's commitment to product reliability and customer satisfaction.

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5. Conclusion

Belimo's fully certified 22G series gas monitors set a new standard in CO and NO_2 detection. The 22G02 CO, 22G14 NO_2, and 22G0214 combo models exemplify Belimo's commitment to safety, delivering robust solutions for diverse environmental settings. By achieving full compliance with UL 2075 and ULC-S588 standards, Belimo provides facility managers with dependable, standards-aligned solutions for accurate gas monitoring in potentially hazardous environments, giving building occupants peace of mind, and keeping them safe. [10]

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To learn more about Belimo Gas Monitors, click here.

5-year warranty