



The IP33 Box is designed to provide extra protection from water for the ammonia detection unit in outdoor or harsh indoor environments.

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ly in air inlets and outlets. When an ammonia leak takes place, the monitoring in the inlets helps to check that no ammonia gas is returning to the factory. Monitoring the outlets is also helpful in analyzing the released concentration.

Thanks to the IP65 enclosure, Vaisala AMMONICAP® Ammonia Detectors can be installed outdoors. In addition to this, Vaisala offers an extra enclosure for installation sites where the detector may need extra protection from water. It can be used in both indoor and outdoor environments. The enclosure also has a UV protected cover, which extends the lifetime of ammonia detectors in outdoor use.

AMT Series – versatility for diverse environments

Ammonia detection is required in a wide variety of environments in the food industry: outdoors, indoors, cold and warm, wet and dry. Constantly changing humidity and temperature conditions - which often combine with strong aromas - demand good selectivity and stability from an ammonia detector. The Vaisala AMMONICAP® Ammonia Detector with its top selectivity is an ideal choice for the food industry, whatever the installation conditions. ●

Associated Wholesale Grocers in Springfield, Missouri is a large refrigerated storage facility with up to 50 million products in the facility at any one time. Refrigerated products are kept at various temperatures. In order to keep the facility refrigerated, a large ammonia system is in operation, which must be continuously monitored for ammonia leaks. Vaisala AMMONICAP® Ammonia Detectors offer the selectivity and many other useful features that the plant needs.

Vaisala AMMONICAP® technology Ammonia Sensing at Its Best

The 840,000 ft² facility was built in 1970, with a new ammonia refrigeration system installed in 1985. A large, 3,175 kg (7000 lb) ammonia refrigeration system is used to store up to 50 million dollars worth of products in the facility at any one time. It is of paramount importance that the ammonia refrigeration system is working properly. An integral part of the ammonia refrigeration system at Associated Wholesale Grocers is an ammonia leak detector.

Numerous requirements

When choosing an ammonia leak detector, the maintenance supervisor of Associated Wholesale Grocers had many factors to consider. The detector should be highly specific to ammonia, and must not cause false alarms due to other odors in the area, for example caused by forklift trucks. The detector must operate in a

wide temperature range at the various temperatures that occur at the facility. It must also withstand fluctuating humidity and be easy to maintain.

Having previously tried many technologies, the maintenance supervisor had never succeeded in finding a technology that could meet all his needs. Going through the manufacturers of solid state and electrochemical sensors, he decided to try a fairly new technology in ammonia sensing, a polymer thin film capacitive sensor. With the new AMMONICAP® technology, introduced in 2001, Vaisala has been the manufacturer to meet the requirements of Associated Wholesale Grocers.

Vaisala AMMONICAP® technology

The AMMONICAP® is a capacitive sensor with an ammonia sensitive polymer film. Ab- ➤

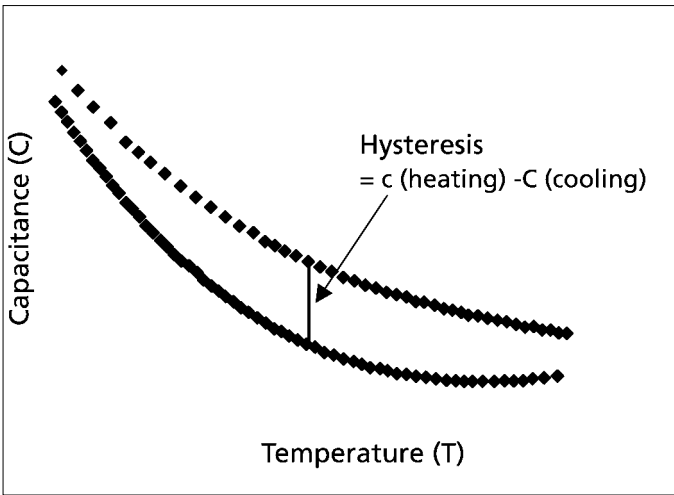


Figure 1. Ammonia sorption causes hysteresis between the heating and cooling curve.

sorption of ammonia changes the capacitance of the capacitor. Water molecules are also absorbed in the polymer. The effect of humidity is eliminated with a novel measurement technique based on a temperature-controlled measurement cycle. When the sensor is rapidly heated and cooled back and forth, ammonia and water are alternately absorbed and desorbed. Ammonia sorption causes hysteresis between the heating and cooling curve (see figure 1).

Ammonia leak detection crucial

Ammonia leak detection is an integral part of ammonia refrigeration systems. Ammonia has been used for refrigeration throughout the 20th century in a variety of applications such as cold storage, ice cream plants, slaughter houses, breweries, ice rinks, etc. Ammonia has excellent thermodynamic properties. However, due to the level of expertise required in system design and operation, it is mainly used in large industri-

al refrigeration systems.

Considered to be one of the environmentally friendly refrigerants, ammonia neither depletes the ozone layer nor contributes to global warming. However, ammonia is a hazardous chemical, so monitoring is required. Exposure to ammonia will result in irritation of the eyes and throat. High levels of exposure will lead to problems with respiratory organs, and may eventually result in death. Reliable ammonia leak detection is essential to ensure personnel safety.

High selectivity eliminates false alarms

Associated Wholesale Grocers has had the Vaisala Ammonia Detectors AMT102 in use for the past year. It has greatly helped their situation with its tremendous selectivity. Typically in the past with other technologies, when a forklift truck passed a sensor it would cause a false alarm. The AMMONICAP[®] has solved this problem, and no false alarms have occurred. This

was one of the company's major concerns when choosing an ammonia sensor.

Working in cold storage applications there are numerous temperature intervals depending on the product in storage. Even with the various temperature ranges (-22 °C to 21 °C, -10 °F to 70 °F), the Vaisala sensors have worked great. In this application humidity does not really pose a problem, but in some areas of the facility, such as the compressor room, the humidity may sometimes reach higher levels.

Plug and play

Easy maintenance was a key factor when choosing Vaisala over other manufacturers. With the annual calibration, Associated Wholesale Grocers was able to eliminate the time-consuming

monthly/quarterly calibration check with electrochemical cells, where calibration bottles are used to check the cells before making an adjustment in the field. If a field adjustment could not be made, the units would have to be changed. This would happen every two years with each sensor. With the Vaisala units, maintenance is simple. Spare probes are kept on site and on a yearly basis the probes are changed and sent to Vaisala for calibration. It's the plug and play method.

In addition to ease of maintenance and high selectivity, Vaisala Ammonia Detectors AMT102 have also met the other requirements of the facility well, and have operated excellently in the wide operating temperature and varying humidities. ●

Figure 2. A Vaisala Ammonia Detector AMT102 in operation at the cold storage facility of Associated Wholesale Grocers.

