

PT 110

W74 Flow Switch Installed in Explosive Atmospheres

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Introduction

Directive 94/9/EC of the European Parliament pertains to equipment and protective systems installed in potentially explosive atmospheres. ATEX is a common name for this directive. PureT manufactures the W74 flow switch, this electro-mechanical device can be installed in flammable gas systems.

Product Description

The W74 flow switch is intended for installation in semiconductor gas piping systems for hazardous gases, including flammable gases. An encapsulated magnet within the switch moves upward when the calibrated trip point has been exceeded. The magnet movement triggers a hermetically sealed reed switch sending a signal (normally closed or open) to a controller. The reed switch is attached to a three wire cable that the gas system builder connects to the controller. The controller supplies a power source (VDC, W, A maximum) to monitor for an open or closed switch signal.

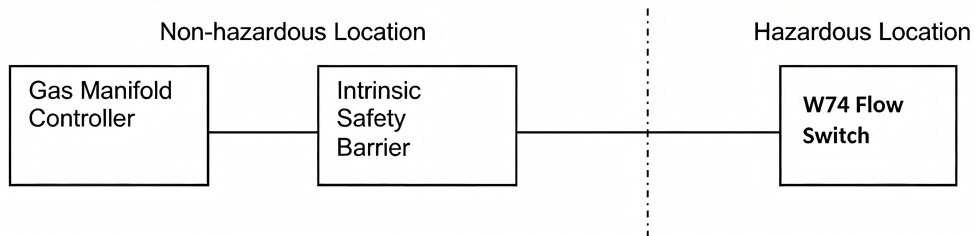
Reasoning for Explosive Protection for the W74 Flow Switch

In the case of a leak in a flammable gas piping system, an explosive atmosphere could envelope the W74 reed switch and cable assembly. Normally the location of the W74 installation would be classified Equipment-group II, Category 3 G per the ATEX directive because flammable gases would only be present for a short period of time if a leak occurred. The ATEX directive requires equipment and protective systems used the location have explosive protection. It should be noted that the system owner is responsible for determining the classification of the installation, not Pure T. Some owners may classify the location as Equipment-group II, Category 2 G as they believe that gases may be present occasionally.

Solution

The W74 Flow Switch does not generate or store energy making it designated as a “simple device”, The W74 Flow Switch does not require ATEX approval when installed with ATEX approved “intrinsic safety barrier” that meets the requirements of EN50020.

A typical installation is shown below. The intrinsic safety barrier normally consist of a zener diode to limit voltage and a resistor to limit the current. The use of an intrinsic safety barrier makes the installation acceptable for Equipment-group II, Category 2 G or 3 G locations.



When selecting a barrier the user will need to consider the below information from the W74 flow switch. It should be noted that most intrinsic safety requires lower limits than the ones stated below.

Reed switch electrical characteristics

Maximum power: 5.0 amps

Maximum voltage: 175 volts

Maximum switching current: 0.25 A

Maximum carrying current: 1.50 A

Maximum capacitance: 1.0 pF

Cable electrical characteristics

Voltage: 300 V

In addition to considering the W74 design characteristics, the user must select the appropriate wiring and connectors while using proper installation techniques for electrical hook-up.

Conclusion

A review of the ATEX directive has determined that the W74 excess flow switches do not require ATEX approval when used with an intrinsic safe barrier.