Installation & Operation Instructions for Series 688 Level Switch

Note: *This document may be used in conjunction with WellMark Document, Section No. 2.5, "Series 688 Level Switch for Pressure Vessels up to 2000 psig".*

Specifications

Switch Housing	CSA Approved Class I, Groups C & D Class II, Groups E, F & G
Housing Operating Temperature	Ambient -20°F to +160°F
Sensor Operating Temperature	-20°F to +220°F
Max. Operating Pressure	2000 psig
Electrical:	
Input Voltage	Nominal: 115 VAC, 230 VAC, 24 VDC
Absolute Limits	90-135 VAC, 180-270 VAC, +/- 4 VDC
Frequency	AC Power: 50-60 Hz
Time Delay	Independent, non-integrating on make and break
Delay Time Range	50 milliseconds min. long delay, 30 sec. max.
Output	Relay DPDT Form C Contacts
Ratings	5 A @ 120 VAC Non-Inductive 5 A @ 24 VDC Non-Inductive
Electrical Conduit Connection	1/2" Female Pipe Thread
Process Connection	1-1/2" MNPT or 2" MNPT

Application

The Series 688 is a single-point on/off level switch, which completes an electrical circuit to a pump, valve, alarm or other device. When mounted in a 1" NPT port, this unit senses virtually any liquid and does not need adjustment when the vessel contents are changed. It will ignore foam, surge or splash to indicate true liquid level, with repeatability to 0.050 inches standard.

Installation

The control should be installed horizontally or vertically as shown at right. Assure that threads on the unit and mating female pipe thread are clean and free of debris. Use a suitable pipe thread sealant or anti-seize compound, making sure not to over-tighten. The unit should be mounted such that the probe is positioned at the desired controlling level. Wiring diagram is shown at right.

Operation

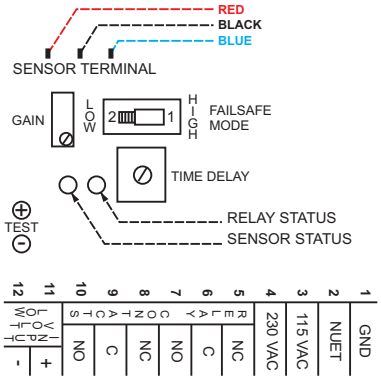
The sensor is a magnetostrictive device consisting of a diaphragm, nickel tube, magnet, drive coil and pickup coil. When 40kHz energy is applied to the drive coil, it causes the diaphragm to vibrate at a frequency determined by the mechanical resonant system of the sensor. Electrical energy is transferred to the pickup coil.

The pickup coil of the sensor is connected to the input of an amplifier and the output of the amplifier to the drive coil to form a feedback loop circuit. Any energy appearing in the output of the sensor will be fed to the amplifier, amplified and returned to the input sensor. This causes vibrations at 40kHz to occur in the diaphragm and furnish a signal back to the amplifier for re-amplification. When the gain of the amplifier is adjusted so as to exceed the losses within the sensor continuous oscillations are produced.

If the diaphragm of the sensor is exposed to a process liquid which offers greater mechanical resistance to the motion of the diaphragm, the transfer of energy to the pickup coil decreases. This results in a decrease in the signal feedback into the amplifier and a corresponding decrease in the signal available from the output of the amplifier. The decreased signal triggers a voltage-sensitive network that controls the output relay.

A unique AUTO TEST self-checking circuit constantly verifies the integrity of the sensor circuits. The RED LED is illuminated when the product is present at the sensor and the system is oscillating at approximately 40kHz. If the amplitude or the frequency of the sensor circuits changes, the RED LED will go on. If the change of state occurs due to a level change the relay will follow and change its state. However, if the change of state is due to a sensor failure or some other component failure, the relay will immediately transfer to the alarm condition. This foolproof feature protects the system for loss of power, major component failure or damaged sensor conditions.

Wiring Diagram



Unit Locating Options