Installation and Operations Manual

Excess Flow Switch

Model W74

Caution: The customer is entirely responsible for product selection and it should be based upon the customer's own analysis regardless of any recommendations, published or communicated, by Pure T. Products must also be installed, operated and maintained correctly for safe, problem free usage.

General Information

The W74 excess flow switches (EFS) are installed in gas system to indicate when gas flow has exceeded a trip point. The signal is indicated by an open or closed electrical contact from a reed switch. The signal is typically sent to a controller that is monitoring the gas system and closes an isolation valve when excess flow is indicated by the EFS. The W74 is available in a number of trip points and porting configurations with two body sizes. Please refer to the W74 data sheet for specific product details.

Product Selection

Before installing the W74, the following must be confirmed:

1. Verify the materials of construction are compatible with the application process gas.
2. Verify the pressure and temperature ratings are appropriate for the application.
3. Confirm the proper trip point has been selected for the application.
4. Confirm that application is gas and not a liquid.
5. Confirm the W74 can be installed vertically within 8 degrees.

Installation

1. The W74 product label has a flow arrow indication the proper flow direction for installation.
2. Confirm that there are no sensitive electronics near the flow switch installation as the W74 incorporates a strong magnet that can affect other

electronic devices in the area.

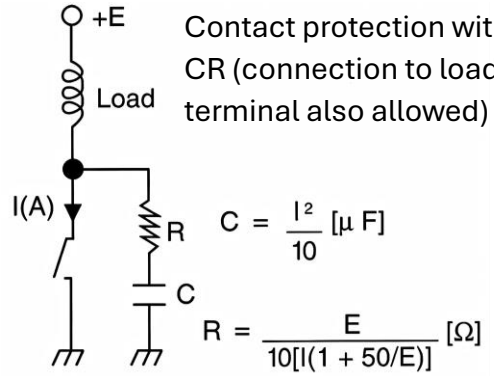
3. Confirm that there are no strong magnets near the W74, a strong magnet near the W74 can affect the W74 reed switch operation.
4. Install the W74 in the gas system using proper mating fittings.
5. Connect reed switch signal wire to the controller as described below.
    a. Use brown and blue wire for normally closed installation.
    b. Use black and blue wire for normally open installation.
6. After installation the following must be confirmed to ensure proper operation.
    a. Verify the switch is wired properly.
    b. Verify the switch is mounted vertical within 8 degrees.
7. After installation perform a helium leak test on all fitting connections and welds per standard industry practices.
8. After installation, use nitrogen gas flow to perform a trip point test confirming that the switch trips sending a signal to the controller and the switch resets when flow is reduced and stopped.

Reed Switch Protection Circuit

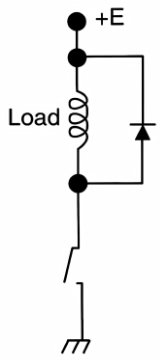
When a reed switch is connected to an inductive load or a load where surge or in rush current flows (capacitance or lamp load, long cable, etc.), the following contact protection circuits are required for the reed switch.

Inductive Load

If the reed switch is applied in a circuit that has an inductive electromechanical device such as a relay, solenoid or coil driven counter, the energy stored in the device will provide a voltage spike to the reed contacts when the switch opens. Therefore, protection for the switch should be provided in the circuit. This protection will reduce the chance of premature switch contact deterioration. Two recommended inductive load switch protective circuits are shown below.



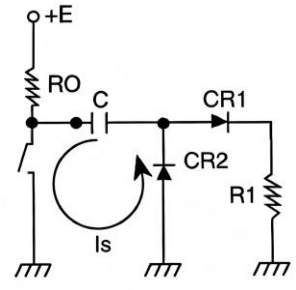
Contact protection with CR (connection to load terminal also allowed)



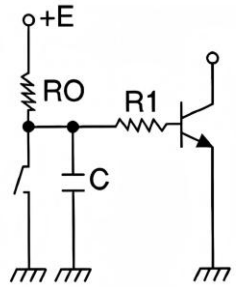
Contact protection with a quenching diode (connection to contact lead also allowed). In case the open state of the contacts continues for a relatively long time, the protection circuit should be connected to the terminal.

Capacitive Load

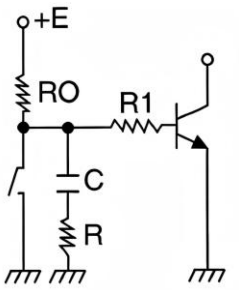
When a capacitor is in a closed circuit with a reed switch the current spike that occurs at capacitive discharge will cause reed switch contact deterioration. The following circuits are recommended to protect the reed switch when in the same circuit as a capacitor.



Differential circuit without contact protection. The energy stored in C will cause inrush current (ls) when the contacts close.



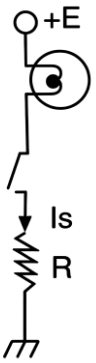
Circuit with C for chattering protection. Inrush current will also be caused as in the circuit at the left.

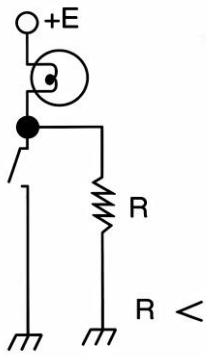


Circuit with R for contact protection. R should be between 50Ω & 500Ω.

Lamp Load

If the reed switch is used in a circuit with a tungsten filament lamp load the current inrush will damage or even weld the switch contacts. To prevent lamp load contact damage to the switch a protective circuit such as the two below are recommended.



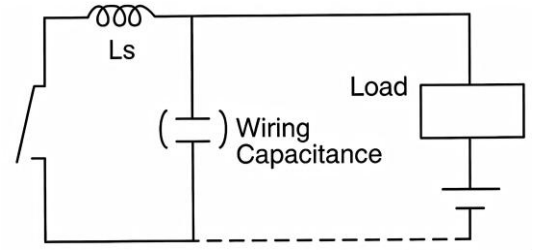


Wiring Capacitance

Where the reed switch is remote from the load and connected to the load by cable, static capacitance can be developed. In those applications, it is recommended that a contact protection circuit, such as the one below, be used.

Note: The value of the surge suppressor (Ls), in the protective circuit is 0.5 to 5mH depending on the load current. In some instances the surge suppressor can

be replaced with a resistor of 10 to 500 ohms.



Operation

Once the W74 excess flow switch is installed properly, no additional action is required for proper function.

When flow exceeds W74 trip point the pressure differential though the EFS causes the internal float with an encapsulated magnet to lift, causing the reed switch normally open contacts to close or normally closed contacts to open. When flow is reduced below the trip point the float moves downward and the reed switch reverts to its previous position.

Gas systems start up note: Pressurization of system can cause flow surges that exceed the selected trip point of the W74. It is often termed a 'nuisance trip' and is mitigated by a time out dwell with the controller where the trip is ignored. If used in a manual gas system, verify that the switch resets after pressurization.

Please contact Pure T or your local representative, if you need additional information or have further questions.