



Property Risk Consulting Guidelines

XL Risk Consulting

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DROP-IN-PRESSURE WATERFLOW ALARMS

INTRODUCTION

Supervision of all fire protection control valves 2½ in. (65 mm) or larger is a very important element of a fire alarm system used to supplement or supplant standard watchman service. This is consistent with National Fire Alarm Code requirements.

When this valuable supervision is not available, a method of detecting sprinkler system waterflow should be considered such that an alarm can be initiated even if the sprinkler control valve is in the closed position.

POSITION

Use drop-in-pressure type waterflow devices when control valve supervision is not provided as a part of a central station, remote station, or proprietary protective signaling system, or as an adjunct to an auxiliary fire alarm system.

DISCUSSION

In 1954, in response to problems with a drop-in-pressure waterflow alarm device called “The Rockwood Sprinklarm,” AXA XL Risk Consulting (then Factory Insurance Association) devised a drop-in-pressure waterflow alarm method using a small riser-mounted excess pressure pump for wet pipe automatic sprinkler systems. (An excess pressure pump is not needed for dry pipe systems.)

Systems of this design are still available and the drop-in-pressure type waterflow alarm devices may still be found in service, typically with an excess pressure pump. Excess pressure pump systems are not common and have mostly been removed from operation with the provision of vane type waterflow devices.

When a drop-in-pressure device requires an excess pressure pump, it is not recommended to install the device without the pump, as has occasionally been discovered on wet pipe systems supplied by fire pumps. For the switch to work in this case, the fire pump starting pressure must be less than the waterflow alarm switch setting. Otherwise, the fire pump will start before the drop-in-pressure switch initiates an alarm. This arrangement subjects the system to excessive hydraulic shock.

One excess pressure pump can be used to supply two or more adjacent risers by connecting the pump discharge to a point above the alarm check valve through a small check valve with a hole drilled in the clapper.

If provided, the excess pressure pump should be monitored with a supervisory pressure switch. Set this switch to trip when the pressure drops 10 psi (0.7 bar) below normal. This will prevent false alarms due to a drop in pressure from a pump failure. A typical excess pressure system may maintain a system pressure of 120 psi (8.3 bar). The low pressure supervisory switch would be set to trip at 110 psi (7.5 bar). High pressure should be monitored to prevent damage to sprinkler system and long delay of a waterflow alarm. The low pressure supervisory switch is set to trip approximately 10 psi (0.7 bar) below the normal excess pressure.

Set the waterflow switch to trip 10 psi (0.7 bar) below the supervisory switch. The trip point of the waterflow switch must be higher than the water supply pressure can be expected to reach.

A pressure drop type waterflow device is connected to the system side of the check valve. Activation of a sprinkler head in the system results in a loss of pressure, the pressure will drop down to whatever the supply pressure is. The waterflow switch detects this drop in pressure and sends an alarm signal.

If no excess pressure pump system is used, set the waterflow switch to trip 10 psi (0.7 bar) below the normal static pressure.