

CONTROLLED CLOSURE WITH NAILOR COMBINATION FIRE/SMOKE DAMPERS

WHAT IS CONTROLLED CLOSURE?

Controlled closure is a term used when a damper is caused to close in a non-abrupt, or non-instantaneous fashion via the return spring that is commonly built into today's fire/smoke damper actuators. Under normal (non-emergency) HVAC system operation power is applied to the actuator circuit to open the damper and hold it open. The actuator is wired in series with a heat responsive device that "trips" at a pre-set high temperature (fire condition) and cuts power to the actuator allowing the actuator return spring to close the damper in a "controlled" manner. A smoke detector or alarm system (by others) that cuts the power to the actuator circuit may also be incorporated into the system.

WHY CONTROLLED CLOSURE?

Traditionally, combination fire/smoke dampers have utilized a fusible link that melts under fire conditions, separating the actuator from the blades, allowing an independent spring mounted on the damper jackshaft to "snap" the damper closed instantaneously. This instantaneous closure, under certain conditions, can result in costly damage to the ductwork as the inertia of the air in motion creates extreme pressures, both negative and positive, not normally encountered or designed for in the HVAC system. With controlled closure via the actuator return spring, the damper closes in a regulated or controlled manner, usually within 15 seconds to meet common building code criteria. This permits time for upstream and downstream duct pressures to equalize more, providing a more gradual change in pressure as the damper closes, eliminating any potentially damaging instantaneous pressure differentials.



HOW DOES IT WORK?

Electric Actuator with ERL (Electric Resettable Link):

Fire Conditions: Nailor's ERL (Electric Resettable Link) detects an abnormally high temperature, 250°F (121°C) standard (165°F (74°C), 212°F (100°C) or 350°F (177°C) available), and interrupts power to the actuator allowing the actuator return spring to close the damper (controlled closure). An over-center knee-lock linkage locks the damper closed as required by NFPA 90A and UL 555. Upon a return to normal conditions, the damper may be reopened by pressing the ERL manual reset button located on the damper sleeve.

Smoke, Testing or Power Failure Conditions: If smoke is detected or during system testing or if there is a power failure, power is interrupted to the actuator, allowing the actuator return spring to close the damper (controlled closure). Upon a return to normal conditions, power is restored to the actuator and the damper automatically reopens.



CONTROLLED CLOSURE WITH NAILOR COMBINATION FIRE/SMOKE DAMPERS**Pneumatic Actuator with PRL (Pneumatic Replaceable Link):**

Fire Conditions: Nailor's PRL (Pneumatic Replaceable Link) detects an abnormally high temperature, 250°F (121°C) standard (165°F (74°C) or 212°F (100°C) available), and allows the pneumatic actuator return spring to close the damper (controlled closure). An over-center knee-lock linkage locks the damper closed as required by NFPA 90A and UL 555. Upon a return to normal conditions, the damper may be reopened by replacing the fusible link on the PRL located on the damper sleeve.

Smoke, Testing or Power Failure Conditions: An EP (Electro-Pneumatic) switch (by others) must be utilized to interconnect the smoke detector with the pneumatic actuator. If smoke is detected or when system testing or if there is a power failure, the EP switch allows the pneumatic actuator return spring to close the damper (controlled closure). Upon a return to normal conditions, air pressure is restored to the actuator and the damper automatically reopens.

MLS-400 Reopenable Control System with Electric Actuator:

Fire Conditions: A three position master control switch (by others) must be utilized for reopenability. With the master control switch in "normal" position, Nailor's primary (low limit) heat sensor detects an abnormally high temperature, 165°F (74°C), and cuts power to the actuator allowing the actuator return spring to close the damper (controlled closure). The primary heat sensor can be bypassed to reopen the damper for smoke management purposes by placing the master control switch to the "reopen" position. The damper remains operational until the secondary (high limit) heat sensor's temperature is reached (250°F (121°C) standard, 350°F (177°C) optional) at which time power is cut to the actuator allowing the actuator return spring to close the damper (controlled closure) and lock it closed as required by NFPA 90A and UL 555. Upon a return to normal conditions, the damper may be reopened by pressing the sensor manual reset button located on the damper sleeve.

Smoke, Testing or Power Failure Conditions: If smoke is detected or during system testing or if there is a power failure, power is interrupted to the actuator, allowing the actuator return spring to close the damper (controlled closure). Upon a return to normal conditions, power is restored to the actuator and the damper automatically reopens. To close the damper for smoke management purposes place the master control switch (by others) to the "closed" position.

Nailor Combination Fire/Smoke Dampers...Are you comfortable specifying anything else?

