

Pre-action sprinkler systems (single & double interlock)

system

Wet pipe vs dry pipe vs pre-action — when to use single-interlock, double-interlock, or non-interlock for sensitive environments.

How pre-action differs

A pre-action system has closed sprinkler heads (like a wet system) but piping is dry until both an independent detection signal and head operation occur. The pre-action valve is held shut by air or nitrogen supervisory pressure.

Single interlock

Valve opens on detection alone, before any sprinkler operates. Used in cold storage (low risk of accidental discharge but freeze risk on wet system).

Double interlock

Valve opens only when BOTH detection signal AND loss of air pressure (from a fused head) occur. Used in data centres, archives, museums — minimises false water release.

Non-interlock

Valve opens on detection OR pressure loss. Faster water delivery; used where speed matters more than discharge protection.

Trade-offs

Pre-action systems are more complex, more expensive, and need more maintenance than wet systems. They also delay water delivery (especially double interlock — sometimes >60 s). Use them only when water sensitivity genuinely justifies the cost.

Source: NFPA 13 (2022) §8.3; FM DS 2-0