



Fire Detection



Occupant Warning



Exit & Emergency Lighting



Fire Extinguishers



Fire Doors



Fire Hose Reels



Fire Hydrants



Fire Pumps



Gas Suppression



Sprinkler Systems



# SPRINKLER SYSTEMS



## Sprinkler Systems

### What Is A Fire Sprinkler System?

Fire sprinkler systems in buildings are used to provide a reliable method of automatically detecting and extinguishing fires.

The system often serves as the first line of defence against fires, giving people more time to safely escape any imminent danger and follow the approved evacuation plan to safety.

Some buildings not only have pumps to boost the pressure of the water supply but also have large water storage tanks to supply the sprinkler system.

### Why Do Buildings Have Fire Sprinklers?

The Building Code of Australia volume 1 parts E1.5 and G3.8 detail the mandatory requirement for fire sprinklers to be provided in various classes of buildings.

### Types Of Fire Sprinkler Systems

#### Wet Pipe Sprinklers

The system is constantly filled with water allowing a quick response should a fire occur. They are also the most commonly installed type of sprinkler in buildings. A high rise or multi-floor office building would be a typical commercial property where these are installed.

#### Pre-Action Sprinklers

These systems are filled with air when not in use and water flows through them when smoke detectors are activated. Two triggers are required to start the flow of water. The system is used in buildings with high-value items so that water damage is not prevalent.

#### Dry Pipe Sprinklers

Similar to pre-action systems, dry pipe sprinklers use pressurised air in the pipes, which exits before the water flows. This causes a delay before the water attacks the fire, but is a good choice for buildings in colder areas so the pipes do not freeze in winter.

#### Deluge

Also similar to a pre-action system, the deluge sprinkler system requires a smoke or heat detector as well. This system features open nozzles that allow a large flow of water when a fire occurs. Deluge systems are good for buildings with hazardous chemicals or flammable liquids



### Types Of Fire Sprinklers

#### Pendent

Pendent fire sprinklers hang from above-ceiling pipes and distribute water in a domed or conical pattern using a convex deflector. Unlike concealed pendent sprinklers which hide behind decorative plates, the head of a traditional pendent fire sprinkler remains visible after installation.

#### Upright

Upright fire sprinklers spray water upward to a concave deflector, producing a dome-shaped spray pattern. They are used to cover specific areas and to prevent ice and debris from collecting in the head. Upright sprinklers are installed where obstructions interfere with coverage and in dry-pipe systems facing freezing temperatures.

#### Sidewall

Sidewall fire sprinklers install along walls or beneath beams where ceiling piping is unavailable, or where aesthetic concerns or obstructions weigh against the use of other sprinkler types. Most are designed to protect small rooms, closets, or hallways and have a semicircular deflector that produces a crescent-shaped spray pattern.

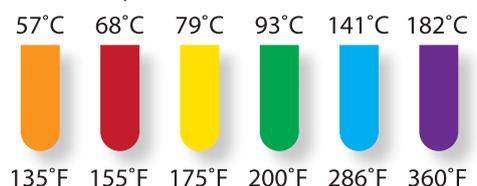
#### Concealed

Concealed models install in walls or ceilings and fully cover a pendent or sidewall sprinkler head using a cover plate. This heat-sensitive plate detaches at temperatures approximately 20 degrees lower than the fire sprinkler head, allowing the concealed sprinkler's deflector to drop and the head to activate.

Not all fire sprinklers are designed for the same purpose. Quick-response sprinklers are common in dormitories, hotels, auditoriums, and other places where many people gather. Standard-response sprinklers are found in industrial and commercial spaces where keeping a building and its contents intact is a priority.

Fire sprinklers with bigger K-factors have a larger orifice, allowing them to discharge more water at lower pressure and to produce bigger water droplets that are more capable of penetrating fires.

The most common K factors are 5.6K for fire sprinklers with a 1/2" (12.7mm) thread connection and 8.0K for fire sprinklers with a 3/4" (19.1 mm) thread connection. Sprinkler bulbs are colour coded to identify the activation temperature.





## Sprinkler Systems

### Where Should Fire Sprinklers Be Located?

Australian Standard AS2118.1 specifies general requirements for the design, installation and commissioning of automatic fire sprinkler systems in buildings.

There are no simple rules to follow because each building is different, both in its layout, and fire risks. The spacing of sprinkler heads is largely dependent on the hazard type or hazard classification within the building.

### How Do Fire Sprinklers Operate?

Most sprinklers have a small glass bulb with a liquid in it. This bulb blocks the flow of water. When a fire occurs the liquid in the bulb becomes hot, expands and then shatters the glass. This causes water to spray automatically from the sprinkler continuously until the system is shut off. Smoke will not activate a fire sprinkler. When one sprinkler activates water does not flow through all sprinklers in the system. Water will only flow through a sprinkler if its glass bulb has been shattered.

### System Components

#### Water Supply & Storage

A water supply for a fire sprinkler system can be derived from a reliable source of water such as; street mains, static water supply such as a tank or dam. Water storage must also include a facility for automatic replenishment.

#### Pipework & Valves

To direct the water from its point of origin (supply) to its destination (sprinklers) requires a series of interconnected pipes at defined sizes. Control valves are used in combination with the pipework to control and direct the flow of water.

#### Booster Pumpset

In some circumstances where the hydraulic analysis has determined that the water supply is insufficient for the building requirements, one or more booster pumpsets may be required. A pumpset may comprise a combination of electric or diesel motors.

#### Fire Sprinklers

The end-points of the system are the sprinklers, which are strategically located throughout a building.

#### Block Plan

A plan of the risk with the position of the main stop valves clearly indicated is required to be placed adjacent to each set of installation control assemblies or group of valves.

### Maintenance, Inspection & Testing

Western Australia's building legislation requires owners of Class 2 to Class 9 buildings (which includes residential apartments) to ensure the building's firefighting services and equipment are maintained. This is to ensure that safety systems remain capable of performing to a standard not less than they were originally required and commissioned to achieve.

There is a financial penalty for noncompliance with the building legislation.

The Building Commission considers the adoption of Australian Standard AS1851-2012 Routine service of fire protection systems and equipment as good practice and a means for owners to ensure fire safety measures are serviced at regular frequencies to demonstrate suitable operation, and rectified or repaired if necessary to meet their regulatory obligation on maintenance.

AS1851 requires fire pumps to be inspected every month. There are additional inspection and test checklists required to be undertaken six monthly, yearly, five yearly, ten yearly, twenty five yearly and thirty yearly.

<b>ROUTINE SERVICE FREQUENCIES</b>	Monthly	Three Monthly	Six Monthly	Yearly	Five Yearly	Ten Yearly	Twenty Five Yearly	Thirty Yearly
 Fire Detection	✓		✓	✓	✓			
 Occupant Warning	✓			✓	✓			
 Exit & Emergency Lighting			✓	✓				
 Fire Extinguishers			✓	✓	✓			
 Fire Doors		✓ <small>Horizontal Sliding Doors</small>	✓	✓				
 Fire Hose Reels			✓	✓				
 Fire Hydrants	✓ <small>Where Pumpsets Fitted</small>		✓	✓	✓			
 Fire Pumps	✓		✓	✓	✓			
 Gas Suppression	✓		✓	✓		✓		
 Sprinkler Systems	✓		✓	✓	✓	✓	✓	✓



**Design**

We design solutions, tailored to your building.



**Installation**

Our installation teams are focused on delivering on time and on budget projects.



**Service & Maintenance**

We offer regular servicing and maintenance to ensure that your systems are working at their optimum level.



**Emergency Call Out**

The Emergency Call Out Service ensures that you are covered 24 hours, 7 days a week for fault and emergency.



**Fire Safety Training**

We deliver training courses to ensure your team has the knowledge to act competently during an emergency.



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