



Fire Detection



Occupant Warning



Exit & Emergency Lighting



Fire Extinguishers



Fire Doors



Fire Hose Reels



Fire Hydrants



Fire Pumps



Gas Suppression



Sprinkler Systems



**FIRE PUMPS**



## Fire Pumps

### What Is A Fire Pump?

Fire pumps are required when the local municipal water system cannot provide adequate pressure to meet the hydraulic demands of the fire sprinkler, fire hydrant and fire hose reel systems. This typically occurs if the building is tall, such as in high-rise buildings, or in systems that need to flow a large volume of water, such as in storage warehouses. Pumps are also needed if the fire systems are supplied from a water storage tank.

### Why Do Buildings Have Fire Pumps?

The Building Code of Australia volume 1 parts E1.3, E1.4 and E1.5 detail the mandatory requirement for fire pumps to be provided in various classes of buildings.

### Types Of Fire Pumps

A fire pump installation has two basic parts: the pump and the driver. The pump serves the single purpose of providing the necessary flow and pressure to meet the demands and design of the fire protection systems. Two types of pumps are found in most applications, the centrifugal split case and the vertical turbine. The centrifugal split case is usually used in applications where the water supply to the pump intake is under pressure. The vertical turbine is usually used in situations where the water supply is from a well, cistern, or body of water.

The driver refers to the method by which energy is provided to the pump. The two approved driver choices are diesel engine and electric motor. The driver also must have some type of controller device, the method by which the engine or motor is operated.

Like all important systems, there must be backup if the primary fails. For the majority of fire pumpsets the main pump is electric and a second backup pump that is diesel-powered, in case the electricity fails, which is common. Each of these pumps can supply the required amount of water individually - they are identical in capacity.

A jockey pump is a small pump connected to the fire systems in parallel with the fire pump. It maintains pressure in the fire system piping to an artificially high level so that the operation of a single fire sprinkler, hydrant or hose reel will cause an appreciable pressure drop, which will be easily sensed by the fire pump automatic controller, causing the fire pump to start. The jockey pump is essentially a portion of the fire pump's control system.

### Types Of Fire Pump Controllers

The electric motor controller provides the electric current to operate the motor driver and also provides monitoring of the pump operation, including start and stop pressure monitoring.

The diesel driver controller provides the method for starting the diesel engine and other features similar to those of the electric motor driver. However, whereas an electric motor may be shut down quickly after starting, the diesel motor should be allowed to reach operating temperature to reduce engine problems. When manually started the diesel driver usually has a timer that will not permit shutting down the driver for a preselected time, usually 30 minutes. Electric motor-driven pumps must operate for a minimum of 10 minutes. When the system is automatically started all pumps are designed to run to destruction.

Reliability is the key factor that caused the shift to diesel and electric pumps. The electricity supplying the building or complex also supplies the electric pumps. It is not required that there be a separate electric company feed to ensure the reliability of the electricity supply to the pump. Therefore, if there is a general loss of power to the area, such as during a storm, there will be no electricity supply for the fire pump. In some situations, diesel generator sets (gensets) are installed to provide backup power for the fire pump.

However, this is not required and is done only in situations where reliability is critical; in such situations, the insurer requires the installation because of the nature of the risk. Although generators are not required in all situations, property owners should be encouraged to provide backup electric service.





## Fire Pumps

### Where Should Fire Pumps Be Located?

Australian Standard AS2941 specifies requirements for pumpset systems for use with fixed fire protection installations such as sprinkler, hydrant, water spray, and hose reel systems. It covers water supplies and specific requirements for pumps, drivers, fire pump controllers, and auxiliary equipment.

AS2304 provides the water storage requirements for fire protection and set out the minimum requirements for the design, construction, installation, commissioning and maintenance of bolted steel circular and rectangular water tanks for the storage of water for fire protection systems. This standard also provides guidance on water sources and qualities that influence tank design and construction, together with water conservation measures.

Fire pumps are usually housed in a pump room as close as practicable to the source of water supply. It is required that; adequate security is provided to prevent unauthorised entry, heating is provided to ensure the room temperature remains above 4 degrees Celsius, adequate signage to ensure emergency responders can locate the pump room in a timely manner, adequate internal space to allow maintenance and fully enclosed construction that is properly weatherproofed.

### How Does A Fire Pump Operate?

The pumps are controlled by pressure sensors. When a firefighter opens a hydrant, when a sprinkler activates or a hose reel is used, water gushes out of the system and the pressure drops. The pressure sensors will detect this drop and automatically switch the fire pumps on. The only way to switch off a fire pump is for a firefighter to do this manually in the pump room.

### Maintenance, Inspection & Testing

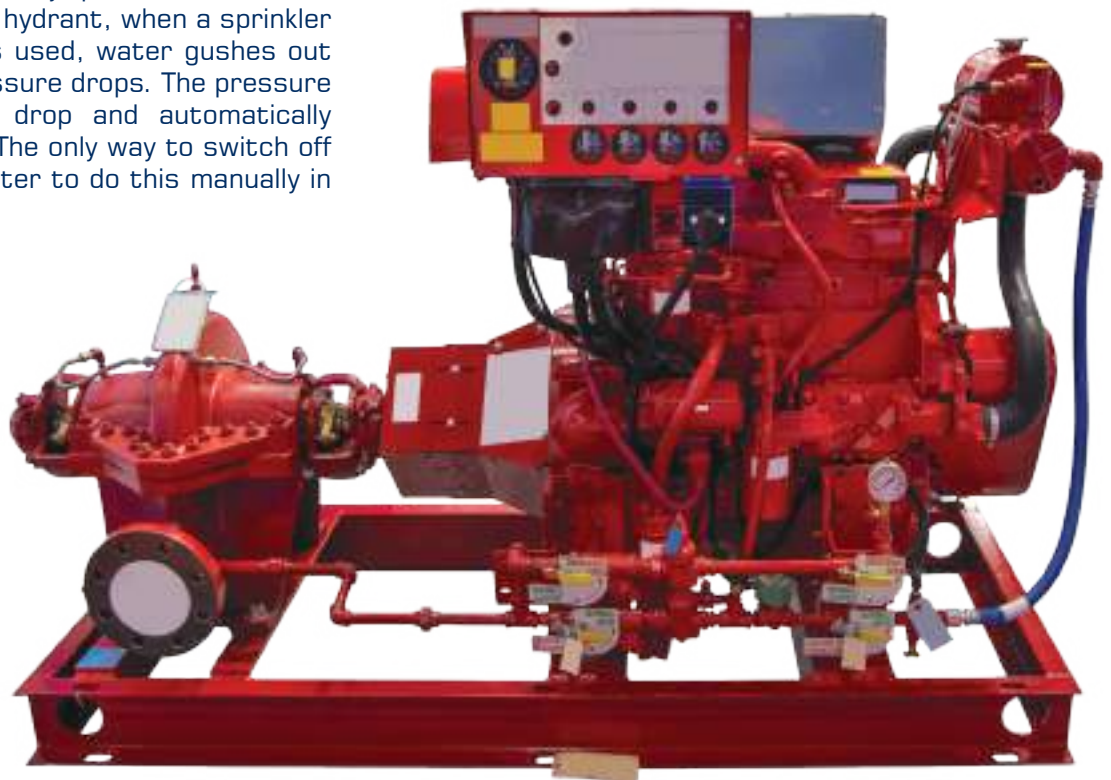
Western Australia's building legislation requires owners of Class 2 to Class 9 buildings (which includes residential apartments) to ensure the building's firefighting services and equipment are maintained. This is to ensure that safety systems remain capable of performing to a standard not less than 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 every six months, yearly and five yearly.

Water storage tanks are also required to be inspected every month. There are additional inspection and test checklists required every six months, yearly and ten yearly.




ROUTINE SERVICE FREQUENCIES	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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