This particular system, known as a dry sprinkler system, has been designed for situations in which there is a potential for freezing conditions. This means that instead of being filled with water, the system is filled with air under pressure. Air pressure is maintained in the system by means of an air compressor. The dry pipe valve is designed to mechanically hold back the force of water by air pressure. The only location where water is present is at the control valves which require continuous heating to prevent freezing.

In the event of a fire, the heat-activated sprinkler(s) will open and the air will begin to exhaust, reducing the air pressure in the system. The air can not be replenished fast enough which allows the water pressure to force the dry pipe valve to open and water to flow into the piping system. After the valve operates, the entire sprinkler system operates just like a regular wet system. Water flows to the activated sprinkler or sprinklers and flow over the fire thereby controlling and cooling. Again, only those sprinklers near the fire origin operate. In addition, sensing switches operate an alarm which is wired to the electronic alarm system sending a signal indicating sprinkler activation. The water will flow until the system is manually shut-off.

Because dry systems are usually installed in areas subject to freezing, proper drainage is critical. Branch lines are to be pitched at least ½ inch per 10 feet and mains pitched at least ¼ inch per 10 feet.