

The most limiting factor to beautiful, healthy plants is applying the right amount of water, at the right times, without applying too much, which can encourage pests and disease.

In-ground sprinkler systems use a series of sprinkler heads installed at fixed locations in the yard. When properly designed, installed and maintained, in-ground systems give complete and efficient coverage.

These sprinklers are designed to maintain soil moisture, ultimately protecting the overall health of a landscape. Any time your plants do need a little extra water, your sprinkler system should precisely deliver the water to the plant's root zone where it can be used effectively.

PARTS AND COMPONENTS OF AN IN-GROUND SPRINKLER SYSTEM

In order to keep your system running at peak performance, it's important to understand the key parts and components to your system. In addition to what you see above ground, automated in-ground sprinkler systems are built on a framework of underground PVC pipes and fittings. They are designed to safely deliver water from the city's main water line to different zones of your yard. Wiring runs along these pipes to transmit signals from the sprinkler controller to the valves in each zone. When your controller sends a signal, these valves open and water flows through the pipes to your sprinkler head or drip tubing. In the case of pop-up heads, the pressure causes the nozzle to "pop up" from the ground so that it can precisely direct water to your plant's root zone. Each system is different based on the unique characteristics of the site and surrounding plant material.



1. WATER METER – A device that measures the volume of water delivered to a property. Some water meters measure water in gallons while others measure in cubic feet. Most residential water meters are located near the curb or sidewalk at the front of the property in a concrete or metal “box.” The water meter box will have a metal or plastic lid and may be marked, “Water Meter.”

2. BACKFLOW PREVENTER – The mechanical device that protects the potable water supply from potential contamination from sprinkler system water. The type of backflow preventer used depends on the degree of hazard and the piping system involved, but they are required by regulatory agencies to protect the domestic water supply from contamination. Consult local building codes for laws applicable in your area. The backflow preventer is the first component of your sprinkler system.

3. MASTER VALVE – The master valve is installed on the mainline after the backflow preventer and before the electronic control valves. It reduces water waste by protecting the landscape from flooding in the case of a ruptured main line or malfunctioning valve. Older sprinkler systems may not have one installed and should be considered for new systems.

4. PVC PIPE – The white semi-rigid plastic piping commonly used in sprinkler systems.

5. MAIN LINE – This pipe supplies water from the point of connection at the water meter to the control valves and is under constant pressure whether the sprinkler system is running or not.

6. VALVE BOX/COVER – Plastic box that contains the sprinkler zone valve (usually green or black). It can be round or rectangular in shape.

7. VALVE – A valve is like a faucet, allowing water to pass through in response to commands from the controller. As valves receive an electronic signal to open, water flows to your sprinklers. When this signal stops, the valve closes, and the flow of water stops. Each sprinkler valve creates a “zone” for controller settings.

8. SOLENOID – The electromagnet component, connected by wire, to a controller which causes the opening and closing of automatic valves.

9. PRESSURE REGULATOR – A pressure regulator is a device that helps maintain a constant downstream operating pressure. Sprinkler systems need 30 to 50 psi (pounds per square inch) to run under optimal conditions. Drip irrigation components work best between 15 to 25 psi. Depending on your water provider, your water pressure may significantly exceed these amounts, leading to water waste.

10. LATERAL LINE – The name of the pipe installed downstream from each valve where the sprinklers are attached. When the valve is open, the lateral line fills with water and raises the nozzle stem of the sprinkler body (see 14).

11. ROTOR – Rotor sprinklers (or gear driven rotors) are an alternative to spray heads that rotate side to side (ranging from 45–360 degrees) and deliver water in one large single stream at slower rates than spray heads. A slower delivery rate reduces water run-off. They have a higher operating water pressure (between 45 and 50 psi) and typically have a precipitation rate between 0.5 and 1 inch per hour. Rotor sprinklers are a great choice for medium to very large areas of turf and are ideal for slow-draining or sloped landscape areas.

12. SPRAY HEAD – A fixed (ranging from 45–360 degrees) spray sprinkler component that pops up from the ground and applies water in a set pattern, usually from 5 to 25 feet in range. They are used primarily for lawns, and in some landscape areas. When improperly designed and maintained, fixed-spray heads can put out a mist of water that easily evaporates or is blown off during windy conditions. With application rates that are typically higher than other sprinkler system technologies, the biggest problem with fixed-spray heads is that they often put out water faster than our hard clay North Texas soil can absorb, contributing to increased runoff and higher water bills.

13. NOZZLE – The component of the sprinkler head that sprays water. A nozzle’s design as well as its size, shape, and placement control the distance, watering pattern and distribution efficiency of the sprinkler. Typically, they are sold separately from the sprinkler head and come in varying spray patterns and distances. A small plastic filter rests beneath the nozzle to keep debris from clogging the flow of water.

14. NOZZLE STEM (Sometimes also called a Nozzle Riser) – A component of the sprinkler head that the nozzle attaches to. It pops up during operation (when the sprinkler zone is running).

15. RISER – The name for the section of pipe connected above a lateral line to support a sprinkler or nozzle. Risers can be segmented for custom length, flexible or rigid. They have male pipe threading on each end to allow for removal or repair.

16. MULTI-STREAM ROTORS – Also known as rotary nozzles, these pop-up head nozzles use multiple water streams to apply larger droplets of water slowly and evenly for greater efficiency and increased water savings. They are perfect for landscapes with slopes or clay soils. Many have an adjustable pattern from 45 to 360 degrees in addition to radius adjustment. Multi-stream nozzles can be purchased to mimic the specific pattern of any existing spray nozzles.

17. DRIP TUBING – The part of a micro-irrigation system that can direct water to a plant's root zone where it can be easily and efficiently used. Drip tubing minimizes water losses through evaporation, which is common when using other overhead spraying technologies. A properly designed and installed drip irrigation system can be up to 90% efficient, making it the best technology for landscape beds, raised beds and hard-to-irrigate areas.

18. DRIP EMITTER – The part of a drip irrigation system that produces the water droplets. Emitters can be stand-alone pieces that are attached to the tubing (point source) or they can be included in the tubing during manufacturing (in line.) Drip emitters deliver water at very low rates (measured in gallons per hour) and they operate under reduced pressure when compared to other sprinkler system technologies. They help reduce water loss and potential fungus issues. When installed and used properly, drip emitters apply water directly to the root zone and not on the foliage of the plant.

19. SPRINKLER SYSTEM CONTROLLER – The controller works like an alarm clock, automatically opening and closing valves according to a preset timed schedule. Most controllers are very easy to set after familiarizing yourself with the operating manual. If you have misplaced your operating manual, an online version can be found by searching your specific model number. Most new controllers allow for seasonal adjustments and "Cycle and Soak" settings as well as the addition of sensors that shut off the system when it rains. If your controller does not have one of these functions, consider replacing it with a newer version to help efficiently manage water, which will likely help reduce your water bill.

20. RAIN and FREEZE SENSOR – These tools aid the homeowner by preventing the sprinkler system from running during a rain event or when temperatures are near or below freezing. Freeze sensors can also aid in preventing damage to sprinkler systems and help avoid icy safety hazards. It is important to note that rain and freeze sensors are required in most areas and applications.

With a basic understanding of these components, and a little proper maintenance, you can keep your lawn and landscape looking it's best while making efficient use of a natural resource.

Sprinkler System Quick Fixes:

The best practice is to check your sprinkler system monthly during the growing season for problems. Most of the time checking each sprinkler head for proper function and distribution will help identify problems before the plants in your landscape start suffering. Typical problems with sprinkler systems are related to poor water distribution and/or a lack of routine maintenance. Sprinkler heads should be adjusted properly to avoid misting or over-spraying sidewalks, driveways and streets. Use the simple steps below to identify and fix problems yourself or find a TCEQ licensed irrigator by visiting www.tceq.texas.gov.

Problem: Sprinkler head spraying water onto the sidewalk, driveway, or road

Fix: Redirect pop up nozzles so that water is applied only on the landscape. If the spray pattern is greater than your landscaped area you may need to adjust or replace the nozzle with a different spray pattern.



Problem: Sprinkler head not popping up

Fix: Using your foot, firmly but gently press the pop-up riser on the sprinkler head all the way down, and then release it so it pops back up (you may get wet doing this!). Repeat this 4 or 5 times, if necessary, to loosen and flush out debris that may be caught between the riser and the cap. If this does not work, turn off the water and try pulling up the riser on the sprinkler with your hand. Even with the proper spring resistance, the riser should move easily up and down without too much resistance.

Problem: Spray nozzle missing, not operating, or has reduced water flow

Fix: Check nozzle and filter for damage or blockage or replace nozzle and filter.



Problem: Poor distribution pattern (brown or dry patches in lawn)

Fix: Check nozzle for damage or blockage; replace nozzle with proper pattern; increase or decrease throw distance (distance the water travels out of the spray head) by turning the screw on top of nozzle. Tighten the screw to decrease the throw or loosen the screw to lengthen the distance of the throw.

Problem: Sprinkler head broken, bubbling or gushing water from top

Fix: Replace cracked or broken nozzle. Be sure to replace with the same spray pattern and distance. There should be a small marking on the top. For example: 10H (throws 10 feet in a half-circle).



Problem: Sprinkler head no longer positioned straight up and down

Fix: Realign pipe to an upright perpendicular position. This may require you to loosen the soil around the sprinkler head and riser, pull the head perpendicular and then tamp the soil back in place or re-install the riser tee.



Problem: Water bubbling, dripping, or gushing all the time

Fix: Check to make sure the valve is not leaking. Look for signs of water runoff due to excessive run times. Heavy rainfall may also be a contributing factor to water puddling in your yard or running off your landscape during wet periods. Do not irrigate during these periods.

Problem: Grass, shrubbery or tree blocking distribution pattern

Fix: Prune overgrown plant material. Raise or lower riser (within reason). Move sprinkler head if necessary.



Problem: Dry landscape areas or poor coverage

Fix: Check the pressure of the system. Check and clean nozzles and filters. Adjust spray throw pattern of sprinkler nozzle. Avoid irrigating when windy. Maintain a mulch layer on all planted beds. Aerate the soil and add ¼ -½ inches of sifted compost to lawn area. In sloped areas, consider the "Cycle and Soak" method.

Problem: Sprinkler head sunken into the ground, not fully popping up

Fix: Install a new riser to raise the sprinkler head to be even with the grade of the soil.



Problem:

Sprinkler heads creating a cloud of mist

Fix: This is usually caused by too much pressure. Consider installing a pressure regulator at the meter or valve or changing to pressure regulating heads.



Problem: Area along road, driveway or sidewalk stays too dry

Fix: Correct poor distribution pattern by adjusting the throw pattern of the nozzle or replace it with correct pattern nozzle. Utilize the "Cycle and Soak" method. Correct poor quality or heavily compacted soil by aerating the lawn area and adding ¼ -½ inches of sifted compost. The best alternative for this area may be to hand-water or utilize a soaker hose.

Problem: Runoff occurs before adequate water applied

Fix: Use the "Cycle and Soak" Method. On your sprinkler system controller, set the station to run for two or three short intervals instead of one longer cycle.

