TORO. Count on it.

Do-It-Yourself

Sprinkler Planning & Installation Guide

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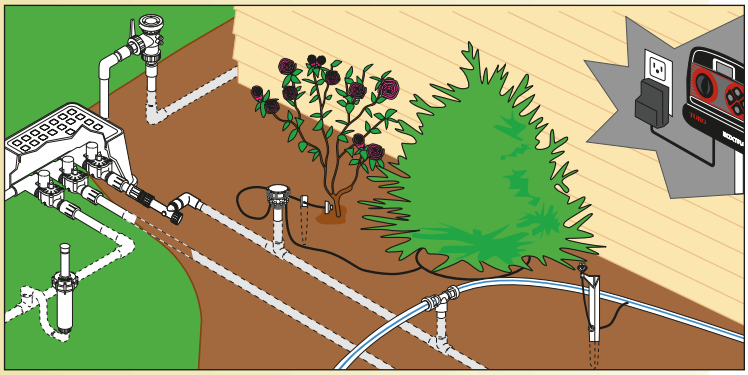
TWO SYSTEMS ARE BETTER THAN ONE

Congratulations on your decision to install an automatic irrigation system. An automatic irrigation system will help you create the landscape you've always wanted by making sure your plants get the water they need, just when they need it. How many times have you forgotten to water your lawn, or worse yet, over-watered it and ended up with unsightly brown spots and muddy puddles? You could be using up to 50% more water than your yard needs. That isn't good for your lawn or your pocketbook. The solution is precision watering using an automatic irrigation system which can be adjusted to the individual needs of different plantings. You will get a thicker, greener lawn and more beautiful gardens, as you save time and water.



An example of traditional sprinkler-based and drip irrigation systems. This system uses automatic in-line valves.

There are two different styles of irrigation systems you can use: **traditional sprinkler-based systems** and **drip irrigation systems**. The good news is you don't have to choose between them because they work better together. This is an instance where two really are better than one.

Traditional sprinkler-based systems are well suited to watering large areas of grass and areas with plants having similar watering needs. They water uniformly by broadcasting water in well defined patterns, five feet or more in diameter. To water smaller areas, we recommend drip irrigation.

Drip irrigation is the ideal complement to traditional irrigation. Rather than broadcasting water over large areas, a drip system is set up to water very small, specific areas. For that reason, drip systems are good for patios, near foundation walls, watering specific plants within larger garden areas and tight, slow-draining clay soils. In so doing, drip systems use little water and discourage weed growth. (For details on drip irrigation and planning, refer to the Toro Blue Stripe Drip Planning & Installation Guide.)

So, in order to create the best irrigation system possible for your plants, don't think in terms of traditional *or* drip; think in terms of traditional *and* drip. You get the best of both worlds and the very best results.

BEFORE YOU BEGIN

There is no question that planning and installing an irrigation system is a big job, but it is not a difficult one. To make it easier, we have divided the process into just three steps that walk you through the job from beginning to end. They are: Gather Required Information, Map Out Your System and Install It.

Remember, we're here to help you.
Visit **www.toro.com** or **www.torodesign.com**
or call **800-367-8676.**

CHECK LOCAL CODES AND PERMIT REQUIREMENTS

Before beginning your irrigation project, contact your local water company or the proper municipal authority for information on building codes and required permits. They can also tell you about requirements for the backflow prevention devices required in your area. These devices protect your water supply from contamination and are required for inground irrigation systems.

WARNING! ***Serious injury may result from damaging buried electrical or gas lines. Before digging or trenching, have your local utility companies mark all buried cables, pipes, and gas lines!***

✓ TOOLS AND OTHER SUPPLIES YOU MAY NEED

During installation, you will need several accessories and a variety of pipe fittings. The list below shows materials you may need:

- ❑ PVC pipe cutter
- ❑ Screwdriver
- ❑ Pipe wrenches
- ❑ Hammer
- ❑ Trenching shovel
- ❑ Line marking paint
- ❑ 1" pipe clamps (poly only)
- ❑ PTFE tape
- ❑ Duct tape
- ❑ Tape measure
- ❑ Solvent, primer, rags *(PVC only — do not use pipe dope on plastic-threaded fittings.)*
- ❑ Toro flow and pressure gauge
- ❑ Toro marking flags
- ❑ Toro water-proof connectors or grease caps
- ❑ 18 gauge, multi-strand direct burial wire (number of strands varies depending on the number of zones).

BEGINNING YOUR DESIGN

There are two options for getting a design for your automatic irrigation system:

1. Follow the instructions in this guide and use the layout paper on page 6 to design and draw your irrigation system.

OR,

2. **Let Toro do the irrigation system design for you!** See page 4 for more information on Toro's Sprinkler Design Service.

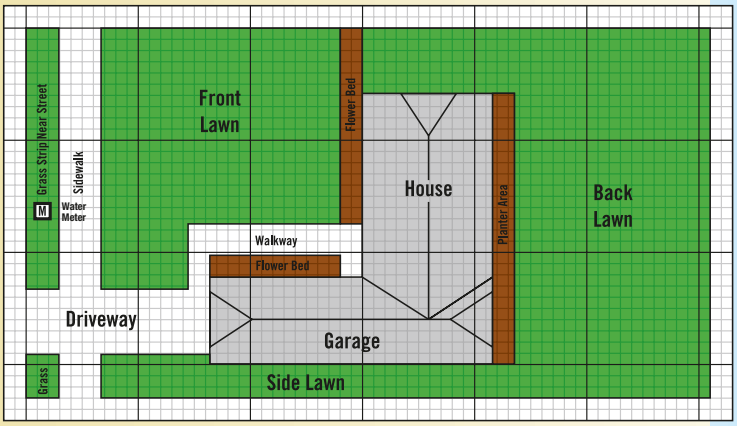
In either case, you will need to complete sections A - D. We suggest you use the following planning tools: pencil, scratch paper, drawing compass, 50' tape measure, straight edge or ruler, line marking paint for marking trenches, Toro flags for marking sprinkler locations and a Toro Flow & Pressure Gauge.

TIP: ***If you do not own a flow & pressure gauge, ask your local home center if they have one in their rental center.***

A DRAW YOUR PROPERTY

Use the layout paper provided on page 6 of this guide.

Each small square on the graph should represent one square foot of actual property or use a scale such as 1 inch = 10 feet, 1 inch = 20 feet, etc. Using the tape measure, measure your property and draw it to scale on the layout paper. Use the drawing below as an example.



REMEMBER:

- Outline your house, garage, and other structures.
- Show walkways, drives, slabs, patios, and other surfaces.
- Identify trees and major obstacles.
- Measure and record the perimeter of your property.
- Identify any slopes.
- Show groundcover, grass, flower beds and landscaping.
- Identify the size and location of the water meter (or pump) and main line.
- Identify the type of soil in your yard: sand, loam, or clay.

TIP: ***Be sure to double check all measurements.***

STEP 1 - GATHER REQUIRED INFORMATION

B DETERMINE YOUR SOIL TYPE

There is a simple way to determine what type of soil – **sand**, **loam**, or **clay** - you have in your yard. All you need is a clean, empty jar with a lid, some clean water, a tablespoon of detergent, and a sample of the soil you want to test. To do so:

- Fill the jar about $^1/_3$ full with the soil to be tested.
- Fill the jar with water and detergent then cap it.
- Shake the jar vigorously and set aside for several hours or overnight.

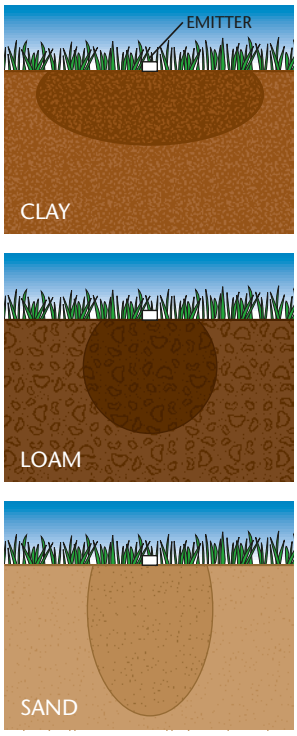
Evaluate the results:

A. If the water is clear and the soil has settled to the bottom, you have predominantly sand soil.

B. If the water is still murky with bits of matter still suspended in it, you have loam soil.

C. If the water is still murky, and there is a visible ring of sediment around the jar, then your soil is mostly clay.

For more information on soil types and more precise ways to ascertain soil composition, you can refer to: **www.yardcare.com**.



Wetting patterns for different soil types

C WATER SERVICE INFORMATION

Once you have the property plan completed, you will need to gather some very important information about your property's water supply system.

What is the diameter of the water supply line?

Call your local water company or, if they can't help you, measure your supply line (the pipe coming out to meter). Wrap a piece of string around the pipe once and then measure the string. Use the chart below to determine the supply line diameter.

Length of String	2¾"	3¼"	3½"	4"	4⅜"	5"
Copper Service Line	¾"	-	1"	-	1¼"	-
Galvanized or PVC	-	¾"	-	1"	-	1¼"

Diameter = _____**inches**

D WATER FLOW & PRESSURE

DETERMINE YOUR WATER PRESSURE & FLOW

You can use either of the two methods listed:

1 USING A TORO FLOW & PRESSURE GAUGE

The Toro Flow and Pressure Gauge is a dual purpose device designed to measure water pressure to 160 PSI and water flow to 13 GPM. This flow and pressure gauge is not intended for use on lines larger than one inch. The gauge will only measure flow through the outside faucet – not in the line.

To measure the static pressure:

- Make sure no water is being used inside or outside the home.
- Attach the flow gauge to the outside faucet nearest to where the main line enters the house.
- Make sure the flow gauge is closed by completely turning the handle clockwise.
- Open the outside faucet slowly to avoid damaging the flow gauge.
- When the outside faucet is fully opened, read the system static pressure and record it below.

Record the static system pressure here: **Static PSI _____**

✳ **NOTE:** *Static pressure measures the pressure in the system with no water running. It is measured in pounds per square inch or PSI.*

To measure the dynamic pressure and gallons-per-minute rates:

- Continue to open the flow gauge slowly by turning the handle counter-clockwise.
  **As the flow gauge opens, pressure will drop from the static reading and the gallons-per-minute (GPM) reading will rise.*
- Open the flow gauge until pressure drops to 50 PSI.
- Record the gallons-per-minute reading on the chart below.
- Continue to close the gauge to 45 and 40 PSI and record the GPM readings.

If the pressure does not drop to 40 PSI after opening the flow gauge all the way then take the flow and pressure reading at the full-open position. If rapid fluctuation occurs on the flow gauge, record the average reading.

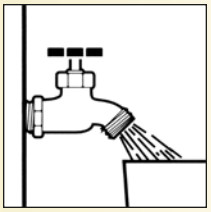
✳ **NOTE:** *Dynamic or working pressure is the pressure in the system with the water running. The dynamic pressure will determine how far your sprinklers will spray.*

Record the GPM indicated on your flow and pressure gauge here:

_____GPM at 40 PSI
_____GPM at 45 PSI
_____GPM at 50 PSI

If readings are higher, record here: **_____GPM at __ PSI**

2 USING A BUCKET & STANDARD PRESSURE GAUGE



- Find the outside faucet that is closest to your water supply line. *(Call this Faucet 1)*
- Select a different outside faucet on your house and attach a pressure gauge. *(Faucet 2)*
- With Faucet 1 closed, open Faucet 2 all the way and record the static water pressure below.
- With Faucet 1 open all the way, check the pressure reading on the gauge at Faucet 2.
  **If it is less than 40 PSI, turn down the water flow from Faucet 1 until the reading reaches 40 PSI.*
- Place a 5-gallon bucket under Faucet 1 and time how long it takes to fill it. Use the chart below to convert to GPM. This test tells you what your home's water capacity is measured in GPM at 40 PSI.
- Repeat this procedure at 45 PSI and 50 PSI and record these three results on the chart below:
  This is how much water is available with a working pressure of 40 PSI or the higher reading that you recorded. (Minimum operating pressure for most sprinklers is 35 PSI.)

Time To Fill Bucket	Gallons Per Minute
15 seconds	20 GPM
20 seconds	15 GPM
25 seconds	12 GPM
30 seconds	10 GPM
40 seconds	7.5 GPM

Record the static pressure here: **Static PSI _____**

Record the GPM here:

_____GPM at 40 PSI
_____GPM at 45 PSI
_____GPM at 50 PSI

If readings are higher, record here: **_____GPM at __ PSI**

✳ **NOTE:** *If you use a different size bucket, time how long it takes to fill it. Convert this to GPM using the following formula:*

60 ÷ Seconds x Gallons

For example: A 2-gallon bucket that fills in 15 seconds means the available flow is 8 GPM

60 ÷ 15 x 2 = 8 GPM

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PROPERTY PLAN LAYOUT SHEET

Your Name: _____ Scale: _____ Inch = _____Feet

MAP OUT YOUR SPRINKLERS AND EMITTERS

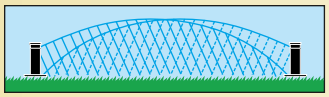
Now it's almost time to draw in your sprinklers on your irrigation plan. Before you do, be sure to consider the following information:

- Draw sprinklers within each zone of your plan one area at a time.
- Place sprinklers with the greatest radius in larger areas. *Pay attention to the allowable spacing range for the sprinklers selected to create head-to-head coverage.
- Always place sprinklers in a way that avoids spraying the side of your house, walls, fences, etc. Also, minimize the water spraying onto sidewalks, driveways and streets.
- Place half-circle sprinklers on edges and borders, quarter-circle sprinklers in corners, and full-circle sprinklers in the middle of spaces.
- Use rotor or impact sprinklers to cover large areas. They can distribute water up to 48'.
- Use 570™ fan spray sprinklers to cover smaller areas. They are effective up to radii of 15'.
- Use bubblers or drip irrigation in small confined areas and to water plants individually.
- To help in your planning and irrigation component selection, we have included component selection information in the Appendix (pages 14-17) at the end of this manual.

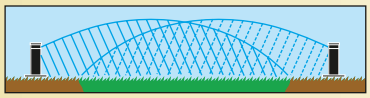
TIP: *Do not mix fixed-spray and rotors within the same zone.*

HEAD-TO-HEAD COVERAGE

For proper coverage, layout your sprinkler heads so that the spray from one reaches all those adjacent to it. Head-to-head coverage ensures uniform water application, which saves water and creates the best possible results. (Refer to diagram.) For areas with winds regularly above 8 mph, place sprinklers closer together — 90% of the spray radius or less depending on the prevailing wind direction and speed.



Correct head-to-head spacing



Incorrect head-to-head spacing

Determine the correct spacing using the sprinkler radius. For example, if you are using Toro 570™ sprinklers with a radius of 15', place your sprinklers no more than 15' apart - closer together if you are in a windy area.

Full Circle

Half Circle

Quarter Circle

TIP: *To make sure you have proper head-to-head spacing, use a compass to draw arcs representing sprinkler coverage, as shown in the diagram.*

CREATE YOUR ZONES

Now it's time to determine how many zones you will need. A zone is a group of sprinklers that operate together using one common irrigation valve. Each valve, and thus each zone, is operated by your system's timer.

A DIVIDE YOUR SYSTEM

To determine the number of zones you need in your system, do the following:

1 **Write down the flow capacity in GPM** for each type of sprinkler in your layout. (see page 17)

2 **Next, divide similar sprinklers into groups.**
- Separate lawn and shrub areas.
- Separate shady and sunny areas.

*Different sprinkler types apply water at different rates so don't mix sprinkler types within zones. For example, fixed-spray sprinklers should not be grouped with rotary sprinklers.

3 **Add up the sprinkler GPM for each of the zones** you have created on your plan. If the total flow exceeds the safe design capacity for your system, split that zone in two, or, if possible, put some of the sprinklers into another zone. Remember to move sprinklers to other zones based on slope, sun, shade or GPM.

B COUNT YOUR ZONES

Count up the number of zones you have in your design. That is the number of irrigation valves you will need. In the example on page 8, we will need eight valves because we have eight zones. This will also affect the size timer you will need to buy.

C LAYOUT THE VALVES ON YOUR PLAN

We recommend grouping the valves together. For example, grouping all the valves needed to operate the front yard zones together. This symbol ◓ represents a valve location.

Locate the first set of valves in a convenient spot near the main water connection. A good idea is to place valves next to walks or in planters for easier access.

The example on the next page shows two valve manifold locations. The front valve manifold controls zones 1, 2, 3 and 4. The backyard valve manifold controls zones 5, 6, 7 and 8.

It is recommended that the timer be able to control more valves than are called for in your plan. This will make any future expansion much easier. The Toro ECXTRA® expandable timer would be ideal to use in this example.

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D DRAW IN THE PIPES

Use the following symbols to layout your irrigation pipes:

- Main line from the water source to the valves
- From the valves to the sprinkler heads (shown only for zones 1 and 4)
- Under driveway and walkways

When laying out your irrigation lines observe the following guidelines:

- Use as many straight runs as possible.
- Try to avoid turns, which result in loss of pressure.
- Avoid runs under sidewalks and driveways whenever possible.
- Make 90 degree connections wherever possible.

✳ **NOTE:** *You can include more than one pipe in a trench.*

Depending on local codes and zone GPM , consider using 1" Schedule 40 PVC pipe upstream of control valves and at least ¾" Class 200 PVC pipe or ¾" poly pipe downstream.

E DRAW IN THE LOCATION OF THE TIMER

Install the timer inside your garage or on an outside wall near a 120 VAC outlet. Toro offers a weather-resistant timer cabinet for mounting in exterior locations. Toro also offers an ECXTRA® expandable timer with an integrated all-weather enclosure to make mounting in exterior locations easier. Check local electrical codes for connection requirement to outside plugs. Use this symbol ⋈ to reflect the timer location.

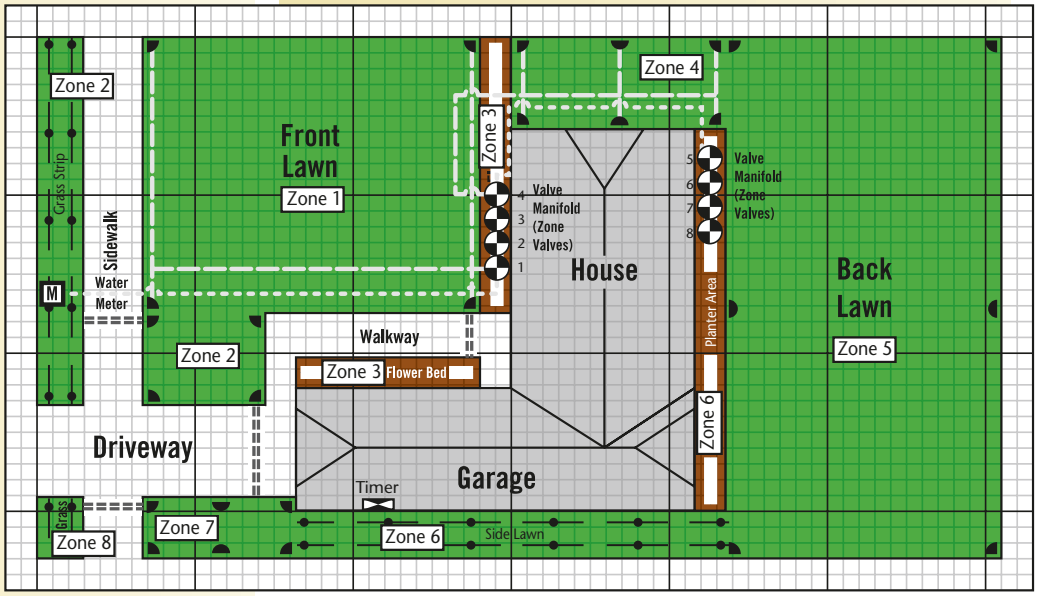
Place zone or valve wires in the same trenches as the pipe. Remember that the valves will be wired to the timer, so run the valve wires where they will be easily accessible. Toro recommends 18-gauge, multi-strand, direct-burial wire to connect valves to sprinkler timers if the distance is 1000 feet or less (refer to Timer to Valve wire sizing chart on page 18). You will need one wire per zone, plus the common wire. For instance, this eight-zone system requires nine wires. Be sure to use Toro's Waterproof Connection Caps or grease caps for all your waterproof connections.

TIP: *Always install 2 or more wires than valves to make it easier to add more valves in the future.*

• USING THE GPM RATE TO CHOOSE THE CORRECT PIPE

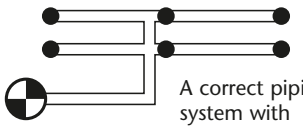
To determine the proper pipe size for your system, refer to the chart below.

FLOW RATES FOR SERVICE LINES & SPRINKLER LINES	
Maximum Flow through PVC (Plastic) Pipe:	
PVC Pipe Size	**Max. GPM**
¾" Schedule 40	8 GPM
1" Schedule 40	13 GPM
¾" Class 200	10 GPM
1" Class 200	15 GPM
Maximum Flow through New Galvanized Pipe:	
Galvanized Pipe Size	**Max. GPM**
¾" Galvanized Pipe	8 GPM
1" Galvanized Pipe	13 GPM
Maximum Flow through Type K Copper Pipe:	
Copper Pipe Size	**Max. GPM**
¾" Copper Tube	6 GPM
1" Copper Tube	12 GPM
Maximum Flow through Polyethylene Pipe:	
Poly Pipe Size	**Max. GPM**
¾" Poly Pipe	8 GPM
1" Poly Pipe	13 GPM

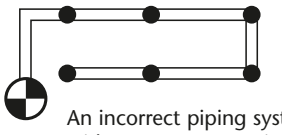


KEY:

- Zone Valve
- Timer
- Sprinkler Head
- M Water Meter



A correct piping system with straight runs.



An incorrect piping system with too many turns in the pipe results in reduced flow and pressure to the last sprinkler on the line.

✳ **NOTE:** *In freezing areas, poly pipe should be used downstream of zone valves.*

CHECK LOCAL CODES AND PERMITS

Double check to ensure you have secured all permits. In addition, have the local utilities mark all the buried lines and pipes before you start digging.

811 Know what's below. Call before you dig.

In most areas, dialing 811® will get your utilities marked. Otherwise contact your local utility provider(s).

A MARK YOUR SPRINKLERS, RISERS, VALVES & TRENCHES

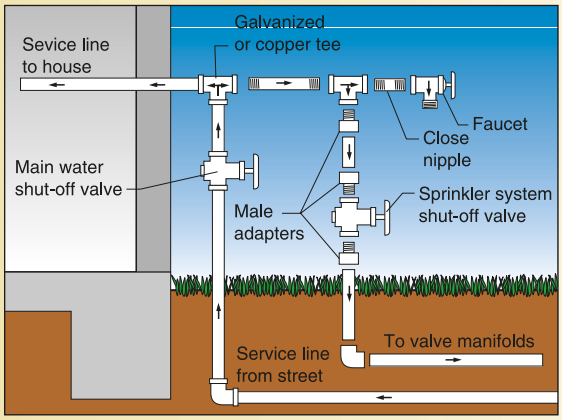
Use Toro flags to indicate sprinkler locations according to your design. Also, mark the location of your drip system risers. Even if you plan to install the actual drip system at a later date, you can install your drip risers with the rest of your system.
Use line-marking spray paint to mark where you'll trench for pipes and wiring. Check your worksheet to make sure you mark the lines accurately. You will be digging your trenches along these lines.

B TAP INTO YOUR MAIN WATER LINE

By cutting into your service line and slipping on a compression tee, you can connect your sprinkler system to the water supply without soldering. In some instances, you can avoid cutting the main line by attaching your system to the outside faucet connection (see diagram and note). PVC pipe may be substituted for copper in non-freezing areas.

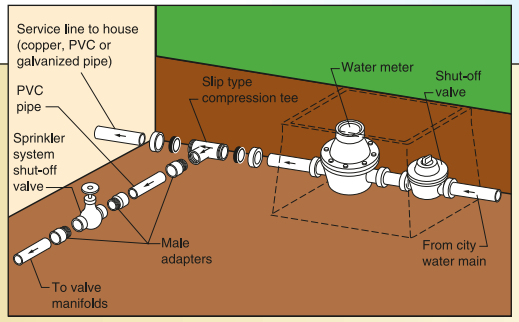
1 SHUT-OFF VALVES

Whether a Pressure Vacuum Breaker (PVB) is used or not, we recommend installing a shut-off valve between the zone valves and the service line. This will allow you to easily turn off the water to your irrigation system if you need to make repairs or replace parts. Check local codes for the type of shut-off valve recommended.



Typical installation from a faucet

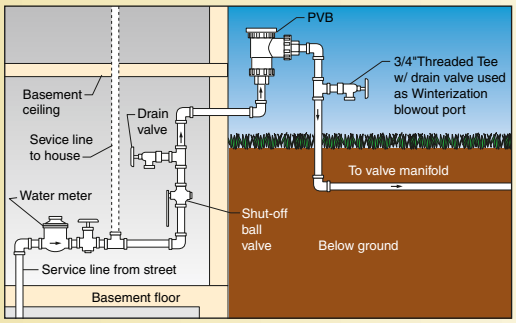
Cold Climates: If you live in an area where it gets below freezing, it's best to winterize your system in the fall. To make it easier to attach the air line to blow out your system, add a tee in the main supply line (S x S x T) between the PVB and the valve manifold, screw a cap on the extra leg.



Typical installation if the meter is in your yard

2 IF THE METER IS IN YOUR YARD:

1. Shut off your water supply at the meter (check with your water department first).
2. Dig to expose the service line.
3. Tie into the service line, between the water meter and the house.
4. Remove a section of pipe, leaving a gap large enough to slide on a compression tee.
5. Slip the tee over each end of the pipe.
6. Tighten the compression nuts. The rubber gasket will compress against the pipe, creating a seal to prevent leakage.
7. Install a short nipple, using PTFE tape on all threaded connections to the tee.
8. Attach a shut-off valve, in a small enclosure, to this section of pipe. The shut-off valve allows you to turn off the system by hand, if necessary.
9. Keep this connection as clean as possible. This is your tap water supply.



Typical installation if the meter is in your basement

3 IF THE METER IS IN YOUR BASEMENT:

1. Shut off your water supply at the meter (check with your water utility).
2. Install an appropriate tee into the service line for the irrigation connection.
3. Drill a hole through the sill above the foundation, or chisel a hole in the basement wall for the irrigation line to run through. Make it no bigger than needed for a 1" pipe.
4. Install the connection fittings, as shown. A ball valve is a good choice for the irrigation shut-off. For the drain valve, use a gate-type valve. The drain valve should be as low as possible to allow complete system drainage.
5. Feed your irrigation system pipe out through the basement wall, and run it to the backflow preventer location.
6. Finally, seal the hole in the sill or foundation with caulking compound.

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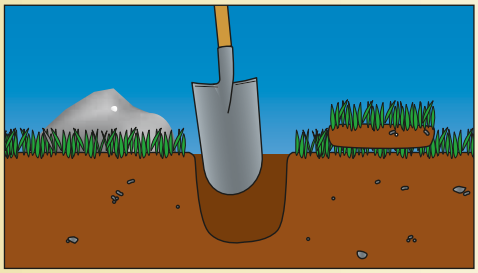
C MAIN AND LATERAL LINE TRENCHING

The main irrigation line is the pipe that runs from your service line to your valve manifolds. The lateral lines are the lines that run from the valve manifolds to the sprinkler heads.

1 TRENCHING BY HAND

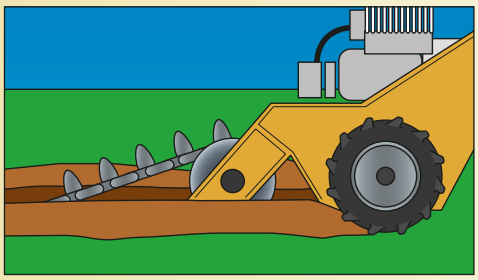
To soften the soil, water the ground approximately two days before you dig. Dig trenches 8" to 12" inches deep. Put sod on one side of the trench and soil on the other.



WARNING! *Before digging any trenches, you must have all underground utilities marked to avoid any damage. Call your local underground locator service, or the city for information, or dial 811.*

2 TRENCHING USING A TRENCHER

Trenching machines are an easier, faster alternative to digging with a shovel. They can be rented by the hour, day or week, usually from a lawn supply store or rental equipment dealer. The person you rent from can show you how to operate the machine properly and safely. Trenchers should not be used to dig through ground cover, flower beds, on steep slopes or near buildings. Be sure to verify all underground utilities before trenching. In colder climates a vibratory plow is used for pulling pipe.



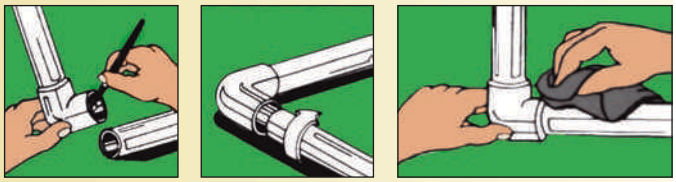
Do it the easy way, use the **Toro Dingo** *with Trenching Attachment*

D INSTALL THE IRRIGATION SYSTEM MAIN LINE

Attach the main sprinkler line to the service line. Run it along the bottom of the trench from the house to the first set of valves, and if required, to the second set. Place the valve wires under the pipe in the bottom of the trench whenever possible.

1 WORKING WITH PVC PIPE

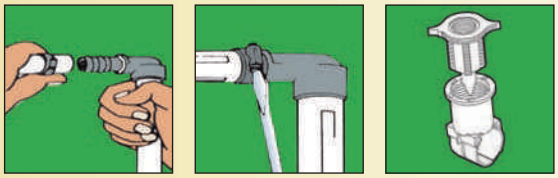
1. Cut pipe with a PVC pipe cutter.
2. Brush on a primer to clean the pipe surface and the inside of the fitting.
3. Brush glue on the outside end of the pipe and lightly inside the fitting.
4. Slip the pipe into the fitting and give it a quarter turn.
5. Hold in place for about 15 seconds so the glue can set.
6. Wipe off excess glue with a rag.



NOTE: *Wait at least one hour before running water through the system. (Check manufacturer's recommendation.)*

2 WORKING WITH POLY PIPE

1. Cut pipe with a PVC pipe cutter.
2. Slip a stainless-steel clamp over the end of the pipe.
3. Insert the barbed fitting into the end of the poly pipe, past the barbs.
4. Slide the clamp over the barbs of the fitting.
5. Tighten the clamp.



Self-tapping Saddle (53686)

TIP: *Save time by using the Toro Self-Tapping Saddle for poly pipe (80-100 PSI). No more sawing, drilling or gluing! Self-Tapping Saddles are available at your local home center.*

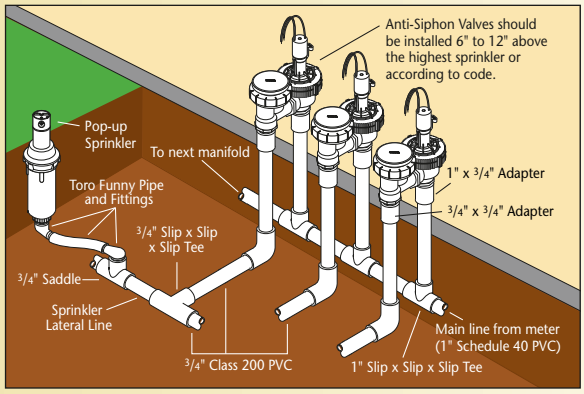
TIP: *To relax poly pipe, expose it to sunlight. Never expose poly pipe to open flame.*

WARNING! *Do not use poly pipe as the connecting pipe between the service line and the control valves. Surge pressure may rupture the poly pipe. Be sure to check local codes for correct type of pipe to use.*

E BUILD VALVE MANIFOLDS

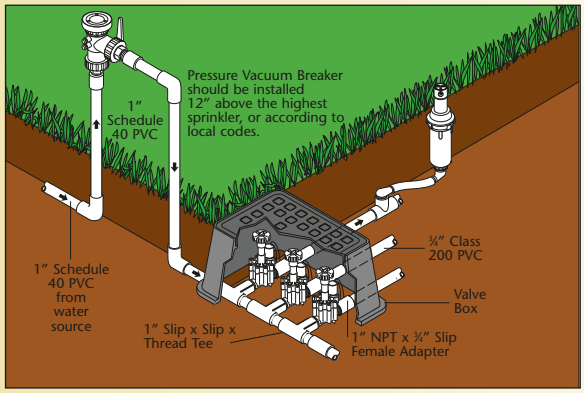
A group of valves running off the same supply line is called a manifold. We recommend grouping your valves into manifolds based on their use or location. For example, one control valve manifold to operate front yard zones and one to operate backyard and/or side yard zones. Use flags to mark the location of the valves, as indicated on your worksheet.

Refer to the valve inlet size chart on this page for general valve inlet size rule of thumb.



1 ANTI-SIPHON VALVE INSTALLATION

Anti-siphon valves are backflow prevention valves designed to protect your water supply from contamination. Some sort of backflow prevention is required on every irrigation system, so you need to check the building codes in your area to find out if an anti-siphon valve will work for you. These valves are always installed above ground, so be sure to dig out an area large enough to accommodate your inlet and outlet pipes.



2 IN-LINE VALVE INSTALLATION

In-line valves are installed below ground and should always be installed in a protective valve box. Dig out the area where in-ground valves are to be installed, and add several inches of gravel to the bottom of the hole. Place the top of the valve box so that it is even with the surface of the ground. When you buy a valve box, be sure to find out how many valves fit in each box so you know how many to buy. In some cases, you will need more than one valve box per manifold.

✳ **NOTE:** *If one of the valves will be used for drip irrigation, leave enough room between the valve and the sides of the valve box for the filter and pressure regulator that are part of your drip system. It may be a good idea to install those parts on the valve, then, install the valve in the valve box.*

TIP: *When putting together your valve manifolds, always include one or two extra connections in each manifold. This makes it easier to expand your system at a later date.*

TIP: *Look for valves with the flow control feature. It saves water!*

F INSTALL LATERAL PIPE

Start from the valves and move outward, laying the connecting pipe along the bottom of the trench (more than one pipe may be laid in a trench). At each flag, install a tee or elbow fitting, and if needed, a riser for sprinkler attachment. We recommend that you use Toro Funny Pipe® for all your sprinkler head installations. Refer to the Funny Pipe® section for more information.

G FLUSH THE SYSTEM TO CLEAR DEBRIS

After the pipe has been connected and the glue has dried (PVC pipe only), turn on the water, open valves one zone at a time and flush until the water runs clear. Seal the fitting with duct tape to keep dirt out until the sprinklers are installed.

✳ **NOTE:** *Don't backfill your trenches until your final system operation check is complete.*

H INSTALL YOUR SPRINKLERS ZONE-BY-ZONE

Install one sprinkler zone at a time, using Toro Funny Pipe® to connect to the lateral lines. Remember to refer to your planning worksheet.

1. Placing a sprinkler in a trench as a guide, measure from the connecting pipe fitting to the bottom of the sprinkler and cut a length of Funny Pipe to fit. Place sprinklers at least 3" from sidewalks and curbs and 6" from fences and buildings.
2. Install the appropriate Funny Pipe elbow into the sprinkler and into the PVC or poly pipe fitting. No glue or clamps needed.
3. Connect the Funny Pipe to the sprinkler and to the pipe fitting.

✳ **NOTE:** *Do not use more than 4' of Toro Funny Pipe with each sprinkler head.*

4. Position the sprinkler in the trench so that the top of the sprinkler is flush with ground level. Stabilize the sprinkler with soil without filling the entire trench.
5. Verify that the sprinkler is vertical for optimum performance.
6. Repeat this process for each sprinkler.

VALVE INLET SIZE	
Size of Inlet	**Gallons Per Minute (GPM)**
3/4"	Under 8 GPM
1"	Above 8 GPM

Malfunctions aren't common, but when they occur, they're often due to one of these causes. Refer to each product's specific operating manual for additional information.

TIMERS

PROBLEM	CAUSE	SOLUTION
Watering cycle repeats	Multiple start times set	Check program and turn off all but one start time
	Season adjust is set at more than 100%	Reset Season Adjust
Fuses blow regularly	Faulty valve solenoid	Replace solenoid
	Damaged or shorted wiring	Inspect and repair wire
	Faulty timer	Replace timer
LED display is blank	No power to timer	Check outlet for power
	Faulty transformer	Replace transformer
	Blown fuse	See above (fuses)
Lawn is not watered	Timer is off	Turn timer on
	Blown fuse	See above (fuses)
	Damaged timer/valve wiring	Repair wire
	Faulty transformer, timer or rain sensor device	Replace timer, sensor or transformer
	Program incorrect	Check timer program
One zone does not function	Damaged wiring at timer or one manifold	Repair wiring
No water to one or all zones	Damaged wiring at timer and zone	Repair wire

ALL SPRINKLERS

PROBLEM	CAUSE	SOLUTION
Sprinklers will not pop up	Not enough water pressure to run the zone	Split the zone in two
	Master or zone valves not completely open	Open counterclockwise
	Flow control on zone valve not fully open	Open flow control
	Debris between sprinkler riser and riser seal	Clear debris
Sprinklers "stick up" after watering	Damaged riser or riser seal	Replace sprinkler
	Damaged retraction spring	Replace sprinkler
	Radius adjustment screw turned off	Open counterclockwise
	Debris in nozzle	Remove debris
Water doesn't spray from nozzle	Internal filter clogged	Clean screen
Water flooding from sprinkler	Missing nozzle	Install nozzle
	Faulty or missing sprinkler head	Replace sprinkler

VALVES

PROBLEM	CAUSE	SOLUTION
No water at sprinkler heads	Main water supply valve is off	Turn supply valve on
	Faulty valve solenoid	Replace solenoid
	Flow control at valve is closed	Open fully counterclockwise
	Zone valve wires not connected	Connect wires
	Debris in valve, solenoid or metering orifice	Disassemble valve and clean with fresh water
One or more zones won't stop watering	Faulty valve diaphragm	Replace diaphragm
	Faulty valve	Replace valve
	Damaged or cracked valve body	Replace valve
	Damaged or cracked bonnet	Replace valve
External water leaks at valve	Damaged or cracked pipe and fittings	Check and replace as needed
	Damaged diaphragm	Replace diaphragm
Water leaks from lowest sprinkler in zone	Debris between diaphragm and diaphragm seat	Clear debris from valve
	Damaged diaphragm	Replace diaphragm
	Debris in solenoid	Clean solenoid
	Faulty solenoid	Replace solenoid
	Valve manual bleed open	Tighten by hand

ROTORS

PROBLEM	CAUSE	SOLUTION
Water doesn't spray from nozzle	Internal basket screen plugged with debris	Clean screen
Sprinkler does not rotate	Not enough water pressure to rotate sprinkler	Split zone in two
	Debris in sprinkler head	Clean debris from sprinkler
	Faulty sprinkler head	Replace sprinkler
Sprinkler rotates in one direction and stops	Not enough water pressure to rotate sprinkler	Split zone in two
	Faulty sprinkler head	Replace sprinkler
	Missing nozzle	Replace Nozzle

STEP 3 - INSTALL IT!

I INSTALL YOUR TIMER

1. **Install the timer in your garage or another convenient place.** If an outdoor location is desired, use an outdoor cabinet to protect the timer against the effects of weather. Make sure an adequate power supply is available. Toro timers require only a standard outlet. (See instructions included with the timer for details.)
2. **If you haven't already done so, lay the valve wires** in the bottom of the trenches, beneath the pipes.

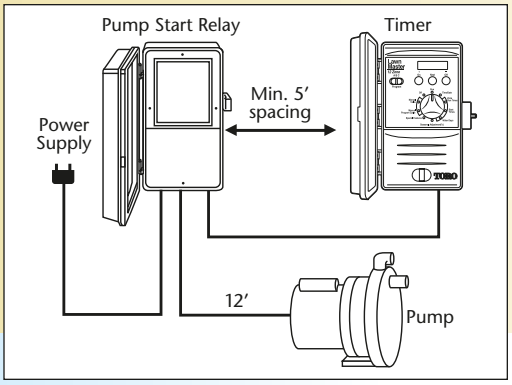
   TIP: *Installing more wire strands than your system currently requires can be a real time saver. Adding them now is simple, adding them later after all the dirt is back in place and the grass is growing is not.*

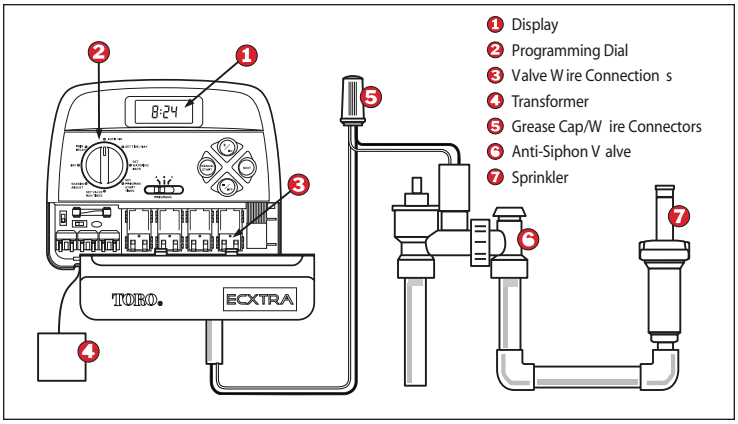
3. **Connect the valves to the timer using the valve wires.**
   - **a.** Take one wire from each valve and connect them to a common wire. (For ease of identification, use the white wire as the common.)
   - **b.** At the timer, connect the common wire to the common terminal on the timer.
   - **c.** Take the other wire from each valve and connect them to the timer terminals in sequence.
4. **Plug in the timer.**

WARNING! *All outdoor electrical connections must be waterproofed. Use Toro's Grease Caps/Waterproof Wire Connectors.*

J OPTIONAL: CONNECTING A PUMP START RELAY

If your system will get water from a well, water tank, or pond, a pump start relay lets you automatically activate the pump if your water supply requires one. For proper function, the timer must be installed at least 12 feet from the pump and 5 feet from the pump starter to prevent malfunctions.





K CHECK YOUR SYSTEM OPERATION

1. Slowly turn on the water, then manually open an irrigation valve.
2. Adjust the sprinklers to ensure proper coverage. (See sprinkler installation instructions for details.)
3. If you don't have complete head-to-head coverage, follow the steps below:
   - **a.** Make sure the control valve and shut-off valve are fully open.
   - **b.** Turn off any water being used in the house (washers, showers, faucets, etc.).
   - **c.** Fine-tune sprinkler spray positions and spray patterns to match your coverage area.
   - **d.** If coverage is still not complete, go back and check your system layout against the plans.
   - **e.** When you see that the coverage is satisfactory, fill in the trench.
4. Once you are satisfied with your installation you can move on to installing your drip irrigation system. The following chapter gives detailed instructions for handling this installation.

CONGRATULATIONS!

When properly installed, your Toro automatic irrigation system will help keep your landscape green and healthy for years of recreation and enjoyment.

SELECT YOUR COMPONENTS

Use the information in this section to help you choose the best sprinklers and components for your system.

A THE RIGHT SPRINKLERS

No matter what your landscape demands,
Toro has the sprinkler family to cover every inch.

TIP: ***Select sprinklers with the largest possible radius that is appropriate and use fewer sprinklers and valves. That means fewer zones and less trenching.***

1 570™ SERIES FIXED-SPRAY SPRINKLERS

Radius: 5′-17′
Toro 570™ Series fixed-spray sprinklers produce a precise, uniform fan of water that's ideal for small lawn, shrub and ground cover areas. Pop-up models disappear when not in use. Shrub sprays mount above foliage to water ground cover and shrubs. True matched precipitation rates and color coding by radius are just two of the valuable features of 570™ sprinklers and nozzles. Toro has more than 35 different interchangeable nozzles to choose from to give you maximum flexibility and precision.
Perfect for smaller lawn and garden areas.

2 FLOOD BUBBLER

Radius: 0′-2′
Use the Toro Flood Bubbler for slow, deep watering around trees, shrubs, vegetable and flower gardens. Fully adjustable flows from 0 (off) to 2 GPM. Perfect for small groundcover areas. Toro offers a nozzle model (shown) and a riser model.

3 340 MULTISTREAM SPRINKLER

Radius: 15′-33′
Toro's unique gear-driven 340 MultiStream sprinklers are recognized by their graceful "fingers of water." These slowly rotating streams are not only attractive; their slower watering rates minimize run-off. Perfect for slopes, medium-sized lawns and ground cover.

4 SINGLESTREAM SPRINKLER

Radius: 34′-48′
Its gear-driven design provides years of smooth, quiet operation. Perfect for medium-to-large lawn areas.

Toro 340 MultiStream *Sprinklers are as attractive to watch as they are effective for watering.*

5 PROSTREAM XL™ SPRINKLER

Radius: 25′ – 46′
With an adjustable radius for full or part circle watering, the versatile Toro ProStream XL works with any 4" or 5" rotor on the market. Perfect for medium-to-large lawn areas.

6 SIMPLESET™ SPRINKLER

Radius: 27′-47′
The Toro SimpleSet™ Lawn Sprinkler offers full and part-circle operation in a single unit. This closed-case rotary sprinkler is ideal for large lawn areas and as its name implies, it is simple to set.

7 UNIVERSAL IMPACT SPRINKLERS

Radius: 25′-45′
Toro Universal Impact Sprinklers are adjustable from 20°-340° for part-circle operation or 360° for full circle operation. They are a great choice for well and dirty water applications and will supply years of reliable operation.
Perfect for large lawn areas.

B THE RIGHT IRRIGATION VALVES

There are two types of valves: anti-siphon and in-line. Please check your local codes to determine which is appropriate in your area.

1 ANTI-SIPHON VALVES

Anti-siphon valves have backflow prevention devices integrated into each individual valve to keep the water from the sprinkler system (and any contaminates) from entering your clean potable water supply. Anti-siphon valves are always installed above ground, 6" to 12" above the highest sprinkler or according to local codes.

2 IN-LINE VALVES

In-line valves are installed below ground for out-of-sight operation. When using in-line valves, your system will need to be protected by an anti-siphon device. Check the local codes.

3 PRESSURE VACUUM BREAKER (PVB)

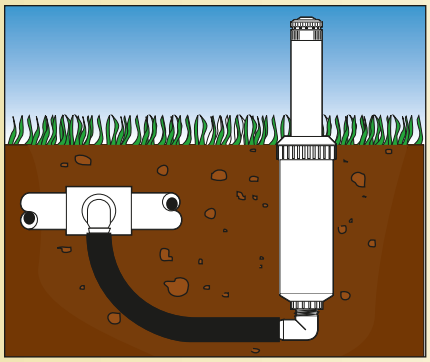
A pressure vacuum breaker can be used with in-line valves to prevent the backflow of contaminated water into your potable water supply. Check local codes.

Toro 1" Jar Top Valves
installed in a valve box.

C THE RIGHT ACCESSORIES: TORO FUNNY PIPE®

Toro Funny Pipe® is high-strength composite poly-tubing that solves tough sprinkler installation and replacement problems. Put simply, Funny Pipe® acts like a flexible extension cord between the sprinkler line and sprinkler head, allowing you to easily position sprinklers wherever you need them.

Whether you are installing a new system or replacing an old sprinkler head, Funny Pipe® can make the job quick and easy.



✳ **NOTE:** *Do not use more than 4' of Toro Funny Pipe® with each sprinkler head.*

Toro Funny Pipe 50' Roll

Toro Funny Pipe 100' Roll

Toro Funny Pipe 24" Stick

Toro Funny Pipe
Flex Assemblies

D THE RIGHT TIMERS

You are free to use any irrigation timer you choose with your system, and mount it almost anywhere.

When choosing a new timer, there are just a few things to keep in mind while you shop:

1. Can it control all the zones I have now and in the future?

Buy a timer that has at least two more zones than you need. That way you are ready for future expansion without replacing the timer.

2. How many different programs should the timer run?

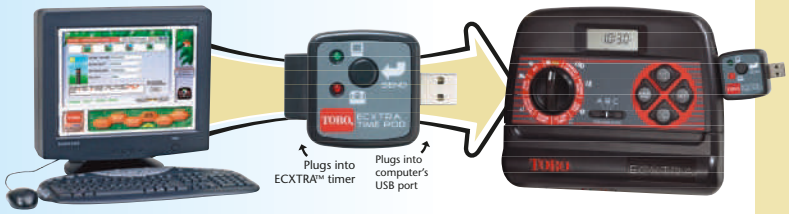
A single program timer is not recommended. It is virtually impossible to create an efficient watering schedule for even the smallest lawns with just one watering program.

3. How many start times do I need?

As with programs, having multiple start times allows for more convenience and efficiency while irrigating. Multiple start times lets you adjust your watering for soil type and plant needs.

4. Should I use an indoor or an outdoor timer?

This is usually a matter of preference, more than need. Most timers come in both versions, or can be mounted in after-market housings for outdoor use.



The ECXTRA™
Finally, Timer Programming Made Simple…
and Smart!

TORO TIMERS

1 ECXTRA™ TIMER

Toro ECXTRA Timers are unique irrigation timers that can be programmed using your PC and **include expansion capability** for control and convenience. Add a zone to any ECXTRA to expand capacity up to 10 zones for indoor models or 12 zones for outdoor models.

Toro offers easy to use Scheduling Advisor Software that will create a watering program based on your specific landscape characteristics and geographical region. The Toro Time-Pod conveniently stores your watering program and transfers the information to your ECXTRA timer.

Other ECXTRA features include...

- **Battery-free Backup Protection**, using non-volatile memory protects your schedule and settings in the event of a power failure.
- **Programmable Pump-Start** lets the user adjust the delay between the irrigation pump start up and irrigation system activation assuring proper water pressure is always available.
- **365-day Calendar** manages even the most complicated municipal water restrictions.
- **Seasonal Adjust** feature lets the watering schedule be adjusted for changes in local weather, without the need for reprogramming

2 LAWNMASTER™ II TIMER

The LawnMaster II is a feature rich, simple to install and program timer that includes:

- **3 Programs** for flexible watering according to plant type
- **Pump Start relay** port for use with well water systems
- **365 day calendar** that enables programming based on municipal water restrictions
- **Seasonal adjust** to increase watering during hotter months and decrease watering in cooler months without having to reprogram

E HOW MANY SPRINKLERS CAN I USE?

When planning an irrigation system, one of the most important tasks the designer does is figure out just how many sprinkler heads can be installed on one zone, given the available water pressure and flow. If too many sprinklers are installed, then when they are all running, there may not be enough water available for them to function correctly. This can also adversely affect the water pressure inside the house. It is better to design your zones so that you have some "excess" capacity in them. Then, if needed, you will be able to add a sprinkler or two later on without needing to change your zones.

An important factor in this "How Many Sprinklers" equation is the sprinkler pattern you will use. Are they all 90° Quarter-Circles? Are they Half-Circles? The truth is you will usually be using a mixture of different patterns with different flow requirements. This can make things seem a lot more complicated when you are trying to add the flow up and figure out your total per zone.

To help you, we have put together a chart that shows you the maximum number of sprinklers that you can put on one zone, if that zone has a certain amount of water pressure and flow. For example, if you are using 570 spray heads and you have 30 PSI at the head of water pressure to work with (called working or dynamic pressure), you can see that if your system can deliver 5 GPM at that pressure you can use a maximum of one 15' Full-Circle on that zone, but up to 5 Quarter-Circles. The more flow and pressure you have, the more sprinklers you can install in any zone.

For the exact flow by sprinkler type, refer to the Sprinkler Performance Chart on the right.

HOW MANY SPRINKLERS CAN I USE?

	Gallons Per Minute (GPM)			
	5 GPM	8 GPM	12 GPM	15 GPM
570 Series Sprayheads (@ 30 PSI)				
15' Quarter Circle (90°)	5	9	14	17
15' Half Circle (180°)	3	4	7	9
15' Full Circle (360°)	1	2	3	4
Single Stream & SimpleSet Rotors (@ 45 PSI)				
30° to 120° (1.5 Nozzle)	3	5	8	10
121° to 240° (3.0 Nozzle)	1	2	4	5
241° to 360° (6.0 Nozzle)	0	1	2	2
MultiStream Rotors (@ 35 PSI)				
90°	3	5	8	10
135°	2	3	5	6
180°	1	2	3	4
270°	1	1	2	3
360°	0	1	1	2
Universal Impact Rotors (@ 30 PSI)				
90° (Orange Nozzle)	3	5	8	10
120° (Red Nozzle)	2	4	6	7
180° (Black Nozzle)	1	2	4	5
270° (Blue Nozzle)	1	2	3	3
360° (Green Nozzle)	0	1	2	2

* pressures are based on working pressure at the head
* all measurements based on Class 200 PVC for all lateral pipes

SPRINKLER PERFORMANCE CHARTS

570™ Series Nozzles

5' SERIES WITH 0° TRAJECTORY (RED)

PATTERN	PSI	GPM	RADIUS
90°	30	0.09	5'
180°	30	0.19	5'
360°	30	0.38	5'

8' SERIES WITH 5° TRAJECTORY (GREEN)

PATTERN	PSI	GPM	RADIUS
90°	30	0.24	8'
180°	30	0.50	8'
360°	30	1.00	8'
0-360°	30	3.2	9'

10' SERIES WITH 12° TRAJECTORY (BLUE)

PATTERN	PSI	GPM	RADIUS
90°	30	0.40	10'
180°	30	0.71	10'
360°	30	1.49	10'
0-360°	30	3.9	11'

12' SERIES WITH 23° TRAJECTORY (BROWN)

PATTERN	PSI	GPM	RADIUS
90°	30	0.50	12'
180°	30	1.09	12'
360°	30	2.19	12'
0-360°	30	3.22	12'

15' SERIES WITH 27° TRAJECTORY (BLACK)

PATTERN	PSI	GPM	RADIUS
90°	30	0.85	15'
180°	30	1.65	15'
360°	30	3.60	15'
0-360°	30	3.82	13'

SPECIAL PATTERN (ORANGE)

PATTERN	PSI	GPM	W x L
	30	1.20	9' x 18'
SIDE STRIP	30	0.90	4' x 30'
CENTER STRIP	30	0.90	4' x 30'
END STRIP	30	0.45	4' x 15'

ADJUSTABLE FLOOD BUBBLER

MODEL #	PATTERN	FLOW
53692	360°	0-2.0 GPM

570 PC ADJUSTABLE BUBBLER NOZZLE

MODEL #	PATTERN	FLOW
53786	360°	0-2.0 GPM

Universal Impact Sprinkler-40

MODEL #	PSI	SPACING	GPM
53720	40	37'	2.2

Universal Impact Sprinkler

MODEL #	PSI	SPACING	GPM
53722	40	40'	4.4

SingleStream Sprinkler

STD. NOZZLE	MODEL-PATTERN	45 PSI FLOW - SPACING
Orange	53739 - 90°	1.0 GPM - 40'
Black	53738 - 180°	3.0 GPM - 41'
Green	53737 - 360°	6.0 GPM - 43'
Black	53715 - Adj.*	3.0 GPM - 41'

*Orange and green nozzles included 3.0 GPM installed and set to 180°

SimpleSet™ Lawn Sprinkler

MODEL #	PATTERN	PSI	SPACING	GPM
53674	90°	40	37'	1.5
	180°	40	40'	2.5
	360°	40	37'	5.0

340 MultiStream Sprinkler – based on full circle spray Pattern

MODEL #	PRESSURE	SPACING 18 FT.	26 FT.	33 FT.
53757 (Lawn), 53758 (Shrub), 53759 (High-Pop)	50 PSI	3.7 GPM	5.6 GPM	7.5 GPM

Note: The water flow in GPM (Gallons Per Minute) is based on a full circle (360°) spray pattern. The flow will vary depending on the spray pattern used. For example, the flow through a 180° pattern is about half of a 360° pattern, and a 90° pattern has roughly one quarter the flow of a 360° pattern.

Universal Impact Sprinkler-45

MODEL #	PSI	SPACING	GPM	NOZZLE	PATTERN
53721	40	35'	1.8	Orange	90°
		37'	2.2	Red	120°
		39'	3.6	Black	180°
		41'	4.2	Blue	270°
		43'	6.5	Green	360°

PSI: Pressure Per Square Inch (Working Pressure)
GPM: Gallons Per Minute

FREQUENTLY ASKED QUESTIONS

1 SYSTEM DESIGN

Q: How do I get started?
A: You can design your system yourself or take advantage of the Toro Design Service. In either case, you will need some basic information (see pages 1-8).

Q: How long will it take to install my system?
A: After you have your completed design and have parts in-hand, it will take an average* of 2-3 days (about 1-2 weekends). *(Average home lot size of ¼ acre)

Q: If I have my plans prepared, how quickly will I get my design?
A: It will take approximately 2 weeks to get your design back. Or for the cost of shipping, you can have your plans sent 2 Day Express (call 800-891-0742). You can check the status of your design, view and print your plans at www.torodesign.com

Q: How much will it cost for my sprinkler system?
A: If you have a professional contractor install your system, you can expect to pay at least 2-3 times more than if you do it yourself. Typical cost for doing it yourself may be between $800 and $1,600*. Every home is different. *(Average home lot size of ¼ acre)

2 INSTALLATION

Q: How far apart do I space the sprinklers?
A: To ensure proper watering of your lawn, water spray from one sprinkler head must reach the next sprinkler head (head-to-head coverage). If you space heads too far apart and do not have head-to-head coverage, you will end up with brown spots (dying grass) (see page 7).

Q: Can I mix different heads on the same zone (same valve)?
A: No. You should avoid mixing small and large area sprinklers on the same zone because they have different watering amounts and will cause over and under watering.

Q: How many sprinklers can I put on one zone (one valve)?
A: Your water pressure and water flow will determine the maximum number of heads that can be used. Too many heads on a zone will create low pressure in your system and will cause the heads to work improperly (see page 27).

Q: What type of pipe should I use to connect the system?
A: You can use either Polyvinyl Chloride (PVC) or Polyethylene (Poly) Pipe. In freezing climate areas, you will generally use Poly Pipe. Consult your local codes to find out what's required in your area (see page 11).

Q: How do I install drip or micro-irrigation?
A: You will start by connecting to the water source. In addition to the valve, Drip or micro-irrigation requires a filter and pressure regulator to protect the small emitters (drippers). Then you connect the ½" Drip Tubing. Next you decide on the best method to water your plants. Refer to Toro's Blue Stripe Drip Planning & Installation Guide for more details.

3 VALVES

Q: How do I hook up my valves?
A: Valves connect to your timer with simple wiring. Each valve has 2 wires; choose 1 as the zone wire, and the white wire as the Common wire. Use 18-gauge multi-strand wire if the distance between the timer and valve is 1000 feet or less (Refer to the chart below on this page for longer distances). Always use more strands than you need for future expansion. (Wire sold separately.) (see page 14)

Q: When I connect my valves to PVC, do I use glue?
A: Most valves will connect to the sprinkler system with a PVC connector with male threads. Simply screw the male connector into the valve. Use primer to prepare the pipe and fitting, then glue the other end of the PVC connector to the rest of the pipe flowing to your system (see page 11).

Q: How many valves will I need?
A: You need 1 valve for each zone.

Q: How do I determine what type of valve I need?
A: Local water regulations determine the type of valve you need. Call your local water company to determine what is required in your area (see page 12).

4 TIMERS

Q: How do I hook up my timer?
A: Your timer connects your valves with simple wiring connections. From your timer, you will have 1 common wire (white) that will link all valves together, and 1 colored wire for each individual valve (see page 14).

Q: How do I determine what type of timer I need?
A: There are four factors to consider:

1: How many zones (valves) you have. (Hint: always leave room for expanding your system as your landscape expands).

2: How many programs or watering schedules you need. Simple timers have one or two programs. For the most efficient watering, select a timer with 3 programs.

3: How many start times do you need? Select a timer with 3 or more start times.

4: Location of the timer: select indoor or outdoor.

Consider the ECXTRA™ with the ability to be programmed using a home computer (see page 25).

TIMER TO VALVE WIRE SIZING CHART

Gauge	Maximum Distance
18	1000 ft
14	1450 ft
10	1750 ft
6	1930 ft

The tips listed below will help you get the most from your new Toro irrigation system. Please pay special attention to the water conservation tips. Conserving water is not only the right thing to do for the planet; it is also the right thing to do for your budget.

1 WATER CONSERVATION

- Always use "head-to-head coverage" in your irrigation system.
- Keep the soil consistently moist but not wet. This eliminates runoff, and ensures your plants a steady supply of water.
- Do not water at night - water will sit on the lawn and may cause disease.
- Water in the early morning - evaporation is minimized and the lawn utilizes the most water.
- Do not water midday – evaporative loss is at its greatest.
- Create multiple programs for your irrigation system – this allows you to water most efficiently.
- Install a rain sensor – it will prevent the system from running during rain.
- Use drip irrigation in flower beds - it saves substantial amounts of water.
- Reduce run times for zones in the shade.
- Allow grass to grow before mowing - this reduces water usage.
- Practice "grass cycling"- this reduces evaporative water loss from the lawn, while reducing the need for fertilizer.
- Sharpen your mower blade - sharp blades are easier on the grass and save water.
- De-thatch your lawn - water will get to the roots faster and evaporate less.
- Aerate your lawn - it prevents soil compaction and allows water to soak in faster.
- Keep plants with different watering needs on different zones – trees vs. lawn, etc.
- Plant native species - native plants do better and need less special care than exotics.
- Mulch flowerbeds and trees - it reduces evaporation and controls weeds.
- Know your soil type - the three basic types: sand, loam, and clay require different watering schedules for optimal results.

By implementing these conservation tips, your water use can be cut dramatically.

INSTALL A RAIN SENSOR

A rain sensor saves water by shutting down your irrigation system temporarily when it rains without erasing your programs. It is easy to attach to roof eaves.

INSTALL DRIP-IRRIGATION

Install a Drip-Irrigation system using Toro's Blue Stripe® Drip Products to save time, money and water. Refer to pages Toro's Blue Stripe Drip Planning & Installation Guide for more information.

2 WATER SCHEDULING

For best results, create a weekly watering schedule. Figure out your total weekly watering needs (run times). Divide those runtimes into watering days, and if your timer supports multiple start times, by that number.

For example, if the weekly watering requirement for one zone is 65 minutes a week, you would water 9-10 minutes every day or 16-17 minutes every other day. It is better to water for shorter periods, but to do it more often. This allows the moisture level in the soil to remain constant. Also, consider the type of soil you are watering. If you have sandy soil, longer runtimes may be better, whereas with clay soils, you will need to apply water more slowly and use more start times.

The key is building the most flexibility into your system possible, and using that flexibility to create the most precise schedule you can. Precision equals performance and water savings.

3 WINTERIZATION PROCEDURES FOR COLD CLIMATES

The water supply should be turned off at the main valve and the irrigation timer should be set to the "Rain" or "Off" setting. Each valve should be turned on manually to release pressure and water in the pipes. This is done to protect any components that could freeze.

Your irrigation system may have manual or automatic drain valves that need to be opened for proper drainage, make sure the drain valve is pointing downward to facilitate flow or the system will have to be blown out using compressed air.

Do not exceed 50 PSI of air pressure.

⚠ **WARNING!** ***We recommend hiring a professional when winterizing with compressed air.***

* Follow the recommended winterization instructions included with your sprinkler timer.

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