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IRRIGATION DESIGN INSTALLATION GUIDE

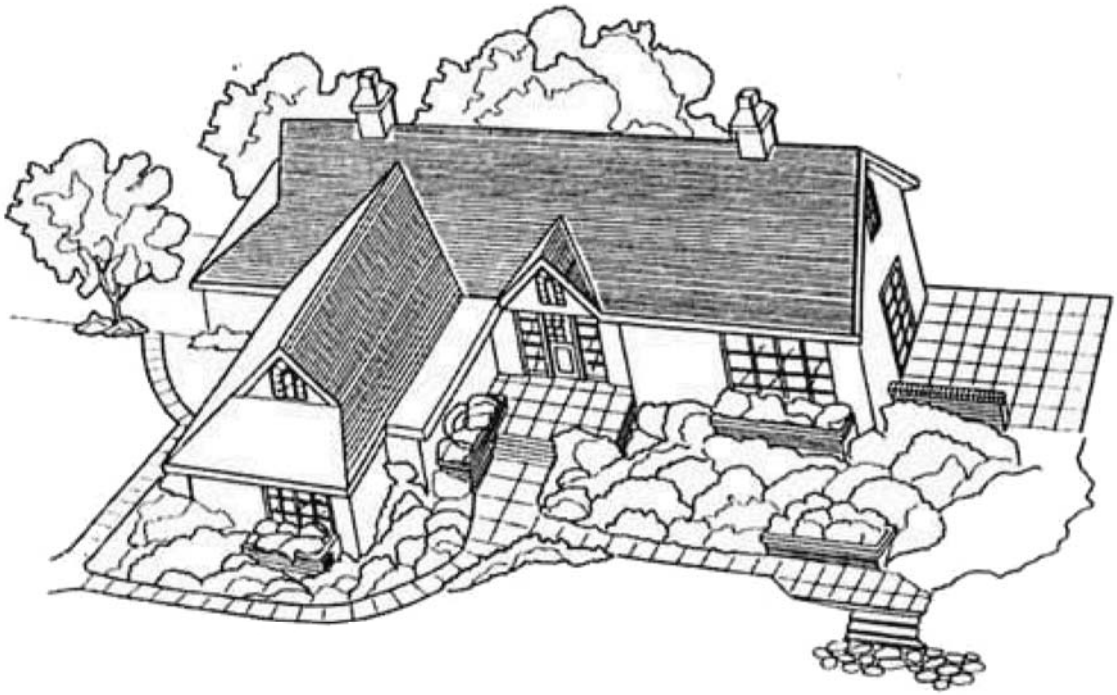

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Table of Contents

You are about to venture into an increasingly popular do-it-yourself home improvement. Many homeowners have found it rewarding and economical to install their own underground sprinkler system!

The planning of your new system is the most important part in assuring an effective installation, unique only to your landscaping theme. This booklet will guide you through the same planning and installation process the pros use.

STEP ONE: GETTING STARTED

Please review the booklet prior to starting, to gain an overall view of what is required, and to make sure your sprinkler system will provide coverage of your yard. You first need to gather the following information about your water supply:

A. WATER METER & SERVICE LINE SIZE:

You may or may not have a water meter. If you do, the size of your water meter is usually 5/8", ¾", or 1". The size may be stamped on your meter. If not, your water company will have the information.

Write your Meter Size here: _____

The service line is the water pipe running from the street to your house. To determine the correct size, first find the copper or plastic pipe where it enters your house through the basement. There will be a shut-off valve located close to the source. Wrap a string around the pipe just before the valve and measure the string length.

Use the chart below to determine the diameter of the line:

Length of string	2 1/4"	3"	3 1/8"	3 3/4"
Size of copper line	1/2"	3/4"		1"
Polybutylene	1/2"		3/4"	

Write your Service Line here: _____

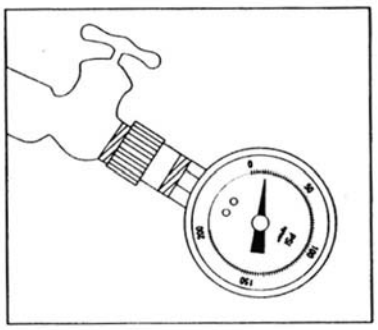
B. PUMPING SYSTEMS

Many rural homeowners rely on wells as a source of water. It is common to run a 1" polyethylene line from these wells to the house.

Pumps are usually sized according to the depth of the well and the water available. If you are not aware of the size and capacity of your pump, it will be necessary to contact your local pump supplier. He will need to know the serial number and model number of the pump. Design your system to the pressure (P.S.I.) and flow capacity of your pump.

Write your Pump Capacity here: _____ @ _____ P.S.I

C. STATIC WATER PRESSURE



Water pressure is measured in pounds per square inch (P.S.I.). A static water pressure is obtained at the outside faucet when no water is running in the house. The pressure may be read by attaching a pressure gauge to the outside faucet, with the faucet completely open. You should be able to borrow a pressure gauge from the retailer where you obtained this pamphlet.

Write your Pressure here: _____ P.S.I

D. GALLONS PER MINUTE AVAILABLE:

Using the previous information, refer to this chart to determine how many gallons per minute (G.P.M.) are available for your system.

EXAMPLE: With a meter of 5/8", a service line of ¾", and water pressure of 55 P.S.I., you would have 10 G.P.M. available.

Find your available G.P.M. on the chart and write it below.

DETERMINING GALLONS PER MINUTE

Size Of		**Water Pressure**								
Water Meter	Service Line	30	35	40	45	50	55	60	65	70
5/8"	½"	2	3.5	5	6	6.5	7	7.5	8	NA
5/8"	¾"	3.5	5	7	8.5	9.5	10	11	11.5	13
¾"	¾"	5	7	8	9	11	12	14	15	16
¾"	1'	7.5	10	11.5	13.5	15	16	17.5	18.5	19

Write your Gallons Per Minute here: _____

NOTE: If you don't have a water meter, then assume your water meter is the same size as your service line. i.e.: ¾ service line, ¾ meter size at 55 P.S.I. = 12.0 G.P.M

NOTE: If your service line is longer than 75 feet from the main source or is old enough to have some corrosion inside, a simple flow test can be performed. Time how long it takes to fill a bucket of a known size from one of your outside faucets. Convert this to gallons per minute using the following formula:

$$\frac{\text{BUCKET SIZE IN GALLONS X 60}}{\text{SECONDS TO FILL}} = \text{G.P.M.}$$

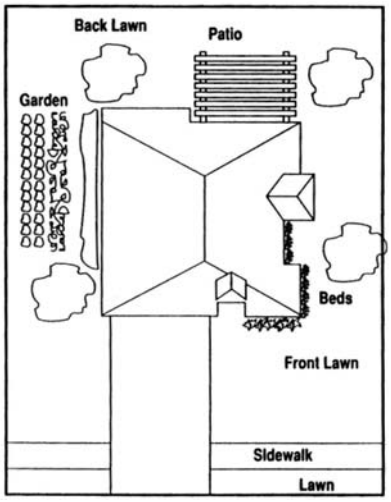
EXAMPLE: A two gallon bucket that fills in 15 seconds means that the available flow is 8 gallons per minute.

$$\frac{2 \times 60}{15} = \text{G.P.M.}$$

E. DRAW YOUR LAYOUT PLANS

In addition to the information above, you will need an accurate scale drawing of your property. Measure your property with a tape measure, and draw your plan to scale as accurately as you can. Check this list to make sure you have included everything:

- ♦ Outline of house and other buildings
- ♦ Patio, sidewalk, driveway, and deck
- ♦ Fences, walls, and planters
- ♦ All lawn areas
- ♦ Trees, shrubs, ground cover, and garden beds
- ♦ Location of water source and service line
- ♦ If your water is supplied by pump, show the location of the pump and well



Now label the parts of your drawing, and lightly shade in those areas to be sprinkled.

STEP TWO: PLANNING YOUR SYSTEM

Now you're ready to plan your system! As you progress with your plan, make sure it will meet all local code requirements. Some cities or towns may require a permit.

Many local codes require installation of a backflow preventor to protect your water system from possible contamination. (See Section J. Backflow)

F. SELECT SPRINKLER HEADS

There are many types of sprinklers available of the market today. However, most yards can easily be irrigated using the following four groups of sprinklers.

GROUP (1) LARGE AREA SPRINKLERS

GROUP (2) SMALL AREA SPRINKLERS

GROUP (3) SHRUB AREA SPRINKLERS

GROUP (4) DRIP FOR FLOWERS AND GARDENS

DRIP, because of its special application techniques, is covered in another pamphlet. Please ask your dealer for a copy if you would like more information.

In the design of our system, we are interested in large radius sprinklers for areas where maximum distance is required, and smaller radius sprinklers for smaller lawn and shrub areas.

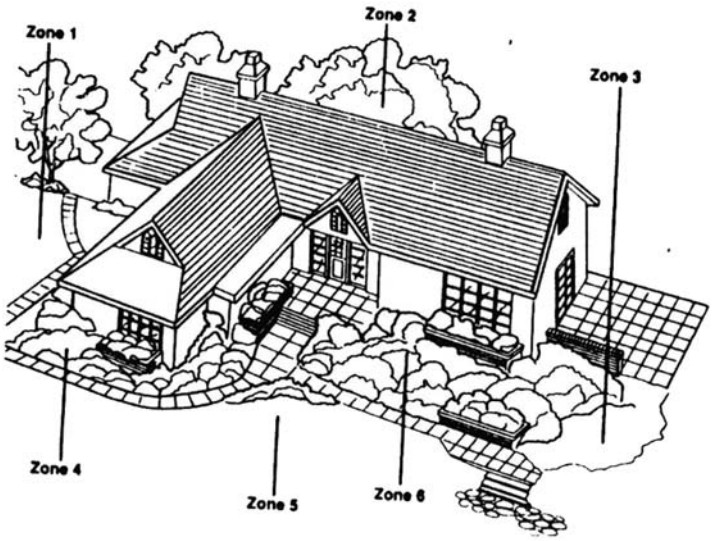
Please refer to the following charts A, B, & C to select the sprinkler heads best suited to your needs. Be sure to note the spacing and G.P.M. requirements for each sprinkler you select.

NOTE: Sprinklers must overlap their throw to assure even water distribution. Because of the often-high wind conditions encountered, we suggest you use 100% overlap, or head to head spacing.

EXAMPLE: If a sprinkler radius is 40 feet, you would place the sprinklers 40 feet apart.

Do not mix spray sprinklers and large gear drive sprinklers on the same circuit.

Exceeding the recommended spacing produces dry spots.



TYPE OF SPRINKLER

Group 1: LARGE HEAD

CHART A

TYPE OF SPRINKLER DESCRIPTION:

MINIPRO, PROPLUS, PRO SPORT

Group 1: LARGE HEAD Gear driven sprinkler for medium to large areas, when pop-up feature is desired. Install flush at ground level. Sprays a single stream of water that rotates.

Will provide arc adjustment from 40º to 360º covering and area of 17’ to 66’.

Performance Charts

Mini-Pro

		30 PSI		40 PSI		50 PSI	
	Nozzle	Rad. Ft.	GPM	Rad. Ft.	GPM	Rad. Ft.	GPM
Std Angle	#.75	17’	.75	17’	.8	18’	.9
26º	#1	20’	.9	21’	1.2	21’	1.3
Radius	**#1.5**	**23’**	**1.4**	**24’**	**1.7**	**24’**	**1.9**
17’ to 30’	#2	25’	1.8	27’	2.1	27’	2.4
	#3	28’	2.7	30’	3.0	30’	3.3

The factory installed nozzle is the one shaded.

Pro-Sport

	40 PSI		50 PSI		60 PSI		70 PSI	
Nozzle	Rad. Ft.	GPM	Rad. Ft.	GPM	Rad. Ft.	GPM	Rad. Ft.	GPM
#5	45	5.1	47	5.9	47	6.5	49	7.1
#10	53	10.6	53	11.8	53	12.6	55	13.5
#15	57	13.0	59	14.2	59	15.4	63	16.5
#20	65	18.9	67	20.5	69	21.9	71	23.2
#25	67	22.8	71	24.8	75	26.5	77	26.8
#30	57	23.7	69	25.6	69	27.5	71	29.2

The factory installed nozzle is the one shaded.

Pro-Plus

		30 PSI		40 PSI		50 PSI		60 PSI	
	Nozzle	Rad. Ft.	GPM	Rad. Ft.	GPM	Rad. Ft.	GPM	Rad. Ft.	GPM
Low Angle	#1	22	1.5	24	1.7	26	1.8	28	2.0
12º	#3	29	3.0	32	3.1	35	3.5	37	3.8
	#4	31	3.4	34	3.9	37	4.4	38	4.7
	#6			38	6.5	40	7.3	42	8.0
Std Angle	#.5	28	0.5	29	0.6	29	0.7	30	0.8
26º	#.75	29	0.7	30	0.8	31	0.9	32	1.0
	#1	32	1.3	33	1.5	34	1.6	35	1.8
	#2	37	2.4	40	2.5	42	3.0	43	3.3
Radius	**#2.5**	**38**	**2.5**	**39**	**2.8**	**40**	**3.2**	**41**	**3.5**
28’ to 50’	#3	38	3.6	39	4.2	41	4.6	42	5.0
	#4	43	4.4	44	5.1	46	5.6	49	5.9
	#6			45	5.9	46	6.0	48	6.3
	#8			42	8.0	45	8.5	49	9.5

The factory installed nozzle is the one shaded.

TYPE OF SPRINKLER

Group 2: SMALL HEAD

CHART B

DESCRIPTION: K-SPRAY

Pop-up sprinkler. Ideal for small lawn areas. Install flush at ground level. Produces a constant fan of water for 4’ to 15’.

Performance Charts

Fixed Angle Spray Nozzles

	Pressure	7’-8’		9’-10’		12		15	
ARC	PSI	Rad. ft	GPM	Rad. ft	GPM	Rad. ft	GPM	Rad. ft	GPM
90	15	5	0.18	7	0.29	9	0.45	11	0.65
	20	6	0.21	8	0.33	10	0.53	12	0.75
	25	7	0.24	9	0.36	11	0.60	14	0.82
	30	8	0.26	10	0.39	12	0.65	15	0.92
120	15					9	0.60	11	0.87
	20			8	0.36	10	0.70	12	1.00
	25					11	0.80	14	1.10
	30			9	0.44	12	0.87	15	1.23
180	15	5	0.37	7	0.58	9	0.90	11	1.30
	20	6	0.42	8	0.65	10	1.05	12	1.50
	25	7	0.47	9	0.72	11	1.20	14	1.65
	30	8	0.52	10	0.79	12	1.30	15	1.85
240	20					10	1.29	12	1.95
	30					12	1.60	15	2.40
270	15	5	0.55	7	0.87	9	1.35	11	1.95
	20	6	0.63	8	0.98	10	1.58	12	2.25
	25	7	0.71	9	1.08	11	1.80	14	2.48
	30	8	0.78	10	1.18	12	1.95	15	2.78
360	15	5	0.74	7	1.16	9	1.80	11	2.60
	20	6	0.86	8	1.30	10	2.10	12	3.00
	25	7	0.96	9	1.44	11	2.40	14	3.30
	30	8	1.05	10	1.58	12	2.60	15	3.70
CST	20			3’ x 16’	0.85			4’ x 24’	0.8
	30			4’ x 18’	0.90			4’ x 30’	1.0
EST	20			3’ x 8’	0.41			4’ x 12’	0.4
	30			4’ x 9’	0.45			4’ x 15’	0.5
SST	20			3’ x 16’	0.85			4’ x 28’	1.1
	30			4’ x 18’	0.90			5’ x 32’	1.3

Variable Angle Spray Nozzles (VAN)

	Pressure	8’ Green		10’ Blue		12’ Brown		15’ Black	
ARC	PSI	Rad. ft	GPM	Rad. ft	GPM	Rad. ft	GPM	Rad. ft	GPM
90	20	9	0.40	9	0.40	10	0.45	13	0.55
	25	9	0.42	9	0.42	10	0.52	14	0.63
	30	10	0.45	10	0.45	12	0.55	15	0.70
	40	10	0.50	10	0.50	12	0.60	16	0.80
180	20	9	1.00	9	1.00	9	1.10	13	1.30
	25	9	1.10	9	1.10	10	1.21	14	1.49
	30	10	1.20	10	1.20	10	1.35	15	1.65
	40	10	1.25	10	1.25	11	1.53	16	2.00
270	20	9	1.40	9	1.40	9	1.60	13	1.90
	25	10	1.59	10	1.59	10	1.74	15	2.15
	30	10	1.75	10	1.75	10	1.395	15	2.35
	40	10	2.05	10	2.05	11	2.05	16	2.70
360	20	9	2.30	9	2.30	9	2.40	13	2.80
	25	10	2.51	10	2.51	10	2.61	14	3.26
	30	10	2.65	10	2.65	11	2.78	15	3.60
	40	11	2.75	11	2.75	12	3.03	15	4.10

TYPE OF SPRINKLER

Group 3: SHRUB HEAD

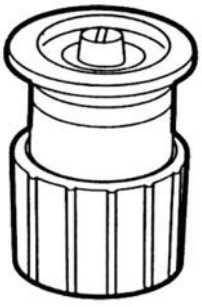


CHART C

DESCRIPTION: K-SPRAY SHRUB ADAPTER

Shrub spray sprinkler for ground cover, flower beds, garden areas, and shrub areas.

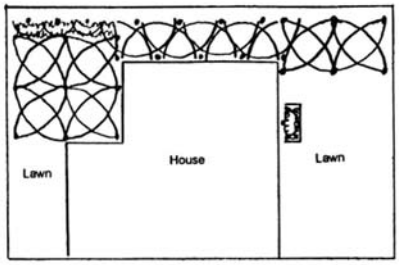
Shrub spray nozzles are mounted above the top of the foliage.

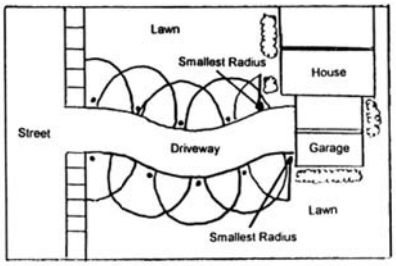
Use the shrub adapter fitting to adapt nozzle to 1/2” riser of appropriate height to suit shrub conditions.

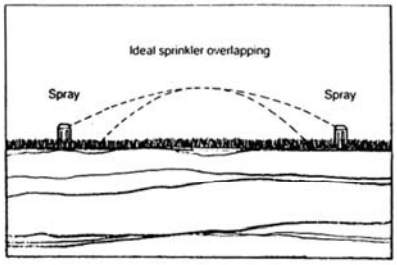
Use specifications shown in **CHART B.** Same spray nozzles are used for shrub spray sprinklers.

G. PLOT SPRINKLER LOCATIONS

Begin positioning your sprinkler locations on your property plan. Then use a pencil compass to draw the pattern for each head. Adjust the spacing to ensure complete coverage. Minimize spraying into sidewalks while ensuring full coverage. Make sure water does not hit the side of your house.



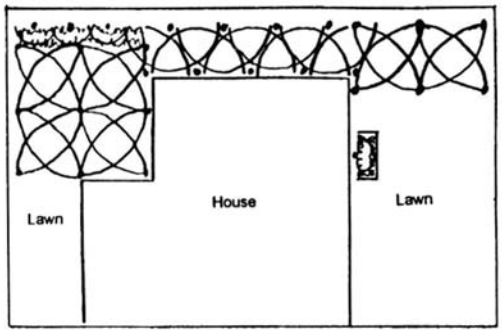


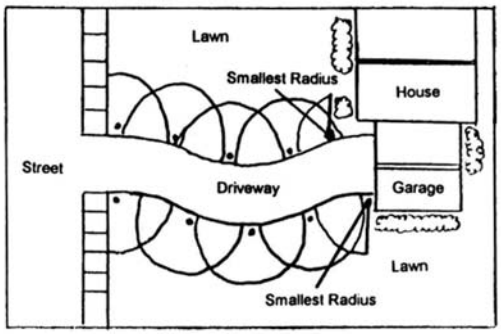


For best results, use quarter circle heads in corners, half circle heads along edges, and full circle heads for interior areas. Be sure to follow the spacing requirements and remember that the sprinkler patterns must overlap to assure full coverage. The distance of throw of all sprinklers may be adjusted. Therefore, if you plan to change the throw, you must position the sprinklers so that water will overlap properly.

EXAMPLE: Sprinklers adjusted to cover only a 30-foot radius, should be spaced 30 feet apart.

Large gear drive heads are fully adjustable from 40 degrees 360 degrees and offer somewhat more flexibility when positioning.





NARROW LAWN AND SHRUB AREAS:

In these areas, such as long narrow areas along the side of your house, you may require a combination of side strip, end strip and center strip heads. Center strip spray in two directions; end strip in one direction only; and side strip in narrow direction from the side.

End Strip

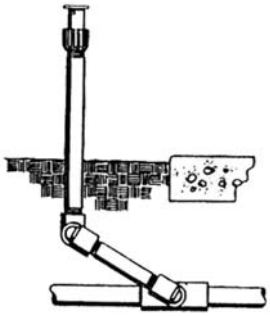
Center Strip

Side Strip

HELPFUL HINT: If a tree, bush or shrub obstructs the water throw of one sprinkler, this area will have to be covered by the throw of another sprinkler.

FLOWER BEDS & SHRUBS:

Use shrub spray heads in flowerbeds, shrub areas, planters and other areas that require soaking. Shrub spray heads should be installed on risers high enough to clear the plants they are watering. However, you may prefer to use a drip system for special areas. Drip offers four basic methods of watering: drip emitters, mist sprayers, low volume sprinklers, and soaker tubing. Please ask your dealer for more

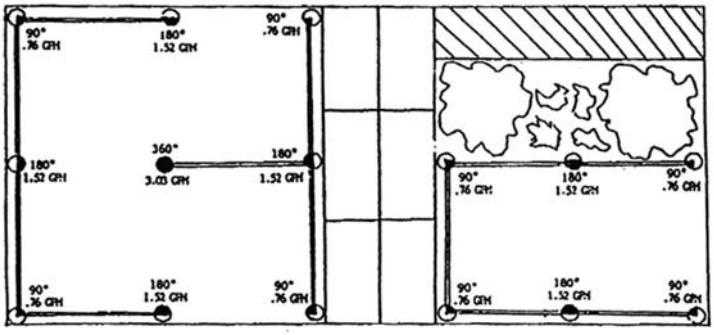


NOTE: Small spray heads have fixed arc nozzles and must be placed exactly, so the selected spray pattern will cover properly.

H. DIVIDE SPRINKLER SYSTEM INTO CIRCUITS

Once you have plotted the sprinkler location, divide your system into circuits. A circuit is a group of sprinklers on a common pipeline.

Referring to the sprinkler head chart. Write the G.P.M. requirements next to each sprinkler on your plan. Then group the sprinklers into circuits. Use colored pencils to highlight each circuit more clearly. Start at the control valve location (water source) and connect all sprinklers in the circuit and add the G.P.M. requirements as you go. Try to balance the system so that each circuit requires about the same G.P.M. (Please refer to the illustration below).



This chart is based on: 35 P.S.I. working pressure at sprinkler heads, ¾" service line, ¾" water meter and 7 G.P.M.

You may wish to group your sprinklers according to the water requirements of your lawn (remember do not mix large area heads with small area heads).

EXAMPLE: Sunny or sloped areas require more water than shaded areas of your lawn.

IMPORTANT: Make sure the total G.P.M. for each circuit is well within the available G.P.M. of your water system. If G.P.M. is excessive the circuit will not operate properly.

I. DETERMINE CONNECTING PIPE SIZE

If you are connecting to your mainline outside your house, you should use a SCH 40 pipe, from point of connection to your irrigation main shut off. If you are making your connection inside your house, you must use local copper or PEX pipe. You should call a plumber to do this connection or check your local codes. You should also use an approved cross connection tee (usually brass). This connection may have to be done by a plumber, depending upon your local regulations.

J. BACKFLOW

As you are connecting into you and your neighbour's drinking water supply, most municipalities require some form of acceptable backflow prevention. These devices help protect the public safely by preventing possible water contamination.

Your municipal water supplier will be able to advise you which type is required in your municipality. The device may be either:

- ♦ Atmospheric vacuum breakers
- ♦ Dual check valves
- ♦ Double check valve assembly

Most important, no matter which type is used, it must be installed properly and meet local codes.

K. PLAN CONTROL VALVES

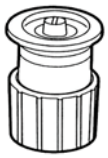
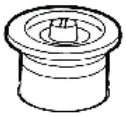
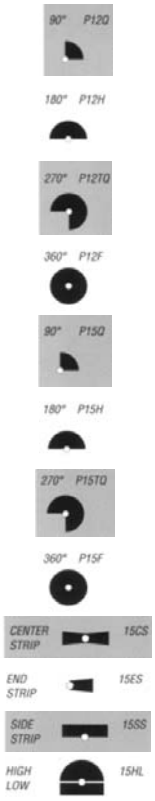
Each circuit will be operated by a separate control valve. A control valve is simply a way of controlling a group of sprinklers. These valves can be manual (operated by hand) or automatic (operated by an automatic timer).

Assemble your control valves in a group and join them to a water supply. Such a grouping of valves is called a "manifold".

Most systems have a manifold in the front yard, and another in the back yard. These manifold assemblies are usually located in an accessible location, and installed in a valve box flush with the surface of the lawn or shrub area it is located in.

Once your plan is complete, you are ready to purchase your materials and begin the actual installation. Use the "Materials Checklist" to make sure you have everything you need.

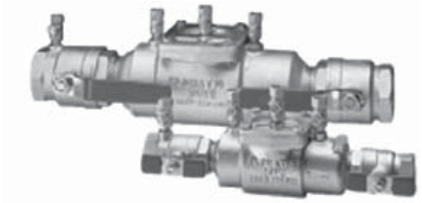
MATERIALS CHECKLIST

PRODUCT	DESCRIPTION	QUANTITY
	**LARGE HEAD** **MINIPRO, PROPLUS, PROSPORT** Adjustable gear driven sprinkler Adjustable from 40 – 360 degrees	
	**SMALL HEAD K-SPRAY** Spray pop-up sprinkler (body only)	
	**SHRUB HEAD** Shrub adapter fitting (less nozzle)	
	**NOZZLES FOR SMALL HEADS & SHRUB HEADS** 	

MATERIALS CHECKLIST

PRODUCT	DESCRIPTION	QUANTITY
	HIT VALVE Irrigation Control Valve (electric)	
	DURA VALVE BOX Underground Chamber for Valves 6” 10” 14” x 19”	
	HOSE BIB	
	OATEY PRIMER & SOLVENT FOR PVC	
	TEFLON TAPE	

MATERIALS CHECKLIST

PRODUCT	DESCRIPTION	QUANTITY
	**ELECTRONIC CONTROLLER K-RAIN**	
	**KING ONE-STEP WIRE CONNECTORS**	
	**LOW VOLTAGE MULTI-CONDUCTOR CONTROL WIRE**	
	**BACKFLO PREVENTOR**	
	**RAIN SENSOR** To shut off system when it rains	

MATERIALS CHECKLIST: PVC PIPE AND FITTINGS

	Size	Item #	Quantity
PVC Cement & Primer			
Clear PVC Cement	118 ml	OAT/CC118	
	236 ml	OAT/CC236	
Grey PVC Wet/Dry Cement	118 ml	OAT/CRS118	
	236 ml	OAT/CRS236	
Wet/Dry Primer	236 ml	OAT/PRS236	
Purple PVC Primer	118 ml	OAT/PP118	
	236 ml	OAT/PP236	
Thread Sealers			
Teflon Tape	1/2" x 480"	PA/TT	
Teflon Paste	8 oz	PA/TF8	
PVC Pipe Straps (2 Hole)			
	1/2”	ST/S05	
	3/4”	ST/S07	
	1”	ST/S1	

PVC Pipe & Fittings

Class 200 (SDR 21)

O.D.	I.D.	Wall	Max. PSI	Size	Item #	Quantity
0.840	0.716	0.062	200	1/2”	PVC/20005	
1.050	0.930	0.060	200	3/4”	PVC/20007	
1.315	1.189	0.063	200	1”	PVC/2001	
Schedule 40 (CSA) (SDR 17)						
0.840	0.622	0.109	600	1/2”	PVC/4005	
1.050	0.824	0.113	480	3/4”	PVC/4007	
1.315	1.049	0.133	450	1”	PVC/401	

	Size	Bag Qty	Item #	Quantity
Tee	1/2”	10	4/01005	
S x S x S	3/4”	10	4/01007	
	1”	10	4/01010	
Red Tee	3/4” X 3/4” X 1/2”	10	4/01101	
S x S x S	1” X 1” X 1/2”	10	4/01130	
	1” X 1” X 3/4”	10	4/01131	
Tee	1/2”	10	4/02005	
S x S x T	3/4”	10	4/02007	
	1”	10	4/02010	
Red Tee	3/4” X 3/4” X 1/2”	10	4/02101	
S x S x T	1” X 1” X 1/2”	10	4/02130	
	1” X 1” X 3/4”	10	4/02131	
Tee	1/2”	10	4/05005	
T x T x T	3/4”	10	4/05007	
	1”	10	4/05010	
Elbow 90°	1/2”	10	4/06005	
S x S	3/4”	10	4/06007	
	1”	10	4/06010	
	3/4 x 1/2 RED ELL		4/06101	
Elbow 90°	1/2”	10	4/07005	
S x T	3/4”	10	4/07007	
	1”	10	4/07010	
	3/4” x 1/2” FIPT	10	4/07101	
	1” X 1/2” FIPT	10	4/07130	
Elbow 90°	1/2”	10	4/08005	
S x T	3/4”	10	4/08007	
	1”	10	4/08010	

	Size	Bag Qty	Item #	Quantity
Street Elbow 90°	1/2”	10	4/09005	
Spigot x S	3/4”	10	4/09007	
	1”	10	4/09010	
Street Elbow 90°	1/2”	10	4/10005	
MIPT x S	3/4”	10	4/10007	
	1”	10	4/10010	
Marlex	1/2”	10	4/12006M	
Street Elbow 90°	3/4”	10	4/12008M	
MIPT x FIPT	3/4” x 1/2”	10	4/12101M	
Street Elbow 90°	1/2”	10	4/12005	
MIPT x FIPT	3/4”	10	4/12007	
	1”	10	4/12010	
Elbow 45°	1/2”	10	4/17005	
S x S	3/4”	10	4/17007	
	1”	10	4/17010	
Cross	1/2”	10	4/20005	
S x S x S x S	3/4”	10	4/20007	
	1”	10	4/20010	
Coupling	1/2”	10	4/29005	
S x S	3/4”	10	4/29007	
	1”	10	4/29010	
Red. Coupling	1” x 3/4”	10	4/29131	
Coupling	1/2”	10	4/30005	
T x T	3/4”	10	4/30007	
	1”	10	4/30010	
Riser/Extender MxF	1/2”	10	4/34005	
Female Adapter	1/2”	10	4/35005	
FIPT x S	3/4”	10	4/35007	
	1”	10	4/35010	
Male Adapter	1/2”	10	4/36005	
MIPT x S	3/4”	10	4/36007	
	1”	10	4/36010	
Red. Male Adapter	1/2” X 3/4”	10	4/36074	
MIPT x S	3/4” X 1”	10	4/36102	
	1” X 3/4”	10	4/36131	
Reducing Bushing	3/4” x 1/2”	10	4/37101	
Spigot x S	1” x 1/2”	10	4/37130	
	1” x 3/4”	10	4/37131	
Reducing Bushing	3/4” x 1/2”	10	4/38101	
Spigot x FIPT	1” x 1/2”	10	4/38130	
	1” x 3/4”	10	4/38131	
Red. Bushing	3/4” x 1/2”	10	4/39101	
Mipt x FIPT	1” x 1/2”	10	4/39130	
	1” x 3/4”	10	4/39131	
Cap	1/2”	10	4/47005	
Slip	3/4”	10	4/47007	
	1”	10	4/47010	
Cap	1/2”	10	4/48005	
FIPT	3/4”	10	4/48007	
	1”	10	4/48010	
Plug	1/2”	10	4/50005	
MIPT	3/4”	10	4/50007	
	1”	10	4/50010	

PVC Sch 80 Nipples

Size		Length	Item #	Quantity
1/4"	x	Close	8/80005	
	x	3"	8/80030	
3/8"	x	Close	8/81005	
	x	Short	8/81015	
	x	3"	8/81030	
1/2"	x	Close	8/82005	
	x	2"	8/82020	
	x	3"	8/82030	
	x	4"	8/82040	
	x	5"	8/82050	
	x	6"	8/82060	
	x	12"	8/82120	
	x	18"	8/82180	
	x	24"	8/82240	

PVC Sch 80 Nipples

Size		Length	Item #	Quantity
3/4"	x	Close	8/83005	
	x	2"	8/83020	
	x	3"	8/83030	
	x	4"	8/83040	
	x	5"	8/83050	
	x	6"	8/83060	
	x	12"	8/83120	
	x	18"	8/83180	
1"	x	Close	8/84005	

Cut Off Nipples (Marlex)

1/2"	x	6"	I/CON05	
3/4"	x	6"	I/CON07	

MATERIALS CHECKLIST: POLY PIPE & COMPRESSION FITTINGS

All Stainless Steel Gear Clamps

Size	Bag	Item #	Quantity
7/16”	10	PO/SSC6	
1/2”	10	PO/SSC8	
5/8”	10	PO/SSC10	
3/4”	10	PO/SSC12	
1”	10	PO/SSC16	

Oetiker Clamps

1/2” Utility Poly	PO/O198
3/4” Utility Poly	PO/O256
1” Utility Poly	PO/O331
Pincer	DAW/CT108

Poly Pipe

Non CSA 75 PSI

Size	Length	ID	Item #	Quantity
1/2”	100’		PO/U05100	
3/4”	100’		PO/U07100	
1”	100’		PO/U10100	

Poly Pipe 100 PSI

1"	100’	1.049	PO/P10100	
1 1/4”	100’	1.380	PO/P12100	

	Size	Bag Qty	Item #	Quantity
Tee	1/2”	10	PO/01005	
Ins X Ins X Ins	3/4”	10	PO/01007	
	1”	10	PO/01010	
Reducing Tee	3/4” X 1”		PO/01101	
Ins X Ins X Ins	1” X 3/4”		PO/01131	
Tee	1/2”	10	PO/02005	
Ins X Ins X FIPT	3/4”	10	PO/02007	
	1”	10	PO/02010	
Reducing Tee	3/4” X 1/2”	10	PO/02101	
90 Elbow	1/2”	10	PO/06005	
Ins X Ins	3/4”	10	PO/06007	
	1”	10	PO/06010	
90 Elbow	1/2”	10	PO/07005	
Ins X FIPT	3/4”	10	PO/07007	
	1”	10	PO/07010	

	Size	Bag Qty	Item #	Quantity
Reducing 90	3/4” X 1/2”		PO/07101	
90 Elbow	1/2”	10	PO/10005	
Ins X MIPT	3/4”	10	PO/10007	
	1”	10	PO/10010	
Cross	1/2”		PO/20005	
	3/4”		PO/20007	
Coupling	1/2”	10	PO/29005	
Ins X Ins	3/4”	10	PO/29007	
	1”	10	PO/29010	
Red. Coupling	3/4” X 1/2”	10	PO/29101	
	1” X 3/4”	10	PO/29131	
Female	1/2”	10	PO/35005	
Adapter	3/4”	10	PO/35007	
Ins X FIPT	1”	10	PO/35010	
Male Adapter	1/2”	10	PO/36005	
Ins X MIPT	3/4”	10	PO/36007	
	1”	10	PO/36010	
Increasing	1/2” x 3/4”	10	PO/36074	
	3/4” x 1”	10	PO/36102	
Reducing	3/4” x 1/2”	10	PO/36101	
	1” x 3/4”	10	PO/36131	
Plug	1/2”	10	PO/49005	
Insert	3/4”	10	PO/49007	
	1”	10	PO/49010	

STEP THREE: INSTALLING YOUR SYSTEM

The hardest part of doing your sprinkler system is now accomplished. You've designed it or had it designed and you've paid for it. Now all you have to do is pick a weekend, install the system, and sit back and let it do your work for you. Let's get started!!!

A. TOOLS REQUIRED

Shovel
Rake
Measuring tape
Pipe wrench
Pipe cutters or hack saw
Flags or stakes

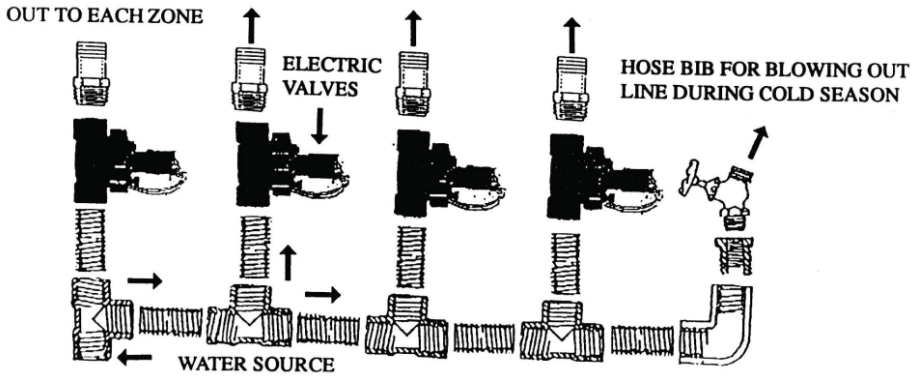
B. WATER SOURCE FOR SPRINKLER SYSTEM

Connect to supply line from water meter or main shut off. If you are reluctant to do this, have a plumber cut into the supply line and run the pipe to the best location for the sprinkler system valves, both in the front and rear yard areas. Have a full flow gate valve installed in this line (so water can be shut off for winterization of your system).

NOTE: In most municipalities, a backflow preventor must be installed after the shut-off valve. Consult your dealer for assistance.

C. MANIFOLD ASSEMBLY

If your supplier is having you use threaded PVC fittings for your manifold, then it should look like this below. Follow these steps:
1. Dig a hole that is big enough to fit the valve box, allowing about 6 8 inches of leeway on all side.
2. Layout fittings as they will be, when assembled.



3. Wrap all threads with Teflon tape, recommended 2 to 3 revolutions per thread.

4. Assemble your manifold (be sure to note the flow of the water through the valve). A general rule is to tighten fittings hand tight, plus one turn with a pipe wrench.

HELPFUL HINT: Once tees and elbows are assembled, it is impossible to thread valves on. So begin by assembling the valves to the appropriate tees and elbows.

5. Connect to water source fitting.
6. Place completed manifold assembly into the hole you have dug.
7. Turn on water and check for leaks.
8. Shut off water.
9. Now place gravel or drain rock underneath the valve assembly.

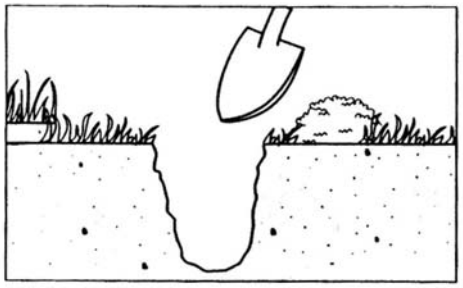
D. CONTROL WIRING

1. Control panel may be located in any indoor convenient place near a 110 volt outlet. o.e.: garage. Install controller in chosen location as per manufacturer's instructions. Do not plug it in until all wiring is complete.
2. Wiring is simple. Take one wire from each soenoid , amd attach the white common wire from the multi-conductor wire. Now, attach each remaining wire from the solenoids to coloured (hot) wires from the multi-conductor wire. Seal each connection in waterproof "wire connectors".

E. INSTALLING SPRINKLERS, PIPES AND FITTINGS

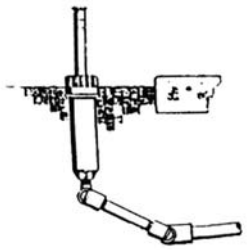
Take this part of the installation one circuit at a time. Then you can see it operate before moving onto the next one. Follow these simple instructions for each zone.

1. Decide which zone you wish to begin with. From your design, measure out the location of the sprinkler heads, and place a stake at each location.
2. Make a trench where the pipe will be located. Trenching should be done by making a "V" cut in the turf, removing sections and placing it alongside the trench. Put the soil on one side, and

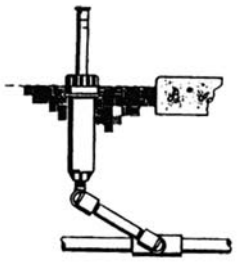


HELPFUL HINT: You can place more than one pipe in a trench if necessary, simply make your trench slightly deeper to allow for multiple lines.

3. Assemble the sprinklers to their appropriate tee or elbow. (as per diagram)



PVC SWING JOINT WITH ELBOW CONNECTION



PVC SWING JOINT WITH TEE CONNECTION

4. Place pipe in trench. Polyethylene pipe is very flexible so you may have to place some dirt on top of pipe, in order to hold it in place.

5. Now begin your assembly of fittings to the pipe.

6. When leveling the pop-up sprinkler with the turf, it should sit flush with the sod. Remember that you will be mowing the lawn and you do not want to have to replace sprinklers that are set too high. You also do not want the lawnmower to drop into a hole left from the installation.

HELPFUL HINTS: Place a board across the top of the sprinkler head, so that it stretches from one side of the trench to the other. Hold the board down by placing your feet on either side of the trench.
This will put your head at turf level. Now, fill in the hole with soil and tamp it down firmly with your foot

7. Sprinklers in shrub areas should be placed at a height that is in accordance with the present height of the shrubbery or plant material. Shrub heads should be slightly above the highest shrub that they are meant to cover.

HELPFUL HINTS: Pipes in shrub beds and gardens should be placed as close to the edge of the area as possible. This ensures that when future digging is required, you will remember where it is.

8. Continue with the installation, including all tees required to join lateral lines. Working toward the valve manifold, your final connections should be into the male adapter at the appropriate valve.

9. Your circuit should be fully installed now. We recommend that you turn the circuit on for approximately 30 seconds, to allow any dirt and debris in the lines to escape before placing the appropriate nozzles and screens in the sprinklers.

10. Turn the circuit on and adjust the sprinkler arcs and radiuses, as follows:

HELPFUL HINTS: Adjustment of sprinklers should be done when your house water pressure is at a maximum (no other water is being used in the household). This is because you will probably be watering at night, when there is no other water use, and radiuses change according to pressure.

ı) Small Area Heads

- Radius is adjusted by simply turning the screw in the center of the head, with a small screwdriver, clockwise or counter-clockwise until the desired radius is achieved.

- arc is adjusted by simply grabbing the stem (the part of the sprinkler that is popped-up) and ratcheting it, until it is spraying in the correct direction.

NOTE: If the arc is too small or too great, you should refer to your list of available nozzles, and select a nozzle closer to what you want to achieve.

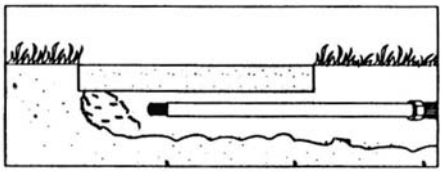
ı ı) Large Area Heads

- refer to manufacturer's directions

11. Replace remaining soil and sod into the trenches and tamp down.

HELPFUL HINT: To get sod back to as close to original condition as possible; tamp sod with the back of your shovel, water the trench, and tamp again with your foot or shovel.

12. After appraising and accepting your work, go onto the next zone and follow the same instructions



HELPFUL HINT: For going under obstacles, attach your hose to a length of pipe with a hosepipe adaptor. Place the end of the pipe where you want it to tunnel, for example under a concrete sidewalk, then turn on the water. Push the pipe under the obstacle as the water pressure cuts a channel. Be careful to avoid damaging walls and driveways by washing away too much soil.

F. INSTALLATION OF VALVE BOX

After all the zones are installed, place the valve box over the top of the manifold assembly and bury it, so that the top of the valve box is flush with the ground.

G. MANUAL SPRINKLER SYSTEMS

Manual systems are installed using the same procedures as above. Use manual gate valves or ball valves in place of automatic drain valves. Wiring and control wiring instructions do no apply.

H. TESTING

Test your sprinkler system automatically now. Program the controller to turn each zone on for approximately two minutes, then watch as each zone turns on, one at a time, until all zones have watered. If you are satisfied with the look of your sprinkler system, program your sprinkler system to come on at the desired time, with the desired length of time per zone. Now sit back, relax, and let your sprinkler system do the work of watering for you.

I. RAIN SENSOR INSTALLATION PROCEDURES

1. After the sprinkler system is fully installed, but before doing the final program of the controller, you could install the rain sensor.
2. Unplug the control panel.
3. Locate an unsheltered place where the rain sensor will receive the maximum amount of rainfall.
4. Install the rain sensor on a wall or appropriate structure.
5. Run the wires to the valve assembly, if necessary, digging them into the ground.

HELPFUL HINT: Wire can easily be hidden behind drain spouts, by either using wire clips or a staple gun. (If using a staple gun be sure not to harm the wires.)

6. Find a place in the common (white) wire, where it can be easily cut.
7. Cut the wire and join one wire of the rain sensor wires, to one end of the cut wires, and the remaining wire to the other end of the cut wire.
8. Set your rain sensor to the desired setting (usually 1/8" ¼" is recommended).
9. There should also be manufacturer installation instructions inside the box.
10. Plug in the controller, program the controller, and you're all set!!!

GENERAL INFORMATION

A. AUTOMATIC CONTROLLERS

Automatic controllers provide the ultimate in watering convenience and conservation. They can be preset to activate any circuit from one to ninety-nine minutes any time of day, and any day of the week. Dual programming features allow different scheduling for lawn and shrubs. The controller will have to be sized large enough to control the valves in the system. No more staying at home to water the yard or getting someone to water while you're on vacation.