

Institutional Spray

Rugged, Water-Saving Sprinklers Designed for Commercial, Institutional, and Public Area Applications



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Institutional Spray

PRODUCT OVERVIEW

There is a Hunter sprinkler that delivers the ultimate in water savings, as well as the durability of a rugged design. From top to bottom, the Hunter Institutional Spray (available in a shrub model, 4", 6", and 12" pop-ups) combines exceptional strength with a complete range of innovative features... just the need for high traffic area installations.

With the Institutional Spray, Hunter provides the industry with a spray head built for high-pressure operation. A pressure regulator built into the stem maintains a constant outlet pressure of 30 PSI with inlet pressures ranging up to 100 PSI regardless of the nozzle installed. This single feature allows nozzle performance to always be at maximum efficiency regardless of the inlet pressure providing a substantial savings of water.

You'll find the construction of the Institutional Spray is brawny and durable, made of a super tough ABS plastic that is the best type of material for spray heads due to its strength. A multi-buttress thread design is used with great success for fast and easy servicing. A flat body cap, with a UV resistant wiper seal that allows your system to work at maximum efficiency while delivering effective performance highlights the Institutional Spray. Some crucial features the installer will value are the side inlet on the 6" and 12" models, the easy pull-up flush plug, and the ratcheting riser stem.

In addition to all these great features, there's one more that helps make the Institutional Spray even better: No flow-by at pressures above 10 PSI! Designed specifically to handle higher water pressures as proficiently as low, the wiper seal's perfect fit eliminates wasteful leakage and flow-by, allowing your irrigation system to provide you with the most effective coverage possible.

The Institutional Spray—it's the ultimate in spray head design and function for residential and commercial landscape and turf applications from a name you can trust.



PRODUCT FEATURES AND BENEFITS



Pressure Regulation... The most efficient water-saving device offered

For long pipe runs with wide variations in available pressure, large elevation changes that make design difficult, or high and variable pressure situations that create nozzle performance problems, the Institutional Spray provides a comprehensive solution. A pressure regulator built into the stem that maintains a constant outlet pressure of 30 PSI with inlet pressures ranging up to 100 PSI regardless of the nozzle installed. This single feature allows nozzle performance to always be at maximum efficiency regardless of the inlet pressure. Unlike pressure compensating disks or screens, no additional parts are needed or can get mixed up with the wrong nozzle type at the job site.





The Institutional Spray pressure regulator is sufficiently dirt tolerant, allowing installers to flush through the sprinkler when installing and starting up a new system.

"Fogging and misting," the result of systems operating under high pressure, will also no longer be an issue. All in all, the Institutional Spray's pressure regulator saves time, water, and money.

Built-in Anti-vandal, Anti-geyser Device... A true water-saver spray head providing peace-of-mind

The Institutional Spray incorporates a mechanism, which reduces water flow through the head when the nozzle is missing or broken.

Spray head maintenance seems to always include the replacement of vandalized or broken nozzles. But, before those nozzles are replaced a lot of water is lost as "geysers" (the water shooting up out of a spray head), which typically ends up in the street. This extreme water loss is not only

With



Without

costly, increasing the water bill significantly, but there is a high risk for accidents and property damage. When using the Institutional Spray, water flow will be lowered by 70% if the nozzle is removed or damaged, reducing water costs and the potential risks of accidents and property damage.

If no nozzle is installed



Institutional Spray



Anti-drain Check Valve...

Elevation changes are no longer an issue

The Institutional Spray family anti-drain check valve, which is factory installed or available as an optional part, will hold back an incredible 14' of elevation change. When an Institutional Spray body is ordered with the check valve pre-installed from the factory, the words CHECK VALVE are stamped in white lettering on the cap to aid in spray head identification.

This Hunter check valve is unique in this class of spray heads because it may also be field installed after head installation. Contractors or irrigation maintenance personnel will appreciate the fact that if the Institutional Spray is installed without a check valve, but is found to require one at a later date, it can be easily added into the bottom of the riser assembly.

A significant advantage of a spray head check valve is its ability to trap water in the system piping. This substantially reduces wear on system components by minimizing surges (water hammer)

when the valve opens.



No wasteful low-head drainage

Also, by stopping low head drainage, the Institutional Spray check valve will put an end to landscape damage caused by flooding and erosion.

Heavy-Duty Body Construction... Robust design stands up to high traffic areas

The Institutional Spray body has been designed to withstand the harshest environments. The material used to construct the body and cap is super tough ABS plastic that



Heavy duty ribbing



Stands up to heavy traffic

has been molded with dimensions that furnish the highpressure ratings given to this sprinkler. A multi-thread buttress design is used on the cap (because of its superior strength in cap-to-body gripping capacity) making the head very robust when it comes to withstanding high inlet surge pressures. Also contributing to its outstanding ruggedness, external ribbing is molded

into both the body and cap to strengthen the unit against heavy traffic such as riding lawnmowers or other heavy equipment.

Ratcheting Riser... Quick arc alignment

Turning the riser stem on the Institutional Spray by "ratcheting" will quickly and easily align the spray pattern to the correct position. This adjustment can be made while the sprinkler is operating, allowing one to align the spray pattern within the proper boundaries as required.

The Institutional Spray's ratcheting system is an integral part of the body and riser stem. This integration aids in making it a very sturdy and robust ratchet system.

The body of the Institutional Spray also works in conjunction with the ratcheting riser stem by providing six internal ribs which substantially increase the stability of the ratcheting system. With six ribs in the body, riser "walk" (the 'twisting' tendency of the riser, induced by the up and down action of the retract spring) is eliminated.

FEATURES AND BENEFITS (continued)

Multi-function Wiper Seal... Water efficient and long life

The Institutional Spray comes with a heavy-duty pressure-activated multi-function wiper seal which has been treated with UV inhibitors to insure long life when constantly exposed to the sun's rays. The flow-by is



Seal grips riser at top and bottom—eliminating wasteful flow-by

0 GPM at 10 PSI or greater and only 0.1 GPM otherwise. This no flow-by allows installers to add more heads on the same valve.

The additional wiper seal support in the Institutional Spray helps to ensure strength and reliable performance of the wiper seal under higher pressures. Plus, in the field, the wiper seal can be easily removed from the cap. This permits easy cleaning or replacement and keeps the benefits of no flow-by during operation as well as a positive retraction every time.



Compatible with All Female-Threaded Nozzles... Accepts all major brands

The Institutional Spray is fully compatible with all the popular female-threaded nozzles in the industry widely inventoried by contractors. In addition, Hunter's complete line of compatible nozzles, including the adjustable and fixed arcs as well as specialty units such as the Micro-Spray or PCN Bubbler nozzle, are available for a total installation. Now installers can irrigate any landscaped area with the Hunter spray head line.

Handy Flush Plug... Makes flushing and nozzle

Makes flushing and nozzle installation fast and easy

The Hunter Flush Plug is a new innovative design that positively keeps muddy water and debris from entering back into the spray head after flushing is complete. It is designed to open as the stem extends upward and completely close when the stem is in the retracted position. The flush plug allows the flushed water to escape only in one direction, which is ideal when trying to keep water off



Directional flushing action



Pull-ring flush cap

effortless pull up of the riser stem, making installation of nozzles easier and quicker.





Standard female thread nozzles

Institutional Spray

Standard Side Inlet... Installation convenience for deep-seated bodies



Side inlet reduces digging

The 6 and 12-inch models come with a standard ½" sideinlet for installation in shallow depth trenches making retrofits or new installations easy to accomplish. The side plug is removable and placed in the bottom inlet for quick versatility in challenging sites.

Heavy-Duty Spring... Positive retraction under any conditions

With its heavy-duty high-grade stainless steel spring, the Institutional Spray provides dependable stem retraction time after time. The spring and multi-function wiper seal work together to assure no more "stick-ups" in harsh environments, eliminating the least effective use of contractors time-the callback.

Optional Black Rubber Cap Cover... Ideal for high traffic and play areas

Now, **all** your Hunter sprinklers on the project can provide a degree of protection in high traffic or play areas when the spray head rubber cover is used on the Institutional Spray. This rubber cover serves the same function as the rubber cover on the rotors. An important feature to those who come in contact with the top of the sprinkler in an abrupt manner. This black spray head rubber cover is fieldinstallable and may be ordered using P/N 469805. Purple reclaimed water I.D. cap (P/N 458530)

Reclaimed Water I.D... Options for effluent water use

Watering with reclaimed water? Ask for the field-installable purple Hunter spray head body cap (P/N 458530) for permanent and confident identification. The cap can easily be screwed onto Institutional Spray bodies before installation. Or ask for the field-installable

purple Hunter spray head cap cover (P/N 469800) for quick and confident identification. The cover can easily be snapped onto Institutional Spray body caps either before or after installation.

5-Year Warranty... Hunter Industries backs up its products

A full five-year warranty by Hunter communicates to our customers that the Institutional Spray stands up to the environment. The end-user can be assured of a quality product with a guarantee of dependable operation.

Date Coding...

Identify exactly when the spray head was manufactured

Hunter spray heads, including the Institutional Spray, have the manufactured date code molded on the top of the cap near the wiper seal. The date is molded as a 4-digit code, the first two digits representing the calendar quarter, the last two digits indicating the year (e.g., 02 05 stands for 2nd Quarter, 2005).



Sprayhead body cap cover (P/N 469800)

PRODUCT COMPARISONS

FEATURES	Hunter® Institutional Spray	Hunter® Institutional Spray CHECK	Rain Bird® 1800 PRS	Rain Bird® 1800 SAM-PRS	Toro® 570Z PRX	Toro® 570Z PRX COM
Pressure regulation in-stem	v	~	✓	~	v	v
Pressure regulator rated to 100 PSI	~	~				
Optional "field installed" drain check valve	~	included				
Check valve controls up to 14' of elevation change	option	~	N/A	v	N/A	~
Heavy-duty external ribs on body and cap	~	~				
Ratcheting riser	~	~	~	~	~	~
No flow-by wiper seal at 10 PSI	~	~	~	~	~	~
Serviceable wiper seal	v	~			~	v
Accepts industry standard female thread nozzles	~	~	~	~		
Positively self-sealing flush plug	~	~				
Directional flow flush plug	~	v				
Standard side-inlet on 6" and 12"	 ✓ 	~	~	~	6" option	
Optional reclaimed water identification body cap	~	~				
Optional rubber cover	~	~				
5 Year warranty	~	v	v	v		

TECHNICAL INFORMATION

MODELS

INST-00 – Shrub INST-04 – 4" Pop-up INST-06 – 6" Pop-up INST-12 – 12" Pop-up

DIMENSIONS

 Overall height: INST-00 – 3¾" (9.6 cm) INST-04 – 5½" (15.5 cm) INST-06 – 8¾" (22.5 cm) INST-12 – 16¼" (41 cm)

• 1/2" female inlet NPT

• Exposed diameter: 21/4" (6 cm)

OPERATING SPECIFICATIONS

- Pressure range: 15 to 100 PSI (1.0 to 6.9 bars; 103 to 689 kPa)
- Flow-by: 0 at 10 PSI (.07 bars; 69 kPa) or greater; 0.1 GPM (0.02 m³/hr; 0.4 l/min) otherwise
- Maintains constant outlet pressure at 30 PSI, with varying inlet pressures up to 100 PSI.
- Precipitation rates: approximately 1.5" (38 mm) per hour using Hunter nozzles

OPTIONS AVAILABLE

- Optional field-installed drain check valve for up to 14' (4.3 m) elevation change. P/N 437400
- Optional field-installed reclaimed water identification body cap. $\ensuremath{\text{P/N}}$ 458525
- Optional field-installed black rubber cover. P/N 469805
- Optional field-installed reclaimed water identification cover.
 P/N 469800

SPECIFICATION GUIDE

EXAMPLE: INST - 06 - CV - 15H

MODEL	POP-UP HEIGHT	OPTIONS	NOZZLE SERIES	PATTERN
INST = Institutional Spray	00 = Shrub	CV = Factory-Installed	8 = 8 Series	A = Adjustable
(Includes Factory-	04 = 4" Pop-up	Drain Check Valve	10 = 10 Series	Q = Quarter-Circle
Installed Pressure	06 = 6" Pop-up	(Pop-up Models Only)	12 = 12 Series	H = Half-Circle
Regulator)	12 = 12" Pop-up	CV-R = Factory-Installed	15 = 15 Series	F = Full-Circle
		Reclaimed Body Cap	17 = 17 Series*	

Note: Bodies and nozzles sold separately. Also compatible with Hunter's bubbler and specialty nozzles. * 17 Series available in Adjustable, Quarter, and Half-Circle patterns only.



Pressure Regulation Payback Analysis

Estimated Water & Dollar Cost Savings Using Hunter Institutional Sprays

Fill in boxes A through R to determine your initial investment return using Hunter Institutional Sprays

Current nozzle operating pressure PSI			Α		
Enter the operating pressure for an individual zone or the aver system. If only static pressure is available, subtract 20 PSI from pressure estimate.	rage operating pressure for the en m static pressure to use as a "rou	tire gh"			
Multiplier number from Multiplier Table correspon	nding to				
the nozzle operating pressure	0		B		
Optional: Actual total GPM of zone or system at cu	urrent				
Actual GPM measurements for a zone taken from the existing	water meter will				
be your most accurate.					
Total GPM of zone or system at 30 PSI (Refer Hunter	Product Catalog Nozzle Specifica	tions)			
If zone pressure is used for A, use zone GPM, if A is for a comp	plete system use total system GPl	И.			
If C is socilable subtract D for m C					
This is actual water savings in GPM.					
If C is not available, multiple B and D together –					
This is estimated water savings in GPM.					
American and a since and dear in an investor					
Average watering time per day in minutes			G		
Average watering days per week					
Average watering weeks per year					
Multiply (E or F) and G, H and I.					
This is the yearly water savings in gallons.					
Water unit cost per 1000 gallons or	¢	/ 1000 =		¢	
water unit cost per 1000 galons of	Ψ			Φ	
Water unit cost per 100 cubic feet (HCC)	\$	/ 748 =	K	\$	
N 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				•	
Multiply J and K This is the estimated cost of water savings ber year				Þ	
Actual cost savings may vary due to site conditions unaccount	ted for.				
Calculate the estimated cost of upgrading to	Price of Institutional Spr	ay	- 17/1	\$	
Hunter Institutional Spray	Price of standard spray h	ead			
				\$	
Subtract N from M			0	\$	
This is the price difference of the spray heads.					
Number of spray heads in analysis			P		
Multiply O and P				\$	
This is the cost of upgrading to Institutional Spray.					
Divide Q by L then multiply by 12 months			R		
I ms is the estimated investment payback in months.					



Example: Nozzle Specifications

Nozzle Operating Water Pressure: Number of Spray Heads: 10 15H $\frac{4}{14}$ 15Q Total Zone GPM: 22.32 60 PSI 1.86 GPM each (catalog spec. at 30 PSI) 0.93 GPM each (catalog spec. at 30 PSI) at 30 PSI

Example: Calculations

Estimated	Water & Dolla	ar Cost	Savings U	sing Hunter	Instit	tutional Sprays
ill in boxes A through R to determine your initial investmen	nt return using Hu	unter Instit	utional Spray.	s		
Current nozzle operating pressure (PSI)						60
Enter the operating pressure for an individual zone or the au ystem. If only static pressure is available, subtract 20 PSI fr ressure estimate.	verage operating p om static pressure	pressure fo e to use as	r the entire a "rough"		Λ	00
Multiplier number from Multiplier Table corresp	onding to					
he nozzle operating pressure					В	0.41
Optional: Actual total GPM of zone or system at	current					
pperating pressure, if available Actual GPM measurements for a zone taken from the existing the your most accurate.	ng water meter w	vill			С	
Fotal GPM of zone or system at 30 PSI (Refer Hunt f zone pressure is used for A, use zone GPM, if A is for a co	ter Product Catalo Somplete system us	og Nozzle se total sys	Specifications tem GPM.)	D	22.32
f C is available, subtract D from C <i>Fhis is actual water savings in GPM</i> .					Ε	
f C is not available, multiple B and D together <i>Chis is estimated water savings in GPM</i> .					F	9.15
Average watering time per day in minutes					G	В
Average watering days per week					Н	5
Average watering weeks per year						40
Multiply (E or F) and G, H and I.					J	14640
ms is the yearty water savings in gauons.				11000		
Water unit cost per 1000 gallons or	\$	5		/ 1000=	K	\$
Water unit cost per 100 cubic feet (HCC)	\$	5	1.90	/ 748=	Κ	\$ 0.00254
Multiply J and K					-	\$ 37.19
This is the estimated cost of water savings per year. Actual cost savings may vary due to site conditions unaccou	nted for.					
Calculate the estimated cost of upgrading to	Price of Ins	stitutional	Spray		М	\$ 5.60
Tanter Institutional Spray	Price of sta	andard sp	ray head		М	\$ 2.60
Subtract N from M This is the price difference of the spray heads.					0	\$ 3.00
Number of spray heads in analysis					Ρ	14
Multiply O and P This is the cost of upgrading to Institutional Spray.					Q	\$ 42.00
Divide O by L then multiply by 12 months					D.	477 55
Sivile Q by L then multiply by 12 months					K	13.55

Pressure Regulation Cost Analysis Multiplier Table

Pressure (PSI)	Multiplier Number
30	0
35	0.08
40	0.16
45	0.23
50	0.29
55	0.35
60	0.41
65	0.47
70	0.53
75	0.59

The values in this table were derived from Bernoulli's equation (5.19). Please refer to Roberson/Crowe, Engineering Fluid Mechanics (Fourth Edition), Houghton Mifflin Company, Boston, MA, 1990.

In the table above, Bernoulli's equation was applied to calculate the Potential Water Savings multiplier. This multiplier depicts the amount of water that could be saved by operating standard spray heads at 30 PSI.

INSTALLATION DETAILS



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INST-04, 06 & 12: REPLACEMENT PARTS

ltem	Description	i				Catalog No.								
1	Flush Cap-E	Blue				423905								
2	Snap-On Ri	ubberCover		Bla	ack	469805								
				Pu	rple	469800								
3	Body Cap	Standard (Black)				458510								
		With Check Valve I	D (Black)			458515								
		Reclaimed Body Cap (Purple)												
		ırple)	458535											
4	Wiper Seal		472300											
5	Spring (Not	Spring (Not shown to scale) 4"												
					6"	460400								
					12"	460500								
6	Riser				4"	437505								
					6"	459105								
					12"	462205								
\bigcirc	Check Valve	e Assembly				437400								
8	Body	/ 4" w/o Side Inlet												
		6" w/ Side Inlet												
			12" w/ Si	de l	nlet	459000								
9	Side Plug (Not available on 4" m	nodel)			460600								



PRODUCT OVERVIEW

When spray sprinklers are used in irrigation systems, fast and easy installation are two of the most important concerns for the installer. And, both of these concerns are put at ease when the installer chooses to use one of the many choices of Hunter spray nozzles. Whatever the particular landscape need, Hunter has the nozzles that can do the job best. In fact, any spray head body that uses femalethreaded nozzles (whether a Hunter spray body or a competitor's) can have the ultimate in versatility with a Hunter nozzle.

Adjustable Arc Nozzles: The Ultimate in Convenience. Hunter's famous patented Adjustable Arc nozzles are fully adjustable from 25° to 360°, thus virtually every landscape need can be met. The nozzles are available in radius ranges of 8', 10', 12', 15', and 17', (2.4 m, 3.0 m, 3.7 m, 4.6 m, 5.2 m), and are color-coded in brown, red, green, black, and gray for fast and easy radius identification. The most notable advantage of the Adjustable Arc nozzle is that there is no need to keep an inventory of the many different odd arc nozzles seldom used on jobs.

Pro-Spray Nozzles: Superior Coverage. Hunter's Pro-Spray nozzles are factory set at a quarter, half, or full circle pattern. These nozzles are available in radius ranges of 8', 10', 12', 15', and 17', (2.4 m, 3.0 m, 3.7 m, 4.6 m, 5.2 m), and are also color coded in brown, red, green, black, and gray for fast and easy radius identification. In addition, Hunter now offers a trio of short-radius nozzles in 2', 4', and 6' ranges (0.6 m, 1.2 m, 1.8 m). These new nozzles are just the answer for small spaces that have longed for a better solution than trying to drastically reduce the radius range on a nozzle designed for longer throws.

The clear advantage of the Pro-Spray nozzle is an economic one. When installing nozzles along straight runs or in areas that require full circles, labor will be saved by not having to adjust each nozzle to these common patterns. Micro-Spray Nozzles: Vandal-Resistant, Low Volume Watering. The unique pop-up design of the Hunter Micro-Spray Nozzle, coupled with the fact that it attaches directly to a female-threaded pop-up spray sprinkler, makes this alternative to drip a winner. When not in use, both the nozzle and the spray head body retract, so nothing sticks up above the surface. And when it's in operation, the pop-up nozzle gives nearly an extra inch of clearance over plants. With its many body options of various pop-up heights and nozzle selections, the Hunter spray line is a complete line, providing solutions to every landscape spray head application.

Specialty Nozzles: Special Watering Requirements Made Easy. For the specific watering needs of narrow areas of your landscape, Hunter offers a full range of nozzles for specialty applications. Three strip pattern nozzles are available, including a left corner, right corner, and side strip model. For the watering needs of slope or non-turf areas, the S-8A and S-16A nozzles can be used. These nozzles are adjustable-arc stream spray type nozzles providing a multiple stream spray pattern to cover any area from 25° to 360°, up to an 18' radius.

PCN Bubbler Nozzles: The Alternative to Drip. When bubblers are the apparent choice to water plantings, Hunter has a better solution: the PCN nozzle. This nozzle functions like a spray nozzle but operates like a bubbler by placing water around the riser. The PCN nozzle threads directly onto any female-thread pop-up spray head body, allowing it to retract to ground level. The result is no more unsightly bubbler risers sticking up out of the landscape. Because its ability to remain out of sight reduces vandalism and repair, the PCN is your best choice for traditional bubbler applications.

PRODUCT FEATURES AND BENEFITS

Short Radius Nozzles...

2', 4', and 6' radius for those tight hard-to-water areas

Hunter now offers a trio of standard quarter and half arc pattern short-radius nozzles in your choice of radius: 2', 4', and 6' (0.6 m, 1.2 m, 1.8 m). These new nozzles are just the answer for small spaces that have longed for a better solution than trying to drastically reduce the radius range on a nozzle designed for longer throws. Quarter and half only.

Strip Pattern Nozzles...

Narrow areas, no problem

To accommodate the needs of those long, narrow planting strips, we offer the industry's widest variety of nozzle solutions, including $5' \times 15'$ corner and end strips, $5' \times 30'$ and $9' \times 18'$ side strips, and a $5' \times 30'$ center strip. The radius of these nozzles can be adjusted down 25% without loss of an efficient pattern distribution. And, no matter which nozzle you choose, each is an excellent problem solver for keeping your irrigation needs under control in tight areas.



Stream Spray Nozzles... Customized low application rate arcs

Hunter also offers two dial-setting, adjustable arc stream spray nozzles that throw as far as 18' (5.9 m) at 30 PSI (206 kPa) combining the convenience of customized arc selection with a lower application rate. The stream spray is an outstanding nozzle to use on slopes and ground cover areas with tight soils as these applications typically require low precipitation rate nozzles.



Filter Screen... Large surface area

Along with every nozzle comes a large filter screen that prevents clogging from debris in the water, ensuring uniform coverage. This filter is easy to install; it drops in from the top.



Matched Precipitation... Even distribution of water regardless of the arc

In properly installed irrigation systems, quarter-, half-, full-, and odd arcs are designed to be used on the same zone. Hunter spray nozzles produce true matched precipitation across most popular arc and radius ranges, with even distribution of water regardless of the arc. This allows for efficient, even distribution of water throughout the entire area. Hunter's matched precipitation nozzles increase customer satisfaction by providing a greener, healthier landscape.

Matched Precipitation Rate Sprinklers



Standard Female Threaded Design... Compatible with the most popular brands

A variety of spray sprinkler bodies on the market today require a female threaded nozzle. All Hunter spray head nozzles meet that standard and are completely compatible with most major brands. This makes the nozzles ideal both for new installations and service of existing systems.

Adjustable Arc Nozzles...

Quick and easy; performance at its max

With an easy turn by hand, you can change the Adjustable Arc nozzles to keep the spray in the areas as designed. Finetuning can be made anywhere from 25° to 360°.

A particularly appealing feature of the Hunter nozzle is that no tools are required to adjust the arc.





The Adjustable Arc nozzle can be used for any area including areas that require custom odd arcs.

Pro-Spray[®] Nozzles...

Save time, save money

For contractors that desire fixed pattern nozzles, Hunter offers a great array of models which are color-coded for easy identification.



Numerous Radius Ranges of Standard Adjustable and Fixed Nozzles... Versatile flow and throw

Whether installing Adjustable Arc or a Fixed Arc nozzles choose from a 8', 10', 12', 15', or 17' (2.4 m, 3.0 m, 3.7 m, 4.6 m, 5.2 m) radius range nozzle to meet the different design applications you might need. The radius can be reduced up to 25% without changing the pattern distribution characteristics.

Micro-Spray Nozzles...

The sensible alternative to drip irrigation

For shrubs and flowerbeds that require 100% irrigated coverage, sometimes a low pressure/ low volume irrigation system is not the type of watering you're looking for. With the revolutionary new Hunter Micro-Spray Nozzles, excellent coverage with an accurate distribution of water is the norm for a 4-5 foot radius. Contractors will find these Micro-Sprays very user-friendly because of their ability to work under full line pressure and no additional filtration is needed. Unlike regular sprays that discharge a lot of water with higher force, these nozzles send out a finer spray that will not create "run-off" or damage plants. The nozzles attach directly to any Hunter spray body, so no special installations, such as filters, or retrofits are required. And because the Micro-Spray is itself a pop-up,

the nozzle retracts and hides from view when not in use—making them vandal-proof and creating a more eye-pleasing appearance.



PRODUCT PERFORMANCE

Pro-Spi	Pro-Spray [®] Nozzles Performance Data																						
			8 Foot F Fixed (Qi Trajector Color Co	ładius Jarter, Ha l f, y: 0° de: Brown	, Full) ●	Nozzle 8	10 Foot Radius Nozzle Fixed (Quarter, Half, Full) Nozzle Trajectory: 15° 10 Color Code: Red 10				12 Foot Radius Fixed (Quarter, Half, Full)NozzleTrajectory: 28° Color Code: Green12				15 Foot Fixed (Qu Trajector Co l or Co	Radius Jarter, Ha l f y: 28° de: B l ack	, Full)	^{Nozzle} 15	17 Foot Fixed (Qu Trajector Color Cc	Radius uarter) 'y: 28° ide: Gray	Nozzle • 17		
Arc	Pressure PSI	Pattern	Radius ft.	Flow GPM	Preci	p in/hr ▲	Radius ft.	Flow GPM	Preci	p in/hr ▲	Radius ft.	Flow GPM	Preci	p in/hr ▲	Radius ft.	Flow GPM	Preci	p in/hr ▲	Radius ft.	Flow GPM	Preci	p in/hr ▲	
000	20		7'	0.17	1.34	1.54	9'	0.30	1.43	1.65	11'	0.50	1.59	1.84	14'	0.77	1.51	1.75	16'	0.97	1.46	1.68	
90	25		8'	0.19	1.14	1.32	10'	0.33	1.27	1.47	12'	0.55	1.47	1.70	15'	0.86	1.47	1.70	17'	1.13	1.51	1.74	
	30	Q	8'	0.24	1.44	1.67	10'	0.39	1.50	1.73	12'	0.63	1.68	1.95	15'	0.93	1.59	1.84	17'	1.20	1.60	1.85	
	35		9'	0.33	1.57	1.81	11'	0.49	1.56	1.80	13'	0.73	1.66	1.92	16'	1.03	1.55	1.79	18'	1.25	1.49	1.72	
	40		10'	0.48	1.85	2.13	12'	0.63	1.68	1.95	14'	0.84	1.65	1.91	17'	1.13	1.51	1.74	19'	1.38	1.47	1.70	
1000	20		7'	0.34	1.34	1.54	9'	0.60	1.43	1.65	11'	1.00	1.59	1.84	14'	1.54	1.51	1.75	16'	1.94	1.46	1.68	
100	25		8'	0.38	1.14	1.32	10'	0.66	1.27	1.47	12'	1.10	1.47	1.70	15'	1.72	1.47	1.70	17'	2.26	1.51	1.74	
	30	H	8'	0.48	1.44	1.67	10'	0.82	1.58	1.82	12'	1.31	1.75	2.02	15'	1.86	1.59	1.84	17'	2.40	1.60	1.85	
	35		9'	0.66	1.57	1.81	11'	0.98	1.56	1.80	13'	1.46	1.66	1.92	16'	2.06	1.55	1.79	18'	2.50	1.49	1.72	
	40		10'	0.96	1.85	2.13	12'	1.26	1.68	1.95	14'	1.68	1.65	1.91	17'	2.26	1.51	1.74	19'	2.76	1.47	1.70	
2000	20		7'	0.68	1.34	1.54	9'	1.20	1.43	1.65	11'	2.00	1.59	1.84	14'	3.08	1.51	1.75	16'	3.88	1.46	1.68	
360	25	_	8'	0.76	1.14	1.32	10'	1.32	1.27	1.47	12'	2.20	1.47	1.70	15'	3.44	1.47	1.70	17'	4.52	1.51	1.74	
	30	F	8'	0.95	1.43	1.65	10'	1.62	1.56	1.80	12'	2.65	1.77	2.05	15'	3.72	1.59	1.84	17'	4.80	1.60	1.85	
	35	-	9'	1.32	1.57	1.81	11'	1.96	1.56	1.80	13'	2.92	1.66	1.92	16'	4.12	1.55	1.79	18'	5.00	1.49	1.72	
	40		10'	1.92	1.85	2.13	12'	2.52	1.68	1.95	14'	3.36	1.65	1.91	17'	4.54	1.51	1.74	19'	5.52	1.47	1.70	
Note: The	nstitutional	Snrav's h	uilt-in nres	sure requiati	ion cont	role outr	out to a ma	vimum of 3		nrecinta	tion rates r	alculated for	r 360 der	aree onei	ration								

Pro-Sp	Pro-Spray [®] Nozzles Performance Data – Metric																											
				2.4 M Fixed (Traject Color (eter R : Quarter ory: 0° Code: B	adius (; Ha l f, I rown	8 ft.) Full)	Nozzle 8	e Fixed (Quarter, Half, Full) Trajectory: 15° Color Code: Red • 1					Trajectory: 28° Trajectory					4.6 Meter Radius (15 ft.) Fixed (Quarter, Half, Full) Trajectory: 28° Color Code: Black						eter Ra Quarter ory: 28° Code: G	17 ft.) Nozzle 17		
		Pres	sure	Radius	Flo	W	Precip	mm/hr	Radius	FI	W	Precip	mm/hr	Radius	FI	ow	Precip	mm/hr	Radius	FI	ow	Precip	mm/hr	Radius	Flo	W	Precip	mm/hr
Arc	Pattern	Bars	kPa	m	m³/hr	l/min			m	m³/hr	I/min		A	m	m³/hr	1/min			m	m³/hr	I/min			m	m³/hr	l/min		A
۹No		1.4	137	2.1	0.04	0.6	34	39	2.7	0.07	1.1	36	42	3.4	0.11	1.9	40	47	4.2	0.17	2.9	38	44	4.9	0.22	3.7	37	43
	•	1./	1/1	2.4	0.04	0.7	29	34	3.0	0.07	1.3	37	44	3.7	0.12	2.1	37	43	4.5	0.20	3.3	37	43	5.2	0.26	4.3	38	44
	ų	2.1	206	2.4	0.05	0.9	37	42	3.0	0.09	1.5	44	55	3.7	0.14	2.4	43	49	4.5	0.21	3.5	40	47	5.2	0.27	4.5	41	47
		2.4	240	2.7	0.07	1.3	40	46	3.3	0.11	1.9	46	48	4.0	0.17	2.8	42	49	4.8	0.23	3.9	39	45	5.5	0.28	4./	38	44
		2.7	2/4	3.0	0.11	1.8	47	54	3.6	0.14	2.4	49	57	4.3	0.19	3.2	42	48	5.2	0.26	4.3	38	44	5.8	0.31	5.2	37	43
180°		1.4	137	2.1	0.08	1.3	34	39	2.7	0.14	2.3	42	47	3.4	0.23	3.8	40	47	4.2	0.35	5.8	38	44	4.9	0.44	7.3	37	43
		1.7	171	2.4	0.09	1.4	29	34	3.0	0.15	2.5	37	44	3.7	0.25	4.2	37	43	4.5	0.39	6.5	37	43	5.2	0.51	8.6	38	44
	н	2.1	206	2.4	0.11	1.8	37	42	3.0	0.19	3.1	46	55	3.7	0.30	5.0	44	51	4.5	0.42	7.0	40	47	5.2	0.54	9.1	41	47
		2.4	240	2.7	0.15	2.5	30	46	3.3	0.22	3.7	46	48	4.0	0.33	5.5	42	49	4.8	0.47	7.8	39	45	5.5	0.57	9.5	38	44
		2.7	2/4	3.0	0.22	3.6	35	54	3.6	0.29	4.8	49	57	4.3	0.38	6.4	42	48	5.2	0.51	8.6	38	44	5.8	0.63	10.5	37	43
360°		1.4	137	2.1	0.15	2.6	34	39	2.7	0.27	4.5	42	47	3.4	0.45	7.6	40	47	4.2	0.70	11.7	38	44	4.9	0.88	14.7	37	43
000	-	1.7	171	2.4	0.17	2.9	29	34	3.0	0.30	5.0	37	44	3.7	0.50	8.3	37	43	4.5	0.78	13.0	37	43	5.2	1.03	17.1	38	44
	F	2.1	206	2.4	0.22	3.6	36	42	3.0	0.37	6.1	46	55	3.7	0.60	10.0	45	52	4.5	0.84	14.1	40	47	5.2	1.09	18.2	41	47
		2.4	240	2.7	0.30	5.0	40	46	3.3	0.44	7.4	46	48	4.0	0.66	11.1	42	49	4.8	0.94	15.6	39	45	5.5	1.14	18.9	38	44
		27	274	3.0	0 44	7.3	47	54	3.6	0.57	95	49	57	4.3	0.76	127	42	48	5.2	1.03	1/1	- 38	- 44	5.8	1.25	20.9	37	43

Note: The Institutional Spray's built-in pressure regulation controls output to a maximum of 2.1 Bars (206 kPa).

Data represents test results in zero wind. Adjust for local conditions.

Note: When calculating flow and radius utilizing the Institutional Spray body at pressures greater than 30 PSI, use only the 30 PSI (2.1 Bars, 206 kPa) figures. When using any other Hunter spray head body, flow and radius will vary depending on nozzle pressure.

Adjustal	Adjustable Arc Nozzles Performance Data																				
		8 Foot Ra Adjustable	adius e from 25°	to 360°	Nozzle	10 Foot R Adjustable	adius from 25°	to 360°	Nozzle	12 Foot Adjustabl	Radius le from 25°	to 360°	Nozzle	15 Foot R Adjustable	adius from 25°	to 360°	Nozzle	17 Foot Adjustabl	Radius e from 25°	to 360°	Nozzle
		Trajectory Color Cod	: 0° e: Brown	٠	8A	Trajectory: Color Code	15° e: Red	۲	10A	Trajectory Color Cod	y: 28° de: Green	۲	12A	Trajectory: Color Code	28° e: Black	٠	15A	Trajectory Color Cod	: 28° le: Gray	۲	17A
Arc	Pressure PSI	Radius ft.	Flow GPM	Preci	p in/hr	Radius ft.	Flow GPM	Preci	ip in/hr	Radius ft.	Flow GPM	Preci	ip in/hr	Radius ft.	Flow GPM	Preci	p in/hr	Radius ft.	Flow GPM	Preci	p in/hr
	20	7'	0.17	2.67	3.08	9'	0.17	1.62	1.87	11'	0.25	1.59	1.84	14'	0.39	1.51	1.75	16'	0.49	1.46	1.68
45°	25	8'	0.20	2.35	2.71	10'	0.20	1.50	1.73	12'	0.28	1.47	1.70	15'	0.43	1.47	1.70	17'	0.57	1.51	1.74
	30	8'	0.25	2.95	3.40	10'	0.25	1.89	2.18	12'	0.32	1.68	1.95	15'	0.47	1.59	1.84	17'	0.60	1.60	1.85
	35	9'	0.26	2.42	2.80	11'	0.26	1.62	1.87	13'	0.37	1.66	1.92	16'	0.52	1.55	1.79	18'	0.63	1.49	1.72
	40	10'	0.37	2.81	3.25	12'	0.37	1.95	2.25	14'	0.42	1.65	1.91	17'	0.57	1.51	1.74	19'	0.69	1.47	1.70
000	20	7'	0.34	2.67	3.08	9'	0.34	1.62	1.87	11'	0.50	1.59	1.84	14'	0.77	1.51	1.75	16'	0.97	1.46	1.68
90	25	8'	0.39	2.35	2.71	10'	0.39	1.50	1.73	12'	0.55	1.47	1.70	15'	0.86	1.47	1.70	17'	1.13	1.51	1.74
	30	8'	0.49	2.95	3.40	10'	0.49	1.89	2.18	12'	0.63	1.68	1.95	15'	0.93	1.59	1.84	17'	1.20	1.60	1.85
	35	9'	0.51	2.42	2.80	11'	0.51	1.62	1.87	13	0.73	1.66	1.92	16'	1.03	1.55	1.79	18'	1.25	1.49	1.72
	40	10	0.73	2.81	3.25	12	0.73	1.95	2.25	14	0.84	1.65	1.91	17	1.13	1.51	1.74	19	1.38	1.47	1.70
120°	20	/	0.45	2.67	3.08	9	0.45	1.62	1.8/	10	0.07	1.59	1.84	14	1.03	1.51	1.70	10	1.29	1.40	1.08
	20	0 0	0.52	2.30	2./1	10	0.52	1.50	1./3	12	0.73	1.47	1.70	10	1.10	1.47	1.70	17	1.01	1.01	1.74
	30	0 0'	0.68	2.90	3.40 2.80	11'	0.68	1.09	1.87	12	0.04	1.00	1.90	10	1.24	1.59	1.04	18'	1.00	1.00	1.00
•	40	10'	0.00	2.42	3 25	12'	0.00	1.02	2.25	14'	1 12	1.00	1.92	17'	1.57	1.55	1.75	10	1.07	1.45	1.72
	20	7'	0.57	2.01	3.08	9'	0.68	1.55	1.87	11'	1.00	1.00	1.84	14'	1.51	1.51	1.75	16'	1 94	1.46	1.68
180°	25	8'	0.00	2.35	2 71	10'	0.00	1.50	1.73	12'	1 10	1 47	1 70	15'	1 72	1 47	1 70	17'	2.26	1.10	1 74
	30	8'	0.98	2.95	3.40	10'	0.98	1.89	2.18	12'	1.26	1.68	1.95	15'	1.86	1.59	1.84	17'	2.40	1.60	1.85
	35	9'	1.02	2.42	2.80	11'	1.02	1.62	1.87	13'	1.46	1.66	1.92	16'	2.06	1.55	1.79	18'	2.50	1.49	1.72
	40	10'	1.46	2.81	3.25	12'	1.46	1.95	2.25	14'	1.68	1.65	1.91	17'	2.26	1.51	1.74	19'	2.76	1.47	1.70
	20	7'	0.91	2.67	3.08	9'	0.91	1.62	1.87	11'	1.33	1.59	1.84	14'	2.05	1.51	1.75	16'	2.59	1.46	1.68
240°	25	8'	1.04	2.35	2.71	10'	1.04	1.50	1.73	12'	1.47	1.47	1.70	15'	2.29	1.47	1.70	17'	3.01	1.51	1.74
	30	8'	1.31	2.95	3.40	10'	1.31	1.89	2.18	12'	1.68	1.68	1.95	15'	2.48	1.59	1.84	17'	3.20	1.60	1.85
	35	9'	1.36	2.42	2.80	11'	1.36	1.62	1.87	13'	1.95	1.66	1.92	16'	2.75	1.55	1.79	18'	3.33	1.49	1.72
-	40	10'	1.95	2.81	3.25	12'	1.95	1.95	2.25	14'	2.24	1.65	1.91	17'	3.01	1.51	1.74	19'	3.68	1.47	1.70
270°	20	7'	1.02	2.67	3.08	9'	1.02	1.62	1.87	11'	1.50	1.59	1.84	14'	2.31	1.51	1.75	16'	2.91	1.46	1.68
210	25	8'	1.17	2.35	2.71	10'	1.17	1.50	1.73	12'	1.65	1.47	1.70	15'	2.58	1.47	1.70	17'	3.39	1.51	1.74
	30	8'	1.47	2.95	3.40	10'	1.47	1.89	2.18	12'	1.89	1.68	1.95	15'	2.79	1.59	1.84	17'	3.60	1.60	1.85
	35	9'	1.53	2.42	2.80	11'	1.53	1.62	1.87	13	2.19	1.66	1.92	16'	3.09	1.55	1.79	18'	3.75	1.49	1.72
	40	10'	2.19	2.81	3.25	12	2.19	1.95	2.25	14	2.52	1.65	1.91	17	3.39	1.51	1.74	19'	4.14	1.47	1.70
360°	20	1	1.36	2.67	3.08	9.	1.36	1.62	1.87	11	2.00	1.59	1.84	14	3.08	1.51	1.75	16	3.88	1.46	1.68
	25	8	1.56	2.35	2.71	10	1.56	1.50	1.73	12	2.20	1.47	1.70	15	3.44	1.47	1.70	17	4.52	1.51	1.74
	30	0 '	2.04	2.95	3.40	10.	2.04	1.69	1 07	12	2.52	1.00	1.90	10'	3.12	1.59	1.04	10	4.80 5.00	1.00	1.00
	35 40	9 10'	2.04	2.42	2.00	12'	2.04	1.02	2.25	14'	2.92	1.00	1.92	17	4.12	1.55	1.79	10	5.00	1.49	1.72
Note: The In	40	rov'o built in		2.01	0.2J		Z.JZ	20 001	2.23	14	0.00	1.05	1.31	11	4.52	1.01	1.74	13	0.02	1.47	1.70

Strip Pa	trip Pattern Nozzle Performance Data				Model S-8A Stream Spray Nozzle						Model S-16A Stream Spray Nozzle					
Color Code	: Blue 🛛 🔵				Perform	ance Data					Perform	ance Data				
Nozzle Model	Pressure PSI	Width x Length	Flow GPM	Precip in/hr	Adjustable Color Cod	from 25° to e: B l ue	360°				Adjustable Color Cod	e from 25° to e: Blue	360°			
LCS-515	20 25	4' x 14' 5' x 15'	0.55 0.60	0.95 0.77	Arc	Pressure PSI	Radius ft.	Flow GPM	Precip	o in/hr ▲	Arc	Pressure PSI	Radius ft.	Flow GPM	Precip	in/hr ▲
.eft-Corner Strip	30 35 40	5' x 15' 5' x 15' 5' x 15'	0.65 0.70 0.75	0.83 0.90 0.96	90°	20 25 30	7 8 8	0.29 0.32 0.35	2.28 1.93 2.11	2.63 2.22 2.43	90°	20 25 30	15 16 16	0.40 0.46 0.50	0.68 0.69 0.75	0.79 0.80 0.87
RCS-515	20 25	4 x 14 5 x 15	0.55 0.60	0.95 0.77	\$ -	35 40	8 9	0.38 0.41	2.29 1.95	2.64 2.25	\$	35 40	17 18	0.54 0.57	0.72 0.68	0.83 0.78
ight-Corner Strip	30 35 40	5 x 15 5 x 15 5 x 15	0.70 0.75	U.83 0.90 0.96	180°	20 25 30	7 8 8	0.54 0.57 0.60	2.12 1.71 1.80	2.45 1.98 2.08	180°	20 25 30	15 16 16	0.67 0.80 0.88	0.57 0.60 0.66	0.66 0.69 0.76
SS-530	20 25	4 x 28 5 x 30	1.10 1.20	0.95 0.77		35 40	8 9	0.63 0.66	1.89 1.57	2.19 1.81	_	35 40	17 18	0.97 1.04	0.65 0.62	0.75 0.71
Side Strip	30 35 40	5 x 30 5 x 30 5 x 30	1.30 1.40 1.50	U.83 0.90 0.96	360°	20 25 30	7 8 8	1.08 1.11 1 15	2.12 1.67 1 73	2.45 1.93 2 00	360°	20 25 30	15 16 16	1.19 1.46 1.66	0.51 0.55 0.62	0.59 0.63 0.72
					*	35 40	8 9	1.18 1.22	1.77 1.45	2.05 1.67	*	35 40	17 18	1.82 1.99	0.61 0.59	0.70

Data represents test results in zero wind. Adjust for local conditions.

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Note: When calculating flow and radius utilizing the Institutional Spray body at pressures greater than 30 PSI, use only the 30 PSI (2.1 Bars, 206 kPa) figures. When using any other Hunter spray head body, flow and radius will vary depending on nozzle pressure.

PRODUCT PERFORMANCE (continued)

Adjust	djustable Arc Nozzles Performance Data – Metric																										
			2.4 M	eter Ra	adius (8 ft.)	Nozzle	3.0 N	leter R	adius ((10 ft.)	Nozzle	3.7 N	leter R	adius (12 ft.)	Nozzle	4.6 N	leter R	adius	(15 ft.)	Nozzle	5.2 M	eter R	adius (17 ft.)	Nozzle
			Traject	ory: 0°	111 25	10 300	81	Trajec	tory: 15	5°	10 300	104	Trajec	tory: 28	0	10 300	121	Trajec	tory: 28	piii 25	10 300	154	Traject	ory: 28	0 0	0.300	171
	D		Color	Code: B	rown		UA	Color	Code: F	Red		IUA	Color	Code: G	reen	- Deside	ILA	Color	Code: B	llack		IJA	Color	Code: G	ray	Denta	IIA
Arc	Pres	Sure kPa	Radius	Fl(m ³ /hr	0W I/min	Precip	mm/hr	Radius	5 H m ³ /hr	0W I/min	Precip	o mm/hr	Radius	5 H m ³ /hr	0W I/min	Precip	o mm/hr	Radius	m ³ /hr	0W I/min	Precip	o mm/hr ▲	Radius	H m ³ /hr)W I/min	Precip	mm/hr
AIC	14	137	2.1	0.04	0.6	68	78	27	0.04	0.6	41	47	3.4	0.06	0.9	40	47	42	0.09	1.5	38	44	4.8	0.11	1.8	37	43
45°	1.7	171	2.4	0.04	0.7	60	69	3.0	0.04	0.7	44	44	3.7	0.06	1.0	37	43	4.5	0.10	1.6	37	43	5.2	0.13	2.1	38	44
	2.1	206	2.4	0.06	0.9	75	86	3.0	0.06	0.9	55	55	3.7	0.07	1.2	43	49	4.5	0.11	1.8	40	47	5.2	0.14	2.3	41	47
	2.4	240	2.7	0.06	1.0	62	71	3.3	0.06	1.0	48	48	4.0	0.08	1.4	42	49	4.8	0.12	1.9	39	45	5.5	0.14	2.4	38	44
	2.7	274	3.0	0.08	1.4	71	82	3.6	0.08	1.4	57	57	4.3	0.10	1.6	42	48	5.2	0.13	2.1	38	44	5.8	0.16	2.6	37	43
90°	1.4	13/	2.1	0.08	1.3	68	/8	2.7	0.08	1.3	4/	47	3.4	0.11	1.9	40	47	4.2	0.17	2.9	38	44	4.8	0.22	3.7	37	43
	1./ 21	206	2.4	0.09	1.0	0U 75	09 86	3.0	0.09	1.0	44 55	44	3.7	0.12	2.1	3/	43	4.0	0.20	3.J 35	3/	43	0.2 5 2	0.20	4.3	38 11	44
	2.1	200	2.4	0.12	19	62	71	3.3	0.12	19	48	48	4.0	0.14	2.4	40	49	4.0	0.23	3.9	39	45	5.5	0.28	4.5	38	47
	2.7	274	3.0	0.17	2.8	71	82	3.6	0.17	2.8	57	57	4.3	0.19	3.2	42	48	5.2	0.26	4.3	38	44	5.8	0.31	5.2	37	43
1000	1.4	137	2.1	0.10	1.7	68	78	2.7	0.10	1.7	47	47	3.4	0.15	2.5	40	47	4.2	0.23	3.9	38	44	4.8	0.29	4.9	37	43
120*	1.7	171	2.4	0.12	2.0	60	69	3.0	0.12	2.0	44	44	3.7	0.17	2.8	37	43	4.5	0.26	4.3	37	43	5.2	0.34	5.7	38	44
	2.1	206	2.4	0.15	2.5	75	86	3.0	0.15	2.5	55	55	3.7	0.19	3.2	43	49	4.5	0.28	4.7	40	47	5.2	0.36	6.1	41	47
•	2.4	240	2.7	0.15	2.6	62	71	3.3	0.15	2.6	48	48	4.0	0.22	3.7	42	49	4.8	0.31	5.2	39	45	5.5	0.38	6.3	38	44
	2.7	127	3.0	0.22	3.7	/1	82	3.6	0.22	3.7	5/	57	4.3	0.25	4.2	42	48	5.2	0.34	5./	38	44	5.8	0.42	7.0	37	43
180°	1.4	171	2.1	0.15	2.0	60	69	3.0	0.15	2.0	47	47	3.4	0.23	3.0 4.2	37	47	4.2	0.30	6.5	37	44	4.0	0.44	8.6	38	43
	2.1	206	2.4	0.22	3.7	75	86	3.0	0.22	3.7	55	55	3.7	0.29	4.8	43	49	4.5	0.42	7.0	40	47	5.2	0.54	9.1	41	47
	2.4	240	2.7	0.23	3.9	62	71	3.3	0.23	3.9	48	48	4.0	0.33	5.5	42	49	4.8	0.47	7.8	39	45	5.5	0.57	9.5	38	44
_	2.7	274	3.0	0.33	5.5	71	82	3.6	0.33	5.5	57	57	4.3	0.38	6.4	42	48	5.2	0.51	8.6	38	44	5.8	0.63	10.4	37	43
040°	1.4	137	2.1	0.21	3.4	68	78	2.7	0.21	3.4	47	47	3.4	0.30	5.0	40	47	4.2	0.47	7.8	38	44	4.8	0.59	9.8	37	43
240	1.7	171	2.4	0.24	3.9	60	69	3.0	0.24	3.9	44	44	3.7	0.33	5.6	37	43	4.5	0.52	8.7	37	43	5.2	0.68	11.4	38	44
	2.1	206	2.4	0.30	4.9	/5	86	3.0	0.30	4.9	55	55	3.7	0.38	6.4	43	49	4.5	0.56	9.4	40	41	5.2	0.76	12.1	41	41
	2.4	240	2.7	0.31	5.1 7.4	71	82	3.5	0.31	5.1 7.4	40 57	40 57	4.0	0.44	7.4 8.5	42	49	4.0	0.02	11.4	38	45 44	5.8	0.70	12.0	30 37	44
	1.4	137	2.1	0.23	3.9	68	78	2.7	0.23	3.9	47	47	3.4	0.34	5.7	40	47	4.2	0.52	8.7	38	44	4.8	0.66	11.0	37	43
27 <u>0</u> °	1.7	171	2.4	0.27	4.4	60	69	3.0	0.27	4.4	44	44	3.7	0.37	6.2	37	43	4.5	0.59	9.8	37	43	5.2	0.77	12.8	38	44
	2.1	206	2.4	0.33	5.6	75	86	3.0	0.33	5.6	55	55	3.7	0.43	7.2	43	49	4.5	0.63	10.6	40	47	5.2	0.82	13.6	41	47
	2.4	240	2.7	0.35	5.8	62	71	3.3	0.35	5.8	48	48	4.0	0.50	8.3	42	49	4.8	0.70	11.7	39	45	5.5	0.85	14.2	38	44
-	2.7	274	3.0	0.50	8.3	71	82	3.6	0.50	8.3	57	57	4.3	0.57	9.5	42	48	5.2	0.77	12.8	38	44	5.8	0.94	15.7	37	43
360°	1.4	137	2.1	0.31	5.1	68	/8	2.7	0.31	5.1	47	47	3.4	0.45	7.6	40	47	4.2	0.70	11.7	38	44	4.8	0.88	14.7	37	43
	21	206	2.4	0.35	5.9 7 /	75	86	3.0	0.35	5.9 7 /	44	44 55	3.7	0.50	0.3	3/	43	4.0	0.78	13.0	3/	43	5.2 5.2	1.03	18.2	38 /11	44
	2.1	200	2.4	0.44	77	62	71	3.0	0.44	7.7	48	48	4.0	0.66	9.0 11.1	43	49	4.5	0.94	15.6	39	45	5.5	1 14	18.9	38	44
	2.7	274	3.0	0.66	11.1	71	82	3.6	0.66	11.1	57	57	4.3	0.76	12.7	42	48	5.2	1.03	17.1	38	44	5.8	1.25	20.9	37	43

Note: The Institutional Spray's built-in pressure regulation controls output to a maximum of 2.1 Bars (206 kPa).

Strip Pat	tern N	ozzle F	Performance Da	ata – Me	tric		Model S	-8A Str	eam Sj	oray No	zzle
Color Code	: Blue						Perform	ance D	ata – N	letric	
Nozzle Model	Pres Bars	sure kPa	Width x Length	Flo m³/hr	ow I/min	Precip mm/hr	Adjustable Color Code	from 25' e: B l ue	° to 360°		
LCS-515	1.4 1.7	137 172	1.2 m x 4.3 m 1.5 m x 4.6 m	0.12 0.14	2.1 2.3	24 20	Arc	Pres Bars	sure kPa	Radius m	m ³
Left-Corner Strip	2.1 2.4 2.8	206 241 275	1.5 m x 4.6 m 1.5 m x 4.6 m 1.5 m x 4.6 m	0.15 0.16 0.17	2.5 2.6 2.8	21 23 24	90°	1.4 1.7 2.1	138 172 207	2.1 2.4 2.4	0.0 0.0
RCS-515	1.4 1.7	137 172	1.2 m x 4.3 m 1.5 m x 4.6 m	0.12 0.14	2.1 2.3	24 20	•	2.4 2.8	241 276	2.4 2.7	0.0
Right-Corner Strip	2.1 2.4 2.8	206 241 275	1.5 m x 4.6 m 1.5 m x 4.6 m 1.5 m x 4.6 m	0.15 0.16 0.17	2.5 2.6 2.8	21 23 24	180°	1.4 1.7 2 1	138 172 207	2.1 2.4 2.4	0. 0.
SS-530	1.4 1.7	137 172	1.2 m x 8.5 m 1.5 m x 9.1 m	0.25 0.27	4.2 4.5	24 20	*	2.4 2.8	241 276	2.4 2.7	0. 0.
Side Strip	2.1 2.4 2.8	206 241 275	1.5 m x 9.1 m 1.5 m x 9.1 m 1.5 m x 9.1 m	0.30 0.32 0.34	4.9 5.3 5.7	21 23 24	360°	1.4 1.7 2 1	138 172 207	2.1 2.4 2.4	0.2 0.2

Perform	ance D	ata – M	letric				
Adjustable	from 25°	° to 360°					
Color Code	: Blue						
	Pres	sure	Radius	Flo	w	Precip	mm/hr
Arc	Bars	kPa	m	m³/hr	l/min		
0.00	1.4	138	2.1	0.07	1.1	58	67
90-	1.7	172	2.4	0.07	1.2	49	56
	2.1	207	2.4	0.08	1.3	53	62
•	2.4	241	2.4	0.09	1.4	58	67
	2.8	276	2.7	0.09	1.6	49	57
1000	1.4	138	2.1	0.12	2.0	54	62
180	1.7	172	2.4	0.13	2.2	44	50
	2.1	207	2.4	0.14	2.3	46	53
•	2.4	241	2.4	0.14	2.4	48	56
	2.8	276	2.7	0.15	2.5	40	46
0000	1.4	138	2.1	0.25	4.1	54	62
300	1.7	172	2.4	0.25	4.2	42	49
	2.1	207	2.4	0.26	4.4	44	51
	2.4	241	2.4	0.27	4.5	45	52
	2.8	276	2.7	0.28	4.6	37	43

Model S-16A Stream Spray Nozzle Performance Data – Metric												
Adjustable Color Code	from 25 e: B l ue	° to 360	•									
Arc	Pres Bars	sure kPa	Radius m	Flo m³/hr	ow I/min	Precip	mm/hr ▲					
000	1.4	138	4.6	0.09	1.5	17	20					
90*	1.7	172	4.9	0.10	1.7	18	20					
	2.1	207	4.9	0.11	1.9	19	22					
•	2.4	241	5.2	0.12	2.0	18	21					
	2.8	276	5.5	0.13	2.2	17	20					
1000	1.4	138	4.6	0.15	2.5	15	17					
180*	1.7	172	4.9	0.18	3.0	15	18					
	2.1	207	4.9	0.20	3.3	17	19					
_	2.4	241	5.2	0.21	3.7	16	19					
	2.8	276	5.5	0.24	3.9	16	18					
0000	1.4	138	4.6	0.27	4.5	13	15					
360°	1.7	172	4.9	0.33	5.5	14	16					
	2.1	207	4.9	0.38	6.3	16	18					
	2.4	241	5.2	0.41	6.9	15	18					
11	2.8	276	5.5	0.45	7.5	15	17					

Data represents test results in zero wind. Adjust for local conditions.

Note: When calculating flow and radius utilizing the Institutional Spray body at pressures greater than 30 PSI, use only the 30 PSI (2.1 Bars, 206 kPa) figures. When using any other Hunter spray head body,

flow and radius will vary depending on nozzle pressure.

Micro-Spray Nozzles Performance Data													
Arc	Pressure PSI	Nozzle	Radius ft.	Flow GPM	Preci	p in/hr ▲							
90°	25 40 60	MS-Q	5' 5' 5'	0.12 0.14 0.14	1.85 2.16 2.16	2.13 2.49 2.49							
180°	25 40 60	MS-H	5' 5' 5'	0.25 0.28 0.29	1.93 2.16 2.23	2.22 2.49 2.58							
360°	25 40 60	MS-F	5' 5' 5'	0.50 0.56 0.58	1.93 2.16 2.23	2.22 2.49 2.58							

Micro-S	pray N	lozzles	s Perform	ance D	ata – N	letric		
	Pres	sure		Radius	F	DW	Precip	mm/hr
Arc	Bars	kPa	Nozzle	m	m³/hr	l/min		
90°	1.7 2.8 4.1	172 275 413	MS-Q	1.5 1.5 1.5	0.03 0.03 0.03	0.45 0.53 0.53	47 55 55	54 63 63
180°	1.7 2.8 4.1	172 275 413	MS-H	1.5 1.5 1.5	0.06 0.06 0.07	0.95 1.06 1.10	49 55 57	56 63 65
360°	1.7 2.8 4.1	172 275 413	MS-F	1.5 1.5 1.5	0.11 0.13 0.13	1.89 2.12 2.20	49 55 57	56 63 65

Short Radius Nozzles Performance Data

		Color Co	ode: Light B	rown			Color Co	ode: Light G	areen 🔵			Color Co	de: Light B	lue 🔍		
Arc	Pressure PSI	Nozzle	Radius ft.	Flow GPM	Prec	ip in/hr ▲	Nozzle	Radius ft.	Flow GPM	Precip	p in/hr	Nozzle	Radius ft.	Flow GPM	Preci	ρ in/hr ▲
90°	20 25 30 35 40	2Q	2' 2' 2' 2' 2'	0.09 0.10 0.11 0.12 0.14	8.66 9.63 10.59 11.55 13.48	10.00 11.11 12.23 13.34 15.56	4Q	4' 4' 4' 4'	0.20 0.22 0.22 0.24 0.24	4.81 5.29 5.29 5.78 5.78	5.56 6.11 6.11 6.67 6.67	6Q	6' 6' 6'	0.47 0.49 0.51 0.52 0.52	5.03 5.24 5.45 5.56 5.56	5.80 6.05 6.30 6.42 6.42
180°	20 25 30 35 40	2H	2' 2' 2' 2' 2'	0.12 0.14 0.16 0.18 0.18	5.78 6.74 7.70 8.66 8.66	6.67 7.78 8.89 10.00 10.00	4H	4 4 4 4 4	0.41 0.43 0.44 0.46 0.46	4.93 5.17 5.29 5.53 5.53	5.70 5.97 6.11 6.39 6.39	6H	6 6 6 6	0.95 0.97 0.98 0.99 1.00	5.08 5.19 5.24 5.29 5.35	5.87 5.99 6.05 6.11 6.17

Short Radius Nozzles Performance Data – Metric

			Color Co	de: Ligh	t Brown	•			Color C	ode: Ligh	nt Green	•			Color Co	ode: Ligh	nt Blue	•		
	Pres	sure		Radius	FI	ow	Precip	mm/hr		Radius	Flo	w	Precip	mm/hr		Radius	FI	ow	Precip	mm/hr
Arc	Bars	kPa	Nozzle	m	m³/hr	l/min			Nozzle	m	m³/hr	l/min			Nozzle	ft.	m³/hr	l/min		
	1.4	137		0.6	0.02	0.34	220	254		1.2	0.05	0.76	122	141		1.8	0.11	1.78	128	147
90°	1.7	172		0.6	0.02	0.38	244	282		1.2	0.05	0.81	134	155		1.8	0.11	1.85	133	154
	2.1	206	20	0.6	0.02	0.42	269	311	40	1.2	0.05	0.83	134	155	60	1.8	0.12	1.93	139	160
	2.4	241		0.6	0.03	0.45	293	339		1.2	0.05	0.91	147	169		1.8	0.12	1.97	141	163
	2.8	275		0.6	0.03	0.53	342	395		1.2	0.05	0.91	147	169		1.8	0.12	1.97	141	163
1000	1.4	137		0.6	0.03	0.45	147	169		1.2	0.09	1.55	125	145		1.8	0.22	3.60	129	149
180°	1.7	172		0.6	0.03	0.53	171	198		1.2	0.10	1.63	131	152		1.8	0.22	3.67	132	152
	2.1	206	2H	0.6	0.04	0.61	196	226	4H	1.2	0.10	1.67	134	155	6H	1.8	0.22	3.71	133	154
	2.4	241		0.6	0.04	0.68	220	254	••••	1.2	0.10	1.74	141	162	•	1.8	0.22	3.75	134	155
	2.8	275		0.6	0.04	0.68	220	254		1.2	0.10	1.74	141	162		1.8	0.23	3.79	136	157

SPECIFICATION GUIDE EXAMPLE: 2Q קב MODELS PATTERN ittern 2 4 6

= 2' Short Radius Nozzle = 4' Short Radius Nozzle = 6' Short Radius Nozzle	Q = Quarter-Circle Pat H = Half-Circle Patterr

SPECIFICATION GUIDE EXAMPLE: LCS-515

MODELS LCS-515 = Left-Corner Strip Nozzle, 5' x 15' Pattern RCS-515 = Right-Corner Strip Nozzle, 5' x 15' Pattern SS-530 = Side-Strip Nozzle, 5' x 30' Pattern SS-918 = Side-Strip Nozzle, 9' x 18' Pattern CS-530 = Center-Strip Nozzle, 5' x 30' Pattern ES-515 = End-Strip Nozzle, 5' x 15' Pattern

SPECIFICATION GUIDE EXAMPLE: 15 - A Г MODELS PATTERN 8 = 8' Radius A = Adjustable 10 = 10' Radius Q = Quarter-Circle 12 = 12' Radius H = Half-Circle 15 = 15' Radius F = Full-Circle 17 = 17' Radius*

* 17 Series available in Quarter-Circle pattern only.

SPECIFICATION GUIDE EXAMPLE: MS - Q

EARIVIFLE.		
	-	
		_

MODELS PATTERN MS = Micro-Spray Nozzle, **Q** = Quarter-Circle Pattern 5' Radius H = Half-Circle Pattern F = Full-Circle Pattern

SPECIFICATION GUIDE

EXAMPLE: S-16A

MODELS S-16A = Stream Spray Nozzle, 16' Radius, Adjustable Arc S-8A = Stream Spray Nozzle, 8' Radius, Adjustable Arc

> Note: When calculating flow and radius utilizing the Institutional Spray body at pressures greater than 30 PSI, use only the 30 PSI (2.1 Bars, 206 kPa) figures. When using any other Hunter spray head body, flow and radius will vary depending on nozzle pressure.

PRODUCT COMPARISONS

FEATURES - Adjustable Arc Nozzle	Hunter® ADJ	Toro® V-15	Rain Bird® VAN
Popular Female Threaded Nozzle	v		~
Arc adjustable without using tools	v		~
Multiple Radius Ranges available	 ✓ 		~
Filter screen included	v	v	v

FEATURES - Fixed Arc Nozzle	Hunter® Fixed Arc	Toro® Fixed Arc	Rain Bird® MPR
Popular Female Threaded Nozzle	✓		v
2'-18' Radius Ranges	v		
Color-coded for easy ID from side and top	v		
Filter screen included	v	v	v

INSTALLATION AND MAINTENANCE

Installation Instructions

- 1. Install sprinklers onto lateral lines.
- 2. Flush lines, making sure the flush caps are directed away from trench.
- 3. Install screen into riser opening and screw female-threaded nozzle onto riser.
- 4. Adjust arc and radius for each sprinkler as described below.

Arc Adjustment on Nozzles

The Hunter Adjustable Arc nozzles come from the factory with a preset arc of 25°. Before setting the left side of the arc, first set the right ratcheting side by twisting the riser assembly



inside of the sprinkler body, aligning the right side of the spray pattern into the proper area. The raised dot on top of the nozzle indicates the adjustable (left) edge of the spray pattern. Hold the perimeter of the nozzle with

fingers and turn the nozzle counter-clockwise to increase the arc. To decrease the arc, hold the perimeter of the nozzle with fingers and turn the nozzle clockwise, decreasing the arc. The arc can also be increased or decreased by using a flat bladed screwdriver.

Radius Adjustment

Hold the nozzle arc stationary with fingers, or with two pins on the side of the Hunter wrench between any of the nozzle spokes.

Then, adjust the radius with a flat-bladed screwdriver by turning the center screw clockwise.

The radius should not be reduced more than 25%. The nozzles are preset at the factory for maximum radius.



PRODUCT FEATURES AND BENEFITS

PCN Bubbler Nozzle... Out of sight flood watering

Hunter has developed the ultimate in deep watering technology with the PCN Bubbler Nozzle. This nozzle is specially designed to screw on to the SRS spray head and most other female threaded spray head bodies on the market today. This means you get all the advantages of traditional flood bubbler watering with a product that retracts into the ground when not in use. Using the PCN Bubbler you will find that the maintenance hassles of other deep watering methods, such as drip, are eliminated. It's the most tamper-proof, eye-appealing method of deep watering available today. With four flow rates to choose from (.25, .50, 1.0, 2.0 GPM; .9, 1.9, 3.8, 7.6 l/min) the PCN can be used in many different soil types with little concern of runoff.

PCN N	ozzle 8	e PCE	B Perf	orman	ce Da	ita
	Model	Pre	ssure	Flow	F	attern
	25	F	30	0.25	т	rickle
	50		30	0.50	T	rickle
	10		30	1.00	P	attern
	20		30	2.00	Р	attern
Note: Typica	al spacing	1 to 3	IT.			
PCN No	zzle & F	PCB P	erforn	nance D	ata –	Metric
		Pres	sure	Flo	w	Pattern
	Model	Bars	kPa	m³/hr	I/min	Type
	20 50	2.1	206	0.06	0.9	Trickle
U	10	2.1	206	0.23	3.8	Pattern
	20	2.1	206	0.45	7.6	Pattern
Note: Typical spacing 0.3 to 0.9 m.						
SPECIFICATION GUIDE						
EXAMPLE: PCB - 25						
MODELS FLOW PCB = ½* FIPT 25 = .25 GPM PCN = Standard Female Nozzle Thread 50 = .50 GPM 10 = 1.0 GPM 21 = 2.0 GPM						

Adjustable Flow

AFB = ½" FIPT

PCB Bubblers...

No need to guess with specific flow rates

For trees and shrubs that are off the beaten path, and for out of the way places, PCB is your low cost deep watering option. The PCB installs quickly and easily to any ½ inch NPT threaded riser or adapter. And, with our line-up of four different PCB models, that means you can select precisely the one you need to meet each of your individual plant's watering requirements. Choose from flow rates of either .25, .50, 1.0, or 2.0 GPM (.9, 1.9, 3.8, 7.6 l/min) to eliminate guesswork and guarantee that all your greenery gets exactly the water it needs.

Choose the AFB model which pressure compensates to a 2.0 GPM (7.6 l/min) flow and can be fine-tuned with a stainless steel screw adjustment.



Note: Typical spacing 0.6 to 1.2 m.

PRECIPITATION RATE FORMULA

Two formulas are shown below, the first is most useful when comparing precipitation rates between different types of sprinklers or calculating precipitation rates on areas with a single type of sprinkler and uniform head and row spacing. The second method is better suited to areas where sprinkler head flows or spacing varies. Metric versions are shown in parenthesis.

Precipitation Rate - Method #1 - Individual Head Method

$Pr = \frac{34650 \text{ x GPM (for any arc)}}{Degrees Arc \text{ x Head Spacing x Row Spacing}}$			Dr -	l/min (for any arc) x 21,600	mm/hr
		$r_1 =$	Degrees of arc x Head spacing (m) x Row Spacing (m)	11111/111	
		Pr =	m ³ /hr (for any arc) x 360,000		
			Degrees of arc x Head spacing (m) x Row Spacing (m)		
Where:					
Pr	=	precipitation rate	e in inch	es per hour	
GPM	=	flow for a given sprinkler of any arc, in gallons per minute			
Degrees Are	c =	the arc of the given sprinkler in degrees			
Head Space	ng =	the space between the heads in a row, in feet			
Row Spacir	ng =	the space between rows of heads, in feet			
34650	=	constant for conversion of area and flow into common units			
F 1 W/1	. • .1	••••••	070		1 200

Example: What is the precipitation rate for a 270 degree sprinkler with 6.8 GPM spaced at 28' by 30'?

 $Pr = \frac{34,650 \times 6.8}{270 \times 28 \times 30} \qquad Pr = 1.04 \text{ in./hr.}$

Precipitation Rate - Method #2 - Total Area Method

Pr =	96.25 x Tot Total A	tal GPM Area	$\left(\Pr = \frac{\text{Total } \text{m}^3/\text{hr x } 1,000}{\text{Total } \text{Area } (\text{m}^2)} = \text{mm/hr} \right) \left(\Pr = \frac{\text{Total } l/\text{min } x 60}{\text{Total } \text{Area } (\text{m}^2)} = \text{mm/hr} \right)$
Where:			
Pr		=	precipitation rate in inches per hour
Tota	l GPM	=	total flow from all sprinklers in the given area in gallons per minute
Tota	l Area	=	the given irrigated area in square feet
96.2	5	=	constant for conversion of area and flow into common units

Example: What is the average precipitation rate for a section of turf 325' by 80' if the total flow from all sprinklers in the area is 112 GPM.

$$Pr = \frac{96.25 \text{ x } 112}{(325 \text{ x } 80)} Pr = 0.41 \text{ in./hr.}$$

SPRINKLER RUN TIME FORMULA

The sprinkler run time formula calculates the number of minutes required to apply enough water to replace the water lost by evapotranspiration for a specific crop irrigated with a system at a particular precipitation rate and efficiency.

$$T = 60 \text{ x } D \text{ x } Et_{\circ} \text{ x } K_{c}$$

Where: $\Pr{x E_a}$

Т = sprinkler run time in minutes Et_o = reference evapotranspiration rate, in inches K = crop coefficient, percent precipitation rate of the area, in inches per hour Pr = E_a application efficiency of the system, percent = 60 = Constant for conversion of area, flow, inches per hour and inches per day into common units D Watering frequency in days =

Example: Determine the sprinkler run time for a commercial turf site with an Eto of 0.15 inches per day and a crop coefficient for the cool season turf of 0.90. The sprinkler precipitation rate is 1.50 in./hr. with an application efficiency of 65%. The watering schedule is set for every three days.

$$T = \frac{60 \times 3 \times 0.15 \times 0.90}{1.50 \times 0.65} = \frac{24.3}{.975} = 24.92 \qquad T = 25 \text{ minutes every 3 days}$$

