

Sprinklers with **A PURPOSE**

By McKenna Corson

**2023 SPRINKLER
COMPARISON CHARTS**

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Irrigation landscape professionals dive into how efficient sprinkler heads make a difference.

As the U.S. continues to struggle with drought, increased attention and need have been placed on efficient sprinkler heads for landscaping. Irrigation landscape professionals know of the importance of installing these water-saving systems, but it can be easy to forget the actual logistics of how they make a difference.

From what it means to be efficient to how they reduce loss of water application, runoff and drift, irrigation landscape professionals unpack efficient sprinkler heads and how they play a vital role in today's water usage.

Putting the 'efficient' in efficient sprinkler heads

It's easy to read on a sprinkler head's packaging that it's efficient, but what does that really mean?

Jeffrey Johnson, senior product manager, commercial rotors and valves, Rain Bird, Azusa, California, says that for a sprinkler head to qualify as efficient, it depends on the distribution of water in a zone and is always less than 100% due to the application method, evaporation or runoff. The terms "distribution uniformity," "coefficient of uniformity" and "scheduling coefficient" are common irrigation terms used to define the efficiency of sprinklers or emitters.

"Efficient sprinklers are those that discharge water with high uniformity and reduce the energy needed in the process of minimizing pressure or flow," Johnson says.

Rick Hall, CIC, CID, CLIA, market development director for K-Rain Manufacturing Corporation, Riviera Beach, Florida, says that the simplest way to describe the right product choice is "the installation and use of a sprinkler head best suited for the area it will be watering."

Efficiency is achieved in sprinkler design when it is able to regulate the water pressure down to the optimum level for the nozzle design and decrease water waste, says Brodie Bruner, executive vice president of Weathermatic, Garland, Texas.

"An efficient sprinkler incorporates a check valve and sufficient retraction spring strength to retain water in the system rather than allow low head drainage," Bruner says.

Reduction of water application loss

One of the key components of efficient sprinkler heads is their ability to reduce loss of water application.

Alexis Deasy, senior marketing communications manager at The Toro Company, Bloomington, Minnesota, explains that there are multiple ways that efficient sprinkler heads successfully do this, such as by "reducing flushing at start-up so that there is little to no water waste or a head to pop-up, reducing misting and fogging at the head through pressure regulation and ensuring that when the nozzle is damaged or removed, wasteful geysers can be prevented."

Pressure regulation and efficient nozzles like multistream, rotary or curtain nozzles also contribute to preventing water loss.

“Efficient nozzles provide uniform water distribution across the full range of water throw,” Johnson says. “Pressure regulation optimizes the water pressure to reduce wasted water due to misting. As a reference, every 10 psi regulated equals a 7% water savings.”

Hall adds that efficient sprinkler heads spray larger water droplets, thus reducing the effects of wind drift, “which can cause uneven watering or even carry water spray outside the intended area of coverage.”

Aaron Gagnon, associate product manager for large turf rotors, ST systems and accessories, Hunter Industries, San Marcos, California, also attributes efficient sprinkler heads’ capabilities to regulate pressure as a way to reduce loss of water application.

“Many spray bodies have pressure regulators in them,” Gagnon says. “Using this type of product will greatly contribute to using less water.”

Reduction of water loss via runoff or drift

Another significant component of efficient sprinkler heads is their ability to reduce water loss caused by runoff or drift.

Bruner notes that efficient sprinkler heads’ prowess in regulating pressure is key to avoiding drift.

“Many areas have water pressure over 50 pounds while a typical spray sprinkler is designed for optimum performance in the mid-30-pound range,” Bruner says. “Excessive pressure results in misting and drift as the water doesn’t effectively make its way to the root zone of the landscape.”

Bruner also highlights the clash between a spray sprinkler’s typical precipitation rate and soils’ intake rate.

“The typical precipitation rate of a spray sprinkler at 1.5 inches per hour is much greater than the intake rate of soils like clay at only 0.2 inches per hour,” Bruner says. “So, runoff is best reduced through run-and-soak cycling with a smart controller.”

Ensuring that water is applied at the correct rate for the soil type is another way that efficient sprinkler heads reduce runoff or drift.

“Tighter soils will need a slower application rate and larger water droplets to effectively absorb the water that is being applied,” Deasy says.

Reducing runoff or drift in system designs

Efficient sprinkler heads do most of the heavy lifting when it comes to lowering water use. However, contractors can help home or property owners decrease runoff or drift through calculated measures during the irrigation system design process.

Bruner stresses that it’s critical contractors consider a site’s water pressure in their design and equipment selection.

“Contractors should choose matched precipitation rate nozzles with proper head spacing to enable efficient and uniform watering,” Bruner says.



PERIODIC MAINTENANCE IS ALSO NECESSARY TO VERIFY THAT THE ARC SETTINGS ON THE ROTORS AND SPRAYS HAVE NOT CHANGED OVER TIME. CLEANING THE HEADS IS ALSO IMPORTANT TO REMOVE DEBRIS THAT MAY CAUSE LEAKS OR AFFECT WATER DISTRIBUTION.”

– Jeffrey Johnson, Rain Bird

Hall advises contractors or property owners not run sprinklers during windy weather and shut the irrigation system off when runoff or pooling of water on the ground is noticed.

“Multiple start times better known as ‘cycle and soak’ allow the soil/ground time to absorb the spray,” Hall says. “A good general rule is to wait an hour between start times.”

He also urges contractors to use multistream or rotary nozzles as they help with soil absorption instead of wasteful runoff or drift. Contractors should also use up-wind/down-wind head spacing and low-angle nozzles to account for windy conditions.

Johnson suggests contractors use rotors and spray bodies with optional or standard integrated check valves to reduce runoff or low head drainage. Rotors or spray bodies with pressure regulation can also be used to optimize the output pressure of the emitter and eliminate misting and water waste. Contractors should set the edges of the rotor or spray nozzles to minimize watering hardscapes along the edges of turf and reduce runoff or drift. During windy weather, low-angle nozzles can be used to reduce drift.

“Periodic maintenance is also necessary to verify that the arc settings on the rotors and sprays have not changed over time,” Johnson says. “Cleaning the heads is also important to remove debris that may cause leaks or affect water distribution.” 🌧️

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2023 SPRINKLER COMPARISON CHARTS

Editor's note: Information presented in these charts was provided by manufacturers. Please contact the manufacturer directly for more details.



To download a copy of these comparison charts, go to irrigationandlighting.org/2023-sprinkler-comparison-charts.

Thanks to Ewing for sponsoring this year's sprinkler comparison charts.



ROTATING NOZZLES

Manufacturer	Model	Series	Nozzle	M or F thread	Pattern (degrees)	Operating pressure (psi)	Radius (ft.)	Discharge rate (gpm)	Precipitation rate (in./h)
Hunter	MP-1000	MP-1000	adj. arc/radius	M or F	90-210, 210-270, 360	30-55	8-15	0.17-1.01	~ 0.4
Hunter	MP-2000	MP-2000	adj. arc/radius	M or F	90-210, 210-270, 360	25-55	13-21	0.34-1.74	~ 0.4
Hunter	MP-3000	MP-3000	adj. arc/radius	M or F	90-210, 210-270, 360	25-55	22-30	0.71-4.27	~ 0.4
Hunter	MP-3500	MP-3500	adj. arc/radius	F	90-210	25-55	31-35	1.04-3.94	~ 0.4
Hunter	MP Corner	MP Specialty	adj. arc/radius	M or F	45-105	30-55	8-15	0.17-0.53	~ 0.4
Hunter	MP Left Corner Strip	MP Specialty	adj. radius	M or F	strip	30-55	5x15	0.19-0.26	—
Hunter	MP Side Strip	MP Specialty	adj. radius	M or F	strip	30-55	5x30	0.38-0.51	—
Hunter	MP Right Corner Strip	MP Specialty	adj. radius	M or F	strip	30-55	5x15	0.19-0.26	—
Hunter	MP-800SR	MP-800SR	adj. arc/radius	F	90-210, 360	30-55	6-12	0.16-0.98	~ 0.8
Hunter	MP-815	MP-815	adj. arc/radius	F	90-210, 210-270, 360	30-55	8-16	0.42-2.26	~ 0.8
K-Rain	RN100 – options available	Rotary Nozzle	adj. arc/radius, fixed 360	F	90-270, fixed 360	30-50	13-15	0.22-1.2	0.46-0.51
K-Rain	RN200 – options available	Rotary Nozzle	adj. arc/radius, fixed 360	F	90-270, fixed 360	30-50	16-19	0.34-1.88	0.45-0.51
K-Rain	RN300 – options available	Rotary Nozzle	adj. arc/radius, fixed 360	F	90-270, fixed 360	30-50	26-30	0.8-3.7	0.39-0.55
K-Rain	RNS-RES-515	Rotary Nozzle	fixed	F	fixed-right end strip	30-50	4x15-6x15	0.3-0.4	—
K-Rain	RNS-LES-515	Rotary Nozzle	fixed	F	fixed-left end strip	30-50	4x15-6x16	0.3-0.4	—
K-Rain	RNS-SS-530	Rotary Nozzle	fixed	F	fixed-side strip	30-50	4x29-7x32	0.5-0.7	—
K-Rain	RN-100ADJ	Rotary Nozzle	adj. arc/radius	F	80-360	30-50	13-15	0.22-1.2	0.49-0.51
K-Rain	RN-200ADJ	Rotary Nozzle	adj. arc/radius	F	80-360	30-50	16-19	0.34-1.9	0.49-0.51
K-Rain	RN-300ADJ	Rotary Nozzle	adj. arc/radius	F	80-360	30-50	26-30	0.8-3.8	0.41-0.48
Rain Bird	R-VAN14 – options available	R-VAN	8 to 14 ft. adj. R-VAN	F	45-360	30-55	8-14	0.28-1.45	0.6-0.67
Rain Bird	R-VAN18 – options available	R-VAN	13 to 18 ft. adj. R-VAN	F	45-360	30-55	13-18	0.42-2.11	0.6-0.68
Rain Bird	R-VAN24 – options available	R-VAN	17 to 24 ft. adj. R-VAN	F	45-360	30-55	17-24	0.6-3.74	0.6-0.63
Rain Bird	R-VAN-LCS	R-VAN	left corner strip R-VAN	F	left strip	30-55	5x15	0.18-0.28	0.56-0.64
Rain Bird	R-VAN-RCS	R-VAN	right corner strip R-VAN	F	right strip	30-55	5x15	0.18-0.28	0.56-0.64
Rain Bird	R-VAN-SST	R-VAN	side strip R-VAN	F	side strip	30-55	5x30	0.36-0.56	0.56-0.64
Toro	PRN-TA	Precision	gear-driven rotary	M	45-270	20-75	14-26	0.17-2.6	0.6
Toro	PRN-TF	Precision	gear-driven rotary	M	360	20-75	14-26	1.81-3.68	0.6

VARIABLE ARC NOZZLES											
Inlet size (in.)	M or F thread	Manufacturer	Model	Series	Nozzle	Pattern (degrees)	Operation pressure (psi)	Radius	Discharge rate (gpm)	Precipitation rate (in./h)	
n/a	F	Hunter	4A	Pro-adjustable	4-ft. adj.	0-360	20-40	3-4	0.11-0.9	~ 4.0	
n/a	F	Hunter	6A	Pro-adjustable	6-ft. adj.	0-360	20-40	4-6	0.15-1.4	~ 3.5	
n/a	F	Hunter	8A	Pro-adjustable	8-ft. adj.	0-360	20-40	7-9	0.18-2	~ 2.65	
n/a	F	Hunter	10A	Pro-adjustable	10-ft. adj.	0-360	20-40	9-11	0.2-2.36	~ 1.9	
n/a	F	Hunter	12A	Pro-adjustable	12-ft. adj.	0-360	20-40	11-13	0.25-3.36	~ 1.7	
n/a	F	Hunter	15A	Pro-adjustable	15-ft. adj.	0-360	20-40	14-17	0.39-4.52	~ 1.6	
n/a	F	Hunter	17A	Pro-adjustable	17-ft. adj.	0-360	20-40	16-19	0.49-5.52	~ 1.6	
n/a	F	Hydro-Rain	HRN-200-04-ADJ	Adjustable nozzle	4-ft. adj.	0-360	15-70	4-6	0.61-3.36	8.97-17.03	
n/a	F	Hydro-Rain	HRN-200-08-ADJ	Adjustable nozzle	8-ft. adj.	0-360	15-70	7-9	0.39-2.11	2.33-3.49	
n/a	F	Hydro-Rain	HRN-200-10-ADJ	Adjustable nozzle	10-ft. adj.	0-360	15-70	9-11	0.39-2.11	1.68-2.11	
n/a	F	Hydro-Rain	HRN-200-12-ADJ	Adjustable nozzle	12-ft. adj.	0-360	15-70	11-13	0.51-2.6	1.37-1.71	
n/a	F	Hydro-Rain	HRN-200-15-ADJ	Adjustable nozzle	15-ft. adj.	0-360	15-70	13-16	0.59-3.17	1.19-1.54	
n/a	F	Hydro-Rain	HRN-200-18-ADJ	Adjustable nozzle	18-ft. adj.	0-360	15-70	15-19	0.68-3.84	1.02-1.34	
n/a	F	Irritrol	PRO-VAN8	Variable Arc	8-ft. VAN	0-360	20-50	8-10	0.53-2.78	2.59-5.42	
n/a	F	Irritrol	PRO-VAN10	Variable Arc	10-ft. VAN	0-360	20-50	10-13	0.62-3.59	1.19-4.45	
n/a	F	Irritrol	PRO-VAN12	Variable Arc	12-ft. VAN	0-360	20-50	11-14	0.75-3.62	1.51-3.74	
n/a	F	Irritrol	PRO-VAN15	Variable Arc	15-ft. VAN	0-360	20-50	14-17	1.0-4.31	1.18-3.08	
n/a	F	Irritrol	PRO-VAN17	Variable Arc	17-ft. VAN	0-360	20-50	15-18	1.2-4.6	0.97-2.92	
n/a	F	K-Rain	KVF8	High Efficiency KVF Nozzles	8-ft. adj.	0-360	20-40	9-11	0.39-2.3	1.62-2.59	
n/a	F	K-Rain	KVF10	High Efficiency KVF Nozzles	10-ft. adj.	0-360	20-40	10-12	0.45-2.8	1.65-2.16	
n/a	F	K-Rain	KVF12	High Efficiency KVF Nozzles	12-ft. adj.	0-360	20-40	12-14	0.65-3.5	1.47-2.04	
n/a	F	K-Rain	KVF15	High Efficiency KVF Nozzles	15-ft. adj.	0-360	20-40	14-17	0.75-4.6	1.45-1.88	
n/a	F	K-Rain	KVF17	High Efficiency KVF Nozzles	17-ft. adj.	0-360	20-40	17-18	0.85-4.8	1.13-1.65	
n/a	M	K-Rain	KV8	KV Nozzles	8-ft. adj.	0-360	20-50	7-9	0.3-2.3	1.9-3.82	
n/a	M	K-Rain	KV10	KV Nozzles	10-ft. adj.	0-360	20-50	10-13	0.7-3.5	1.87-3.68	
n/a	M	K-Rain	KV12	KV Nozzles	12-ft. adj.	0-360	20-50	11-15	1.1-3.9	2.02-3.42	
n/a	M	K-Rain	KV15	KV Nozzles	15-ft. adj.	0-360	20-50	14-19	1.3-5.3	1.58-2.57	
n/a	M	K-Rain	KV17	KV Nozzles	17-ft. adj.	0-360	20-50	15-20	1.7-5.4	1.27-2.47	
1/2	F	Rain Bird	HE-VAN-08	HE-VAN Series	8-ft. HE-VAN	0-360	15-30	5-8	0.21-1.17	1.76-3.19	
1/2	F	Rain Bird	HE-VAN-10	HE-VAN Series	10-ft. HE-VAN	0-360	15-30	7-10	0.32-1.78	1.72-2.48	
1/2	F	Rain Bird	HE-VAN-12	HE-VAN Series	12-ft. HE-VAN	0-360	15-30	9-12	0.42-2.37	1.58-1.99	
1/2	F	Rain Bird	HE-VAN-15	HE-VAN Series	15-ft. HE-VAN	0-360	15-30	11-15	0.65-3.7	1.58-2.08	
1/2	F	Rain Bird	4VAN	VAN	4-ft. VAN	0-330	15-30	3-4	0.21-0.88	4.93-10.27	
1/2	F	Rain Bird	6VAN	VAN	6-ft. VAN	0-330	15-30	4-6	0.26-1.2	3.21-6.34	
1/2	F	Rain Bird	8VAN	VAN	8-ft. VAN	0-330	15-30	6-8	0.51-1.7	2.79-5.46	
1/2	F	Rain Bird	10VAN	VAN	10-ft. VAN	0-360	15-30	7-10	0.48-2.6	2.5-3.8	
1/2	F	Rain Bird	12VAN	VAN	12-ft. VAN	0-360	15-30	9-12	0.39-2.36	1.58-1.86	
1/2	F	Rain Bird	15VAN	VAN	15-ft. VAN	0-360	15-30	11-15	0.65-3.7	1.58-2.07	
1/2	F	Rain Bird	18VAN	VAN	18-ft. VAN	0-360	15-30	14-18	1.05-5.32	1.59-2.07	
n/a	M	Toro	TVAN8	Variable Arc	8-ft. VAN	0-360	20-50	7-9	0.58-1.96	2.08-5.26	
n/a	M	Toro	TVAN10	Variable Arc	10-ft. VAN	0-360	20-50	9-10	0.59-2.69	2.06-4.18	
n/a	M	Toro	TVAN12	Variable Arc	12-ft. VAN	0-360	20-50	10-13	0.76-3.47	2.0-3.38	
n/a	M	Toro	TVAN15	Variable Arc	15-ft. VAN	0-360	20-50	13-16	1.06-4.33	1.4-2.88	
n/a	M	Toro	TVAN17	Variable Arc	17-ft. VAN	0-360	20-50	15-18	1.25-4.71	1.02-2.57	
1/2	F	Weathermatic	6700	6700	6-12, 7LA, 10LA	20-360	25-60	23-43	1.5-6.3	0.24-1.3	

ROTORS										
Inlet size (in.)	Manufacturer	Model	Series	Nozzle	Pattern	Operation	Radius	Discharge	Precipitation	Gear drive
1/2	Hunter	SRM	4-in. Plastic	8 PI	adj. 40-360	30-50	14-34	0.42-4.3	~ 0.49	yes
1/2	Hunter	PGJ	Shrub, 4-, 6- or 12-in. Plastic	8 PI	adj. 40-360	30-50	14-34	0.42-4.3	~ 0.49	yes
3/4	Hunter	PGP-ADJ	4-in. Plastic	27 PI	adj. 40-360	30-70	22-52	0.5-14.1	~ 0.4	yes
3/4	Hunter	PGP Ultra	Shrub, 4-, 6- or 12-in. Plastic	34 PI	adj. 50-360	30-70	22-52	0.36-14.8	~ 0.4	yes
3/4	Hunter	I-20	Shrub, 4-, 6- or 12-in. Plastic or stainless	30 PI	adj. 50-360	30-70	17-47	0.36-14.8	~ 0.4	yes
1	Hunter	I-25	4- or 6-in. Plastic or stainless	12 PI	adj. 50-360	40-100	40-71	3.8-31.5	~ 0.4	yes
1	Hunter	I-40	4- or 6-in. Stainless, opposing nozzle	6 PI	adj. 50-360	40-100	45-76	7.6-33.7	~ 0.4	yes
1 1/2	Hunter	I-80	4-in. Plastic, opposing nozzle	7 PI	adj. 60-360	40-100	63-97	20.2-59.6	~ 0.6	yes
1 1/2	Hunter	I-90	3-in. Plastic, opposing nozzle	8 PI	adj. 40-360	60-100	66-103	29.5-83.3	~ 0.6	yes
3/4	Hydro-Rain	HRX-075-ADJ	HRX - 4-in. Plastic w/CV	5 STD, 5 LA	adj. 40-360	20-70	24-52	0.7-9.6	0.18-1.03	yes
3/4	Hydro-Rain	HRX-075-ADJ-NP	HRX - 4-in. Plastic NP w/CV	5 STD, 5 LA	adj. 40-360	20-70	24-52	0.7-9.6	0.18-1.03	yes
1/2	Irritrol	430R	430R	PI	partial/FC	30-50	20-35	0.8-3.4	0.28-65	yes
3/4	Irritrol	550R	550R	PI	partial/FC	25-65	25-50	0.74-9.7	0.2-0.99	yes
1/2	K-Rain	13003	MiniPro 4-in.	5 STD	adj. 40-360	20-70	18-33	0.8-3.8	0.26-0.60	yes
1/2	K-Rain	13006	MiniPro 6-in.	5 STD	adj. 40-360	20-70	18-33	0.8-3.8	0.26-0.60	yes
1/2	K-Rain	13012	MiniPro 12-in.	5 STD	adj. 40-360	20-70	18-33	0.8-3.8	0.26-0.60	yes
1/2	K-Rain	RPS50	RPS50	5 STD	adj. 40-360	20-70	18-33	0.8-3.8	0.26-0.60	yes
3/4	K-Rain	RPS75 - options available	RPS75	8 STD, 4 LA	adj. 40-360	20-70	22-51	0.7-8.3	0.16-1.01	yes
3/4	K-Rain	60003	RPS Select	4 built-in	adj. 40-360	20-70	33-46	1.3-6.8	0.23-0.71	yes
3/4	K-Rain	RPS75i - options available	RPS 75i	9 STD, 4 LA	adj. 40-360	20-70	26-48	0.9-9.7	0.22-0.98	yes
3/4	K-Rain	11003	ProPlus	9 STD, 4 LA	adj. 40- continuous 360	20-70	22-50	0.5-10	0.12-0.88	yes
3/4	K-Rain	10003 - options available	SuperPro	9 STD, 4 LA	adj. 40-continuous 360	20-70	26-46	1.1-11.1	0.21-1.22	yes
1	K-Rain	14053 - options available	ProSport High Speed	6 STD	adj. 40-continuous 360	40-90	43-77	5.9- 32.5	0.61-1.56	yes
1	K-Rain	14003 - options available	ProSport	6 STD	adj. 40-continuous 360	40-90	43-77	5.1-29.2	0.48-1.34	yes
1	K-Rain	14003-6INCH	ProSport	6 STD	adj. 40-continuous 360	40-90	43-77	5.1-29.2	0.48-1.34	yes
1/2	Rain Bird	3500SPCSAM	3500 shrub PC w/CV	0.75-4	40-360	25-55	15-35	0.54-4.6	0.37-0.83	yes
1/2	Rain Bird	3504 - options available	3500 4-in. PC	0.75-4	40-360	25-55	15-35	0.54-4.6	0.37-0.83	yes
3/4	Rain Bird	5000SPCSAM - options available	5000 shrub PC w/CV	1-8 Std, 1-3 LA, MPR	40-360	25-65	25-50	0.76-9.63	0.2-1.5	yes
3/4	Rain Bird	5004 (PC or FC) - options available	5000 (PC or FC) 4-in.	1-8 Std, 1-3 LA, MPR	40-360	25-65	25-50	0.76-9.63	0.2-1.5	yes
3/4	Rain Bird	5006PC - options available	5000 6-in.	1-8 Std, 1-3 LA, MPR	40-360	25-65	25-50	0.73-9.63	0.2-1.5	yes
3/4	Rain Bird	5012+PCSAMR - options available	5000+ 12-in. w/PR	1-8 Std, 1-3 LA, MPR	40-360	25-65	25-50	0.73-9.63	0.2-1.5	yes
1	Rain Bird	6504 (PC or FC) - options available	Falcon 6504 (PC or FC) w/CV	4-18	40-360	30-90	39-65	2.9-21.7	0.37-1.31	yes
1	Rain Bird	8005 - options available	8005 P/FC w/CV	4-26	50-360	50-100	39-81	3.8-36.3	0.48-1.28	yes
1/2	Toro	Mini8-4P	Mini 8	PI	partial/FC	30-60	20-35	0.8-3.4	0.24-0.54	yes
3/4	Toro	Stream Rotor	300	PI	9 arcs	35-50	15-33	0.57-7.5	0.33-1.35	yes
3/4	Toro	T5P-RS	T5 RapidSet	PI	partial/FC	25-65	25-50	0.76-9.63	0.2-0.99	yes
1	Toro	T7P	T7	PI	partial/FC	40-100	40-75	1.7-30.6	0.62-1.42	yes
1	Toro	640	640	PI	partial/FC	40-90	47-67	6-25	0.26-4.91	yes
1	Toro	TS90	TS90	PI	partial/FC	40-100	53-95	14-61.5	0.46-0.63	yes
2	Toro	TS170V	TS170	PI	partial/FC	60-115	111-177	113-303	n/a	piston
2 1/2	Toro	P2S	P2	PI	partial/FC	60-115	105-180	70-267	n/a	piston
3	Toro	P2M	P2	PI	partial/FC	70-115	138-226	131-535	n/a	piston
3/4	Weathermatic	T3	T	1, 1.5, 2, 3, 3.5, 4, 6, 8, 9, 13	40-360	30-70	28-61	0.7-14.9	0.17-0.89	yes
3/4	Weathermatic	T3	T	2.0LA, 2.5LA, 3.5LA, 4.5LA	40-360	30-50	29-37	1.6-4.1	0.34-0.67	yes
3/4	Weathermatic	T3-36	T	1, 1.5, 2, 3, 3.5, 4, 6, 8, 9, 13	360	30-70	28-61	0.7-14.9	0.17-0.89	yes
3/4	Weathermatic	T3-36	T	2.0LA, 2.5LA, 3.5LA, 4.5LA	360	30-50	29-37	1.6-4.1	0.34-0.67	yes
3/4	Weathermatic	T3SS	T- SS	1, 1.5, 2, 3, 3.5, 4, 6, 8, 9, 13	40-360	30-70	28-61	0.7-14.9	0.17-0.89	yes
3/4	Weathermatic	T3SS	T- SS	2.0LA, 2.5LA, 3.5LA, 4.5LA	40-360	30-50	29-37	1.6-4.1	0.34-0.67	yes
3/4	Weathermatic	T3-36SS	T-SS	1, 1.5, 2, 3, 3.5, 4, 6, 8	360	30-70	28-61	0.7-14.9	0.17-0.89	yes
3/4	Weathermatic	T3-36SS	T-SS	2.0LA, 2.5LA, 3.5LA, 4.5LA	360	30-50	29-37	1.6-4.1	0.34-0.67	yes
3/4	Weathermatic	T3S	T-shrub	1, 1.5, 2, 3, 3.5, 4, 6, 8, 9, 13	40-360	30-70	28-61	0.7-14.9	0.17-0.89	yes
3/4	Weathermatic	T3S	T-shrub	2.0LA, 2.5LA, 3.5LA, 4.5LA	40-360	30-50	29-37	1.6-4.1	0.34-0.67	yes
3/4	Weathermatic	T35	T	1, 1.5, 2, 3, 3.5, 4, 6, 8, 9, 13	40-360	30-70	28-61	0.7-14.9	0.17-0.89	yes
3/4	Weathermatic	T35	T	2.0LA, 2.5LA, 3.5LA, 4.5LA	40-360	30-50	29-37	1.6-4.1	0.34-0.67	yes
1	Weathermatic	CT70	CT	71-73	40-360	40-80	49-61	8.1-17.8	0.65-1.06	yes
3/4	Weathermatic	6000	6000	4, 5, 6, 7, 8, 9, 10, 11	40-360	20-65	30-51	1.0-9.5	0.21-0.88	yes
3/4	Weathermatic	6000	6000	4LA, 5LA, 6LA, 7LA, 8LA, 9LA, 10LA	40-360	20-65	26-42	0.9-7.5	0.26-1.02	yes
1	Weathermatic	6500	6500	61, 62, 63, 64	40-360	45-75	44-60	2.8-13.2	0.23-0.84	yes
1	Weathermatic	6513	6500	61, 62, 63, 64	40-360	45-75	43-51	2.8-13.2	0.29-1.13	yes
1	Weathermatic	7500	7500	3, 4, 5, 6, 7, 8	40-360	45-90	53-74	9.4-27.5	0.64-1.21	yes
1	Weathermatic	7513	7500	3, 4, 5, 6, 7, 8	40-360	45-90	48-64	9.4-27.5	0.79-1.61	yes
1	Weathermatic	CT70	CT	74, 75	40-360	60-90	59-74	16.6-28	0.92-1.15	yes
1	Weathermatic	CT70-36	CT	71, 72, 73, 74, 75	360	40-90	49-74	8.1-28	0.65-1.15	yes
1	Weathermatic	CT70SS	CT SS	71, 72, 73, 74, 75	40-360	40-90	49-74	8.1-28	0.65-1.15	yes
1	Weathermatic	CT70-36SS	CT SS	71, 72, 73, 74, 75	360	40-90	49-74	8.1-28	0.65-1.15	yes

SPRAY HEADS											
Inlet size (in.)	Manufacturer	Model	Series	Nozzle	M or F thread	Pattern (degrees)	Operation pressure (psi)	Radius (ft.)	Discharge rate (gpm)	Precipitation rate (in./h)	Gear drive
1/2	Hit Products	907T, -CKV, -PRD	900 Telescopic	fixed/adj.	M	20-360	25-70	5-17	0.02-4.6	0.5-2.7	no
1/2	Hit Products	913T, -CKV, -PRD	900 Telescopic	fixed/adj.	M	20-360	25-70	5-17	0.02-4.6	0.5-2.7	no
1/2	Hit Products	913TS	900 Telescopic	fixed/adj.	M	20-360	25-70	5-17	0.02-4.6	0.5-2.7	no
1/2	Hit Products	913TS-PRD	900 Telescopic	fixed/adj.	M	20-360	25-70	5-17	0.02-4.6	0.5-2.7	no
1/2	Hit Products	902-912, 902F-912F, -CKV, -PRD	900	fixed/adj.	M/F	20-360	15-70	5-17	0.02-4.6	0.5-2.7	no
1/2	Hit Products	702-712, 702F-712F, -CKV, -PRD	700	fixed/adj.	M/F	20-360	15-70	5-17	0.02-4.6	0.5-2.7	no
1/2	Hit Products	HP02-HP04, -CKV	HP	fixed/adj.	M	20-360	25-70	5-17	0.02-4.6	0.5-2.7	no
1/2	Hunter	PS Ultra	2-, 4- or 6-in.	female-threaded	F	fixed and adj.	20-70	8-17	varies	1.6	no
1/2	Hunter	Pro-Spray	Shrub, 2-, 3-, 4-, 6- or 12-in.	female-threaded	F	fixed and adj.	15-100	2-17	varies	—	no
1/2	Hunter	Pro-Spray PRS30	Shrub, 4-, 6- or 12-in.	female-threaded	F	fixed and adj.	15-100	2-17	varies	—	no
1/2	Hunter	Pro-Spray PRS40	Shrub, 4-, 6- or 12-in.	female-threaded	F	fixed and adj.	15-100	2-35	varies	—	no
1/2	Hydro-Rain	HRS-150-04	Slim Spray Body	All spray/rotary nozzles	F	fixed and adj.	15-70	4-18	varies	varies	no
1/2	Hydro-Rain	HRS-200 - options available	Commercial Spray Body	All spray/rotary nozzles	F	fixed and adj.	15-70	4-18	varies	varies	no
1/2	Hydro-Rain	HRS-200-PR - options available	Adj. PR w/CV Commercial Spray Body	all spray/rotary nozzles	F	fixed and adj.	15-70	4-18	varies	varies	no
1/2	Hydro-Rain	HRS-200-NP - options available	NP Commercial Spray Body	all spray/rotary nozzles	F	fixed and adj.	15-70	4-18	varies	varies	no
1/2	Hydro-Rain	HRS-200-NP-PR - options available	NP & Adj. PR w/CV Commercial Spray Body	all spray/rotary nozzles	F	fixed and adj.	15-70	4-18	varies	varies	no
1/2	Irritrol	I-PRO400-I-PRO1200	I-PRO	female thread	M	fixed	20-50	5-17	.06-4.75	0.97-5.42	no
1/2	K-Rain	73001	3-in. K-Spray	male thread	F	fixed and adj.	20-70	8-17	0.3-5.4	1.9-3.82	no
1/2	K-Rain	74001	4-in. K-Spray	male thread	F	fixed and adj.	20-70	8-17	0.3-5.4	1.9-3.82	no
1/2	K-Rain	76001	6-in. K-Spray	male thread	F	fixed and adj.	20-70	8-17	0.3-5.4	1.9-3.82	no
1/2	K-Rain	71201	12-in. K-Spray	male thread	F	fixed and adj.	20-70	8-17	0.3-5.4	1.9-3.82	no
1/2	K-Rain	NP2	2-in. NP	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	NP4	4-in. NP	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78002 - options available	2-in. Pro-S	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78003 - options available	3-in. Pro-S	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78004 - options available	4-in. Pro-S	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78006 - options available	6-in. Pro-S	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78012 - options available	12-in. Pro-S	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78004-PR30	4-in. Pro-S PR30	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78006-PR30	6-in. Pro-S PR30	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no

SPRAY HEADS <i>continued</i>											
Inlet size (in.)	Manufacturer	Model	Series	Nozzle	M or F thread	Pattern (degrees)	Operation pressure (psi)	Radius (ft.)	Discharge rate (gpm)	Precipitation rate (in./h)	Gear drive
1/2	K-Rain	78012-PR30	12-in. Pro-S PR30	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78004-PR40	4-in. Pro-S PR40	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78006-PR40	6-in. Pro-S PR40	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	K-Rain	78012-PR40	12-in. Pro-S PR40	female threaded nozzles	M	fixed and adj.	20-70	8-17	varies	varies	no
1/2	Rain Bird	1804 – options available	4-in. 1800	all spray/rotary nozzles	F	fixed and adj.	15-70	2.5-24	varies	varies	no
1/2	Rain Bird	1806 – options available	6-in. 1800	all spray/rotary nozzles	F	fixed and adj.	15-70	2.5-24	varies	varies	no
1/2	Rain Bird	1812 – options available	12-in. 1800	all spray/rotary nozzles	F	fixed and adj.	15-70	2.5-24	varies	varies	no
1/2	Rain Bird	RD04 – options available	4-in. RD1800	all spray/rotary nozzles	F	fixed and adj.	15-100	2.5-24	varies	varies	no
1/2	Rain Bird	RD06 – options available	6-in. RD1800	all spray/rotary nozzles	F	fixed and adj.	15-100	2.5-24	varies	varies	no
1/2	Rain Bird	RD12 – options available	12-in. RD1800	all spray/rotary nozzles	F	fixed and adj.	15-100	2.5-24	varies	varies	no
1/2	Rain Bird	PA8S Shrub Adapters – options available	Shrub Adapter	all spray/rotary nozzles	F	fixed and adj.	15-70	2.5-24	varies	varies	no
1/2	Rain Bird	US400	UNI-Spray (body only)	all spray/rotary nozzles	F	fixed and adj.	15-70	2.5-24	varies	varies	no
1/2	Rain Bird	US410	4-in. UNI-Spray w/Pre-Installed 10VAN	10 ft. VAN	F	0-360	15-70	7-10	0.48-2.6	2.5-3.8	no
1/2	Rain Bird	US412	4-in. UNI-Spray w/Pre-Installed 12VAN	12 ft. VAN	F	0-360	15-70	9-12	0.39-2.36	1.58-1.86	no
1/2	Rain Bird	US415	4-in. UNI-Spray w/Pre-Installed 15VAN	15 ft. VAN	F	0-360	15-70	11-15	0.65-3.7	1.58-2.07	no
1/2	Rain Bird	US418	4-in. UNI-Spray w/Pre-Installed 18VAN	18 ft. VAN	F	0-360	15-70	14-18	1.05-5.32	1.59-2.07	no
1/2	Toro	570Z – options available	570Z Standard	Precision/MPR/TVAN	F	0-360	15-75	0-26	0.04-4.58	0.6-1.73	no
1/2	Toro	LPS 2XX	LPS 200 with TVAN nozzle	TVAN	F	0-360	20-50	0-26	0.04-4.58	0.6-1.73	no
1/2	Toro	LPS 4XX	LPS 400 with TVAN nozzle	TVAN	F	0-360	20-50	0-26	0.04-4.58	0.6-1.73	no
n/a	Toro	0-T-X-X	Precision	fixed spray	M	60-360	20-75	5-15	0.04-2.4	1	no
n/a	Toro	0-X-X	Precision	fixed spray	F	60-360	20-75	5-15	0.04-2.4	1	no
n/a	Toro	0-T-X-XP	Precision	pressure-comp. fixed spray	M	60-360	20-75	5-15	0.06-2.68	1	no
n/a	Toro	0-X-XP	Precision	pressure-comp. fixed spray	F	60-360	20-75	5-15	0.06-2.68	1	no
n/a	Toro	XX-XXX-PC	MPR PLUS	pressure-comp. fixed spray	M	90-360	20-75	5-15	0.05-4.58	1.5	no
n/a	Toro	TVANXX	TVAN	variable arc	M	0-360	20-50	8-17	0.58-4.71	2.2	no
1/2	Weathermatic	MAX4 – options available	Pop-up	various	F	fixed 90-360/adj. 0-360	15-100	5-18	0.3-7.5	1.18-5.74	no
1/2	Weathermatic	MAX6 – options available	Pop-up	various	F	fixed 90-360/adj. 0-360	15-100	5-18	0.3-7.5	1.18-5.74	no
1/2	Weathermatic	MAX12 – options available	Pop-up	various	F	fixed 90-360/adj. 0-360	15-100	5-18	0.3-7.5	1.18-5.74	no
1/2	Weathermatic	MAXS	Shrub Adapter	various	F or M	fixed 90-360/adj. 0-360	15-70	5-18	0.3-7.5	1.18-5.74	no

IMPACT SPRINKLERS										
Inlet size (in.)	Manufacturer	Model	Series	Nozzle	Pattern	Operation pressure (psi)	Radius (ft.)	Discharge rate (gpm)	Precipitation rate (in./h)	Gear drive
1/2	Buckner	17023W	n/a	B	F	25-60	33-44	1.28-5.48	n/a	no
1/2	Buckner	17023R	n/a	B	F	25-60	33-44	1.28-5.48	n/a	no
1/2	Buckner	170W-23W	n/a	B	F	25-60	31-41	0.33-3.51	0.03-0.16	no
1/2	Buckner	170W-23R	n/a	B	F	25-60	29-38	0.56-2.67	0.05-0.17	no
1/2	Buckner	170W-15RP	n/a	B	F	25-50	25-35	0.56-2.45	0.04-0.27	no
1/2	Buckner	90SD	n/a	B	F/P	25-55	35-48	3.54-5.44	0.28-0.35	no
1/2	Buckner	65P	n/a	PI	F/P	25-60	33-47	3.54-5.64	0.34-0.29	no
1/2	Buckner	90DZ	n/a	ZDC	F/P	25-55	34-47	2.11-5.64	0.2-0.28	no
3/4	Buckner	2000SX	n/a	B	F	35-80	40-60	2.53-15.71	0.32-0.56	no
3/4	Buckner	261SDX	n/a	B	F/P	30-60	41-50	3.94-13.73	0.26-0.61	no
1	Buckner	300SAX	n/a	B	F	40-80	47-80	14.61-46.59	0.47-0.89	no
1	Buckner	350SAX	n/a	B	F	40-80	47-80	6.32-46.59	0.29-0.73	no
1	Buckner	360SA	n/a	B	F/P	35-100	49-82	7.75-44.01	0.36-0.73	no
1 1/4	Buckner	AI120	n/a	B	F	55-95	75-113	24.9-121	0.52-1.05	no
1 1/4	Buckner	400S	n/a	B	F	65-100	85-117	34.62-132.18	0.35-0.7	no
1 1/4	Buckner	AI123	n/a	B	F/P	55-95	73-113	24.9-121	0.52-1.05	no
1 1/4	Buckner	AI120	n/a	B	F	55-95	73-113	24.9-121	0.52-1.05	no
1 1/4	Buckner	400S	n/a	B	F	65-100	85-117	34.62-132.18	0.35-0.7	no
1 1/4	Buckner	AI123	n/a	B	F/P	55-95	73-113	24.9-121	0.52-1.05	no
1/2 or 3/4	Irritrol	Titan	Titan	PI	partial/FC	30-50	32-45	1.5-7.5	0.14-0.42	no
1/2 or 3/4	K-Rain	ST-IS45	SureThrow	2.9-4.0	15-360	28-57	37-42	2.0-5.2	0.28-0.56	no
1/2 or 3/4	Rain Bird	2045A	Maxi-Paw P/FC	6-12 Std., 7-10 LA	20-360	25-60	22-45	1.5-8.4	0.28-1.21	no
1/2 or 3/4	Rain Bird	2045A-SAM	Maxi-Paw P/FC w/CV	6-12 Std., 7-10 LA	20-360	25-60	22-45	1.5-8.4	0.28-1.21	no
1/2 or 3/4	Rain Bird	2045A-SAM-NP	Maxi-Paw NP P/FC w/CV	6-12 Std., 7-10 LA	20-360	25-60	22-45	1.5-8.4	0.28-1.21	no
1/2	Rain Bird	2045PJ	Maxi-Bird	6-12 Std., 7-10 LA	20-360	25-60	22-45	1.5-8.4	0.28-1.21	no
2	Rain Bird	XLR	XLR P/FC	12-28	20-360	30-120	80-202	35-379	n/a	no
1 1/2	Toro	TS120V	TS120	PI	partial/FC	45-120	62-125	21-121	n/a	no

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