

LDN[®] Low Drift Nozzle



MECHANIZED IRRIGATION

The LDN - Low Drift Nozzle - offers low application intensity, a consistent droplet size and a large area of coverage at low pressures.



LDN[®] UP3[™] Easy Clean Nozzle



The Senninger LDN - Low Drift Nozzle - was the first spray nozzle providing the option to stack multiple deflector pads. This produces uniform sized droplets along the wide range of nozzle flows found on center pivots, which helps center pivot irrigators fight wind-drift and evaporative loss. The LDN's streamlined body and durable components can handle the rigors of traveling through tall crops. By using multiple deflector pad levels, additional grooves can be added to the LDN to control water direction and droplet size while still providing a gentle, spread-out application.

Large Area of Coverage

The LDN provides the largest area of instantaneous coverage at a lower pressure. By applying water to a larger area of soil surface at any given instant of the sprinkler's operation, the impact of the sprinkler's pattern on the soil structure is reduced. Larger instantaneous coverage area reduces the rate at which the soil is required to take in water. Preservation of intake rate and increased soak times greatly reduce the potential for irrigation water run-off and wheel rutting.

Ultra Low Pressure



The LDN is designed for peak performance at low pressures of 6 to 20 psi (0.41 to 1.38 bar). It makes the most of available water by getting it to the soil efficiently. Lower pressure can translate

to reduced horsepower requirements and less energy consumption, offering irrigators a tremendous opportunity to lower total pumping costs and increase the bottom line.

Spray Nozzle Comparison **LDN[®] UP3[™]**

Easy Clean - Easy Change Nozzle

Nozzle Removal



Nozzle Installation



- No need to disassemble or remove the sprinkler
- Easy snap-in nozzle.
To remove: pinch and pull.
To install: place and click.
- Applicator can be installed directly into a pressure regulator - no special threads or fittings required.

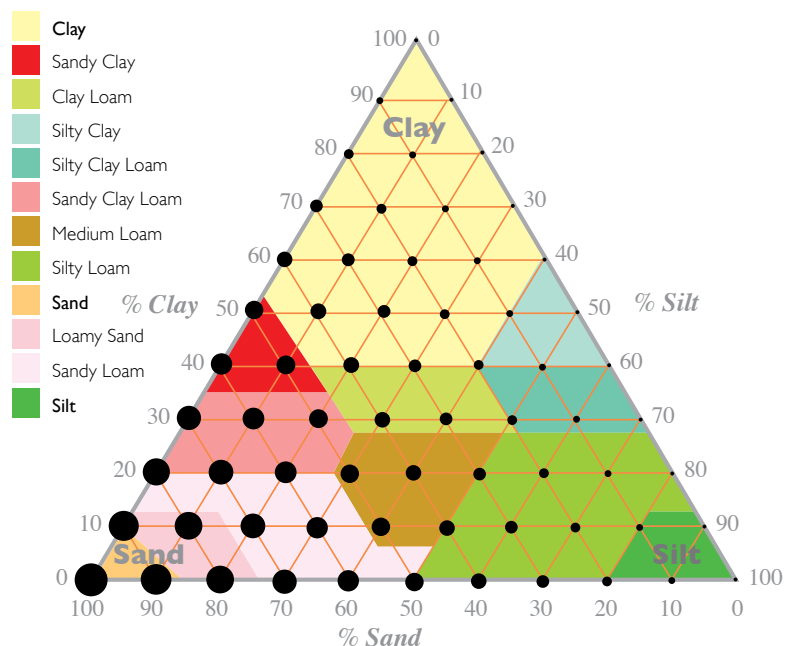


UP3 Nozzle Visibility

The color-coded nozzles are highly visible and easy to identify. The nozzle numbers (corresponding to orifice size in 64ths of an inch) are visible on the ears, with half-sizes denoted beneath the second digit and notches on the lower edge of the nozzle.

Droplet size needed for type of soil

All soils are made up three basic components: clay, sand and silt. The relative amount of each one of these determines the soil type. The black dots spread over the triangle represent the droplet sizes (small medium and large) matched to specific soil types. Use the key to the left to find your most common soil type and then locate the percentage of soil type on the triangle to find the recommended droplet size for your specific area.



Uniformity Affects Application Intensity

Some stream-driven applicators deliver water in a more concentrated ring. This more intense application can negatively impact the soil surface. The design of these applicators can also produce many small droplets that get evaporated or blown away by the wind. The i-Wob offers a gentle more uniform delivery and an even droplet size large enough to resist wind-drift, but not so large as to disrupt the soil.

Dual Nozzle Carrier (patent pending)



Utilizing two different flow rates on a center pivot — a lower rate for germination or chemigation and a higher rate for mature crop irrigation — is an excellent way to save water and energy. The Dual Nozzle Carrier simplifies re-nozzling for this purpose. Simply pinch and pull the nozzle from the applicator, flip the carrier, then place and click to install. The carrier is marked to show the high and low flow nozzles.

LDN[®] UP3[™] Pads & Patterns

Pads

The surfaces of the LDN pads (smooth, medium groove, deep groove) are specially designed to deliver different spray patterns and droplet sizes. Each surface is available in three basic geometries based on the desired trajectory of throw – flat (black), concave (blue) and convex (green).



Multi-Pad Design

The single pad divides a flow into 24 or 33 streams and is ideal for smaller flows. As the flow and nozzle size increase along the length of the pivot, multiple deflector pads can be used to divide larger flows into more streams – up to 66 or 99. These streams are resistant to wind-drift and evaporation as small droplets are virtually eliminated - sending more water to the root zone.

Stream Patterns

The LDN is available with single, double or triple pads.

Easy Change Pads

The LDN's design makes it easy to change from irrigation to chemigation. Simply twist and unlock the deflector pad, flip it over, then twist and lock it back on.

Pad Combinations

Nozzle number	Concave		Flat		Convex	
	Single	Stacked	Single	Stacked	Single	Stacked
4 1/16" (1.59 mm)						
5 5/64" (1.98 mm)	cc-mini	cc-mini	fl-mini	fl-mini	cv-mini	cv-mini
6 3/32" (2.38 mm)	↓	↓	↓	↓	↓	↓
7 7/64" (2.78 mm)						
8 1/8" (3.18 mm)						
9 9/64" (3.57 mm)						
10 5/32" (3.97 mm)	CC	CC	FL	FL	CV	CV
11 1 1/64" (4.37 mm)	↓	↓	↓	↓	↓	↓
12 3/16" (4.76 mm)						
13 13/64" (5.16 mm)						
14 7/32" (5.56 mm)						
15 15/64" (5.95 mm)						
16 1/4" (6.35 mm)						
17 17/64" (6.75 mm)						
18 9/32" (7.14 mm)		CC-FL		CC-FL		FL-CV
19 19/64" (7.54 mm)		↓		↓		↓
20 5/16" (7.94 mm)						
21 21/64" (8.33 mm)						
22 1 1/32" (8.73 mm)						
23 23/64" (9.13 mm)						
24 3/8" (9.53 mm)						
25 25/64" (9.92 mm)						
26 13/32" (10.32 mm)		CC-CC-FL		CC-FL-FL		FL-FL-CV
Nozzle to ground	1 ft - 5 ft (0.46 - 1.5 m)		3 ft - 7 ft (0.91 - 2.13 m)		6 ft up (1.83 m)	
Nozzle to nozzle	Minimum 150% Overlap					



Single Pad: 33 Streams
0.27 - 6.25 gpm
(61 - 1420 L/hr)



Double Pad: 66 Streams
3.93 - 11.5 gpm
(893 - 2619 L/hr)



Triple Pad: 99 Streams
6.99 - 21.2 gpm
(1588 - 4811 L/hr)

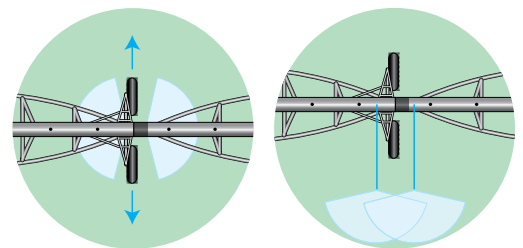
Part-Circle - Directional Pattern

The LDN Part-Circle pad is designed to help center pivot operators reach difficult to irrigate areas near towers. It distributes water away from wheel tracks and helps minimize rutting. With a 170° spray pattern, the LDN Part-Circle binds water into 17 discreet streams at a 10° trajectory for minimum evaporative loss. It is available with nozzles #6 through #18 and can be used in conjunction with standard full circle LDNs or other Senninger sprinklers on the remainder of a machine.

Note: 170° spray pattern can vary slightly based on flow and pressure.

FEATURES

- UP3 snap-in nozzle is easy to remove for cleaning or changing. To remove the nozzle simply pinch and pull, then place and click to install
- Integrated base allows the applicator to be installed directly into a pressure regulator or onto a standard 3/4" NPT female connection with no special threads or fittings required
- Flows: 0.27 to 21.18 gpm (61 to 4811 L/hr)
- Pressures: 6 to 20 psi (0.41 to 1.38 bar)
- Distributes water in a 170° pattern with a 10° trajectory
- Binds water into 17 discreet streams for minimum evaporative loss
- Maximum radius of throw
- Two-year warranty on materials, workmanship and performance
- Nozzle sizes are easily identified with color-coding and embossing on the ears, including half sizes.
- Warranted to maintain correct orifice size for five years



Part-Circle - Distribution Pattern

(For use on rigid drops)

The LDN Part-Circle distributes water away from wheel tracks to help minimize rutting.

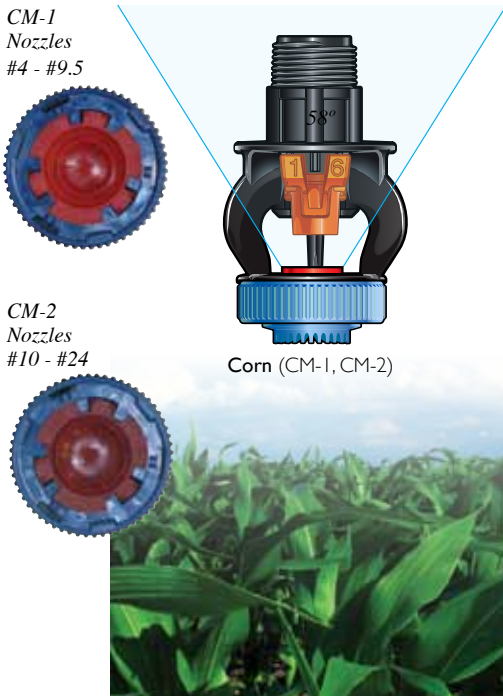
LDN[®] UP3[™] Chemigation

Chemigation (corn or cotton) Options

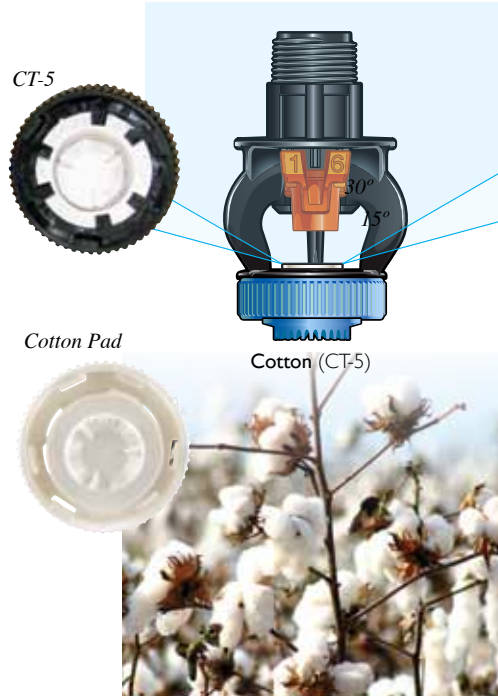
The LDN also offers chemigation pad inserts for corn or cotton. These are designed to produce an upward spray under the crop canopy to wash the underside of the leaves - where pests might hide - thereby eliminating or reducing the need for costly pesticides. To change from irrigation to chemigation mode, simply twist and unlock the deflector pad. Flip it over and twist to lock it back in place. This quick conversion eliminates the need to carry additional parts in and out of the field.



*Corn Chemigation Pad Inserts:
58° upward throw*



*Cotton Chemigation Pad and Pad Inserts:
15 - 30° upward throw*



Note: The LDN is not recommended for surface water or effluent applications.

The OneWeight



It provides stability on drops for a number of pivot applicators. Its unique fit technology allows the weight to fit securely onto the i-Wob, Xi-Wob, LDN, Super Spray, and even some other manufacturer's applicators. The weight's easy-to-install design lets it remain on the applicator during nozzle changes. The One Weight is constructed entirely of zinc alloy. It weighs approximately 0.85 lbs (0.30 kg).

Drag Hose Adapter

The LDN drag hose adapter can be used with a drag hose to apply water directly into the furrow. The adapter is easy to install, snapping right onto the LDN bracket like the LDN pads.



LEPA Options



LEPA Bubbler

The LDN also offers a bubbler pad and a shroud for quick, low-cost conversion to LEPA application. The devices conveniently convert back to spray irrigation with a twist and flip of the LDN pad.



UP3 Bubbler Pad

The bubbler pad gently deposits water directly into the furrow basins. Discharging water very near the soil surface minimizes evaporation and eliminates wind-drift loss. It also keeps the crop canopy dry and helps prevent erosion of rows.

LDN Shroud

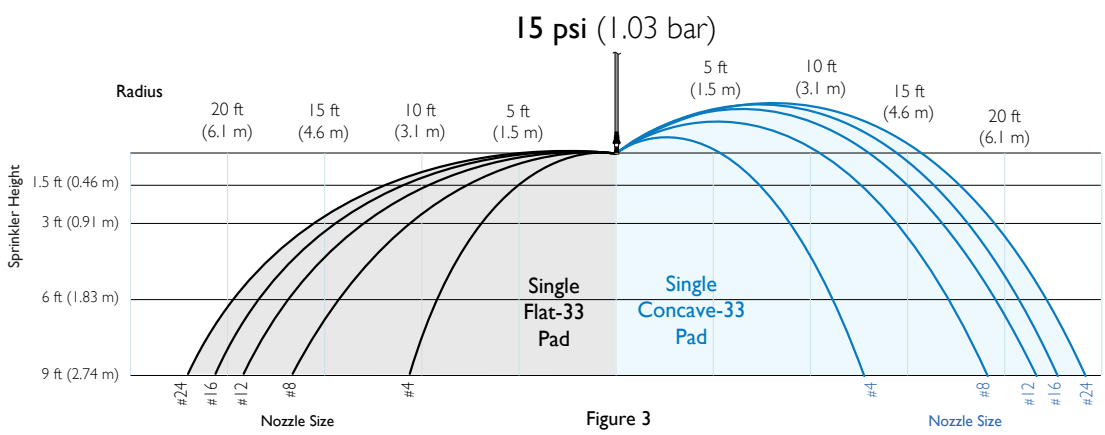
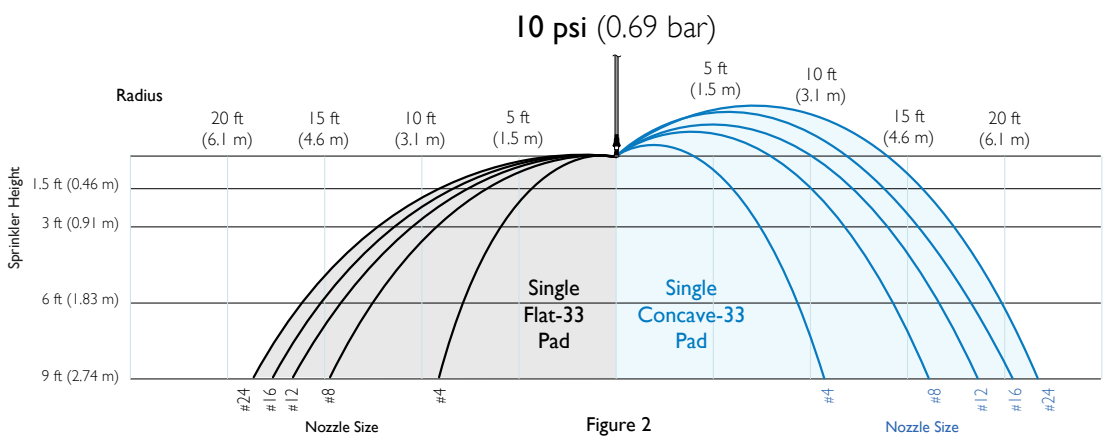
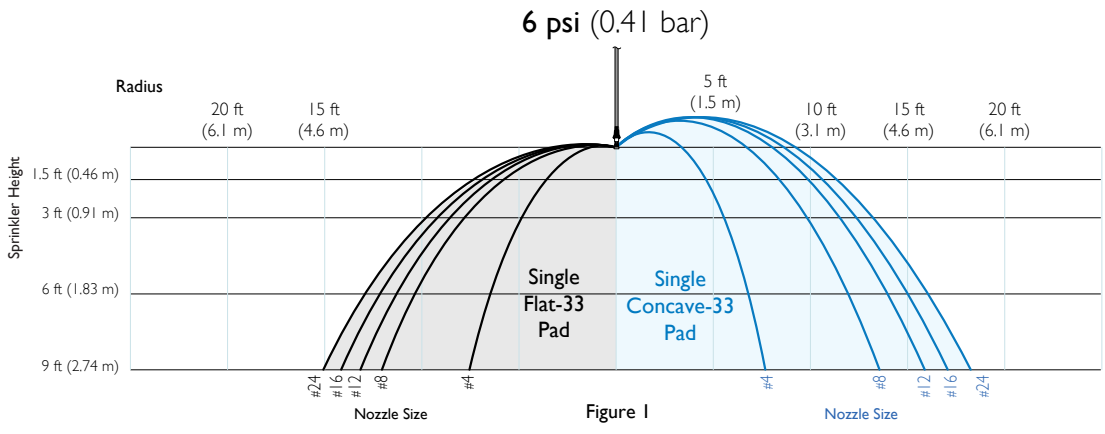


The shroud creates a gentle dome of water for efficient delivery directly to the soil and/or plants, ideal for low crop watering.

The shroud deflects water downward, creating a 36" diameter of water depending on how high the LDN is installed.



LDN[®] UP3[™] Maximum Nozzle Throw



*Note: Nozzle sizes are in 64th of an inch.
For example: #12 nozzle = 12/64 inch = 3/16 inch*

Components LDN[®] UP3[™]

LDN System Assembly

Mounting

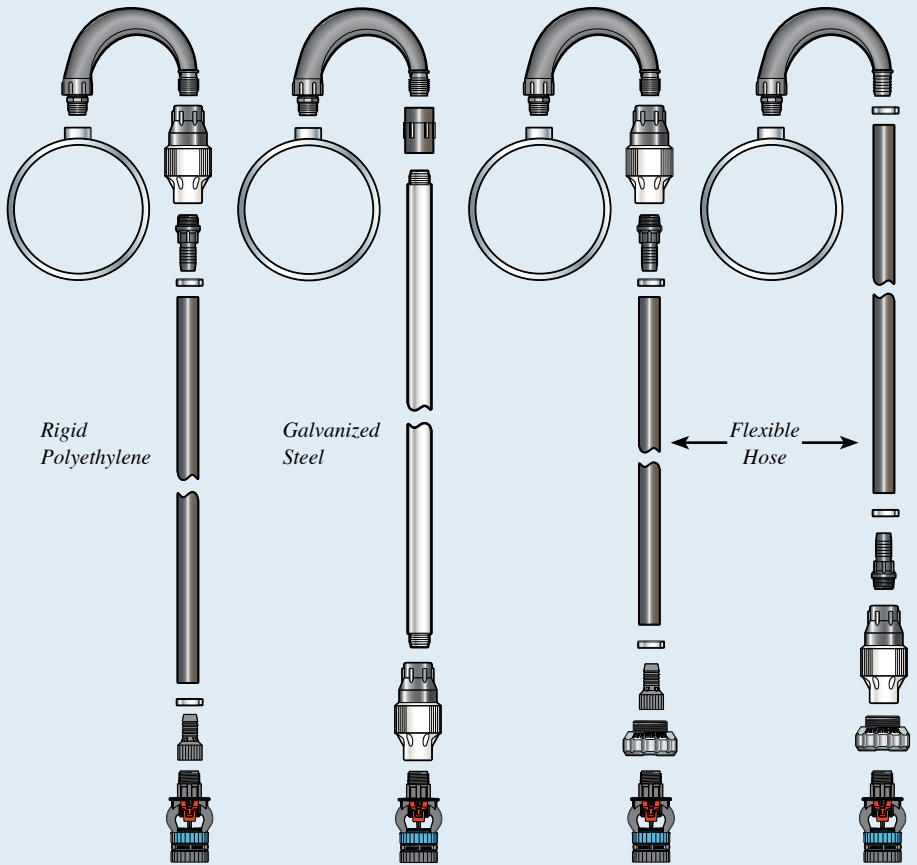
- The LDN can be mounted on rigid drops or flexible hose drops.
- When using a flexible hose, a weight is recommended.
- When using The One Weight, use the internal fit technology to nest the weight onto the base of the LDN.
- Conventional slip-over weights can be used with the LDN.
- Mount the LDN no less than 1.5 - 9 ft (0.46 - 2.74 m) above the ground.

Pressure Regulator Location

- Pressure regulators can be installed at the top of the drop, or near the applicator.
- Always follow your customized printout for proper pressure regulator placement.

Installation

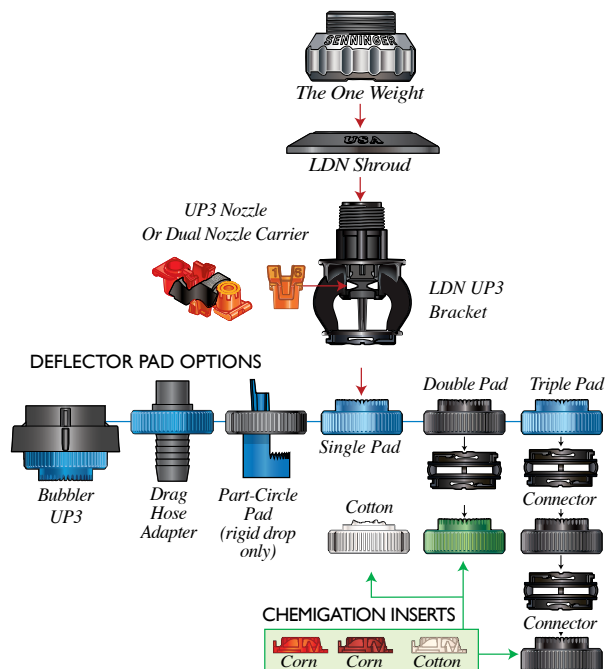
To maintain product warranty and maximize drop component life, refer to the diagrams below for proper installation:



Shown with Senninger 180° Goosenecks and fittings.

Integrated base

With the new UP3 design, the LDN base is now an integral part of the bracket. It can be installed directly into a pressure regulator or NPT female fitting. This increases reliability and means fewer parts are required.



LDN[®] UP3[™] Nozzle Flows - U.S.

Sprinkler Base Pressure (psi)			6	10	15	20
Nozzle	Color	Orifice (inch)	Flow (gpm)			
4	Light Blue	1/16	0.27	0.35	0.43	0.50
4½	Light Blue (notched)	9/128	0.35	0.45	0.55	0.63
5	Beige	5/64	0.43	0.55	0.68	0.78
5½	Beige (notched)	11/128	0.52	0.67	0.82	0.95
6	Gold	3/32	0.62	0.80	0.98	1.13
6½	Gold (notched)	13/128	0.73	0.94	1.15	1.33
7	Lime	7/64	0.85	1.09	1.34	1.54
7½	Lime (notched)	15/128	0.97	1.26	1.54	1.77
8	Lavender	1/8	1.11	1.43	1.75	2.02
8½	Lavender (notched)	17/128	1.25	1.62	1.98	2.29
9	Grey	9/64	1.40	1.81	2.22	2.56
9½	Grey (notched)	19/128	1.57	2.02	2.48	2.86
10	Turquoise	5/32	1.74	2.24	2.75	3.17
10½	Turquoise (notched)	21/128	1.92	2.47	3.03	3.50
11	Yellow	11/64	2.10	2.72	3.33	3.84
11½	Yellow (notched)	23/128	2.30	2.97	3.64	4.20
12	Red	3/16	2.51	3.24	3.97	4.58
12½	Red (notched)	25/128	2.72	3.52	4.31	4.97
13	White	13/64	2.95	3.81	4.66	5.38
13½	White (notched)	27/128	3.18	4.11	5.03	5.81
14	Blue	7/32	3.42	4.42	5.41	6.25
14½	Blue (notched)	29/128	3.67	4.74	5.81	6.71
15	Dark Brown	15/64	3.93	5.08	6.22	7.18
15½	Dark Brown (notched)	31/128	4.20	5.42	6.64	7.67
16	Orange	1/4	4.48	5.78	7.08	8.17
16½	Orange (notched)	33/128	4.76	6.15	7.53	8.69
17	Dark Green	17/64	5.06	6.53	7.99	9.23
17½	Dark Green (notched)	35/128	5.36	6.92	8.47	9.78
18	Purple	9/32	5.67	7.32	8.96	10.35
18½	Purple (notched)	37/128	5.99	7.73	9.47	10.93
19	Black	19/64	6.31	8.15	9.98	11.53
19½	Black (notched)	39/128	6.65	8.58	10.51	12.14
20	Dark Turquoise	5/16	6.99	9.02	11.05	12.76
20½	Dark Turquoise (notched)	41/128	7.34	9.47	11.60	13.40
21	Mustard	21/64	7.70	9.93	12.17	14.05
21½	Mustard (notched)	43/128	8.06	10.40	12.74	14.71
22	Maroon	11/32	8.43	10.88	13.33	15.39
22½	Maroon (notched)	45/128	8.81	11.37	13.92	16.08
23	Cream	23/64	9.19	11.87	14.54	16.78
23½	Cream (notched)	47/128	9.58	12.37	15.15	17.49
24	Dark Blue	3/8	9.98	12.88	15.78	18.22
24½	Dark Blue (notched)	49/128	10.38	13.40	16.41	18.95
25	Copper	25/64	10.78	13.92	17.05	19.69
25½	Copper (notched)	51/128	11.19	14.45	17.69	20.43
26	Bronze	13/32	11.60	14.98	18.35	21.18

Nozzle Flows - Metric **LDN[®] UP3[™]**

Sprinkler Base Pressure (bar)		0.41	0.69	1.03	1.38	
Nozzle	Color	Orifice (mm)	Flow (L/hr)			
4	Light Blue	1.59	61	79	98	114
4½	Light Blue (notched)	1.79	79	102	125	143
5	Beige	1.98	98	125	154	177
5½	Beige (notched)	2.18	118	152	186	216
6	Gold	2.38	141	182	223	257
6½	Gold (notched)	2.58	166	213	261	302
7	Lime	2.78	193	248	304	350
7½	Lime (notched)	2.98	220	286	350	402
8	Lavender	3.18	252	325	397	459
8½	Lavender (notched)	3.37	284	368	450	520
9	Grey	3.57	318	411	504	581
9½	Grey (notched)	3.77	357	459	563	650
10	Turquoise	3.97	395	509	625	720
10½	Turquoise (notched)	4.17	436	561	688	795
11	Yellow	4.37	477	618	756	872
11½	Yellow (notched)	4.56	522	675	827	954
12	Red	4.76	570	736	902	1040
12½	Red (notched)	4.96	618	799	979	1129
13	White	5.16	670	865	1058	1222
13½	White (notched)	5.36	722	933	1142	1320
14	Blue	5.56	777	1004	1229	1420
14½	Blue (notched)	5.75	834	1077	1320	1524
15	Dark Brown	5.95	893	1154	1413	1631
15½	Dark Brown (notched)	6.15	954	1231	1508	1742
16	Orange	6.35	1018	1313	1608	1856
16½	Orange (notched)	6.55	1081	1397	1710	1974
17	Dark Green	6.75	1149	1483	1815	2096
17½	Dark Green (notched)	6.95	1217	1572	1924	2221
18	Purple	7.14	1288	1663	2035	2351
18½	Purple (notched)	7.34	1360	1756	2151	2482
19	Black	7.54	1433	1851	2267	2619
19½	Black (notched)	7.74	1510	1949	2387	2757
20	Dark Turquoise	7.94	1588	2049	2510	2898
20½	Dark Turquoise (notched)	8.14	1667	2151	2635	3043
21	Mustard	8.33	1749	2255	2764	3191
21½	Mustard (notched)	8.53	1831	2362	2894	3341
22	Maroon	8.73	1915	2471	3028	3495
22½	Maroon (notched)	8.93	2001	2582	3162	3652
23	Cream	9.13	2087	2696	3302	3811
23½	Cream (notched)	9.33	2176	2810	3441	3972
24	Dark Blue	9.53	2267	2925	3584	4138
24½	Dark Blue (notched)	9.72	2358	3043	3727	4304
25	Copper	9.92	2448	3162	3872	4472
25½	Copper (notched)	10.12	2542	3282	4018	4640
26	Bronze	10.32	2635	3402	4168	4811



Senninger[®]
Irrigation Inc.

Made in U.S.A.

16220 E. Highway 50, Clermont, FL 34711

Phone: (407) 877-5655

Fax: (407) 905-8249

International Fax: (407) 905-8239

Website: www.senninger.com

E-mail: info@senninger.com

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