



## LDN LOW DRIFT NOZZLE

A Versatile Sprinkler with LEPA Bubbler and Spray Deflector Options

AGRICULTURAL IRRIGATION

*Low Pressure - High Performance*



# OUR MOST VERSATILE SPRAY NOZZLE

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The LDN Low Drift Nozzle offers growers multiple ways to irrigate. One applicator can be used for LEPA applications, spray irrigation, and chemigation. With so many options available, growers can get precise control of their sprinklers' droplet size, trajectory, and application pattern. This makes the LDN capable of adapting to various crop, environmental, and soil requirements.

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## LDN FEATURES

### ULTRA LOW PRESSURE

Low pressure operation saves energy:  
6 to 20 psi (0.41 to 1.38 bar)

### MULTIPLE MODELS

Available with LEPA bubblers, single, double or triple pads, chemigation pads; a part-circle and a drag hose add-on

### STREAMLINED DESIGN

Streamlined body and impact resistant materials can handle the rigors of traveling through tall crops

### UP3 NOZZLES

Convenient UP3 nozzles for easy cleaning or changing. Just pinch and pull, then place and click

### TWO YEAR WARRANTY

Two-year warranty on materials, workmanship and performance







# CLOSE SPACING

## Maximize the Efficiency of your Irrigation Systems

LEPA (Low Energy Precision Application) Close Spacing is a water-efficient irrigation practice that relies on bubble applicators. LEPA systems gently deliver water from a height of 8 to 18 inches (20 to 46 cm) above the ground, without spraying, to combat wind-drift and prevent evaporation loss. Researchers and growers have found that with LEPA heads, at least 20%\* more water reaches the soil than with conventional spray nozzles.

Unlike traditional LEPA systems, where sprinklers are placed 60 to 80 (152 to 2013 cm) inches apart to irrigate every other furrow, the Close Spacing method distributes water over most of the soil surface with 40 inches (1 m) or less between heads. Conservation tillage practices further help prevent evaporation loss, and run-off by holding the water in the rows until the soil can absorb it. As a result, Close Spacing achieves application efficiencies typically exceeding 95%.

*\*Source: LEPA Conversion and Management by Dr. Guy Flippo and Leon New.*

### FEATURES

- ① Prevents wind-drift and evaporation loss
- ② Avoids wetting the plant canopy in row crops
- ③ Achieves a more uniform root zone coverage
- ④ Applies the water needed in fewer pivot passes
- ⑤ Can increase yield using less water - 0.27 to 21.18 gpm (61 to 4168 L/hr)
- ⑥ Low pressures operation of 6 to 20 psi (0.41 to 1.38 bar) can reduce pumping costs
- ⑦ Ideal for both high and low profile crops
- ⑧ Qualifies for government funding in select areas
- ⑨ Reduces the potential rodent damage to crop and equipment over drip systems

### FOR OPTIMUM RESULTS, INCORPORATE:

- ① Tight Spacing - 40 inches (1 m) or less between sprinkler heads
- ② Sprinkler Height - 8 to 18 inches (20 to 46 cm) above the ground
- ③ Conservation Tillage - to increase surface storage capacity and improve filtration
- ④ Level Fields - ideal maximum slope is 1%
- ⑤ Filtration - for smaller nozzles
- ⑥ Soil Moisture Monitoring - to help reduce deep percolation losses

›See nozzle chart on page 15 for mesh recommendations.



LDN with Shroud and beige bubble insert



LDN with Shroud and red CM1 insert



LDN with UP3 Bubbler Pad Assembly



**LDN LEPA PAD ASSEMBLY OPTIONS**



Zinc Weight



Magnum Weight



LDN Shroud



LDN Shroud  
Bubble Spacer-UP3  
(Used in place  
of weight)



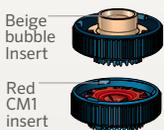
UP3 Nozzle



LDN-UP3 Bracket

**LDN PAD WITH BUBBLE INSERTS** (Shroud required)

**Concave Pads (CC)**  
Blue



Beige  
bubble  
insert  
Red  
CM1  
insert

**Convex Pads (CV)**  
Green



**Flat Pads (FL)**  
Black



**Germination Pads**  
White



Bubble  
mode  
Turn pad  
over for  
spray  
mode

**LDN BUBBLER PAD ASSEMBLIES** (Shroud not required)



Small 12-grooved pads available (Used with UP3 Nozzles #2, #2.5, #3, #3.5, #4, #4.5).  
120-Mesh Filtration Recommended.

**Bubble Recommendations**

Flow: 0.27 to 18.35 gpm (61 to 4168 L/hr)  
Pressure: 6 to 15 psi (0.41 to 1.03 bar)  
#4 - 26 Nozzles



**LDN SHROUD AND BUBBLE INSERTS**

The Shroud is used in conjunction with deflector pads containing a bubbler insert. You can choose either the beige bubble pad insert or the red CM1 pad insert opposite a variety of spray deflector pads. The spray and bubble pad combination allows for easy conversion between spray and LEPA irrigation. The Shroud deflects the water from the bubbler insert down in a gentle dome-shaped pattern, providing complete coverage of the field. Due to its less concentrated distribution pattern, the Shroud can be used on fields without furrows and is often used for germination as well as irrigation.



**LDN UP3 BUBBLER PAD ASSEMBLY**

The bubbler side of the deflector pad gently deposits water onto the soil surface in a bubbling stream. This aerated cascading stream resists the effects of wind and evaporation.



# LDN SINGLE PAD

Single Pad Trajectories:



## EASY CONVERSION TO AND FROM SPRAY IRRIGATION

For spray irrigation with either the LDN Bubbler Assembly or the LDN with the Shroud, simply twist and unlock the deflector pad. Flip it over and twist to lock it back in place.

The LDN is incredibly versatile thanks to its various deflector pad options. The surfaces of the deflector pads (smooth, grooved, medium groove, or deep groove) each deliver a different spray pattern and droplet size. Each surface is also available in three basic geometries based on the desired trajectory of throw – flat (black), concave (blue) for a slightly upward spray, and convex (green) for a slightly downward spray.



**SMOOTH**  
Fine Droplets  
Tighter Soils  
Nozzles #2 - 26



**MEDIUM  
12 GROOVE**  
Medium Droplets  
Medium Soils  
Nozzles #2 - 9



**33 GROOVE**  
Medium Droplets  
Medium Soils  
Nozzles #4 - 26



**24 DEEP GROOVE**  
Larger Droplets  
Looser Soils  
Nozzles #4 - #26

## FOR OPTIMUM RESULTS, INCORPORATE:

Ball Valve - for easy water shut-off when converting between spray, LEPA and chemigation mode  
\*Ball Valve requires F x M adapter when installed over a weight.



## CHEMIGATION CONVERSION

The LDN 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. 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. Any LDN Pad can be backed with a corn chemigation pad or a cotton chemigation pad insert.

**Corn**  
Chemigation Pad Inserts:  
58° upward throw

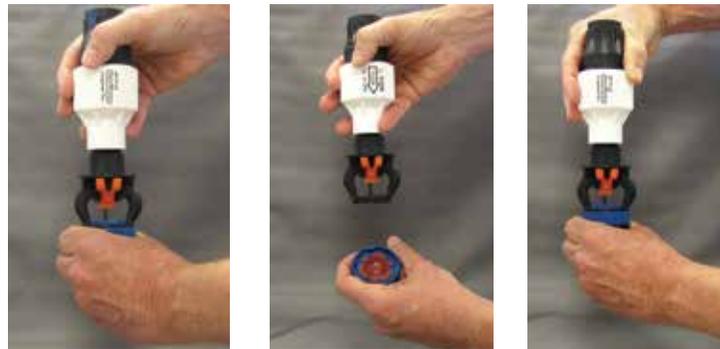
CM-1 Insert      CM-2 Insert

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

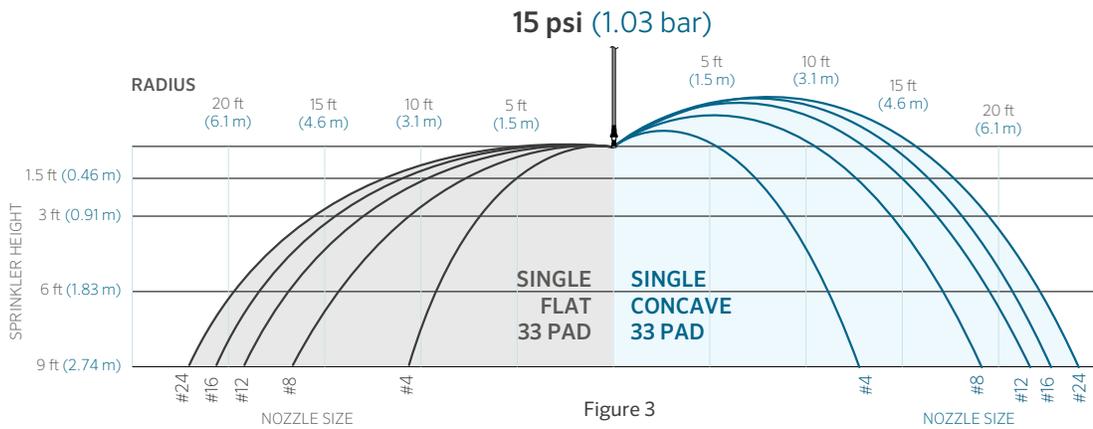
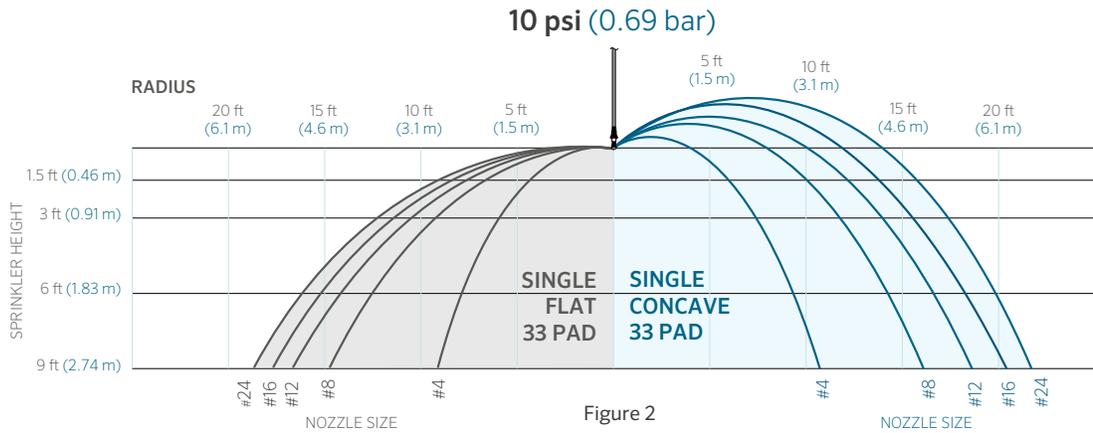
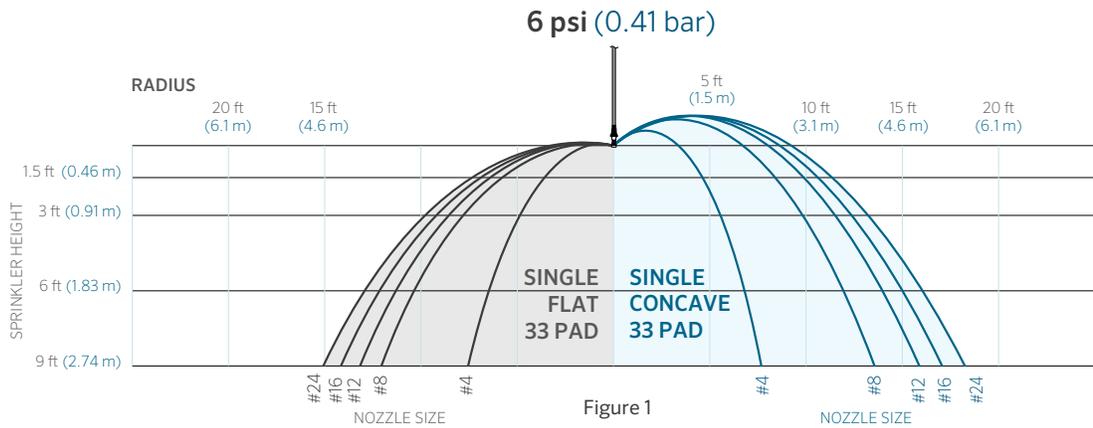
Cotton Pad      CT-5 Insert

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



LDN DESIGN CRITERIA	Single Mini Pad 12 groove	Single Pad 24 Deep Groove	Single Pad 33 Groove
Nozzle sizes			
Minimum	#4 1/16" (1.59 mm)	#4 1/16" (1.59 mm)	#10 5/32" (3.97 mm)
Maximum*	#9 9/64" (3.57 mm)	#26 13/32" (10.32 mm)	#26 13/32" (10.32 mm)
Flows			
Minimum	0.27 gpm (61 L/hr)	0.27 gpm (61 L/hr)	1.74 gpm (395 L/hr)
Maximum	2.56 gpm (581 L/hr)	21.18 gpm (4811 L/hr)	21.18 gpm (4811 L/hr)
Maximum Spacing at 6 ft (1.8 m) ground clearance			
	10 ft (3.0 m)	10 ft (3.0 m)	10 ft (3.0 m)
Pressure at the Nozzle			
Minimum	6 psi (0.41 bar)	6 psi (0.41 bar)	6 psi (0.41 bar)
Maximum	20 psi (1.38 bar)	20 psi (1.38 bar)	20 psi (1.38 bar)

# Maximum Nozzle Throw

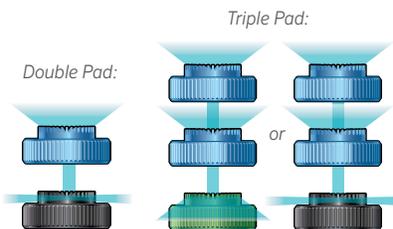


Note: Nozzle sizes are in 64th of an inch. For example: #12 nozzle =  $\frac{12}{64}$  inch =  $\frac{3}{16}$  inch





# MULTIPLE PADS



LDN DESIGN CRITERIA	Double Pad 66 Groove	Triple Pad 99 Groove
Nozzle sizes		
Minimum	#15 15/64" (5.95 mm)	#20 5/16" (7.94 mm)
Maximum*	#26 13/32" (10.32 mm)	#26 13/32" (10.32 mm)
Flows		
Minimum	3.93 gpm (893 L/hr)	6.99 gpm (1588 L/hr)
Maximum	21.18 gpm (4811 L/hr)	21.18 gpm (4811 L/hr)
Maximum Spacing at 6 ft (1.8 m) ground clearance		
	10 ft (3.0 m)	10 ft (3.0 m)
Pressure at the Nozzle		
Minimum	6 psi (0.41 bar)	6 psi (0.41 bar)
Maximum	20 psi (1.38 bar)	20 psi (1.38 bar)

## MULTIPLE PAD OPTIONS

“The LDN was the first spray nozzle for pivots to let irrigators stack multiple pads on one applicator. Each additional pad has extra grooves that divide larger flows into multiple streams, allowing the LDN to distribute water more efficiently along the length of the pivot.

Larger flows can flood a single pad, so the additional streams help eliminate small droplets, reduce wind-drift, and maintain pattern uniformity.

Since the LDN uses multiple pads and deflectors, the diameter of coverage you can achieve with the LDN is incredibly flexible. Each pad has its own trajectory and distance throw, so water isn’t concentrating in one place at any time.

Use the chart below to help you determine if you need double or triple pads, based on your nozzle size.”

NOZZLE SIZES	CONCAVE	
	SINGLE	STACKED
04 1/16" (1.59 mm)		
05 5/64" (1.98 mm)	mini	
06 3/32" (2.38 mm)		
07 7/64" (2.78 mm)		
08 1/8" (3.18 mm)		
09 9/64" (3.57 mm)		
10 5/32" (3.97 mm)	Single	Single
11 11/64" (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)		Double
16 1/4" (6.35 mm)		
17 17/64" (6.75 mm)		
18 9/32" (7.14 mm)		
19 19/64" (7.54 mm)		
20 5/16" (7.94 mm)		Triple
21 21/64" (8.33 mm)		
22 11/32" (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)		



# PART-CIRCLE

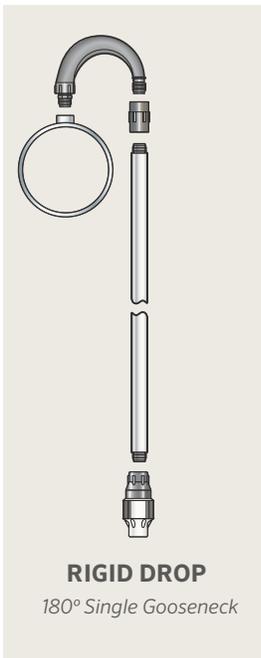
The Senninger Part-Circle LDN is specifically designed to distribute water away from wheel tracks to minimize rut depth.



## FEATURES

- ① Can be used in conjunction with standard full circle LDNs or other Senninger sprinklers on the remainder of a pivot
- ② Distributes water in a 170° pattern with 17 streams at a 10° trajectory for minimum evaporative loss
- ③ Maximum radius of throw- up to 29 ft (8.8 m)

*Dual Nozzle Carrier available see pg. 10*

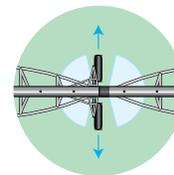


LDN PART-CIRCLE DESIGN CRITERIA	Part-Circle
<b>Nozzle sizes</b>	
Minimum	#6 3/32" (2.38 mm)
Maximum*	#18 9/32" (7.14 mm)
<b>Flows</b>	
Minimum	0.62 gpm (141 L/hr)
Maximum	10.35 gpm (2351 L/hr)
<b>Radius</b>	
Minimum at 3 ft (0.91 m)	9 ft (2.7 m)
Maximum at 3 ft (0.91 m)	25 ft (7.6 m)
Minimum at 6 ft (1.83 m)	11 ft (3.4 m)
Maximum at 6 ft (1.83 m)	28 ft (8.5 m)
Minimum at 9 ft (2.74 m)	13.5 ft (4.1 m)
Maximum at 9 ft (2.74 m)	29 ft (8.8 m)
<b>Pressure at Nozzle</b>	
Minimum	6 psi (0.41 bar)
Maximum	15 psi (1.03 bar)

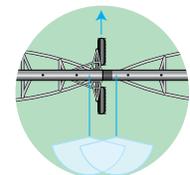
*\*It is recommended that larger nozzle sizes be used only on soils that can handle higher application rates.*

## THE PART-CIRCLE LDN DISTRIBUTES WATER AWAY FROM WHEEL TRACKS.

For use on rigid drops only. Distribution pattern varies by nozzle size and pressure.



Mount the Part-Circle LDN to spray away from the towers regardless of the direction of the pivot.

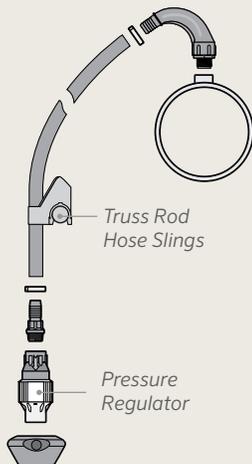


Mount the Part-Circle LDN to spray in the opposite direction the pivot is traveling.

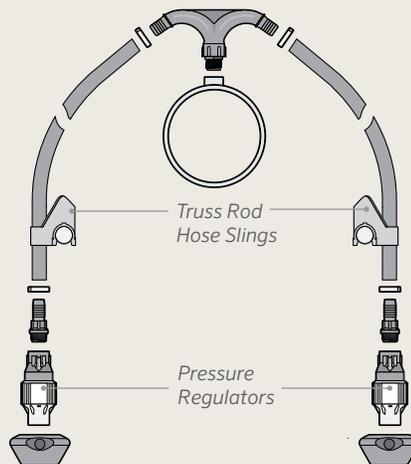
## INSTALLATION

- The LDN can be mounted on flexible hose drops or rigid Polyethylene or galvanized steel drops.
- When using flexible hose drops, 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.
- When using Senninger goosenecks with rigid drops, maximum length should not exceed 1 ft (0.3 m) below truss rod.
- The LDN can be mounted between 1.5 to 9 ft (0.46 to 2.74 m) above the ground.
- 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.

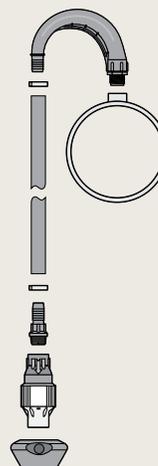
**125° SINGLE GOOSENECK**  
( $\frac{3}{4}$  inch barb)

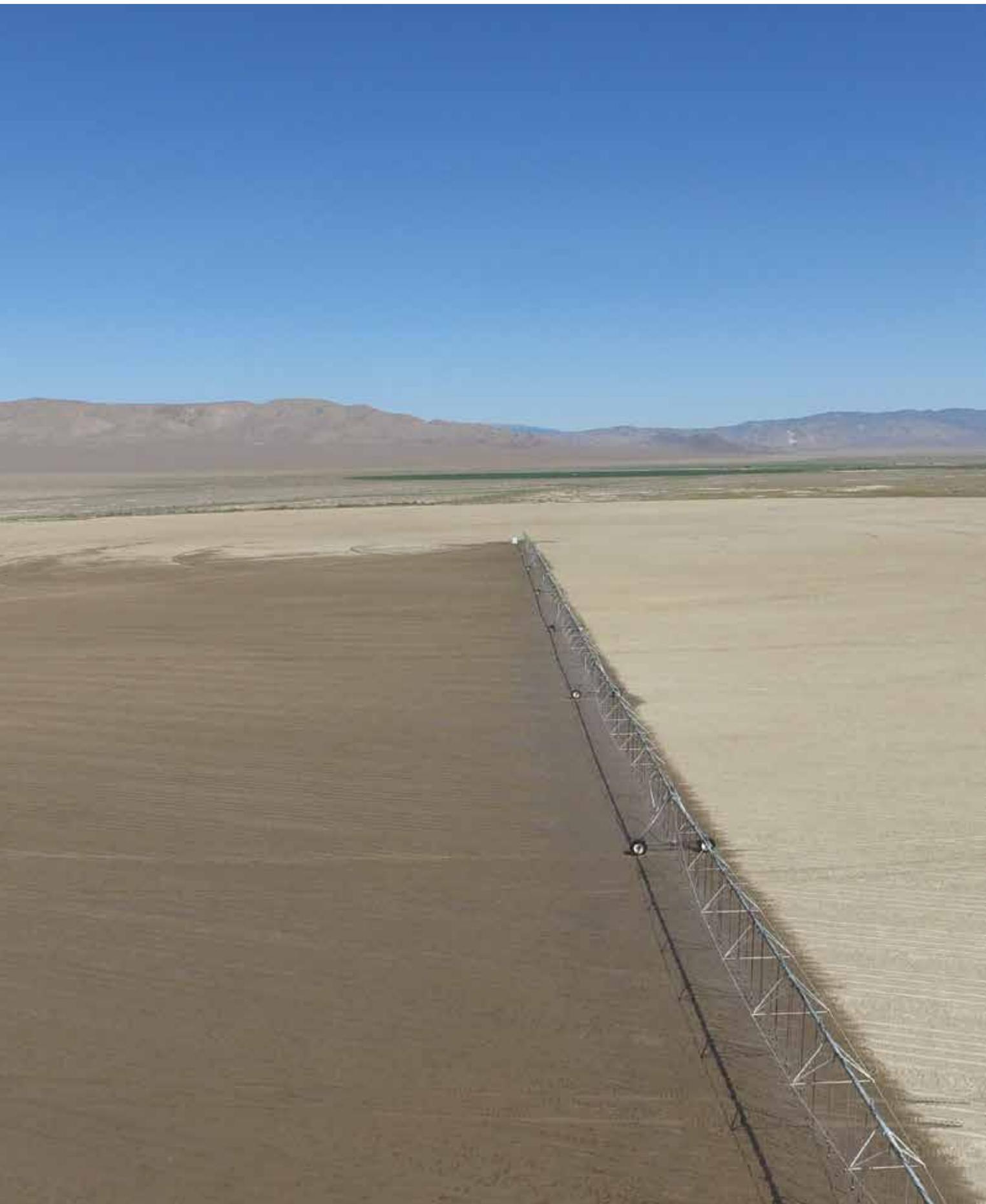


**125° DOUBLE GOOSENECK**  
( $\frac{3}{4}$  inch barb)



**180° SINGLE GOOSENECK**  
( $\frac{3}{4}$  inch barb)





**PRESSURE REGULATORS**

*PRL-  
Low Flow*



*PMR-  
Medium Flow*



*Ask about the patented PSR-2 for systems pumping surface water!*

Pressure regulators enable applicators to operate properly. With low pressure systems, any fluctuations can significantly impact system performance. Higher pressures can create small droplets susceptible to wind-drift, misting and evaporation. Pressure regulators can be installed at the top of the drop or directly above the applicator. A Senninger Pressure Drop can be installed at the end of the pivot just above the bubbler head to help verify system design pressure.

**SENNINGER WEIGHTS**



Senninger weights provide stability on flexible hose drops for a number of pivot applicators. The 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 and the Magnum Weight is constructed of UV-resistant thermoplastic to prevent corrosion and deter metal theft.

**DRAG HOSE ADAPTER**



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

**BALL VALVE**



The dial shut-off knob makes changing or cleaning sprinklers and spray nozzles easy while the system is still operating. The Ball Valve has a streamlined design reduces snagging and unintentional operation. It has a smooth bore interior to maximize bi-directional flow efficiency.

**GOOSENECKS**

*Use only with Truss Rod Hose Slings*



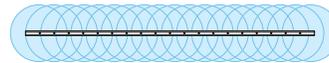
Senninger 180 and 125-degree goosenecks are constructed of non-corrosive, UV-resistant thermoplastic materials for long life and reduced plugging. 125-degree single or double models are used with Truss Rod Hose Slings. Goosenecks offer installation options for either NPT or hose barb outlets.

**TRUSS ROD HOSE SLINGS**

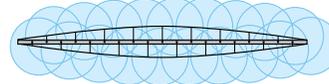


Truss Rod Hose Slings securely fasten a 3/4" flexible hose to the truss rod to maintain drop/sprinkler position. Supporting the flexible hose of the drop prevents kinking and abrasive wear. Color-coded models are available for various truss rod sizes: 5/8" (rust), 1/6" (green), 3/4" (black), 13/16" (grey), and 7/8" (blue).

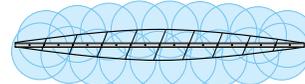
**WATER PATTERNS**



*Conventional Applicators*



*Single 125° Goosenecks (with Truss Rod Hose Slings)*



*Double 125° Goosenecks (with Truss Rod Hose Slings)*

**UP3 DUAL NOZZLE FITTING**



Designed to be used instead of a standard barb x threaded fitting, this device carries two additional UP3 nozzles. Just pinch and pull to remove nozzles and place and click to reinstall. Nozzles are easily identifiable with numbers on the ears. The larger the number, the higher the flow.

**UP3 DUAL NOZZLE CARRIER**



To access the secondary nozzle, pinch and pull the nozzle from the applicator, flip the carrier over and click in the secondary nozzle. The carrier is marked to indicate high and low flow nozzles. When installed in the applicator, if HIGH is visible on the carrier, then the lower flow nozzle is in use. If LOW is visible on the carrier, the higher flow nozzle is in use. (Cannot be used with the LDN Shroud)

**EASY-CLEAN / EASY-CHANGE NOZZLE DESIGN** (Patented)



The Senninger easy change nozzle was introduced in 2008. Just pinch and pull to remove the nozzle then place and click to re-install. There is no need to disassemble or remove the sprinkler for cleaning or changing nozzles.

The nozzle numbers (corresponding to orifice sizes in 64ths of an inch) are visible on the ears. Nozzles are warranted to maintain correct orifice size for five years.

Nozzle # Nozzle color	Nozzle Size	6 psi 0.41 bar		10 psi 0.69 bar		15 psi 1.03 bar		20 psi 1.38 bar	
		gpm (L/hr)	gpm (L/hr)	gpm (L/hr)	gpm (L/hr)	gpm (L/hr)	gpm (L/hr)		
#2 Pink #2.5	1/32" 0.79 mm	0.07	16	0.09	20	0.11	25	0.12	27
	3/128" 0.99 mm	0.11	25	0.14	32	0.17	39	0.19	43
#3 Ice #3.5	3/64" 1.19 mm	0.15	34	0.20	45	0.24	55	0.28	64
	7/128" 1.4 mm	0.21	48	0.27	61	0.33	75	0.38	86
#4 Light Blue #4.5	1/16" 1.59 mm	0.27	61	0.35	79	0.43	98	0.50	114
	9/128" 1.78 mm	0.35	79	0.45	102	0.55	125	0.63	143
#5 Beige #5.5	5/64" 1.98 mm	0.43	98	0.55	125	0.68	154	0.78	177
	15/128" 2.16 mm	0.52	118	0.67	152	0.82	186	0.95	216
#6 Gold #6.5	3/32" 2.38 mm	0.62	141	0.80	182	0.98	223	1.13	257
	13/128" 2.59 mm	0.73	166	0.94	213	1.15	261	1.33	302
#7 Lime #7.5	7/64" 2.78 mm	0.85	193	1.09	248	1.34	304	1.54	350
	15/128" 2.97 mm	0.97	220	1.26	286	1.54	350	1.77	402
#8 Lavender #8.5	1/8" 3.18 mm	1.11	252	1.43	325	1.75	397	2.02	459
	17/128" 3.38 mm	1.25	284	1.62	368	1.98	450	2.29	520
#9 Grey #9.5	9/64" 3.57 mm	1.40	318	1.81	411	2.22	504	2.56	581
	15/128" 3.76 mm	1.57	357	2.02	459	2.48	563	2.86	650
#10 Turquoise #10.5	5/32" 3.97 mm	1.74	395	2.24	509	2.75	625	3.17	720
	21/128" 4.17 mm	1.92	436	2.47	561	3.03	688	3.50	795
#11 Yellow #11.5	11/64" 4.37 mm	2.10	477	2.72	618	3.33	756	3.84	872
	23/128" 4.57 mm	2.30	522	2.97	675	3.64	827	4.20	954
#12 Red #12.5	3/16" 4.76 mm	2.51	570	3.24	736	3.97	902	4.58	1040
	25/128" 4.95 mm	2.72	618	3.52	799	4.31	979	4.97	1129
#13 White #13.5	13/64" 5.16 mm	2.95	670	3.81	865	4.66	1058	5.38	1222
	27/128" 5.36 mm	3.18	722	4.11	933	5.03	1142	5.81	1320
#14 Blue #14.5	7/32" 5.56 mm	3.42	777	4.42	1004	5.41	1229	6.25	1420
	29/128" 5.77 mm	3.67	834	4.74	1077	5.81	1320	6.71	1524
#15 Dk. Brown #15.5	15/64" 5.95 mm	3.93	893	5.08	1154	6.22	1413	7.18	1631
	31/128" 6.15 mm	4.20	954	5.42	1231	6.64	1508	7.67	1742
#16 Orange #16.5	1/4" 6.35 mm	4.48	1018	5.78	1313	7.08	1608	8.17	1856
	33/128" 6.55 mm	4.76	1081	6.15	1397	7.53	1710	8.69	1974
#17 Dk. Green #17.5	17/64" 6.75 mm	5.06	1149	6.53	1483	7.99	1815	9.23	2096
	35/128" 6.93 mm	5.36	1217	6.92	1572	8.47	1924	9.78	2221
#18 Purple #18.5	9/32" 7.14 mm	5.67	1288	7.32	1663	8.96	2035	10.35	2351
	37/128" 7.34 mm	5.99	1360	7.73	1756	9.47	2151	10.93	2482
#19 Black #19.5	19/64" 7.54 mm	6.31	1433	8.15	1851	9.98	2267	11.53	2619
	39/128" 7.75 mm	6.65	1510	8.58	1949	10.51	2387	12.14	2757
#20 Dk. Turquoise #20.5	5/16" 7.94 mm	6.99	1588	9.02	2049	11.05	2510	12.76	2898
	41/128" 8.13 mm	7.34	1667	9.47	2151	11.60	2635	13.40	3043
#21 Mustard #21.5	21/64" 8.33 mm	7.70	1749	9.93	2255	12.17	2764	14.05	3191
	43/128" 8.53 mm	8.06	1831	10.40	2362	12.74	2894	14.71	3341
#22 Maroon #22.5	11/32" 8.73 mm	8.43	1915	10.88	2471	13.33	3028	15.39	3495
	45/128" 8.94 mm	8.81	2001	11.37	2582	13.92	3162	16.08	3652
#23 Cream #23.5	23/64" 9.13 mm	9.19	2087	11.87	2696	14.54	3302	16.78	3811
	47/128" 9.32 mm	9.58	2176	12.37	2810	15.15	3441	17.49	3972
#24 Dk. Blue #24.5	3/8" 9.53 mm	9.98	2267	12.88	2925	15.78	3584	18.22	4138
	49/128" 9.73 mm	10.38	2358	13.40	3043	16.41	3727	18.95	4304
#25 Copper #25.5	25/64" 9.92 mm	10.78	2448	13.92	3162	17.05	3872	19.69	4472
	51/128" 10.11 mm	11.19	2542	14.45	3282	17.69	4018	20.43	4640
#26 Bronze	13/32" 10.32 mm	11.60	2635	14.98	3402	18.35	4168	21.18	4811

120 Mesh  
Filtration  
Recommended

**SMALL UP3 NOZZLES AND PADS**

Small nozzles and mini-deflector pads are designed as an option for the first spans of a machine where overwatering is an issue. These nozzles and pads are ideal for low pressures up to 15 psi (1.03 bar). Due to the small orifice size of nozzles #2 through #4.5, filtration of 120-mesh will be needed.



Senninger's commitment to world-class products, local support and technical expertise ensure we provide the most efficient and reliable agricultural irrigation solutions available in the world today.

A handwritten signature in white ink, appearing to read "Steve Abernethy".

Steve Abernethy, President of Senninger Irrigation