

FOGGER

Irrigating Nurseries and Greenhouses



GREENHOUSE CLIMATE CONTROL

The Fogger is Senninger’s solution for reducing greenhouse temperatures and increasing humidity levels. It creates ideal conditions for plant propagation by distributing extremely fine droplets with excellent pattern uniformity.

Benefits of Senninger Foggers

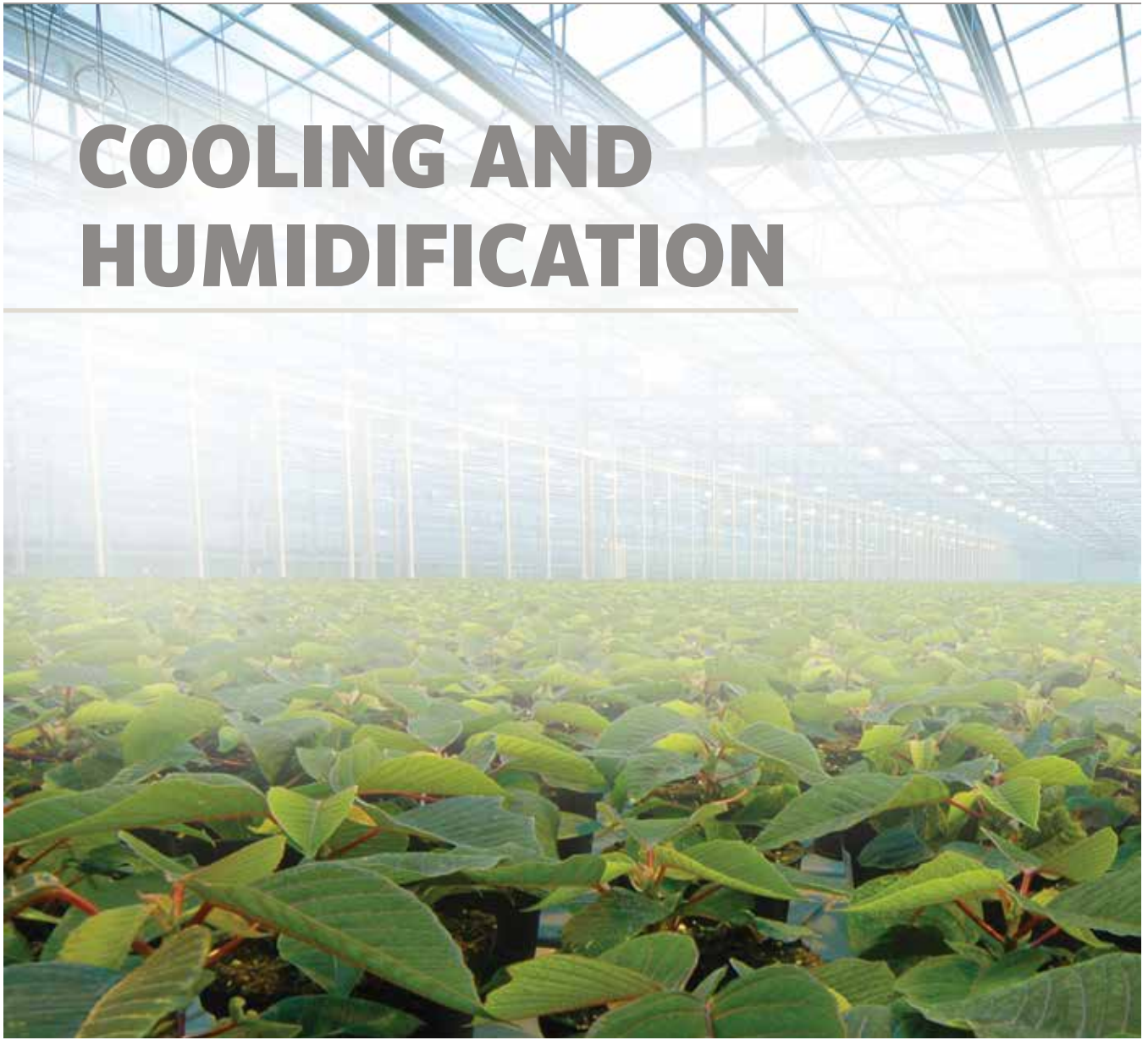
- ① Droplets averaging 65 microns in size at 60 psi (4.1 bar)*
- ② Uniform blanket of droplets for propagation and chemical applications
- ③ Built-in check valve provides instantaneous on-off and prevents line drainage
- ④ Simple, tool-free assembly and disassembly for cleaning and servicing
- ⑤ Engineering-grade UV-resistant thermoplastic construction for protection from corrosion
- ⑥ Operating pressures: 45 to 60 psi (3.1 to 4.1 bar)
- ⑦ Flow averages per nozzle: 1.6 gph (6.05 L/hr)
- ⑧ Easily retrofits existing fogger systems
- ⑨ Two year warranty on materials, workmanship and performance; nozzles are warranted for five years to maintain correct orifice size

FOGGER VS. MISTER COMPARISON

| | Fogger | Mister |
|--|--------|--------|
| Ideal for plants susceptible to root disease | YES | NO |
| Recommended for propagation of seeds and non-rooted cuttings | YES | NO |
| Recommended for propagation of rooted cuttings | NO | YES |
| Cooling & Humidity Control | YES | NO |

* Droplet size measured using the Sauter Mean diameter.

COOLING AND HUMIDIFICATION



COOLING AND HUMIDIFICATION

Fogging systems are extremely efficient tools for controlling greenhouse climate conditions. Climate control in a greenhouse results from the exchange of energy between hot air and the extremely fine droplets created by Senninger's Foggers.

As water droplets are released, they quickly convert from liquid to vapor due to their small size and the high temperatures in a greenhouse. During this process, they absorb the hot air at a rate of 16,726 calories per ounce (or 590 calories per gram) of evaporated water, which helps cool the air temperature and increases humidity levels inside a greenhouse by approximately 6 to 9° F or 4 to 6° C.

The frequency and duration can be customized to meet the specific needs of the crop and installation. The overall results and effectiveness of this system depend on outside temperature and humidity levels.



Graphic representation of Humidification or Cooling installation

HUMIDIFICATION

Some greenhouse plants will suffer serious damage if humidity levels drop below 30% inside a greenhouse. If more humidity is needed, the greenhouse’s ventilation system can be turned off.

Determining how often foggers should be on, as well as the amount of time between fogging events, depends on the desired level of relative humidity. In general, systems used to increase humidity run for a very short amount of time, with the duration of fogging ideally lasting 1 to 3 seconds. A controller, like the Sennode-BT, can help manage the necessary interval between fogging events.

Guidelines for Cooling and Humidity Control

- ① Mount Foggers as high as possible
- ② Install drops perpendicular to the lateral line
- ③ Avoid spraying against roof or greenhouse structure
- ④ 140 mesh filtration recommended

COOLING

A ventilation system is necessary to produce a cooling effect. If dry air is not introduced into the greenhouse as the Fogger cycles on and off, temperatures could rise along with humidity levels.

Most fogging systems used for cooling release droplets for a very short time, with approximately 10 seconds between each round of fogging. The duration of a fogging event depends on the air velocity inside the greenhouse. The type of ventilation system installed determines the velocity.

In most locations, the ventilation system should introduce dry air around 20 times per hour in order to maximize the cooling effect.

INSTALLATION: COOLING AND HUMIDITY CONTROL

| Models | Min. Installation Height | Spacing Between Foggers | Spacing Between Laterals |
|---------|-----------------------------|----------------------------|------------------------------|
| 4 Heads | 3 to 6 ft (0.9 to 1.8 m) | 3 to 10 ft (0.9 to 3 m) | 5 to 15 ft (1.5 to 4.6 m) |



PROPAGATION: SYSTEM DESIGN CONSIDERATIONS

Over-saturation is a common cause of plant diseases, such as fungi and moss, and a danger to greenhouse growers attempting propagation. Foggers can create the ideal conditions for plant propagation by reducing air temperatures and increasing humidity levels inside a greenhouse without wetting plant leaves. Due to the Fogger's smaller droplet size, there is also less soil saturation and more oxygen available to growing plants. The Fogger can also be used for foliage feeding, and to apply insecticides and fungicides. It saves time and provides a uniform application.

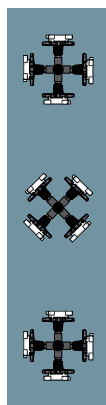
Guidelines for Propagation

- ① For wide benches up to 8 ft (2.4 m) in width, install two lines of Foggers equally distanced from the center of the bench to achieve a more uniform application
- ② Do not install Fogger lines more than one foot (0.3 m) from the edge of a bench
- ③ 140 mesh filtration recommended

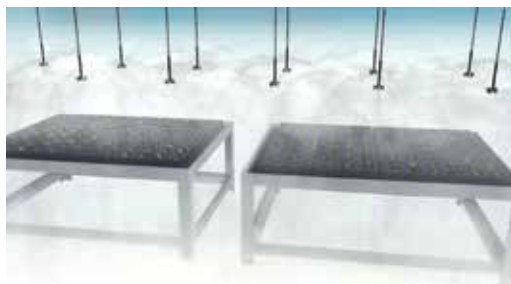
RECOMMENDED INSTALLATION: PROPAGATION

| Models | Installation Height* | Spacing Between Foggers |
|---------|---------------------------------|-------------------------|
| 4 Heads | 1.5 to 2.5 ft (0.5 to 0.8 m) | 3 ft (0.9 m) |

*Above the plant.



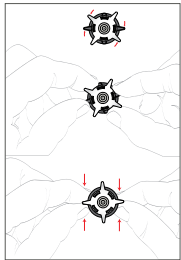
Four-way Foggers should be installed facing 45-degrees from adjacent Foggers.



For propagation, mount the Fogger 1.5 to 2.5 feet (0.5 to 0.8 m) above the bench with 3 feet (0.9 m) spacing between heads.

FOGGER INSTALLATION

Senninger's Foggers can be installed either as a single head fogger or on a 4-way adapter. Each configuration provides different precipitation rates.



Disassembly

1. Firmly grasp the Fogger nozzle and base by the pointed ears.
2. Pinch the pointed ears together until you hear a click, indicating the sprinkler is open.
3. Position the colored nozzle towards the ground so that the black base will be facing up. Carefully remove the base from the Fogger nozzle, which contains the built-in check valve assembly
4. Carefully lift the check valve assembly to clean the nozzle.

Reassembly

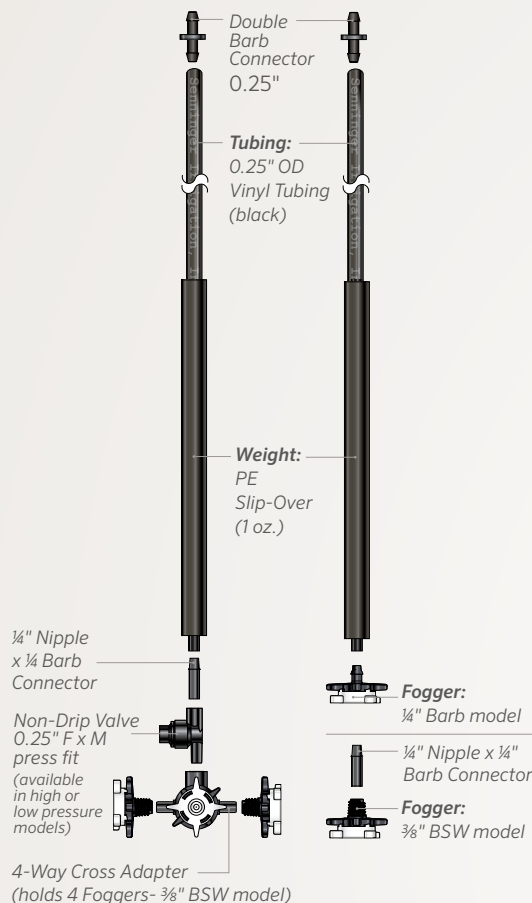
1. Holding the colored nozzle facing toward the ground. Carefully place the check valve assembly* into the nozzle with the rubber seal facing out.

Note: If you decide to remove the check valve assembly, we recommend using another check mechanism to help avoid leakage when the system is turned off.

2. Add the black base so that the tabs on the base align with the grooves on the inside of the nozzle. If it is easier, align the ears on the base with the ears on the nozzle.
3. Twist the ears of the base in the opposite direction from the ears on the nozzle until it locks together.

*If the check valve assembly comes apart, please re-insert the rubber seal into the seal support. Make sure the edges of the seal are pressed completely into the groove that surrounds the check valve seal support.

INVERTED ASSEMBLIES FOR FOGGERS



THREE INSTALLATION OPTIONS

- FOGANC375BSW4H**
- 4-Way Cross Adapter
 - Non-Drip Valve (**high pressure**)
 - 4 Foggers with 3/8" BSW connection

- FOGANC375BSW4L**
- 4-Way Cross Adapter
 - Non-Drip Valve (**low pressure**)
 - 4 Foggers with 3/8" BSW connection

- FOGDANC12375BSW4H**
- Drop Assembly for **four Foggers:**
- 0.25" Double Barb Connector
 - 0.25" Tubing (12")
 - Slip-Over Weight (1 oz.)
 - 0.25" Nipple x Barb Connector
 - Non-Drip Valve (**high pressure**)
 - 4-Way Cross Adapter
 - 4 Foggers with 3/8" BSW connection

- FOGDANC12375BSW4L**
- Drop Assembly for **four Foggers:**
- 0.25" Double Barb Connector
 - 0.25" Tubing (12")
 - Slip-Over Weight (1 oz.)
 - 0.25" Nipple x Barb Connector
 - Non-Drip Valve (**low pressure**)
 - 4-Way Cross Adapter
 - 4 Foggers with 3/8" BSW connection

- FOGDA24375BSW**
- Drop Assembly for **one Fogger:**
- 0.25" Double Barb Connector
 - 0.25" Tubing (24")
 - Slip-Over Weight (1 oz.)
 - 0.25" Nipple x Barb Connector
 - 1 Fogger with 3/8" BSW connection

- FOGDA24250BRB**
- Drop Assembly for **one Fogger:**
- 0.25" Double Barb Connector
 - 0.25" Tubing (24")
 - Slip-Over Weight (1 oz.)
 - 1 Fogger with 1/4" barb connection

- MISIDA24**
- Drop Assembly (**excludes Fogger**):
- 0.25" Double Barb Connector
 - 0.25" Tubing (24")
 - Slip-Over Weight (1 oz.)



PRESSURE REGULATORS

Pressure regulators assure applicators operate properly. Uncontrolled pressure fluctuations can result in unwanted flow deviations or over/under-watering. These fluctuations occur with activation of different zones, variations in field elevation, or changes in water supply. Pressure regulators are available in a variety of models to match specific flow and pressure needs.

| |  |  |  |  |  |  |
|---------------------------|---|---|---|---|---|---|
| | PRLG | PRL | PSR-2 | PMR-MF | PR-HF | PRU |
| Flow Range | 0.5 - 7 gpm (114 - 1590 L/hr) | 0.5 - 8 gpm (114 - 1817 L/hr) | 0.5 - 15 gpm (114 - 3407 L/hr) | 2 - 20 gpm (454 - 4543 L/hr) | 10 - 32 gpm (2271 - 7268 L/hr) | 20 - 100 gpm (4543 - 22713 L/hr) |
| Preset Operating Pressure | 10 - 40 psi (0.69 - 2.76 bar) | 6 - 40 psi (0.41 - 2.76 bar) | 6 - 50 psi (0.41 - 3.45 bar) | 6 - 60 psi (0.41 - 4.14 bar) | 10 - 50 psi (0.69 - 3.45 bar) | 10 - 60 psi (0.69 - 4.14 bar) |
| Maximum Inlet Pressure | 120 psi (8.27 bar) | 120 psi (8.27 bar) | 130 psi (8.96 bar) | 140 psi (9.65 bar) | 130 psi (8.96 bar) | 140 psi (9.65 bar) |
| Inlet Sizes | ¾" F hose, ¾" F NPT | ¾" F NPT, ¾" F hose | ¾" F NPT | ¾" F NPT, 1" F NPT, 1" F BSPT | 1 ¼" F NPT, 1 ¼" F BSPT | 2" F NPT, 2" F BSPT |
| Outlet Sizes | ¾" M hose, ¾" M NPT | ¾" F NPT | ¾" F NPT | ¾" F NPT, 1" F NPT, 1" F BSPT | 1" F NPT, 1 ¼" F NPT, 1" F BSPT, 1 ¼" F BSPT | 2" F NPT, 2" F BSPT |



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, reading "S D Abernethy".

Stephen D. Abernethy, President of Senninger Irrigation