NETAFIM™ NUTRIGATION™

DOSING SYSTEM QUICK SELECTION GUIDE

A dosing unit serves Nutrigation™ and chemigation:

Nutrigation™
The most effective way to increase the yield and quality of a crop is by feeding the plant according to its specific, ever-changing needs. This means delivering the right amount of water and nutrient at the right time. Nutrigation™ refers to injection of nutrients for the plant.

Nutrigation™ is comprised of three stages:
- Dissolving soluble fertilizers (if required).
- Injecting nutrients according to the desired dosing ratios.
- Delivering the precise quantity of nutrients to the plant's root zone.

Chemigation
Chemigation refers to injection of chemicals to prevent or reduce dripper clogging (addition of chlorine, hydrogen-peroxide, acid or others), and the injection of chemicals for crop and soil concerns (herbicides, pesticides and others).

Because the water passages in drippers are relatively small, they can become clogged; therefore, along with filtration, the capability to inject chemicals for dripper clogging control is an important feature.

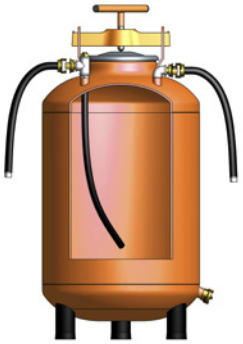
Benefits of Nutrigation™ and/or chemigation:
- Uniform and timely application of nutrients and chemicals
- Reduced soil compaction due to reduced traffic in fields
- Reduced labor requirements, reduced exposure to chemicals
- Reduced environmental contamination.

The design of a chemical injection system involves the selection of injector type and capacity. If the injection system is to be used for Nutrigation™, the injection unit is sized for this use since injection rates for nutrients are usually much higher than injection rates for chemicals such as liquid chlorine or acid.

Any components coming in contact with nutrients, chlorine, or acid should be resistant to corrosion. Some countries require specific types of injectors for agrochemicals. Always follow local laws and chemical labeling requirements.

Nutrients and chemicals may be injected into pressurized drip systems via a variety of methods:
Netafim™ offers a comprehensive array of dosing systems to ensure precise nutrient delivery for any crop, plot size and application.

Fertilizer Tank



A fertilizer tank mixes water with fertilizer for quantitative Nutrigation™. It is operated by the hydraulic pressure in the irrigation system and does not need an external energy source (subject to excess pressure available in the system). The desired amount of fertilizer placed in the tank is dissolved and injected into the irrigation system.
Can be connected to the irrigation system in two ways:

- **Inline** - installed directly on the main line (typical of very low capacity systems).
- **Bypass** - installed as a bypass from the main line, a manual or hydraulic pressure reducing valve (PRV), installed on the main line, produces the required pressure differential to operate the fertilizer tank (typical of high capacity systems).

Fertilizer tanks are simple to use and maintain.

Hydraulic piston motor injector

Its linear hydraulic piston motor is powered by the hydraulic pressure in the irrigation system, and does not require any other energy source for injecting fertilizer into the pressurized irrigation line. Water enters the injector through the upstream inlet and exits it to the drain line through the water outlet. The fertilizer is injected at twice the pressure of the irrigation line, generated by the hydraulic piston motor itself. The liquid fertilizer enters the injector through the suction port positioned inside the fertilizer tank and is injected through the injection outlet, downstream, into the irrigation line.
The water consumption of the hydraulic motor is 3 times the quantity of the chemical injected and it can produce an injection flow rate of up to 320 liter/hour (1.4 GPM), depending on the inlet pressure and the pump model. Can be operated manually or automatically by an irrigation controller.

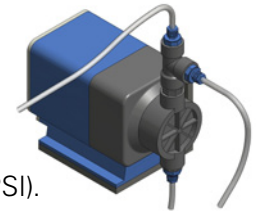
Netafim Venturi Injector - up to 2"

A Venturi injector uses excess pressure in the irrigation system to create a low pressure zone, or vacuum, in the injector throat. This vacuum efficiently draws chemicals into the pressurized water line, eliminating the need for a separate chemical injection pump.
Venturi injectors are the most cost-effective method of introducing chemicals into a pressurized irrigation system, popular because of their simplicity, reliability and low cost, and because they don't require a power source.
Can be easily connected to the irrigation system in two ways:

- **Inline** - installed directly on the main line (typical of very low capacity systems).
- **Bypass** - installed as a bypass from the main line, a manual or hydraulic pressure reducing valve (PRV), installed on the main line, produces the required pressure differential to operate the Venturi injector (typical of high capacity systems).

Venturi injectors include no moving parts and require little maintenance.
They supply an extremely uniform injection rate from start to finish at nominal system flows rates.
Chemical injection capacity: 30 - 1200 l/hr (8 - 320 GPH) depending on injector size and operating pressure. Can be operated manually or automatically by an irrigation controller.

Electric dosing pump



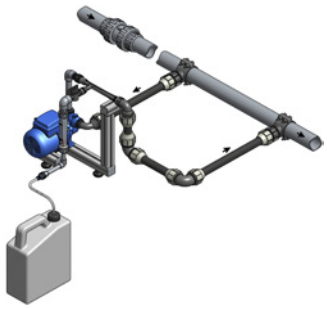
Intended for flow rates up to 25 l/hr (6.6 GPH), the electric pump is usually used for injection of chemicals and acids for system maintenance. Maximum pressure: 10 bar (145 PSI).

Hydraulic fertilizer injector (proportional)

Applies fertilizers and chemicals proportionally to the water flow through an irrigation system in the slow and constant quantities required for steady growth.
Widely used in open fields, orchards and landscaping to inject an additive into a water line at a consistent injection rate under varying water pressure and flow rates.
This process, injecting additives using only water power, is accurate and simple.

- Water driven, non-electric
- Piston driven by water flow
- Solution is added in proportion to water flow for accurate mixing
- Solution is constantly added as water flows through the unit
- Ratio of additive remains constant

Single channel Mini FertiKit



Venturi injector with booster. This method is used when the pressure differential in the main line is not sufficient to activate a basic Venturi dosing unit. The booster pump creates additional pressure to activate the Venturi while preventing head loss to the system. Supplied with selected size of Venturi (up to 3/4"). A check valve should be installed upstream from the bypass.
Can be operated manually or automatically by an irrigation controller.

FertiKit3G™

The FertiKit3G™ is a highly versatile and precise dosing system suitable for an unrivaled range of irrigation system capacities. Covers all applications ranging from open fields to intensive horticulture. Requiring a minimal investment, the FertiKit3G™, a CE-compliant modular system, is the industry's most cost-effective dosing system, whether used for small or large-scale applications.

- **Flexible:** Works with a very wide range of dosing channel flow rates up to 6 units of 50 to 1000 l/hr.
- **Scalable:** For systems from 5 m^3/h to 700 m^3/h capacity and pressures up to 8.0 bar.
- **Cost-effective:** Requires minimal investment with rapid ROI.
- **Modular:** Available in four models including two that do not require a booster pump.

NetaFlex3G™

The NetaFlex3G™ is a reliable, state-of-the-art, open-tank dosing system ensuring very precise and even nutrient dosing for greenhouse crops.
A CE-compliant modular system, the NetaFlex™ easily integrates with multiple Netafim™ and third-party control and monitoring systems, while delivering a uniform quantity or ratio of nutrients.

- **Productive:** Employs precise EC and pH control to assist in delivering a high-quality product with outstanding yields.
- **Uniform:** Delivers a consistent quantity or ratio of nutrients in a homogenous solution thanks to an open mixing tank design.
- **Flexible:** Works with a wide range of dosing channel flow rates up to 6 units of 50-600 l/hr.
- **Scalable:** System flow rates from 5 m^3/h to 60 m^3/h capacity.
- **Focused:** Made for greenhouse applications.

NetaJet3G™

The NetaJet3G™ is a uniform low-energy dosing system featuring a state-of-the-art mixing chamber.
It provides the highest level of dosing precision and uniformity for greenhouse and open-field crops.
A CE-compliant modular dosing system, the NetaJet3G™ easily integrates with multiple Netafim™ and third-party control and monitoring systems.

- **Productive:** Employs precise EC and pH control to deliver consistently high-quality product with outstanding yields.
- **Uniform:** Delivers a consistent quantity/ratio of nutrients thanks to an innovative mixing chamber while maintaining perfect EC and pH control.
- **Flexible:** Works with a wide range of dosing channel flow rates up to 5 units of 1000l/hr dosing channels.
- **Cost-efficient:** Using a single pump for mixing and injection of nutrients, the NetaJet3G is designed to accurately dose with low levels of energy consumption.
- **Scalable:** Scales from 5 m^3/h to 400 m^3/h capacity and pressures up to 6.5 bar.
- **Versatile:** Suitable for applications ranging from greenhouses to net houses.

SELECT A DOSING SYSTEM

Relevant terms:

- **Single dosing channel** - for injection of only one type of fertilizer solution at the same time.
- **Multiple dosing channels** - for injection of several fertilizer solutions at the same time or of a single fertilizer solution at a higher rate.
- **Bulk/Quantitative Nutrigation™** - The entire amount of fertilizers is injected in one shot.
- **Proportional Nutrigation™** - The fertilizers are injected at a constant ratio relative to the flow of irrigation water in the main line.
- **Nutrigation™ based on EC and pH control** - Nutrigation™ is constantly adjusted in order to keep a steady EC and pH level according to the plant's needs.
  Can be conveniently accomplished with a controller (Netaflex™, NetaJet™ or FertiKit™) on the dosing system and EC and pH sensors on the dosing unit.

Select the appropriate dosing unit:

Number of dosing channels	Dosing unit	Required energy resource	Recommended for: Open field / orchard	Greenhouse - soil / net house	Greenhouse - soilless	Comments
Single	Fertilizer tank	💧	●			Will work only if the pressure difference between inlet and outlet is at least 0.3 bar (3 meters).
	Hydraulic piston motor injector		●			Consumes water 3 times the quantity of the chemical injected.
	Netafim™ Venturi injector	💧	●			Requires 15-75% pressure differential for optimal operation, according to the required injection rate.
	Electric dosing pump	⚡	●			
	Hydraulic fertilizer injector (proportional)	💧	●			Requires 15-30% pressure differential for optimal operation, according to the required injection rate.
	Single channel Mini FertiKit	⚡	●			
Multiple	FertiKit3G™	⚡ or 💧	●	●		
	NetaFlex3G™	⚡		●	●	
	NetaJet3G™	⚡		●	●	

Legend:

⚡ Electricity is available on site.

💧 Extra pressure is available in the system in addition to the required pressure for current irrigation.

For detailed technical data, see the product's datasheet at http://www.netafim.com/product/dosing-system---quick-selection-guide.

For clarifications or in case of doubt consult a Netafim™ expert.