

Automatic Liquid Nitrogen Dosing System



Cryotec presents **LINinject®** automatic liquid nitrogen dosing system to pressurize and make inert atmosphere in PET, cans, glass and other type of containers. It is suitable for cold and hot liquids, pastelike and solid products.

Intended Use

LINinject® is intended to create overpressure and inert atmosphere inside a container with still liquids and foods. Inert atmosphere significantly reduces oxidation processes and thus extends shelf life and preserves taste qualities of the product without using food additives.

«Nitrogen Breakthrough» in Packaging Industry

Capability of **LINinject®** to create overpressure and inert atmosphere is fairly a breakthrough in packaging industry. A drop of liquid nitrogen being injected into a container intensively evaporates (boiling temperature -196°C) and turning into a gaseous state increases in volume by 700 times. This physical phenomema allows to achieve two principal things:

- first - to push out the rest of air and oxygen from a container before closing the cap. This increases the shelf life of the product and preserves its original taste qualities;
- second - after the cap closing evaporating nitrogen creates overpressure and thus makes a container tough and solid. This ensures efficient storage, handling and transportation. As well as prevents bottle shrinkage during hot fill packaging.

Nitrogen, as the main component of the air is food safe inert gas, without taste, odor and colour. It dissolves poorly in a product and is approved for the use in food industry. **LINinject®** can be efficiently used to pack cold and hot products into PET, cans, glass and other containers.



Liquih nitrogen injection into PET on the bottling line with the speed up to 45 000 doses per hour





Control cabinet with Touch Screen, PLC platform Siemens Simatic S7-1200

Working material	liquid nitrogen
Capacity of in-line cryogenic vessel	8 liters
Liquid nitrogen dose (min-max)	0.1-1.0 ml
Dosing speed	up to 45 000 doses/h
Supply voltage/ Frequency	220/50 V/Hz
Power consumption	110 W/hour
Required pressure in pneumatic system	>6 Bar
Air flow rate at a pneumatic pressure of 6 bar and a dosing rate of 5,000 doses/hour	100 l/hour
Overall dimensions together with the rack	620x1530x2300 mm
Weight without nitrogen	36 kg
Operation mode	continuous, 24/7
Temperature of environment	+5°C to +40°C
Relative humidity	up to 98%

Injection of Liquid Nitrogen

Injection of liquid nitrogen can significantly reduce the cost of PET preforms, makes it possible to fill convenient, light and cheap PET containers with cold, warm or hot contents without the cost of additional temperature treatment. Today, the demand for nitrogen plants is higher than ever. Nitrogen, as the main component of air, is safe, colorless, tasteless and odorless, chemically inert, slightly soluble in the product and approved for use in the food industry. The creation of an inert environment in containers with food and beverages (such as wine, fresh juices, etc.) significantly weakens the oxidation process, preserving the taste and freshness of the product for a longer time.

Desciption and Principles of Operation

Automatic liquid nitrogen dosing system LINinject consists of vacuum-insulated cryovessel, vacuum-insulated pipeline, volumetric dosing valve and control unit. Cryovessel automatically refills with liquid nitrogen from an external storage tank. Electronic control unit with industrial PLC allows operator to set dosing parameters.

Automatic machine is equipped with a 230 liter cryogenic vessel and a 3 meters flexible vacuum-insulated hose. Original design of dosing unit guarantees injection of strictly limited nitrogen dose into a container every time.

The system is designed to operate within modern filling lines, weighing-and-packaging and closing monoblocks. But it also can be used as an independent unit in food and household chemicals bottling and weighing-and-packaging linear belt conveyors. Main material used for body of LINinject is a 316 stainless steel and design allows for CIP cleaning.

LINinject® is environment friendly and meets safety requirements of "Cryogenic equipment. General safety design requirements" (Russian national standard OCT 26-04-2153).

Conformity certificate EA3C N RU Д-RU.HB27.B.00340/19

LINinject® system includes cryogenic vessel EuroCyl-230/4 (Czech Republic-USA) with a capacity of 230 liters of liquid nitrogen and a pressure of up to 4 bar.

