

**Nitrogenator model DN**

- Venturi Nozzle Injector
- Minimal pressure drop
- Efficient dissolution of gas into liquid
- High dosing accuracy
- No static mixer
- Sanitary design
- PLC controlled. automatic CIP mode

## NITROGENATION

When added to beer, Nitrogen creates creamy and fine foam head with small bubble size; it improves the foam stability and softens the beer palate. While traditionally nitrogenation was applied on ales and stouts, the same process is nowadays successfully used for the classical lagers treating. Nitrogen (15-25 ppm) increases beer foam stability of lagers (5 g/l CO<sub>2</sub>) up to 20 %. Due to its low solubility, nitrogen consumption is very low. Consistent and accurate Nitrogen will determine appearance and quality of the final product.

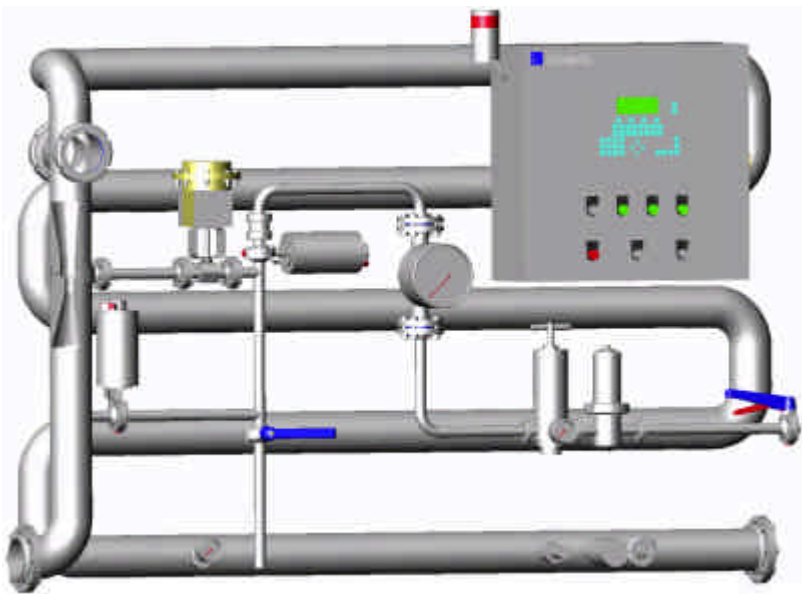
DENWEL provides fully automated solutions for fast and accurate dosing and dissolution of Nitrogen but also for simultaneous injection of N<sub>2</sub> and CO<sub>2</sub> with balanced pressure control to retain both gases into solution.

# NITROGENATION

## Principle

Nitrogen is injected into the beverage through the DENWEL Venturi Nozzle. Individually designed for each application, the Venturi Nozzle combines turbulent flow and increased pressure for an optimal mass transfer rate from gas to liquid. No static mixer or sinter candles are needed and most efficient dissolution of N<sub>2</sub> is achieved with only minimal pressure drop, no gas loss and a fully hygienic layout.

An inspection glass allows visual check of bubble-free, complete dissolution of Nitrogen. A selective inline N<sub>2</sub> analyzer continuously monitors the Nitrogen concentration. The output signal is processed by the PLC to control the N<sub>2</sub> dosing. A high precision control valve accurately adjusts the Nitrogen injection avoiding any over or under carbonation. The backpressure valve maintains constant pressure in the system despite any changes in flow. Constant system pressure ensures fast and accurate control of N<sub>2</sub> dosing.



### Technical specifications

Nominal capacity: 10 to 1000 hl/h  
Pipe Diameter: DN 15 to DN 200  
Nitrogen range: 1 to 25 ppm\*  
N<sub>2</sub> analyzer accuracy: ± 1 ppm

\*up to 55 ppm with in membrane module

### Auxiliary utilities

Power supply: 230 VAC, 50-60 Hz  
N<sub>2</sub>: 6 bar, purity > 99,99%  
Air: 6 bar, dried, oil free

## Control

The system is PLC controlled and has automatic modes for continuous nitrogenation and CIP. The PLC displays relevant process data and controls the Nitrogen content. The measured Nitrogen value is compared to the set point and the N<sub>2</sub> control valve is adjusted accordingly. Special software algorithm provides fast and precise regulation. Representative screens, control lamps and clear instruction ensure user-friendly operation. Digital and analogue output or optional field-bus interface allow remote control of the system.

## CIP

The unit has an uncompromising sanitary design and is fully CIP cleanable. A special bypass ensures complete cleaning of the Nitrogen injector and control valve simultaneously to the product pipe. The remaining part of the gas supply tube can be sanitized with steam.

## Design

The unit comes pre-assembled and tested on a compact frame and can be rapidly put into operation. Proven components guarantee low maintenance and extended lifetime. The modular layout allows easy integration into the plant and efficient combination with other process units like high gravity blending systems. The carbonation unit can be upgraded for simultaneous injection of CO<sub>2</sub> and Nitrogen.