



# Anhydro Dosing System

*The Anhydro Dosing System enables exact dosing of gas (e.g. N<sub>2</sub>) or any liquid (e.g. CO<sub>2</sub>) into the feed line of the spray drying plant. The system which is available in three variations – L for liquids, G for gases and L/G for both liquids and gases – provides a long line of application and performance benefits:*



- Homogeneous density
- Precision control of end product
- High and low dosing capacities
- High accuracies – even in dosing rates as low as 50 g CO<sub>2</sub>/h
- Three control modes – manual, fixed flow rate and proportional flow rate
- Available from 3 bar up to 500 bar (standard 300 bar)
- Optimized PLC integration
- Dosing after the high pressure pump (high pressure dosing)
- Simple installation and operation
- Minimum maintenance requirements
- Compact and mobile design

Benefits & features (CO <sub>2</sub> )								
Product	Dosage guide value (based on wet product)	Bulk density	Colours (product whitening)	Particle size and shape	Sinkability	Soulbility	Angle of powder	Reduced pressure
Coffee	0,2 - 1,2 %	X	X					
Coffee whitener	0,0 - 0,6 %	X		X	X			
Cappuccino (basic material)	0,3 - 0,8 %	X			X	X		
Ice coffee (90 % sugar)	0,3 - 0,6 %	X						
Sweetener	0,1 - 0,5 %	X		X				
Baby food	0,1 - 0,3 %	X						
Malt and mixed malt products	0,2 - 1,5 %	X	X					X
Ovomaltine	0,2 - 1,0 %	X						
Chocolate drink	0,1 - 0,9 %	X	X					
Caramel	0,1 - 0,7 %	X						
Cocoa drink	0,1 - 0,7 %	X						
Milk powder and milk basic products	0,1 - 0,3 %	X						
Sugar products	0,1 - 2,0 %	X		X			X	X
Plant extracts	0,1 - 2,5 %	X		X				X

The Anhydro Dosing System is equipped with a dual supply inlet for gas and/or a dual supply inlet for liquid which enable(s) switching between the two gas supply tanks or the two liquid supply tanks without interruption. When supplied, the gas or liquid is filtered and CO<sub>2</sub> is passed through a cooling aggregate for temperature control.

### **CO<sub>2</sub> dosing process**

The pressure of the cooled CO<sub>2</sub> is boosted in a high pressure piston membrane pump. Accurate flow control is achieved by passing the CO<sub>2</sub> through a mass flowmeter. A valve system ensures compliance with safety and venting requirements.

The CO<sub>2</sub> is then passed on to the injection nozzle in the dryer product feed line via a flexible hose. The injection nozzle can be positioned minimum 1 metre from the dryer high pressure feed pump and minimum 5 metres from the atomizer nozzle outlets.

The injection unit control system features three control modes: manual, fixed flow rate and proportional flow rate. In the proportional flow rate mode, the injection unit mass flowmeter and the flowmeter installed in the feed line are interconnected via the in-house control system and the Anhydro Dosing System control system.

### **High pressure CO<sub>2</sub> injection into milk concentrate**

The ability of CO<sub>2</sub> to lower milk powder bulk density is governed by the solubility of the CO<sub>2</sub> gas in the water component of the milk concentrate. The dissolved CO<sub>2</sub> is released from the water component at the point of atomization, forming vacuoles within the individual milk powder particles. Thereby, the particles are "ballooned", thus reducing the overall bulk density of the powder. The end product is defined by a controlled combination of the quantity of CO<sub>2</sub>, the atomizer nozzle pressure, the feed temperature and viscosity, drying temperature etc.



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