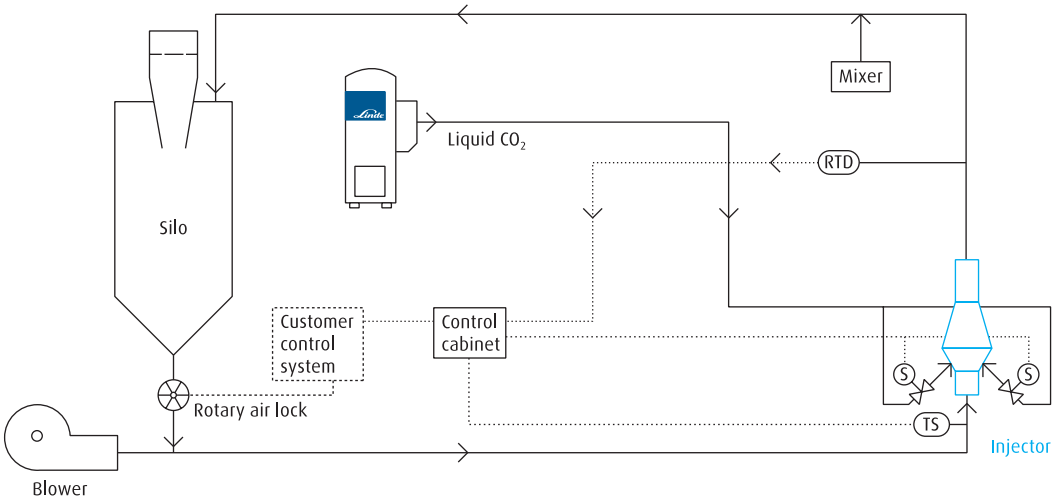
THE LINDE GROUP

Dry ingredient chilling system.

Mode of operation

TS: Temperature switch S: Solenoid valve RTD: Resistance temperature sensor



General information

The dry ingredient chilling system from Linde Gas, which operates at more than 50 locations, was developed to pneumatically cool conveyed products, such as flour, sugar, cocoa, etc. When it is used for flour in the baking industry, it ensures a consistent, top-quality product from every batch of dough.

Taking flour chilling as an example: achieving an accurate and even dough temperature plays a major role in determining the quality of baked goods, whose most important – yet most unpredictable – ingredient usually is flour. The dry ingredient chilling system from Linde Gas chills flour in the transfer line, adding only the precise amount of refrigerant needed to obtain the desired flour temperature. The system can be used with either a vacuum or a pressure air flour conveying system. A programmable controller (PLC) monitors the injection of cryogen in order to guarantee a uniform and consistent flour temperature. The dry ingredient chilling system produces flour temperatures within half a degree Celsius of the set point.

Unlike other chilling methods, Linde's dry ingredient chilling system introduces no additional moisture into the dough and shortens the processing time by chilling the dough more quickly than ice or other conventional methods. It is also fully automated, which eliminates costs associated with the purchase and handling of ice.

Mode of operation

The silo powder valve and blower alert the PLC to the flow of ingredients into the system. The PLC, which usually is mounted at the operator station, regulates the amount of cryogen entering the system at the injector. Further down the line, a resistance temperature sensor (RTD) senses the temperature of the ingredients in the line and relays it to the control panel, which compares the actual temperature to the set point. Valves then open and close, controlling the amount of cryogen released into the system to maintain the set point temperature precisely. The set point can be changed easily as needed.

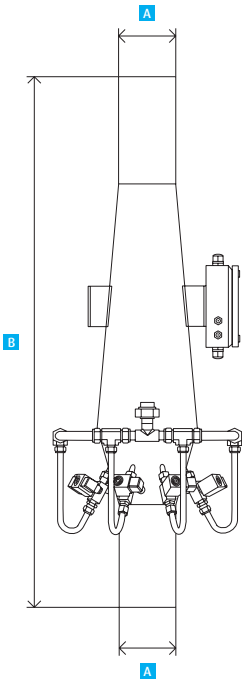
→ Dry ingredient chilling system.

Benefits

- → Consistent powder temperatures provide repeatable batch-to-batch dough quality
- → Cryogenic cooling eliminates problems of excess moisture, unreliable timing and labor costs associated with ice
- → Improved machinability of dough speeds processing
- → Shorter processing time improves efficiency
- → Less wasted dough increases profits
- → Easy installation

Design of the injector

A Diameter B Length



Technical data

Designation	Unit				
Type		Injector	Injector	Injector	Injector
Model		DN 50	DN 80	DN 100	DN 125
Width	mm	350	390	364	425
Height	mm	649	899	1049	1299
Depth	mm	350	390	420	425
Injector diameter (A)	mm	60.3	88.9	114.3	139.7
Injector length (B)	mm	650	900	1050	1300
Maximum diameter of injector	mm	108	156	200	245
Number of injection nozzles/valves		4	4	6	8
Liquid CO_2 operating pressure	bar	15–20	15–20	15–20	15–20
Gaseous CO_2 operating pressure	bar	8–13	8–13	8–13	8–13
Liquid CO_2 pressure max.	bar	25	25	25	25
Gaseous CO_2 pressure max.	bar	25	25	25	25
Max. pressure conveyor piping	mbar	1000	1000	1000	1000
Electrical connection for valves	V DC	24	24	24	24
Weight	kg	15	18	20	25
Noise level	dB(A)	< 70	< 70	< 70	< 70
Type of protection	ATEX	Class 21	Class 21	Class 21	Class 21

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