



Carbonator

Unit to treat the final beverage with carbon dioxide



Application

A carbonator adds carbon dioxide to a ready-for-filling beverage.

Highlights

- Low operation and raw material cost
- High process reliability through control systems
- Constant flow through measuring systems for very high flexibility without losing carbon dioxide dosing accuracy
- Adaptable for any type of filler

Working principle

The carbonator consists of a pressure vessel equipped with a circulating pipe loop and a CO₂ dosing system. In most cases it is combined with a plate heat exchanger for cooling purposes. The outlet is open to the filler and allows as much beverage to leave the carbonator as the filler demands. The inlet is regulated by a modulating valve controlled by a continuous level sensor in the pressure vessel and monitored by a flow meter.

CO₂ is dosed in relation to this flow via a control valve according to the recipe set point. The opening range of the CO₂ control valve is regulated by a mass flow meter in the CO₂ supply line. The higher the pressure and the lower the temperature, the higher the solubility of CO₂ in the beverage. Pushing the start button charges the carbonator with CO₂. Drain valves open to expel remaining foreign fluids once the preset pressure is reached. When the system is empty, the pressure vessel is recharged with CO₂ and the beverage enters the vessel. CO₂ injection now begins according to flow volume. Pressure increases continuously during the filling step but remains constant once production starts. In parallel, the beverage starts to circulate through the cooling plate heat exchanger. When the carbonation level is in spec the outlet valve opens, enabling supply to the filler. In some cases, the carbonator's head pressure is maintained by compressed sterile air instead of CO₂. The carbonator runs as long as there is demand for product. If the predefined level is exceeded the inlet valve closes and the unit stands by until the filler resumes.

Main components

- Main frame
- Carbonisation and mixing tank
- Static mixer
- Control cabinet
- CO₂ supply line
- Measuring loop
- Recirculation line
- Sampling valve in the measuring line for easy checking of °Brix specifications in laboratory during startup.
Not applicable for measuring CO₂ content.

Control panel

The carbonator is controlled by an Allen Bradley Control-Logix or Siemens PLC. This is fitted in a cabinet located on the framework.

Options

- Beverage cooler if product temperature above 20 °C
- CIP discharge pump
- Mass flowmeter on product inlet
- Additional inlet for nitrogen or sterile air as a lower-cost alternative for pre-pressuring the carbonisation vessel (manual changeover between treating gases)
- Analysis instrument for °Brix and CO₂ level



Technical data

Available in different sizes depending on capacity. All parts in contact with the product are made of AISI 316L. The frame is made of AISI 304L. Our carbonators run at the following capacities for final beverage:

- 20 000 l/h
- 40 000 l/h
- 60 000 l/h

Other capacities on request.

Electrical power	400 V, 50 Hz
Other supply voltage or frequency available	

Compressed air	600 kPa (6 bar)
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Example layout

Measurements on request.

