

PARTNER IN STAINLESS STEEL

KHTEC[®]



Fast | Precise | Flexible

CO₂ Management Systems & Carbonators

The professional way to adjust **CO₂- and O₂** for your beverage



BEVERAGE



WINE



CO₂ Membrane System 100 SEMI



CO₂ Membrane System 100 AUTO



CO₂ Membrane System 250 SEMI

CO₂ MEMBRANE SYSTEM

The KH Tec CO₂ Membrane System is based on the latest hydrophobic membrane technology, which allows precise control of gas exchange without altering the essential characteristics of the beverage. The ultra-fine CO₂ bubbles produced provide the product with an outstanding, delicate mouthfeel. The system offers CO₂ regulation from 0 to 9 g/L (extendable to 12 g/L), making it suitable for both carbonation and degassing of beverages.

A unique feature of the system is its ability to remove CO₂ directly from the beverage using a vacuum pump – without the use of nitrogen. This unique combination of membrane technology, CO₂ dosing and precise vacuum control enables not only targeted CO₂ addition but also simultaneous removal of dissolved oxygen.

The system is equipped with extensive sensors and automated valves that ensure precise control and monitoring of all process parameters such as pressure, temperature, and flow. An adaptive dosing model dynamically adjusts CO₂ addition to production conditions, ensuring stable and consistent product quality.

FEATURES AND BENEFITS

Precise CO₂-adjustment

Exact control of CO₂ levels between 0-9 g/L for adjusting still wines, degassing red wines, or carbonating sparkling wines and other beverages. Very low CO₂ levels between 0-2 g/L can also be achieved.

Oxygen degassing

Oxygen is efficiently removed via an automatic proportional valve, resulting in stable and consistent product quality.

Adaptive dosing system

The CO₂ dosing automatically adjusts to flow rate and production conditions to ensure consistent product quality.

Physical control model

Real-time data such as flow, pressure, and temperature are continuously evaluated to optimally control dosing and ensure process stability.

Dosing limits

CO₂ addition always occurs within the physically defined limits, ensuring the safety and efficiency of the entire process. This combination of flexibility and precision makes the KH Tec CO₂ Membrane System an ideal solution for CO₂ regulation in various beverage types.

DEGREES OF AUTOMATION

The KH Tec CO₂ Membrane System is available in four different automation levels, offering flexible adaptation to various requirements and budgets:

System BASIC

The basic system provides reliable CO₂ regulation without an integrated CO₂ sensor. Dosing is done via an automatic CO₂ valve, while a vacuum pump with precisely controlled process valves handles degassing.

Equipment: Automated process valves, instruments for flow, pressure, and temperature measurement.

Control: 7-inch touchscreen for intuitive operation.

System SEMI

Enhances the Basic system with an integrated CO₂ sensor for more precise dosing and consistent product quality. Cleaning is performed manually using diaphragm valves.

Equipment: Integrated CO₂ sensor, manual valve control.

Control: 10-inch touchscreen and IXON remote support router for remote diagnostics.

System AUTO

Advanced automation with additional features such as automatic membrane regeneration and drying. All process valves are pneumatically controlled.

Equipment: Pneumatically controlled valves, automatic membrane cleaning.

Control: 12-inch touchscreen, integration with higher-level control systems, and 1-year cloud data logging.

System CIP

The highest automation level with fully automatic CIP cleaning based on the AUTO system. Equipped with a buffer tank, two dosing pumps for cleaning agents, electric heating, and a CIP pump.

Equipment: CIP system with integrated conductivity measurement for cleaning monitoring.

Control: 15-inch touchscreen for comprehensive control and enhanced user-friendliness.

These graded automation levels offer a customizable and scalable solution, covering everything from the basic version to fully automatic cleaning processes. This modular structure allows the CO₂ Membrane System to be flexibly adapted to specific production requirements. All models offer advanced control and networking options for optimal monitoring and process control.



CO₂ Membrane System 250 AUTO



CO₂ Membrane System 350 SEMI



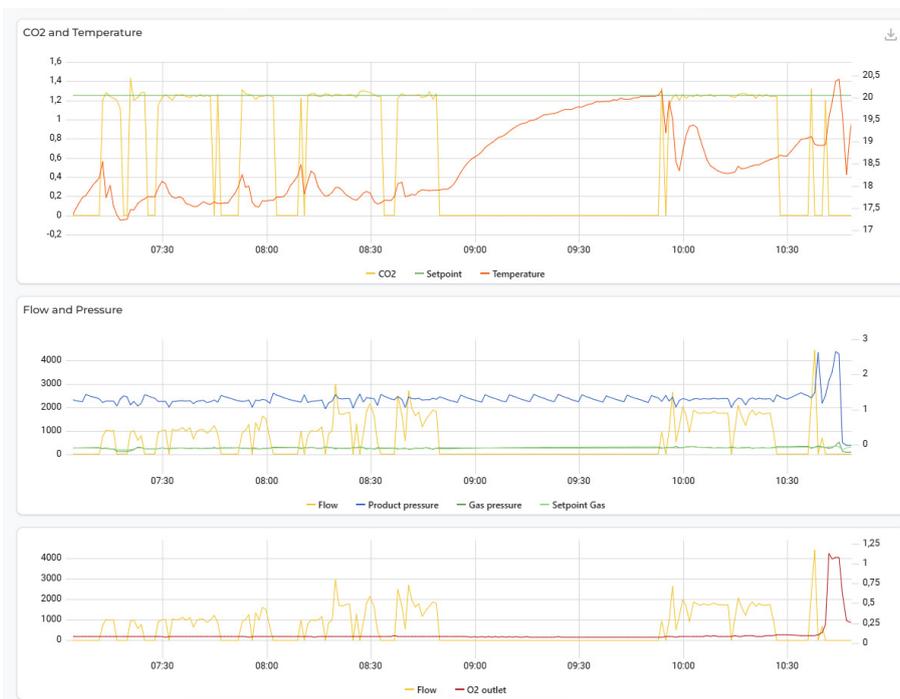
CO₂ Membrane System 350 CIP

DATA COMPARISON

Size	Automation	Length (mm)	Width (mm)	Height (mm)	Weight (kg)	Membrane Area (m ²)	Min Product Flow (L/h)	Nominal Max Carbon Still wine (L/h)	Nominal Max Carbo 5g/L (L/h)	Nominal Max Carbon Still wine (L/h)	Nominal Max Carbon Still wine (L/h)
50	BASIC	880	550	1900	250	20	100	2500	1500	7	DN40
	SEMI	960	600	1900	250						
100	BASIC	880	550	1900	250	40	100	4000	3000	14	DN40
	SEMI	960	600	1900	250						
	AUTO	1200	800	1900	300						
	CIP	1600	860	1900	350						
250	SEMI	1000	600	1900	300	140	300	12000	6000	40	DN50
	AUTO	1200	800	1900	350						
	CIP	1600	1200	1900	400						
350	SEMI	1250	910	2000	380	280	300	24000	12000	80	DN50/65
	AUTO	1400	830	2000	400						
	CIP	2200	1100	2000	450						

*CO₂ addition up to the physical limit; the removal rate depends on flow, temperature, and membrane integrity

DATA LOGGING



HMI - Design BASIC



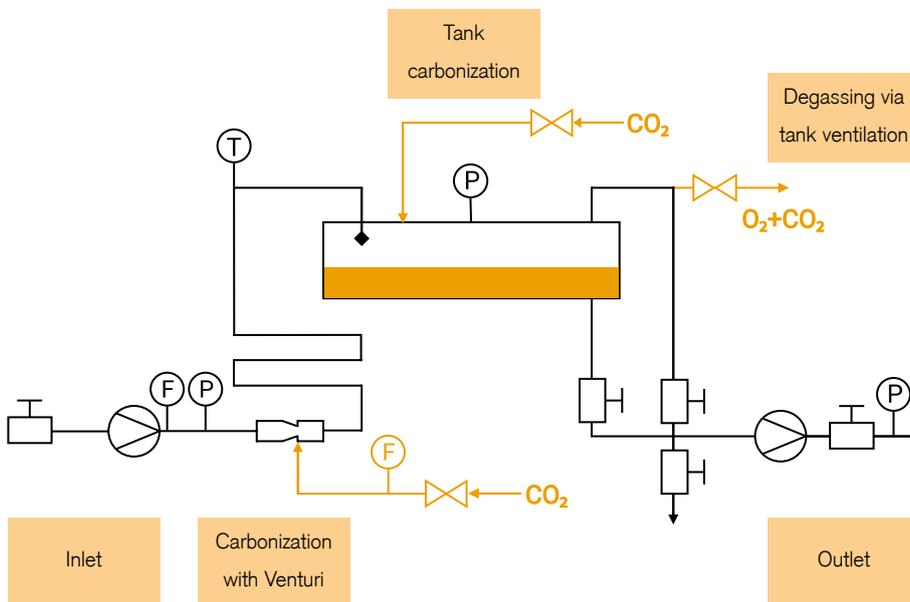
HMI - Design AUTO

CARBO SYSTEM



HMI - Design Carbo System

OPERATING PRINCIPLE



The non-carbonated beverage is first fed into the system via a pump. A Venturi nozzle can be used to precisely inject CO₂ in order to achieve the desired degree of carbonation. Alternatively, it is possible to carbonate via targeted tank pressure. The headspace of the tank is continuously flushed, removing oxygen and ensuring optimum beverage quality. The carbonated beverage can then be transferred directly from the buffer tank to the bottling line.

CARBO SYSTEM



Front View Carbo System

In addition to our CO₂ Membrane System, we offer the Carbo System, a versatile solution for carbonating beverages, especially in applications where membrane technology cannot be used. The Carbo System ensures precise CO₂ addition and is particularly robust and flexible in application.

The carbonation system operates with a compact pressure vessel that is continuously filled with the beverage via a pump. CO₂ can be injected either directly into the mixing zone or into the pressure vessel. The tank serves as a buffer zone and ensures a consistent CO₂ supply to the product.

By venting the carbonation tank, the oxygen content in the beverage can also be significantly reduced. This contributes to stabilizing product quality and minimizes the risk of undesirable oxidation processes.

FUNCTIONS & BENEFITS

Flexible CO₂ management

CO₂ can be dosed either proportionally to the flow or via tank pressure. This allows for individual adaptation to various production conditions and target values.

Oxygen reduction

By specifically venting the carbonation tank, the oxygen content is efficiently reduced, improving the shelf life and quality of the beverage.

Integrated CO₂ sensor

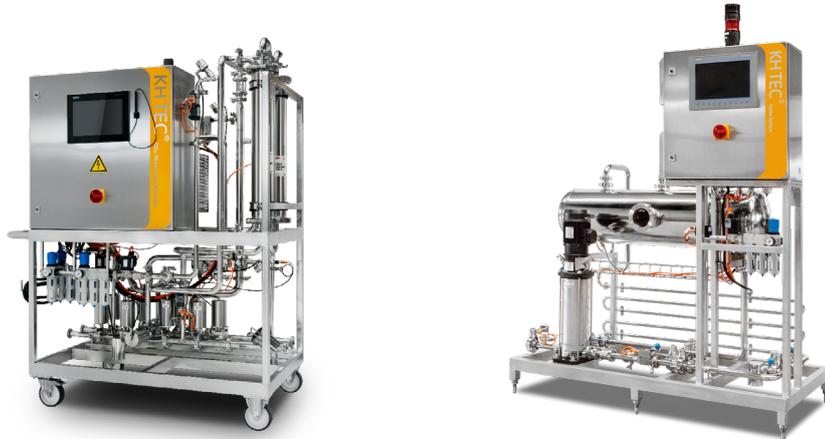
An optional CO₂ sensor at the product outlet continuously monitors the CO₂ content and enables precise control and documentation of values.

The Carbo System offers an ideal complement to production lines requiring flexibility and robustness in CO₂ addition. With this solution, you can reliably carbonate a wide variety of beverages while improving product quality through better oxygen control.



Rear View Carbo System

PROCESS COMPARISON CO₂ MEMBRANE SYSTEM VS. CARBO SYSTEM



Criterion	CO ₂ Membrane System	Carbo System
Type of Application	Optimal for clear, membrane-compatible beverages like still wines, sparkling wines, and carbonated products. CO ₂ adjustment for both dosing and removal.	Suitable for beverages that are not compatible with membrane technology due to particle content or other characteristics.
CO₂ Adjustment	Highly precise control of CO ₂ levels between 0-9 g/L.	CO ₂ addition from 2-9 g/L via flow-proportional dosing or tank pressure control.
Oxygen Content	Very efficient oxygen removal through membrane technology.	Oxygen reduction via targeted venting of the carbonation tank.
Product Consistency	Optimal for homogeneous, clear liquids without particles.	Can be used for beverages with higher viscosity or particles.
Process Automation	Different automation levels (Basic to CIP) with extensive sensor technology and control options.	Robust and simple control, optional with CO ₂ sensor for precise regulation and documentation.
Product Quality	Preserves sensory quality through fine CO ₂ bubbles and stable CO ₂ adjustment.	Ideal for carbonation with simultaneous oxygen reduction.

The KH Tec CO₂ Membrane Systems

are first-class technology systems that enable automatic gas adjustment in wine and other beverages.

- Improved filling performance
- Easy handling
- Innovative and proven technology
- Well over a hundred reference installations in Europe and other leading wine-producing countries worldwide.

KH TEC[®]

KH TEC GmbH

KH vessel TEC GmbH

KH process TEC GmbH

An der Hessel 5 | D-75038 Oberderdingen
Telefon +49 (0) 7045/980-0 | Telefax +49 (0) 7045/980-27 | info@kh-tec.de