

# SIPA

PROCESS TECHNOLOGY

PRODUCT PREPARATION  
AND CLEANING SOLUTIONS



 **SIPA**



# PRODUCT PREPARATION RANGE AND CLEANING SOLUTIONS

An extremely important part of managing a bottling line and obtaining a high-quality finished product is the product preparation phase.

In the last years, the bottling world has seen a burst of product ranges in order to satisfy consumers' requests, which have become more and more diverse and exigent. Consequently, **we have designed a more performance-oriented and flexible range of product preparation and cleaning systems** in order to respond to all the exigencies coming from bottling plants.

Our range allows us to **guarantee a very high quality and stability of the final product** in the preparation of any type of non-alcoholic refreshment drink available on the market today.

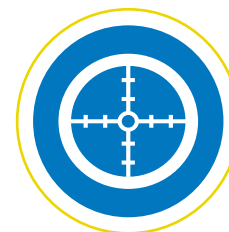
## SIPA PRODUCT PREPARATION SYSTEMS INCLUDE:

- **MASSBLEND**: Continuous beverage mass mixing system
- **CARBO-MW**: Degassing and carbonation unit for water
- **CARBO-SD**: Carbonation unit for soft drink
- **XBLEND**: Continuous beverage mixing unit
- **XTHERM**: Flexible pasteurizing unit
- **VARICLEAN**: CIP unit

## THE COMMON FEATURES OF THE RANGE ARE:

- Gentle product handling to ensure the highest standard in terms of final quality, accuracy and repeatability
- Optimization of the starting phase and automatic product change, reducing the product loss (only for mixers): very short "bottle to bottle" period!
- Product flow control by means of level regulating system in the buffer tank
- Infinitely adjustable outflow quantity to the filler between 25% and 100%
- Easy accessible design: ergonomic positioning of the interface components
- Frequency controlled pumps with quick change solutions for the mechanical seal
- Inline carbonating using an exclusive mixing principle and vacuum assisted degassing
- Reduced gas consumption through capacity control in accordance with the level in the carbonation tank
- Minimum oxygen level in the final product enable high filler performances
- Automatic quick changeover system for product flavour change (only for mixers and Pasto)
- Very simple management
- Reduced footprint: a very compact design and ergonomic tank horizontal positioning to fit in a minimum space
- High Hygienic design concept : for easy cleaning and to provide the highest level sanitation of the equipment

## PROCESS RANGE KEY VALUES



PRECISION



REPEATABILITY



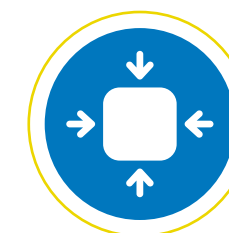
FLEXIBILITY



HYGIENE



COST REDUCTION



COMPACTNESS

## XFILL CONFIGURATION

Fillers in the **FLEXTRONIC C range** are designed to be **configured in the XFILL version**: this means that the carbonating or mixing unit tank will be used as a buffer tank for the filler, which no longer has the product tank on board. A pump sends the product to a ring-shaped manifold in order to ensure the product feeding into the filling valve correctly.





# MASSBLEND CONTINUOUS BEVERAGE CARBONATION AND BLENDING UNIT

**Massblend** is a compact continuous **mixing unit** for the automatic **production of carbonated and non-carbonated beverage**: the system uses the latest **technologies** in the mixing and carbonation fields; the water deaeration is realized in a high vacuum tank, meanwhile the mixing and carbonation are obtained using an **in-line proportional dosing system**.

An adoption of a static mixer and an appropriate stabilization pipe guarantee a **high standard of quality in the final result**. Free-foam filling is guaranteed by the excellent water deaerating values and the defined syrup beverage control.

Syrup is dosed in the water pipe train by a high-precision mass flow meter.

**Real-time control system for flowrate & blending ratios** of all beverage components to use a pre-diluted syrup phase.



## MAIN FEATURES

- In-line CO<sub>2</sub> dosing system with injector and mass flow meter
- Starting, stopping the mixer without syrup and product loss (i.e., flavour change or end of batch)
- Syrup quality check
- Piping exposed to a product made of 1.4401 Stainless Steel (AISI316)
- Reduced changeover down-times The whole system is designed to be fully sanitized up to a temperature of 98°C
- Fully automatic operation controlled by PC unit, complete with operator interface panel and 15" touch screen
- **XFILL** configuration available

## APPLICATION

Preparation of CSD, carbonated mineral water, juices and other non-carbonated products.



## Final product performance:

- Carbonation range: 1,5 ÷ 4,5 V/V
- Standard mixing ratio: from 1:4 up to 1:10
- Carbonation accuracy: ± 0,05 V/V or better in any condition
- Mixing accuracy: ± 0,03 °Bx or better in any condition
- Process capability index; Cpk: > 1,33 related to the finished drink
- Residual oxygen in the final beverage: < 1 ppm
- Outflow rangeability: 1:4

## PRODUCTION CAPACITY

MODEL	CAPACITY
MASSBLEND 12	Up to 12,000 l/h
MASSBLEND 27	Up to 27,000 l/h
MASSBLEND 34	Up to 34,000 l/h
MASSBLEND 42	Up to 42,000 l/h
MASSBLEND 54	Up to 54,000 l/h
MASSBLEND 66	Up to 66,000 l/h

## ADDITIONAL EQUIPMENT:

- Cooling of the carbonated product including control and measuring equipment
- Quantity measurement for Oxygen, CO<sub>2</sub>, °Bx, Diet content, etc
- Mixing ratio up to 1:1
- Energy savings thanks to the insulation of the product buffer tank
- Double stage deaeration with high vacuum principle



# CARBO-MW

## CONTINUOUS DEGASSING AND CARBONATION UNIT

**Carbo-MW** is a compact **deaerating and carbonating unit** for the automatic production of carbonated water: the water deaeration is realized in a saturated tank of CO<sub>2</sub>, combined with the **latest technologies in the carbonation field**.  
The water deaeration is realized with CO<sub>2</sub> stripping or in a high vacuum tank as an option, meanwhile the carbonation is obtained using an in-line proportional dosing system.

### MAIN FEATURES

- In-line proportional CO<sub>2</sub> dosing system with mass flowmeter
- Fully automatic process controlled by a PLC, menu-based 15-inch touch-screen operator control panel
- Product flow control by means of a level-regulating system in the buffer tank
- Piping exposed to a product made of 1.4401 Stainless Steel (AISI316)
- **XFILL** configuration available
- Reduced gas consumption through capacity control in accordance with the level in the carbonation tank
- The whole system is designed to be fully sanitized up to a temperature of 98°C
- **AROMIX**: integration of an inline flavour dosing unit (option). Dosing range from 300 to 2000 ppm
- **VARICLEAN SC**: CIP unit integration on the skid (option)

### APPLICATION

Carbonated mineral water and flavoured water.



### Final product performance:

- Carbonation range: 1,5 ÷ 4,5 V/V
- CO<sub>2</sub> control accuracy: ± 0,05 V/V or better in any condition
- Residual oxygen in the final beverage: < 1 ppm
- Outflow rangeability: 1:4
- Process capability index; Cpk > 1,33 related to the final product

### PRODUCTION CAPACITY

MODEL	CAPACITY
CARBO-MW 12	Up to 12,000 l/h
CARBO-MW 27	Up to 27,000 l/h
CARBO-MW 34	Up to 34,000 l/h
CARBO-MW 42	Up to 42,000 l/h
CARBO-MW 54	Up to 54,000 l/h
CARBO-MW 66	Up to 66,000 l/h

### ADDITIONAL EQUIPMENT:

- Cooling of the carbonated product, including control and measuring equipment
- Quantity measurements for Oxygen, CO<sub>2</sub>, etc
- Energy savings thanks to the insulation of the product buffer tank
- Double stage deaeration with high vacuum principle
- **VARICLEAN SC**: CIP unit integration on the skid



# XBLEND

## CONTINUOUS MULTI-COMPONENT DEGASSING AND MIXING UNIT

**XBlend** is a compact **mixing unit** (mounted on skid) for the automatic production of **still beverages** from 2 to 6 dosing lines (optional): the system uses the latest technologies in the mixing field; the mixing is obtained by using an in-line proportional dosing and the deairing with a high vacuum tank. The basic system is composed of **two components**: one for **deareated water** and one for **syrup**, but it **can be easily expanded** to match any specific production requirements **up to 6 components**. Available on request the quantity measurement for Oxygen, °Bx etc. The whole system is designed to be fully sanitized up to a temperature of 98°C.

**APPLICATION:**  
Still beverages.

- FINAL PRODUCT PERFORMANCE:**
- Mixing ratio for 2 fluids min ÷ max: 1 : 2 ; 1 : 10
  - Outflow rangeability: 1:4
  - Mixing accuracy: ± 0,03 °Bx or better (in steady conditions)
  - Process capability index; Cpk > 1,33 related to the final product
  - Residual Oxygen in the final beverage: < 0,5 ppm

### PRODUCTION CAPACITY

MODEL	MODEL	CAPACITY
XBLEND 12	CARBO-SD 12	Up to 12,000 l/h
XBLEND 27	CARBO-SD 27	Up to 27,000 l/h
XBLEND 34	CARBO-SD 34	Up to 34,000 l/h
XBLEND 42	CARBO-SD 42	Up to 42,000 l/h
XBLEND 54	CARBO-SD 54	Up to 54,000 l/h
XBLEND 66	CARBO-SD 66	Up to 66,000 l/h



# CARBO-SD

## CONTINUOUS BEVERAGE CARBONATION UNIT

**Carbo-SD** is a compact **carbonating unit** for the automatic production of carbonated beverage: the system uses the latest technologies in the carbonation field; the carbonation is obtained **by using an in-line proportional dosing** by a mass flow meter. Xfill version available for direct integration with the filler.

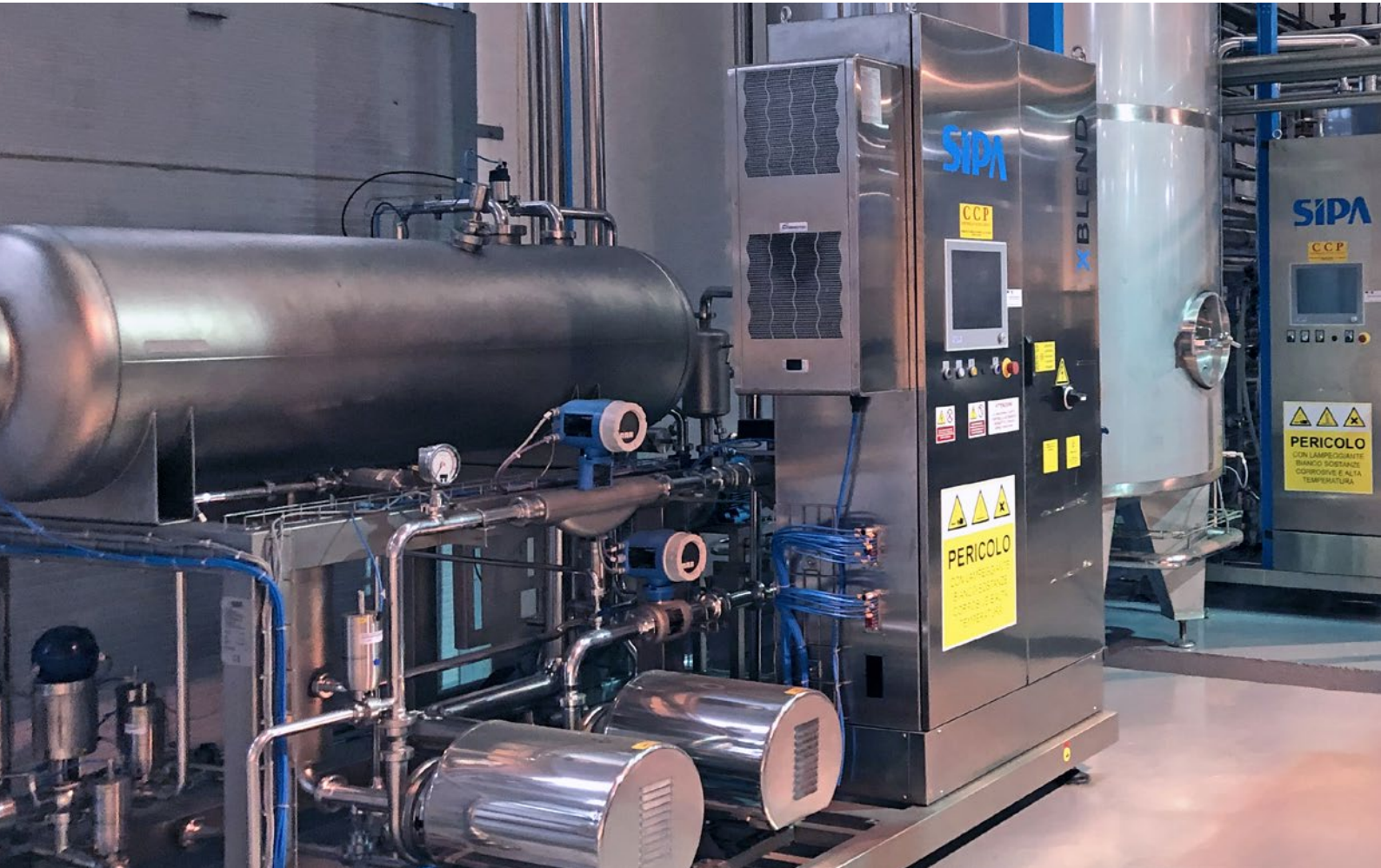
**APPLICATION:**  
Carbonated soft drinks.

- FINAL PRODUCT PERFORMANCE:**
- Carbonation range: 1,5 ÷ 4,5 V/V
  - CO<sub>2</sub> control accuracy: ± 0,05 V/V or better in any condition
  - Outflow rangeability: 1:4
  - Process capability index; Cpk > 1,33 related to the final product



### MULTIPRODUCT LINE PROCESS FLEXIBILITY

The possibility to separate the carbonation and mixing processes into different units enhances the flexibility of the product preparation process, allowing it to cope with several specific production requirements. For example, in a multiproduct line (CSD/HF), it is possible to carbonate the final beverage after pasteurization, just before filling.





# XTHERM

## CONTINUOUS PASTEURIZATION UNIT

**XTherm** is a modular and compact **pasteurizing unit** (assembled on a skid) for the automatic thermal treatment of the finished beverage: the system **uses the latest technologies** in the field of pasteurization. The pasteurization phase takes place by reaching and maintaining the temperature of the product to be treated, while the flow rate is kept constant by using sanitary centrifugal pumps controlled by an inverter.

### MAIN FEATURES

- The whole system is designed to be fully sanitized up to a temperature of 98°C
- N. 1 product buffer tank at atmospheric pressure, vertically mounted
- All parts in contact with the product are made of stainless steel 1.4401 (AISI316)
- Fully automatic operation machine controlled by PLC unit, complete with operator interface panel in touch screen mode (mounted on the front of the switchboard)
- The whole system is designed to be fully sanitized up to a temperature of 98°C
- Sanitary backpressure valves for maintaining positive pressures

### MODELS

Depending on the final use it can be provided either in plate or tubular configuration:

- **TCF** Version with tubular heat exchanger for cold filling
- **THF** Version with tubular heat exchanger for hot filling
- **PCF** Version with plate heat exchanger for cold filling
- **PHF** Version with plate heat exchanger for hot filling

### APPLICATION:

Juices (with our without pulps), isotonic and functional beverages, carbonated soft drinks.



### GENERAL THERMAL PROFILE AND PERFORMANCES:

- Range ability on max. production: 1 ÷ 3 (plate version)
- Range ability on max. production 1 ÷ 2 (tubular version)
- Pasteurization temperature up to 98°C
- Filler supply temperature min ÷ max: 80 ... 90°C. for HF
- Temperature accuracy: ± 0.5°C or better (steady conditions)
- Flow rate accuracy: ±1 % i.v or better (steady conditions)
- Possibility to handle products with pulp: smaller than 1x4 mm @5% W/W

### ADDITIONAL EQUIPMENT:

- Volumetric pumps
- Degassing station
- Homogeniser
- Buffer tank before filler
- Rework tank
- Automatically engaged dummy bottles.
- Digital recording of the main parameter involved in process preparation: FDA 21 CFR part 11



### PRODUCTION CAPACITY

MODEL	CAPACITY
<b>XTHERM 12</b>	Up to 12,000 l/h
<b>XTHERM 27</b>	Up to 27,000 l/h
<b>XTHERM 34</b>	Up to 34,000 l/h
<b>XTHERM 42</b>	Up to 42,000 l/h
<b>XTHERM 54</b>	Up to 54,000 l/h
<b>XTHERM 66</b>	Up to 66,000 l/h



# VARICLEAN

## CIP SANITIZING UNIT

**Variclean** is a compact unit (on skid assembly) used to **wash all the process units** involved in the foodstuff preparation. The module is available as either **fully automatic or semi-automatic**, from the heating stage to the measuring of cleaning fluids and disinfectants, and from the cleaning cycle to the rinsing for the removal of reagents. At start-up, the cleaning cycle is freely selectable; the **operator may select and create washing cycles** with partial phases, the same way the operator can change the washing time, concentration, flow, pressure, etc... Using the HMI installed on the electrical cabinet, the machine can store and retrieve many different cleaning recipes, ensuring **maximum flexibility for the end user**.

### MAIN FEATURES

- Recovery / preparation tank for washing solution  
Capacity: from 2000 L to 6000 L, according to the specific plant needs
- Type of solution heating used: saturated steam or Electrical Coils
- Type of heat exchanger: tubular heat exchanger made in AISI316 stainless steel
- In-line injection of sterilizing agent by using an electronic dosing pump (for the automatic version)
- Fully automatic operation machine controlled by PLC unit, complete with operator interface panel in touch-screen mode (mounted on the front of the switchboard). For the automatic version
- Double heating option available: electrical coils and steam heating

### APPLICATION:

The sanitizing unit can be designed according to the product to be handled on the line, therefore it can be used for any kind of field: beverages, food and chemicals.

### STANDARD SANITIZING SPECIFICATIONS:

- Caustic Soda or Nitric acid concentration:  $1 \div 3 \%$
- Sterilizing solution concentration:  $0,2 \div 1 \%$
- Temperature control:  $\pm 2 \text{ }^{\circ}\text{C}$



### MODELS

- **Standard:** depending on the final use, it can be provided both in a semi-automatic and fully automatic configuration, with a variable number of tanks from 1 to 4
- **Twin:** solutions with 2 streams, designed to clean two filling lines at the same time
- **SC (self cleaning):** CIP integrated on the external product tank of the electronic filler or on the Carbo-MW skid

### PRODUCTION CAPACITY

MODEL	CAPACITY
VARICLEAN 12	Up to 12,000 l/h
VARICLEAN 27	Up to 27,000 l/h
VARICLEAN 34	Up to 34,000 l/h
VARICLEAN 42	Up to 42,000 l/h
VARICLEAN 54	Up to 54,000 l/h



### VARICLEAN SC

#### Self cleaning integrated CIP unit

- Fully automatic solution with reduced footprint
- Automatic sanitation of the entire system through hot water up to  $95 \text{ }^{\circ}\text{C}$ , thus respecting the strictest standards in food hygiene
- Stand-alone solution, no need of external CIP
- Timed sequence of rinsing and closed loop washes with chemical solution (typically nitric acid)
- CIP solution heating by means of electric coils (no need for steam)
- Accurate control of the quantity of the CIP solution by means of a conductivity meter and distribution with a dosing pump
- Less surfaces to be sanitized allow a reduction of the chemical solution to be heated, this means a significant reduction in consumption compared to standard CIP
- “Disinfection” phase available with cold peracetic acid “flooding”
- Mixproof valves guarantee the separation of the chemicals injection circuit from the main product flow





# PRINCIPLE OF OPERATION

## Degassing

The inlet water is finely **atomized** by using a specific diffuser, the residual **oxygen is removed** from water by using the deaeration **with high vacuum principle**. A flow meter indicates the water that is sent to the mixing system by using a sanitary centrifugal pump.

## Blending (only for mixers)

The amount of water serves as a reference variable for the dosing of syrup.

The **flow meter measures the Brix value of the sugar syrup** and uses the data to control the mixing ratio. The syrup is dosed using a **frequency-controlled pump**, a modulating control valve and a pressure measuring device. Utilising the constant pressure on the control valve, the syrup is dosed with highest accuracy. Practically **100% syrup utilization**, including the mixing phase from the syrup room.

## Carbonation

The CO<sub>2</sub> is fed via a control valve and it is measured with a mass flow meter.

By means of a special injector nozzle the **CO<sub>2</sub> is finely dissolved to guarantee the maximum solubility** in the treated product utilising just the required amount for the beverage carbonation.

## Pasteurization

The inlet product to the buffer storage tank, reaches the solution heating stage through a centrifugal or volumetric pump. The **heating** of the solution is obtained **in two steps**, one thanks to the energy recovery of **the heat exchanger** and the other with the aid of a **hot-water circuit**.

Achieving and controlling of the pasteurization temperature occurs with the aid of a hot water circuit which allows a much **more responsive and accurate temperature control**, avoiding the problems related to the exchanger's fouling.

The **final stabilisation** is carried out within the **holding stage piping**. The solution cools down in two steps, one thanks to the energy recovery of the heat exchanger, and the other with the aid of cold water which controls the filler inlet temperature.

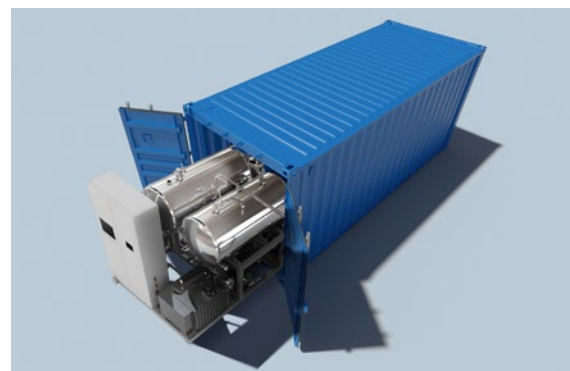
In case of hot filling, cooling of the returning product from the filler takes place in two steps using tower water and cold water in order to achieve the desired recycling temperature, and it could be recovered in a scrap recovery tank.

# ELECTRONIC DESIGN FEATURES

- Menu-based operation using a 15-inch touchscreen, with processes shown in the active flow diagram
- Fully automatic process with no manual operation of valves
- Operator intervention is reduced to a minimum
- Perfectly coordinated components, e.g., pumps and instrumentation
- The operator simply selects the product to handle from a recipe list, and the unit automatically adjusts the parameters to start the production phase
- The operator touch panel also allows for continuous monitoring of the production and the recording function
- Type parameters can be saved on a USB stick for use in verification and documentation workflows
- Prepared for integration in a higher-level process control system; WS ready
- Large recipe memory for reliable, reproducible production using predefined parameters
- All product-dependent parameters can be set on the touchscreen and saved in the integrated program for type management

## Start-Up and transportability

A **Plug & Play solution** has been studied in a unique machine frame to **guarantee very fast start up and commissioning times** and for its logistical flexibility. Indeed all applications have been optimized in order to be packable in standard containers.







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