



# CIP-ML

**Automatic cleaning and sanitization system**



THE CIP ML UNIT IS A FULLY AUTOMATIC MULTITANK SYSTEM PERMITTING STORAGE, PREPARATION, HEATING AND RECYCLING OF CHEMICAL SOLUTIONS, INTENDED FOR FILLER AND MIXER WASHING AND SANITIZATION. IT MAY ALSO BE USED AS A CENTRAL CIP FOR VARIOUS DIFFERENT USES.

# Hygiene

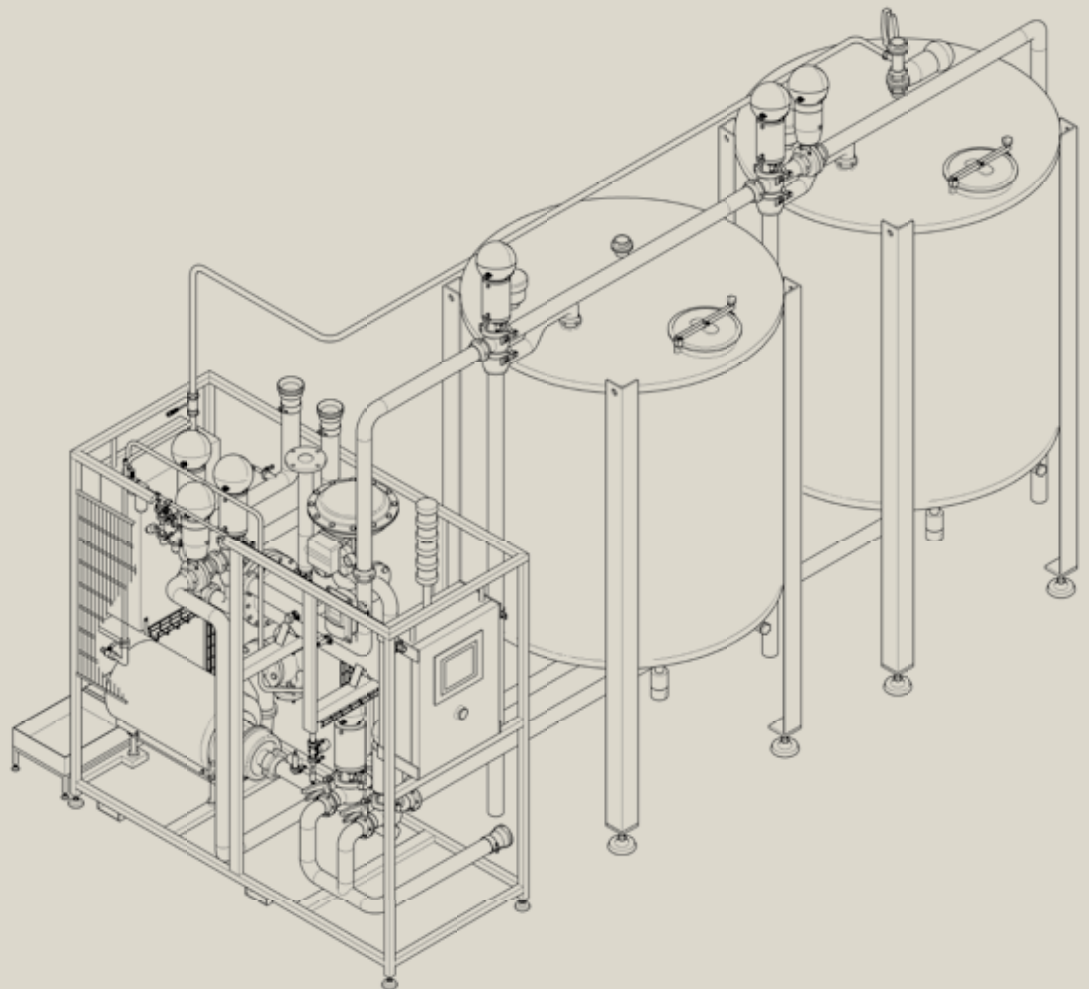
## Cip ML Two

The CIP ML unit is available with 2000 liter to 6000 liter tanks, and other tank capacities on request, and uses an indirect steam heating system with a heat exchanger employing a bundle of corrugated pipes. Parts in contact with the product are made entirely out of AISI 316 steel.



# Main features

- Compact modular design
- simplified installation only with the necessary skids and tanks
- AISI 316 insulated tanks
- designed for extensions
- pre-assembled in the factory
- pump, valves and components in contact with product are all made of approved sanitary materials
- top-quality approved instruments
- components installed for easy maintenance.
- dosing of concentrate solutions by volumetric and conductivity methods
- complete management of washing recipes
- HMI with PC and SCADA.
- storing of all process parameters and events on HD.



# Structure

## Main components

### THE SKID

It is pre-assembled and fully cabled. It has standard dimensions in all models, and its performance may be adjusted by simply adjusting the pump. Constructed in a monoblock fitted with:

- centrifugal sanitary pump
- heating system with tube heat exchanger or plate heat exchanger
- sanitary pneumatic valves
- process and control instruments
- integrated chemicals unit
- electrical panel with PLC complete with electric wiring and pneumatic connections.

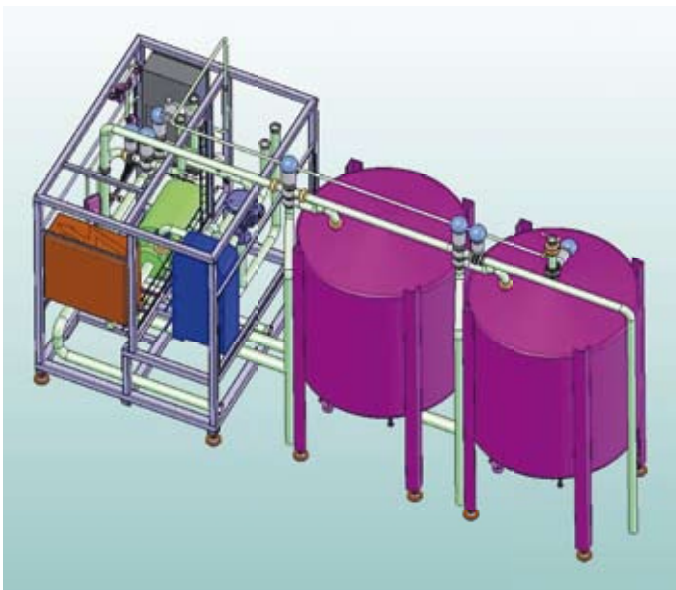
### BUFFER MODULE

It including tank for preparation and storage of solutions.

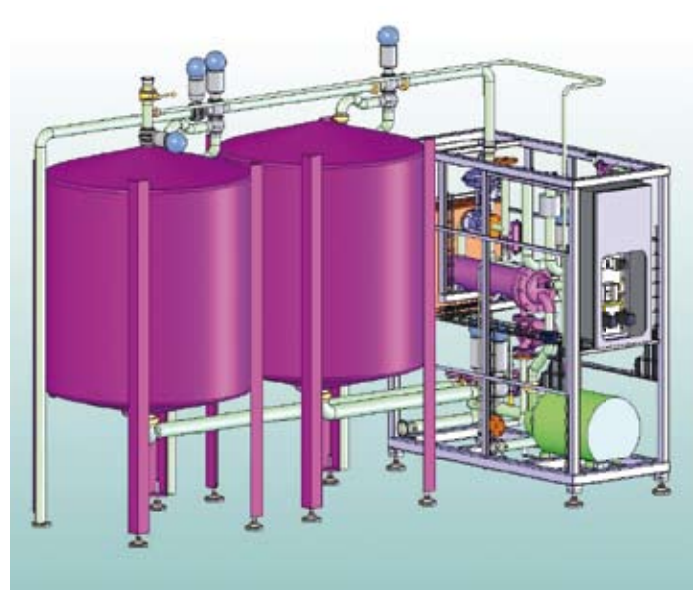
- Standard tanks have a capacity of 2000, 4000 or 6000 liters; other tank capacities are available on request

- valves for filling with water and recycling solutions
  - barometric level transmitter.
- The supply must be completed by installing the appropriate number of tanks of suitable capacity alongside the skid. Future extensions can be made by adding more tanks.

*Heating system with tube heat exchanger*



*Heating system with plate heat exchanger*



# Basic Components

**Finned sanitary centrifugal pump**, capacities of up to 60 m<sup>3</sup>/h with a max. pressure of 4 Bar.

Water is recycled through the heat exchanger to reach the set temperature.

**Steam heat exchanger** with bundles of AISI 316 steel pipes (potential of 1,000,000 kCal/h), assembled horizontally, with electro-pneumatic control valve.

**Lung tank** assembled vertically, with conical upper lid inclined 15°, conical base inclined 15°, access tank DN400 on upper cone, complete with internal protective grating. Insulation made of 50mm thick rock wool with stainless steel guard.

DN100 lower connection on total drain, clamp 2" connection for level transmitter, DN100 internal overflow pipe, spherical washing unit with DN65 connection, labyrinth pressure release unit on DN 100 upper cone. N°4 profiled supporting feet.

*Material:* AISI 316-L steel in contact with product. AISI 304 for other surfaces.

*Finish:* 2B sheet metal with internally pickled seams, 2B laminate with welds shaved and smoothed on the outside.

**Pipes**, tees, curves and pipe connections are made of polished AISI 316 steel, DIN 11851 Standard or clamp. All welds are made in an inert atmosphere of 99.996% Argon both inside and outside, pickled on

the outside, with a polished 100/150 N°4 grain finish. Offtakes on main pipes for connection with instruments or other pipes (dead legs) are at most 1.5 times the minimum offtake diameter. Pipes are connected for easy maintenance, and pipe joints are easily dismantled, if necessary.

**Throttle valves** are approved for sanitary applications, shutter valves and 3A check valves are all made of AISI 316 steel, with food grade seals suitable for CIP, and pneumatic valves have stainless steel actuators. Manual valves have a lock position.

**Chemicals unit** Composed of a pneumatic membrane pump for automatic transfer and dosage of cleaning

solutions, pneumatic membrane valves for distribution of chemicals and rinsing the line during product changeovers. Vortex flowmeter for measuring the quantity of chemical dosed. Tank for the customer's chemical containers, installed on a support integrated in the machine. The unit is supplied assembled in suitable stainless steel casing with a transparent door permitting safe inspection of leakages.

**Sanitary instruments** consisting of temperature transmitter, inductive conductivitymeter, thermal flowmeter, level and vibration sensors, and barometric level transmitter on each tank.



# The process

The **multitank** system permits immediate use of different cleaning and disinfectant solutions. There is no contamination between different substances as tanks are dedicated to specific uses. One tank is typically used for preparation of sanitizing solutions containing hot water,

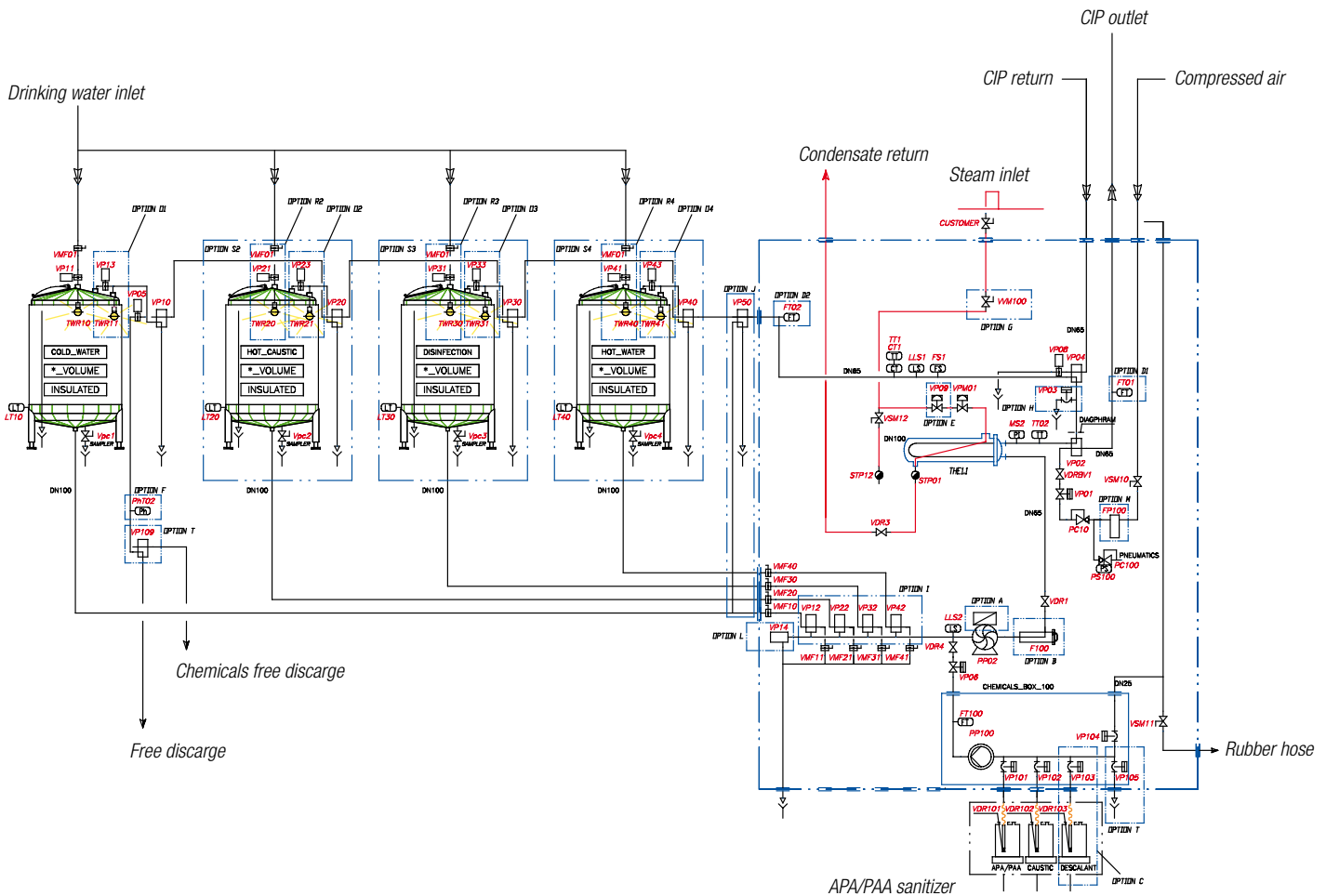
another for caustic solutions which are recovered for recycling at the end of the cycle, while a third is used for preparation of peroxyacetic acid disinfectants. If necessary, an additional tank may be used as a buffer for rinse water. Doses of concentrated chemical

products may be measured by a conductivitymeter, or a flowmeter (volumetric ratio), if conductivity is not significant (as in the case of peroxyacetic acid disinfectants). Washing recipes may be set, permitting performance of the following cycles one immediately after the other:

- CIP rinse
  - production line rinse
  - sanitization with hot water
  - disinfecting with PAA/APA
  - caustic wash
  - descaling with acid.
- Cycle times and temperatures and the concentration of chemical solutions may be pre-set.

## Flow to clean pipeline $V > 1,5 \text{ m/s}$

flow m <sup>3</sup> /h	flow m <sup>3</sup> /h	piping size dn	piping size inch
20	32	80	3"
42	70	100	4"



# Automation

The PLC carries out the task of the physical system management, i.e. control of signals from the field and commanding of actuators in order to perform the predefined plant cycles. Cycles are predefined and consist of fixed sequences to be performed on the basis of a predetermined logic, which is in turn dependent on the state of inputs and the triggering of outputs. Incomplete sequences will be set to generate alarms.

The system offers the following functions during regular operation:

- entering washing recipes
- entering cycles, times, temperatures, conductivity, controls
- selecting washes
- selecting the recipe to be launched on the basis of the object to be cleaned/sanitized
- run/Stop functions
- safe start/stop function for the selected washing cycle
- preparation of washing solutions in tanks and titrating with concentrated product
- specific preparation cycle for automatic titrating of solutions contained in tanks to be performed when CIP is not performing washing
- off/auto/hold/skip function
- off = washing cycle disabled
- auto = washing cycle in automatic sequence
- hold = washing cycle suspended in operation (time stopped)
- skip = Washing cycle skipping phases (forced transition to next step)
- heating PID with analogue signal treatment
- management of heating during washing with temperature reading and adjustment with a modulating valve
- process parameter control
- all parameters such as temperature, flow, conductivity and level are controlled on the basis of the set recipe, and associated with sets of alarms
- PC for command, control, diagnosis, maintenance and adjustment of parameters
- command PC installed in the CIP room for complete control and entry of recipes
- alarm functions
- the alarm condition will produce a sound signal and a light signal when there is an alarm condition
- the alarm condition will be stored in memory
- acknowledgement of the alarm will silence the sound signal and the visual signal if the alarm condition ceases
- if an alarm condition occurs due to absence of flow, conductivity or temperature, the amount of time that has passed must be reset
- recording and printing function (optional).

