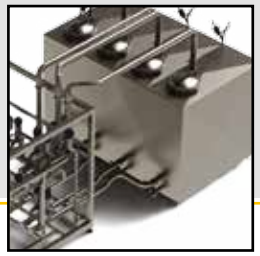
SANOVO
TECHNOLOGY GROUP

SANOVO CIP (CLEANING IN PLACE)



Cleaning solutions

The good manufacturing practice (GMP) in the main food industry sectors requires that the equipment must be cleaned prior to use. The main task of a cleaning process is removal of residues and contaminants (physical, chemicals, microbiological) from all parts in contact with the products.

Concerning the liquid egg sector, there is a lot of specific knowledge and a number of requirements that must be considered to obtain an appropriate result in cleaning, and generally in sanitation.

Some of the basic requirements regarding the design, the sanitary equipment, the installation and automation of the line must be considered carefully, especially in a new plant.

Optimization is the combination of the best components meant to reduce cleaning costs (chemicals, time, water, power, etc.) maintaining the best quality levels.

CIP (Cleaning-In-Place) is an automatic cleaning and disinfecting system designed to reduce manual operations (disassembly and reassembly). It can be integrated in existing plants; cleaning separate parts while other parts are still in production without any risk of contamination.

A CIP must be designed to save money in terms of man-hours, cleaning solutions, energy, water, waste water, and most important: it has to guarantee the proper cleaning and sanitation of the equipment it's meant to serve.

A good CIP should always be the best compromise between cleaning efficiency, energy saving and water consumption.

A good cleaning procedure is based on:

- Flow Rate (a general rule of thumb says between 1,5 - 3,0 m/s (4.9 -9.8 ft/s) in the pipes)
- Temperature (depending on the cycle and type of chemicals)
- Pressure (important for the cleaning of the tanks or containers)
- Concentration (quantity of acid and alkaline)
- Cleaning time (depending on the step in the cycle)

FLOWRATE AND VOLUME OF PIPES

Pipe dimension	pipe l/m (gallon/ft)	Flow rate
1"	0,39 (0.031)	Minimun CIP flow rate = 3.000 l/h (793 gallons/h)
1" ½	0,97 (0.078)	Minimun CIP flow rate = 6.000 l/h (1,585 gallons/h)
2"	1,79 (0.144)	Minimun CIP flow rate = 10.000 l/h (2,642 gallons/h)
2" ½	2,87 (0.231)	Minimun CIP flow rate = 16.000 l/h (4,227 gallons/h)

Depending on the type of controls (Manual or Automatic), the type and distance of the utilities to clean and the type of detergent, SANOVO has various setup of CIP systems based on:

- Number of tanks depending on the type of cleaning solutions
- Automation Level (Manual or Automatic)
- Tank capacity depending on the pipe dimensions and the complexity of the plant
- Flow rate depending on the type of utilities to clean
- Various Optionals for the optimization of the cleaning procedures

CLEANING OF OVOTANKS

Litres (gallons)	Flow Rate l/h (gallons/h)	Pressure Bar (PSI)
1.200 - 6.000 (317 - 1,585)	>= 5.000 (1,321)	>= 2,0 (29)
9.000 (2,377)	>= 7.000 (1,849)	>= 2,0 (29)
12.000 (3,170)	>= 8.000 (2,113)	>= 2,0 (29)
15.000 (3,963)	>= 9.000 (2,378)	>= 2,0 (29)
20.000 (5,283)	>= 10.000 (2,642)	>= 2,0 (29)

The SANOVO CIP System

“PLUG&GO” TESTED PRIOR TO DELIVERY

The CIP plant is fully or partly skid-mounted and has been tested thoroughly prior to shipment for easy and fast start-up of the CIP plant. Only external connections are required before running the CIP plant.

SAVING NATURAL RESOURCES

Our CIPs can be installed with a water recovery tank. The last cycle of rinsing water will be stored in a water recovery tank for re-use in the first water rinsing cycle. Saving 20-50% of water and waste water.

THERMAL STERILIZATION

A thermal sterilization can be added (optional). The thermal sterilization valve ensures that a closed loop is obtained during the thermal sterilization cycle designed to kill bacteria resistant up to 85°C- 90°C / 185°F - 194°F.

AUTOMATION FOR SAFE CLEANING

Our CIPs are available with automatic control of all parameters to eliminate the risk of mixing CIP chemicals. Control and monitoring of all valves ensures no chemical mixing of liquids. The local operator panel - equipped with unique SANOVO software - helps the operator during the cleaning process by displaying operation status, warning and alarms. Data recording and logging is optional if adding SCADA system.

Customized options can be implemented and designed by SANOVO to conform to all the specifications of the customers (i.e. M&S Code of Practice etc.).

SECOND CIP LINE

It’s an indepenent second line, in case you have several utilities and tanks to clean. With this option you can wash two utilities or tanks contemporarily to save time.

RECIRCULATION LINES

To control and adjust the right concentration of Acid and alkaline. Composed of recirculation pumps and conductivity/temperature transmitter and control (available for Sanomidi automatic and Sanomaxi)

DOSING (ALKALINE OR ACID)

Composed of a membrane pump and a pneumatic valve to automatically add acid or alkaline to the tanks in order to have the right concentration.

CONDUCTIVITY PROBE

It’s used to control the concentration level of chemical solutions in water. This is important for the proper dosing and to know that the lines are perfectly rinsed with no acid or alkaline left in the pipes.

CIP RETURN PUMP.

The self priming pump is installed at the end of each cleaning cluster for water and chemical solution recirculation.

FREQUENCY INVERTER

It is possible to select a frequency inverter for installation in the electrical panel to start and stop the feeding pump with a speed ramp and to select the running speed from the operator panel.

The SANOVO SANOMINI CIP (Automatic or Manual)

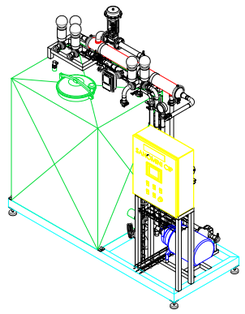
Suitable for SMALL/MEDIUM plants where the Monophase cleaning is used

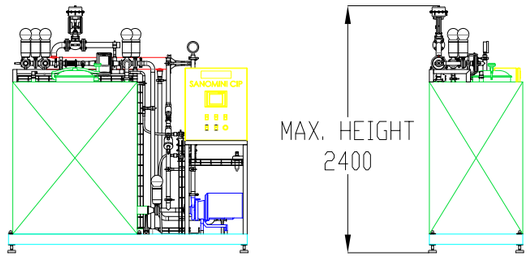
- ELECTRICAL PANEL
- SANOVO MINICIP FRAME
- INFEED PUMP
- TUBULAR MODULE
- COMBINED WATER / ALKALINE / ACID

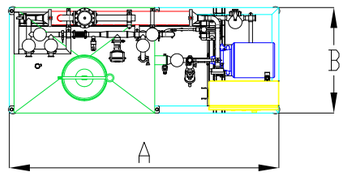
SANOMINI CIP OVERALL DIMENSIONS

FLOW RATE l/h (gallons/h)	TANK	TANK CAPACITY litres (gallons)	A MM (FT)	B MM (FT)	HEIGHT MM (FT)
10.000 (2,642)	WATER / ACID / ALKALINE	1.200 (317)	2.300 (7.6)	900 (2.9)	2.400 (7.9)
40.000 (10,567)	WATER / ACID / ALKALINE	1.200 (317)	2.400 (7.9)	980 (3.2)	2.400 (7.9)
40.000 (10,567)	WATER / ACID / ALKALINE	2.000 (528)	2.700 (8.9)	1.200 (3.9)	2.400 (7.9)

Standard dimensions - can be changed on demand







The SANOVO SANOMIDI CIP (Automatic or Manual)

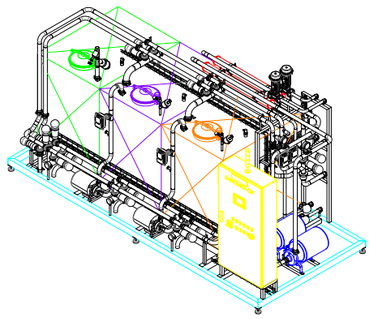
Suitable for MEDIUM/LARGE plants with a limit in the dimension of the CIP tanks (max 2000)

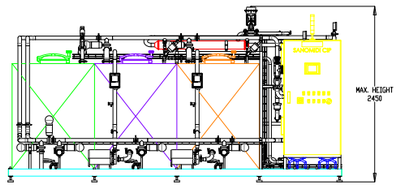
- ELECTRICAL PANEL
- SANOVO MIDICIP FRAME
- INFEED PUMP
- TUBULAR MODULE
- NATURAL WATER
- ALKALINE
- ACID

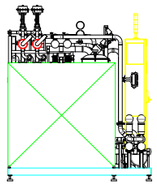
SANOMIDI CIP OVERALL DIMENSIONS

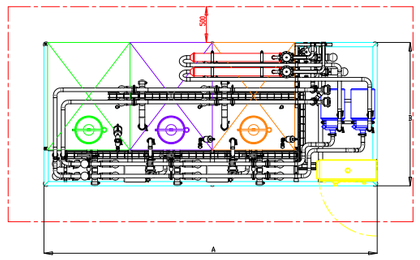
Flow rate l/h (gallons/h)	NUMBER OF TANKS	TANK CAPACITY litres (gallons)	A MM (FT)	B MM (FT)	HEIGHT MM (FT)
16.000 (3,963)	3 -WATER / ACID / ALKALINE	1.000 (264)	4.200 (13.8)	2.000 (6.6)	2.050 (6.7)
16.000 (3,963)	2 - ACID / ALKALINE	1.000 (264)	3.200 (10.5)	2.000 (6.6)	2.050 (6.7)
16.000 (3,963)	3 -WATER / ACID / ALKALINE	2.000 (528)	4.650 (15.3)	2.000 (6.6)	2.450 (8)
16.000 (3,963)	2 - ACID / ALKALINE	2.000 (528)	3.500 (11.5)	2.000 (6.6)	2.450 (8)

Standard dimensions - can be changed on demand









The SANOVO SANOMAXI CIP (Automatic)

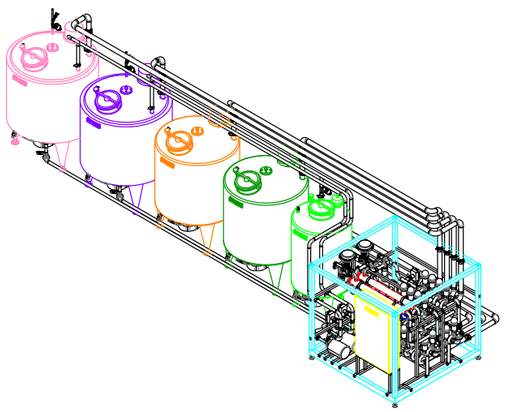
Suitable for all plants. In case of renewing of the cleaning plant the CIP frame can be supplied separately to be connected to existing tanks.

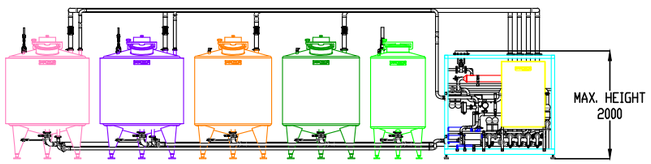
- ELECTRICAL PANEL
- SANOVO MAXICIP FRAME
- INFEED PUMP
- TUBULAR MODULE
- NATURAL WATER
- RECOVERY WATER
- ACID
- LYE
- DISINFECTANT

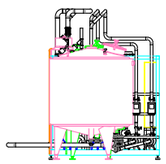
SANOMAXI CIP OVERALL DIMENSIONS

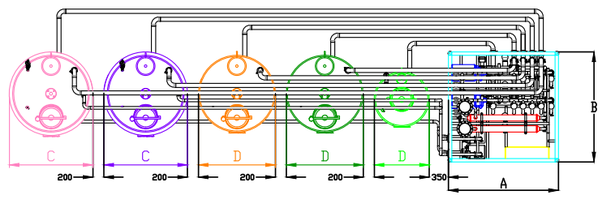
PREASSEMBLED UNIT				TANKS					
				ACID-ALKALINE (INSULATED)			DISINFECTANT-RECOVERY WATER-NATURAL WATER (SINGLE WALLED)		
FLOW RATE l/h (gallons/h)	A MM (FT)	B MM (FT)	HEIGHT MM (FT)	CAPACITY l (gallons)	C MM (FT)	HEIGHT MM (FT)	CAPACITY l (gallons)	D MM (FT)	HEIGHT MM (FT)
16.000 (3,963)	2.000 (6.6)	2.000 (6.6)	2.000 (6.6)	-	1.020 (3.3)	1.520 (4.9)	500 (132)	900 (2.9)	~1.520 (4.9)
				2.000 (528)	1.120 (3.7)	2.175 (7.1)	1.000 (264)	1.000 (3.3)	~2.175 (7.1)
				2.000 (528)	1.520 (4.9)	2.240 (7.3)	2.000 (528)	1.400 (4.6)	~2.240 (7.3)
				3.000 (793)	1.720 (5.6)	2.520 (8.3)	3.000 (793)	1.600 (5.2)	~2.520 (8.3)
				4.000 (1,057)	1.960 (6.4)	2.600 (8.5)	4.000 (1,057)	1.840 (6)	~2.600 (8.5)
				5.000 (1,321)	2.120 (6.9)	2.610 (8.6)	5.000 (1,321)	2.000 (6.6)	~2.610 (8.6)

Standard dimensions, tank capacities and flow rate can be changed on demand.









STANDARD “DOUBLE PHASE” CIP PROCEDURE

Step	Phase	Conc. (%)	Temp. °C (F)	Time (min)
01	Rinse		cold	variable
02	Alkaline*	2-3	60-70 (140-158)	30-50
03	Rinse		cold	variable
04	Acid*	1-1.5	50-60 (122-140)	20-30
05	Rinse		cold	variable
06	Disinfection**	Depending on type	10-15 (50-59)	5-10

**** Alkaline and Acid***
The time of cleaning phases is reckoned in accordance with the proper achieving of flow-rate, temperature and chemical concentration.

***** Disinfection***
The performing of the disinfection phase is done upon specific need.
If water chlorine content is higher than 25ppm; never leave the plant soaked in peracetic acid.

MONOPHASE CIP PROCEDURE

Step	Phase	Conc. (%)	Temp. (°C)	Time (min)
01	Rinse		cold	variable
02	Detergent	Depending on type	60-70 (140-158)	30-50
03	Rinse		cold	variable
04	Disinfection	Depending on type	cold	5-10

Detergent
The counting of 30-40 minutes washing starts only after the proper flow-rate is achieved.

Disinfection
The performing of the disinfection phase is done upon specific need.
If water chlorine content is higher than 25ppm; never leave the plant soaked in peracetic acid.

Acid
A monthly acid cleaning is recommended. After step 3 of monophase, run step 4 and 5 of double phase procedure.

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