SANI·MATIC®

CIP Mini
Clean-In-Place System

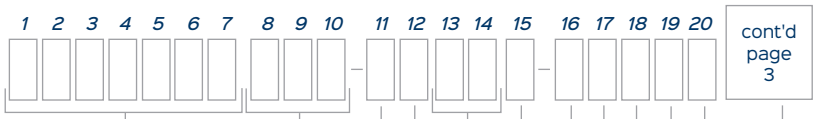
Technical Datasheet

Cleaning Confidence

(p) 800-356-3300 (f) 608-222-5348 **sanimatic.com**

Model Number Key

Example Model #: CIPM110055-1APPU-MN0AT-00000000-0000C



1–7	**Model & Flow Rate**	
	CIPM110	CIP Mini - 110 gpm
8-10	**CIP Pressure**	
	055	55 psig
11	**Tanks**	
	1	One Tank
12	**Tank Size**	
	A	135 gal Nominal Volume
13-14	**Tank Head Type**	
	PP	Panned & Radiused Tank Heads
15	**Tank Insulation**	
	U	Uninsulated Tank (Standard)
	I	Insulated Tank
16	**Skid Mobility**	
	M	Mobile (Standard)
	S	Stationary
17	**Heating**	
	N	No Heating Method (Standard)
	S	In-Tank Steam Sparger
	X	Heat Exchanger - Steam
	E	Electric Heater - 30 kW
18	**Recirculation Manifold**	
	0	No Recirculation Manifold (Standard)
	R	Recirculation Manifold
19	**CIP Tank Water Inlet**	
	A	Anti-Siphon Inlet (Standard)
	S	Static Spray Ball Inlet - With Gasketed Manway
20	**Pump Motor Type**	
	T	TEFC (Standard)
	W	Washdown Duty
	S	Stainless Steel Washdown Duty

cont'd page 3

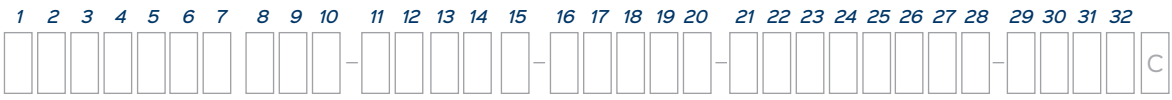
Model Number Key

Example Model #: CIPM110055-1APPU-MN0AT-00000000-0000C

cont'd from page 2

21	**CIP Supply Flow & Pressure Control**	
	0	No Supply Pump VFD Control (Standard)
	V	Supply Pump VFD Control
22	**CIP Supply Flow Monitoring**	
	0	No Supply Flow Monitoring (Standard)
	M	Supply Flow Meter
23	**CIP Supply Pressure Monitoring**	
	0	No Supply Pressure Monitoring (Standard)
	G	Supply Pressure Gauge
	T	Supply Pressure Transmitter
24	**Chemical Monitoring & Control**	
	0	No Chemical Monitoring & Control (Standard)
	1	Wash Conductivity (CIP Supply) Monitoring
	2	Wash & Rinse Conductivity (CIP Supply & Return) Monitoring
25	**CIP Return Flow Monitoring**	
	0	No Return Flow Monitoring (Standard)
	1	Return Flow Switch
26	**CIP Supply Strainer**	
	0	No Strainer (Standard)
	A	Angle-Line Strainer
27	**CIP Supply Air Blow**	
	0	No Air Blow (Standard)
	A	Air Blow
28	**Local Chemical Addition**	
	0	No Local Chemical Pump Assemblies (Standard)
	A	(1) Local Chemical Pump Assembly
	B	(1) Local Chemical Pump Assembly & (1) Chemical Reservoir with Low-Level Switch
	C	(2) Local Chemical Pump Assemblies
	D	(2) Local Chemical Pump Assemblies & (2) Chemical Reservoirs with Low-Level Switches
29	**Controls**	
	0	Allen-Bradley CompactLogix 5370 Controller (Standard)
	1	Allen-Bradley CompactLogix 5380 Controller
30	**HMI Display**	
	0	Allen-Bradley PanelView™ Plus 7 - 7" Operator Terminal (Standard)
	1	Allen-Bradley PanelView Plus 7 - 10" Operator Terminal
31	**Conduit**	
	0	PVC Conduit (Standard)
	1	Stainless Steel Conduit
32	**Reporting**	
	0	No Reporting (Standard)
	1	1-Pen Chart Recorder, Anderson AJ-300 Series
	2	2-Pen Chart Recorder, Anderson AJ-300 Series
	F	2-Pen Chart Recorder, Anderson AV-9000 Series
	G	3-Pen Chart Recorder, Anderson AV-9000 Series
	H	4-Pen Chart Recorder, Anderson AV-9000 Series
	L	SaniTrend® Local
	E	SaniTrend® Cloud CR Essentials
	C	SaniTrend® Cloud CR Insights

Model Number:



Combine numbers 1-20 from page 2 and numbers 21-32 from page 3 for a complete Model Number.

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1. Introduction

Technical information provided within this document is for Sani-Matic's Configured Design Offering (CDO) of the CIP Mini – a small, portable, 1 tank Clean-In-Place (CIP) system designed for the food, beverage, personal care, and nutraceutical industries.

Alternative Design Requests (ADRs) for variations in construction, size, component manufacturers, options, orientation, or other technical requirements should be directed to a Sani-Matic representative or a sales channel for custom quoting and engineering.

The system details described in Section 3 through Section 9 apply to the system and its standard options [designated with "(Standard)" in the model key]. The selectable product options within the model key are described in Section 10. Accessories such as custom system automation, return pump assemblies, field services, and other system additions are described in Section 11.

2. Applications

The CIP Mini can be used for a cleaning-in-place a variety of process equipment, including process tanks, process piping, hoses, and more.

Delivering up to 110 gpm @ 55 psig of CIP Supply Flow, the CIP Mini 110 can be used for cleaning:

- Process tanks up to 11' in diameter for static spray operations
- Process lines up to 3" in diameter

Contact Sani-Matic for specific sizing and application assistance.

Process Pipes

Process Tanks

Hoses

3. Construction

3.1 Certifications and Classifications

- **Electrical Area Classification:** Non-hazardous
- **Electrical Certification:** UL 508A
- **Seismic Design:** None (See Section 11.1.5 for optional Seismic Design)
- **System Certifications:** None

3.2 Structural Framing

- **Design:** Closed square tubing
- **Material:** 304ss square tubing
- **Surface Finish:** Bead blasted
- Fully welded single piece construction
- Four (4) Casters with 5" diameter non-marking wheels allowing the equipment to be moved through the facility. Two (2) Casters are swivel and two (2) casters are stationary.
- One (1) Push handle

3.3 Sanitary Piping

- **Material:** 316Lss sanitary tube and fittings
- **Surface Finish:** 32 µin Ra ID / OD
- **Welding:** Welds are performed manually per AWS D18.1/D18.1M standards (latest edition). The weld interior is argon gas purged.
- **Weld Finish:** As-welded ID / weld color removed OD
- **Slope:** None
- **Connections:** Tri-clamp fittings with single hinged heavy-duty clamps with wing nuts
- **Gasket Material:** EPDM
- **Valves (CIP Process):** Butterfly type with 316Lss body, EPDM seat, and air actuator
- **Valves (Water Inlet):** Ball type with 316ss body, PTFE seats, and air actuator

3.4 Electrical Conduit

- **Conduit:** SCH 40 PVC
- **Flexible Conduit and Fittings:** UL listed PVC with nylon fittings
- Connection to low voltage electrical devices is installed with flexible cord
- Instruments requiring calibration are provided with extra cord to allow the device to remain connected and moved to a calibration cart

3.5 Pneumatics

- **Location:** Instrument air filters, pressure regulators and solenoids are mounted inside the control panel
- **Material:** Interconnections within the control panel and pneumatic air lines from the control panel to the skid mounted valves and equipment are run in polyethylene tube

4. Utility Requirements

The following are the minimum required utilities for the proper operation of the system.

Table 1: Utility Requirements

Description	Requirement	Connection
Water - Supply	110 gpm @ 30 psi	1.5" TC
Water - Drain (Suction Manifold)	Up to 50 gpm	2.5" TC
Water - Drain (Return Manifold)	Up to 120 gpm	2.0" TC
Instrument Air	10 scfm @ 90 psi	0.5" NPT
Electrical	30 Amp @ 460 V AC, 3 PH, 60 Hz.	n/a
CIP Supply	n/a	2.0" TC
CIP Return	n/a	2.0" TC

NOTE:

- Drain temperatures are variable based on the cycle.

5. Physical Size & Layout

The following is the approximate overall size of the equipment.

Table 2: System Size

Description	System Dimensions		
	W"	D"	H"
Standard System Model	74"	39"	75"

NOTE:

- System dimensions and system weight listed are for standard options – certain options or combination of options can increase the overall size of the equipment.

6. Component Manufacturers

Note: Inclusion of certain components is dependent on the model options selected.

Table 3: Component Manufacturers and Models

Component	Manufacturer	Model	Option?
Tank	Sani-Matic	-	
Pump	Ampco	AC+316	
Valves, Butterfly	VNE	51C	
Valve, Ball (water)	VNE	90C	
Level Transmitter	ifm Efector	PI	
Temperature Transmitter	ifm Efector	TD	
HMI	Allen-Bradley	PanelView +7	
PLC	Allen-Bradley	CompactLogix	
Steam Ball Valves	Triac	55	✓
Steam Sparger	Sani-Matic	-	✓
Steam Shell & Tube Heat Exchanger	Enerquip	6x24	✓
Steam Vacuum Breaker	Hoffman	62	✓
Steam Control Ball Valve	Triac	V8	✓
Steam Pressure Gauges	Ashcroft	1008S	✓
Steam Relief Valve	Kunkle	918	✓
Steam Trap	Watson McDaniel	WFT	✓
Electric Heater	ASB	-	✓
Valves, Check	VNE	45C	✓
Static Spray Ball Assembly	Sani-Matic	-	✓
VFD	Allen Bradley	525	✓
Flow Meter	Anderson	FMQ	✓
Pressure Gauge	Anderson	EL	✓
Pressure Transmitter	ifm Efector	PI2794	✓
Flow Switch	ifm Efector	SI6800	✓
Strainer	Sani-Matic	Angle-Line	✓
Air Blow – Y-Ball Check Valve	VNE	EG45	✓
Conductivity Sensor	Rosemount	225	✓
Conductivity Analyzer	Rosemount	1056	✓
Chemical Assembly – Low Level Sensor	ifm Efector	KI5083	✓
Chemical Assembly – Pump	Wilden	P.025	✓
CIP Return Pump	Ampco	SP-220	✓

7. Equipment Description

7.1 Solution Tank

The tank used to hold chemical wash / rinse solutions and provide an air break in the cleaning recirculation line.

- **Tank technical information / construction**
  - **Nominal Volume:** 135 gallons
  - **Working Volume:** 130 gallons
  - **Dimensions:** 30" ID x 47" sidewall
  - **Top Head:** Flat panned 14 ga.
  - **Sidewall:** 14 ga.
  - **Bottom Head:** Flat panned and sloped 14 ga.
  - **Insulation:** None
  - **Spare Connections:** None
  - **Design:** Atmospheric
  - **Material:** 316Lss wetted surfaces
  - **Interior Finish:** 32 µin Ra with weld color removed
  - **Exterior Finish:** 32 µin Ra with weld color removed top head and sidewall / bead blast bottom head
  - **Mounting:** Welded to the structural frame
- **Tank connections / instruments**
  - One (1) 18" Top head lift-off non-gasketed manway
  - One (1) 1.5" TC top head water Inlet – with TC ball valve attached to an anti-siphon tank inlet
  - One (1) 3.0" TC sidewall overflow (skimmer type) with overflow piping run to floor level
  - One (1) 2.0" TC sidewall level transmitter (pressure) with 4-20mA output
  - One (1) 2.0" TC bottom head outlet

7.2 Suction & Supply Manifold

The suction manifold pulls wash solutions from the tank, pumping them to the CIP Supply manifold.

- One (1) 2.5" TC butterfly valve for manifold drain
- One (1) 3-point chemical inlet tee assembly in pump suction piping
- One (1) Centrifugal supply pump
  - **Duty:** 110 gpm @ 55 psi
  - 316Lss wetted materials with EPDM elastomers
  - 7.5 HP, 3500 rpm TEFC motor rated for use with a VFD
- One (1) Temperature transmitter (RTD) with 4-20 mA output
  - Instrument is used to monitor the supply temperature of wash solutions

7.3 Return Manifold

The return manifold allows the wash solutions to be recirculated through the CIP System.

- One (1) Temperature transmitter (RTD) with 4-20 mA output
  - Instrument is used to verify that the temperature at the process has reached the required value
- Two (2) 2.0" TC butterfly valves to direct the return wash solutions to the tank or to drain

7.4 Heating System

No heating method is provided. The system will wash the target equipment using water at the temperature supplied.

7.5 Control System

7.5.1 Control Panel

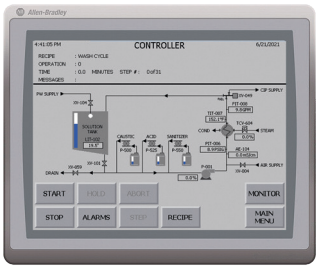
This control panel houses the components used to control the system and is skid mounted.

- One (1) UL Listed enclosure, NEMA 4X, 304ss construction with painted carbon steel back plate
- One (1) Allen-Bradley Bulletin 1769 CompactLogix 5370 with associated digital and analog outputs
- One (1) Ethernet switch, 5-port unmanaged
- One (1) 24V DC, 10 Amp power supply
- Air solenoid valves (as required)
- One (1) Low air pressure alarm switch
- One (1) Instrument air filter
- One (1) Instrument air pressure regulator with gauge
- One (1) Disconnect switch rated for 30 Amps
- One (1) 7.5 HP motor starter (for CIP Supply pump)
- One (1) Transformer to convert the incoming 3-phase power to other needed voltages
- Twenty (20) ft. of SO cord power cord (plug not included)

7.5.2 Operator Interface

Operator interfaces include the HMI and other components installed on the control panel.

- One (1) Allen-Bradley PanelView Plus 7 from Rockwell Automation - 7" color touchscreen, Operator Terminal (HMI)
- One (1) Illuminated emergency stop switch
- One (1) Illuminated reset button
- One (1) 120V AC GFCI Receptacle
- One (1) RJ45-F Ethernet Passthrough



8. Equipment Operation

8.1 System Operating Conditions

- **Maximum System Operating Temperature:** 200 °F
- **Maximum System Operating Pressure:** 60 psi

NOTE:

- Achievable operating temperatures are dependent on system options and utility conditions.

8.2 Operation

- The CIP Mini is connected to utilities & communications (if applicable)
- CIP Supply and CIP Return connections are made between the CIP Mini and equipment to be cleaned.
- The equipment to be cleaned is prepared for CIP (if applicable)
- The CIP Mini is powered up, an operator logs on, the intended CIP recipe (cleaning cycle) is selected, and the start button is pressed.
  - Depending on the options selected and the CIP process, intervention such as manual chemical addition may be required. A fully automated system can be configured.
- Once CIP cleaning cycle(s) are finished, the system can be disconnected from CIP and utility connections and stored as needed

8.3 Cleaning Cycle

The following phases are an example of a typical CIP cleaning cycle. Water fill, water drain, chemical addition, and/or heating steps are not listed but can be part of the phases.

- Pre-Rinse
- Caustic Wash
- Rinse
- Acid Wash
- Rinse
- Final Rinse (With or Without Sanitizer)

All cleaning steps are setup as individual operation codes (OpCodes) enabling full customization of cleaning cycles.

8.4 System Automation

Sani-Matic provides all programming of the HMI and PLC, enabling automation of the provided system. For additional custom system automation (e.g., Custom HMI Screens, Additional Security Levels, External System Communications), see the System Automation options.

- Cleaning sequences will be automatically controlled using wash cycle recipes.
- Up to (40) different recipes can be stored in the PLC.
- Each recipe has its own setpoint values (e.g., time, temperature, conductivity) which are adjustable.
- Up to (96) individual steps per recipe.
- Each step in the recipe is composed of Operation Codes (Opcodes) which define the phase of the wash cycle (e.g., caustic wash, final rinse). Opcodes can be arranged, omitted, or duplicated within the recipe as needed.
- Up to (96) unique Opcodes.
- Measured process variables have alarms with adjustable high/low setpoint values.
- Up to (96) different setpoint values (e.g., time, temperature, conductivity).
- The operator will have the ability to initiate, monitor and edit (with correct security level) the wash cycle, recipes, and setpoint values via the HMI.
- (3) HMI security levels are included.
- HMI User security is setup for local users. If desired, Active Directory User Authentication can be setup by the facility in which the system is installed.

8.5 Automation Interfaces

The standard system reserves for three (3) digital output signals for chemical addition. The signals are used to activate external equipment (e.g., solenoid for chemical pump) for water fill and chemical addition cycle steps. The control system monitors and alarms these incoming utilities if the system has the necessary options. Additional I/O signals may be available (depending on selected options) to allow for an additional interface that may be unique to the individual application of the system (see *Section 11.1.6 System Automation* for additional information).

9. Documentation

One (1) electronic copy of the documentation package is provided as standard. The documentation is provided in the English language and includes the following information:

- Warranty information
- HMI user manual
- Recipe, alarm, and message matrix
- Recommended spare parts
- Device settings (if different than the vendor's standard)
- P&ID
- General assembly drawing
- Electrical panel layout drawing
- Electrical schematics drawing
- Pneumatics drawing
- I/O Listing
- Component manuals (as provided by the vendor)
- PLC and HMI application code

10. Product Options

10.1 Tank Insulation

The **Insulated Tank** option adds an insulated sidewall to the CIP tank for heat conservation and personnel protection. The insulation is chloride free with 304ss sheathing.

10.2 Skid Mobility

Selecting the **Stationary** option removes the casters and push handle and adds four (4) adjustable ball feet making the system suitable for stationary placement in the facility.

10.3 Recirculated Heating

There are three (3) available options for heating the CIP solution:

- **In-Tank Steam Sparger**
- **Heat Exchanger – Steam**
- **Electric Heater – 30 kW**

With the **In-Tank Steam Sparger** option, steam is directly injected into the wash solution in the tank to elevate its temperature. The RTD is relocated from the supply manifold to the tank sidewall. The following are specifications for this option:

- Steam supply manifold
  - One (1) 1" Strainer with manual ball valve for blow down
  - One (1) 1" Automated ball valve for on/off steam control
  - One (1) Steam mixer located in the tank
  - Material: Stainless steel pipe
  - Welding**:** Welds are performed manually per AWS D18.1/D18.1M standards (latest edition). Pipe 2” and smaller will be socket welded. Pipe 2.5" and larger will be butt welded.
  - Weld finish: As welded ID / weld color removed OD
  - Connections: NPT or 150 lb. flange
  - Flange gaskets: Non-asbestos ring type
  - Valves: Ball type with stainless steel body
- Duty: Heat 135 gallons of wash solution from 68 °F to 140 °F in 7 minutes
- Steam Supply: 760 lb/hr @ 50 psi

With the **Heat Exchanger – Steam** option, a shell & tube heat exchanger provides indirect heating of the wash solutions. The heat exchanger will be located in the discharge of the supply pump. The following are specifications for this option:

- One (1) Shell & tube heat exchanger
  - Duty: Heat 110 gallons of wash solution 17°F per pass
  - Steam Supply: 1,065 lb/hr @ 50 psi
  - Single tubesheet
  - Insulation: None
  - Design: ASME rated for 150 psi / full vacuum
  - Material**:** 316Lss wetted surfaces
  - Interior finish: 32 µ-in Ra with welds ground smooth
  - Exterior finish: Manufacturer’s standard
- One (1) Vacuum breaker (brass)
- Steam supply manifold
  - One (1) 2" Strainer with manual ball valve for blow down
  - One (1) Pressure gauge with manual ball valve for isolation
  - One (1) 1.25" Control ball valve with V-notch ball and electro-pneumatic positioner
  - One (1) Pressure relief valve with its discharge piped to the floor
- Condensate return manifold
  - One (1) 0.5” Manual ball valve to drain the shell of the heat exchanger
  - One (1) 1.5” Float and thermostatic steam trap
  - Weld finish: As welded ID / coated with high temperature paint OD
  - Connections: NPT or 150 lb. flange
  - Flange gaskets: Non-asbestos ring type
  - Valves: Ball type with carbon steel body

- Steam/Condensate Piping
  - Material: Carbon steel pipe
  - Welding: Welds are performed manually per AWS D18.1/D18.1M standards (latest edition). Pipe 2” and smaller will be socket welded. Pipe 2.5" and larger will be butt welded.
- Controls Additions
  - One (1) 4-pt. Analog output module

NOTE:

- For both of the above steam options, Sani-Matic standard is to design steam heating applications for 50 psi steam. Installations where the plant supplied steam is more than 50 psi may require a pressure reducing valve (PRV). Unless otherwise specified, it is assumed that the PRV is customer supplied and/or installed by others.

The **Electric Heater – 30 kW** option adds an immersion style electric heater to the system. The electric heater is sized to maintain or minimally raise the temperature of the wash solution (up to 170˚F) and is dependent on the system being filled with water already at or above the desired wash temperature. The electric heater will be located in the discharge of the supply pump. The following are specifications for this option:

- One (1) Electric heater
  - Size: 30 kW
  - Electrical Supply: 38 Amp @ 460V AC, 3PH, 60 Hz.
  - Temperature control: Integral thermostat with temperature settings between 30 ºF - 250 ºF
  - 316Lss wetted materials
  - Interior finish: Electropolished with welds unground
- One (1) 60 Amp solid state contactor for control of the electric heater
- One (1) 60 Amp disconnect switch (upgraded from 30 amp)

NOTE:

- The ability of the system to maintain the temperature of the wash solutions is dependent on heat loses of the item being washed and the supply/return piping between it and the CIP system.

10.4 Recirculation Manifold

The **Recirculation Manifold** option allows the system to direct the wash solutions from the supply pump discharge, through the return manifold, back to the tank. Recirculation mixes the cleaning chemicals and allows preheating of the wash solutions. The following are specifications for this option:

- One (1) 2" Butterfly valve for CIP supply
- One (1) 2" Butterfly valve to direct the wash solutions to the return manifold
- One (1) 2" Spring check valve to prevent backflow in the return manifold while wash solutions are recirculating
- One (1) Orifice plate to provide back pressure when recirculating the wash solutions to the return manifold

10.5 CIP Tank Water Inlet

The **Static Spray Ball Inlet - With Gasketed Manway** option removes the standard anti-siphon attached to the water inlet and replaces it with a spray assembly. The spray assembly will rinse the tank(s) during water fill steps reducing chemical and soil buildup. In addition, a gasketed manway will replace the tank’s standard lift-off non-gasketed manway to eliminate solution loss.

A gooseneck vent will be added to prevent the tank from becoming pressurized.
The following are specifications for this option:

- One (1) Spray assembly with a static spray ball clipped to a removable supply tube
- One (1) 18" Gasketed manway
- One (1) 3" Gooseneck vent

Static Spray Ball Assembly

10.6 Pump Motor Type

The below options can be selected to replace the standard TEFC motor on the pump with an upgraded rating.

- **Washdown Duty** pump motor
- **Stainless Steel Washdown Duty** pump motor (food safe series)

10.7 CIP Supply Flow & Pressure Control

The **Supply Pump VFD Control** option allows the supply pump to be controlled by a variable frequency drive (VFD) allowing it to operate at multiple flow/pressure settings. This is useful when washing multiple types of equipment having different flow/pressure requirements. The supply pump will be controlled to a speed setpoint value (0-100%).

- One (1) 7.5 HP VFD with Ethernet communications for the supply pump's speed control (replaces motor starter)
- One (1) Fan with filter and NEMA 4X shroud to remove excess heat from the control enclosure

10.8 CIP Supply Flow Monitoring

The **Supply Flow Meter** option enables monitoring and alarming capabilities for the supply flow rate of the wash solutions. The following are specifications for this option:

- One (1) 2" Flowmeter (electromagnetic) with 4-20 mA output located in the discharge of the supply pump

10.9 CIP Supply Pressure Monitoring

The **Supply Pressure Gauge** option allows the operator to monitor the supply pressure of the wash solutions. The following are specifications for this option:

- One (1) Pressure gauge located in the discharge of the supply pump

The **Supply Pressure Transmitter** option enables monitoring and alarming capabilities for the supply pressure of the wash solutions. The following are specifications for this option:

- One (1) Pressure transmitter with local indication and 4-20 mA output is located in the discharge of the supply pump

10.10 Chemical Control

The **Wash Conductivity (CIP Supply) Monitoring** option enables monitoring and alarming capability for chemical concentrations of the wash solution. If chemical dosing pump option(s) are selected, the supply conductivity sensor will also be used to control the chemical concentrations to a conductivity setpoint value. The following are specifications for this option:

- One (1) Conductivity sensor (toroidal) with 4-20 mA output is located in the discharge of the supply pump and is used to monitor/control the chemical concentrations
- One (1) Conductivity analyzer (single channel) located on the exterior of the enclosure

The **Wash & Rinse Conductivity (CIP Supply & Return) Monitoring** option enables monitoring and alarming capability for chemical concentrations of the wash solution and final rinse water verification. The final rinse step's completion is based on when a conductivity setpoint value is reached instead of being based on a time based setpoint value. The following are specifications for this option:

- One (1) Conductivity sensor (toroidal) with 4-20 mA output is located in the discharge of the supply pump and is used to monitor/control the chemical concentrations
- One (1) Conductivity sensor (toroidal) with 4-20 mA output is located in the return manifold and is used to monitor the final rinse water conductivity
- One (1) conductivity analyzer (dual channel) located on the exterior of the enclosure

NOTE:

- Conductivity control is used for chemicals that can register a controllable conductivity value (e.g., caustic, acids). Chemicals that are unable to register a controllable conductivity value (e.g., sanitizers) will use timed chemical injection.

10.11 CIP Return Flow Monitoring

The **Return Flow Switch** option enables verification and alarming capability if the CIP wash solutions do not return in a designated amount of time. The following are specifications for this option:

- One (1) Flow switch (thermal dispersion) with on/off output located in the return manifold

10.12 CIP Supply Strainer

The **Angle-Line Strainer** option adds a strainer which removes solids from the wash solutions, protecting spray devices and other equipment from debris, and is installed in the discharge of the supply pump. The following are specifications for this option:

- One (1) 2" TC x 20.75" long Angle-Line strainer with 0.015" wedgewire element and standard seal kit

Angle-Line Strainer

10.13 CIP Supply Air Blow

The **Air Blow** option helps reduce the time required to evacuate water from the process piping during drain steps through use of compressed air blowing through the process lines. The following are specifications for this option:

- One (1) 2" Y-Ball check valve located in the discharge of the supply pump
- One (1) Air blow inlet with 0.5 micron filter disc mounted to the check valve.
- One (1) 0.5" Solenoid valve and regulator, located in the control panel, for control of the air blow.
- The instrument air requirement will increase by 25 cfm.

10.14 Local Chemical Addition

There are four (4) options for adding local chemical addition to the skid:

- **Local Chemical Pump Assembly**
- **Local Chemical Pump Assembly & (1) Chemical Reservoir with Low-Level Switch**
- **Local Chemical Pump Assemblies**
- **Local Chemical Pump Assemblies & (2) Chemical Reservoirs with Low-Level Switches**

These options add the below items to the skid as noted. If only selecting the Local Chemical Pump Assemblies, they can be used with nearby chemical drums – for a complete solution, add the chemical reservoirs.

Local Chemical Pump Assembly - the chemical pump assembly doses the cleaning chemicals and/or sanitizer from a storage drum to the injection point on the CIP system. The concentrations are controlled to a time based setpoint value or to a conductivity setpoint value if the Conductivity Monitoring/Control option is chosen. The chemical pump assembly(s) are mounted to the CIP frame. The following are specifications for this option:

- One (1) Suction lance with foot valve for placement into a drum (by others)
- One (1) Air operated diaphragm pump
  - Duty: 3 gpm @ 45 psi
  - Polypropylene body with Teflon diaphragms
  - (1) 0.25" Solenoid valve (24V DC) with filter/regulator for control of the pump. The pneumatic components and piping are made of brass.
- One (1) Manual bleed valve to aid in the priming the pump
- One (1) 0.25" Check valve to prevent the siphoning of the cleaning chemicals
- Thirty (30) feet of 0.5" Polyethylene tubing for the pump's suction and discharge

Chemical Reservoir with Low-Level Switches - the reservoir provide an on-skid location to store chemical for use in the cleaning cycle. Quick disconnects make the reservoir easy to remove for filling. A level switch is integral to the assembly, providing a low-level alarm. The following are specifications for this option:

- (1) Removable chemical reservoir
  - Volume: 5 gallons
  - Access: Hand hole
  - Vent: Closeable
  - Design: Atmospheric
  - Material: Polypropylene
  - Suction lance with foot valve
  - Quick disconnect couplings for ease of removal
- One (1) tray to hold the chemical reservoir
- One (1) non-contacting capacitive type with on/off output.

10.15 Controls

The **Allen-Bradley CompactLogix 5380 Controller** option replaces the standard Allen-Bradley® CompactLogix™ 5370 Controller offering with the upgraded 5380 Controller series processor. The corresponding I/O modules are also upgraded.

10.16 HMI Display

The **Allen-Bradley PanelView Plus 7 - 10" Operator Terminal** option replaces the standard 7" HMI with a larger 10" HMI.

10.17 Conduit

The **Stainless Steel Conduit** option replaces the system's standard PVC conduit with stainless steel conduit, which has the following specifications:

- **Stainless Steel Conduit:** SCH 40 stainless steel
- **Flexible Conduit and Fittings:** UL listed PVC coated steel with stainless steel fittings

10.18 Reporting

Various reporting options are available for recording the critical cleaning cycle parameters of the automated CIP Mini system:

- **1-Pen Chart Recorder, Anderson AJ-300 Series**
- **2-Pen Chart Recorder, Anderson AJ-300 Series**
- **2-Pen Chart Recorder, Anderson AV-9000 Series**
- **3-Pen Chart Recorder, Anderson AV-9000 Series**
- **4-Pen Chart Recorder, Anderson AV-9000 Series**
- **SaniTrend® Local**
- **SaniTrend® Cloud CR Essentials**
- **SaniTrend® Cloud CR Insights**

The above chart recorder options utilize circular paper charts to record selected cleaning parameters over a 24-hour period. The chart recorders are mounted to the system framing.

NOTE:

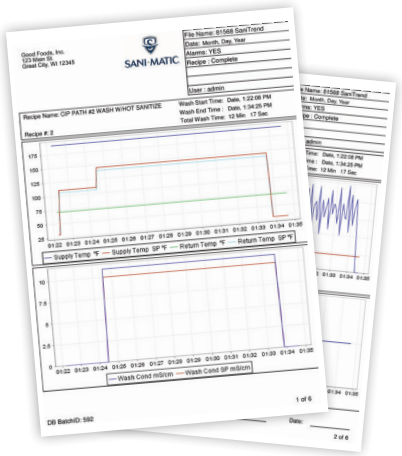
- Chart recorder parameter recording can be selected based on the configured system and number of pens selected

The **SaniTrend® Local** reporting option provides a means of storing, retrieving and printing the cleaning cycle data with a desktop PC.

The PC-based reporting system is installed on a desktop PC and interfaces with the Sani-Matic cleaning system's Programmable Logic Controller (PLC) to collect and store cleaning wash cycle data. An authorized user logs in to the SaniTrend PC to select recipes by date or time through a recipe selection screen.

When the recipe is selected the user can view the recipe data as Recipe Chart Data, Recipe Charts and Recipe Events screens.

The system provides easy access to the cleaning cycle data generated. The data collected is recorded, stored, and the information is printable. Reference the SaniTrend Local brochure for more information.



Sample SaniTrend Local Printout

SaniTrend® Cloud Cleaning Records (CR) Essentials is an online data software that provides automated, secure data acquisition and reporting of critical cleaning cycle information, along with system operational efficiency insights. Users, having a facility user login account, access SaniTrend Cloud via a web browser.

The **Essentials** edition of SaniTrend Cloud includes the following:

- (1) Industrial PC / Edge Device to buffer and transmit data to the cloud portal
- Connectivity software installed on the industrial PC / edge device to allow it to connect to the PLC
- SaniTrend Cloud online portal access

- Product features:
  - Cloud Access to Data (Phone, Tablet, Mobile)
  - Unlimited Users
  - Store and Forward Capabilities
  - Cloud Documentation Storage
  - Live Dashboard Views
  - Email & SMS (Text) Notifications
  - Analog & Digital Data Trending
    - ◊ Up to Eight (8) Analog Values and Setpoints (e.g., temperature, conductivity)
    - ◊ Up to Twelve (12) Digital Values (e.g., pump running, heater on)
  - Cleaning Cycle Reports
    - ◊ Unique Cycle ID
    - ◊ Recipe Name
    - ◊ Up to Eight (8) Analog Values and Setpoints (e.g., temperature, conductivity)
    - ◊ Start Date/Time & Stop Date/Time
    - ◊ Run time (actual)
    - ◊ Downloadable Reports (Print/PDF)
    - ◊ Commenting Feature
    - ◊ Approval Feature

SaniTrend Cloud's information on cleaning cycles and system performance; accessed anywhere by anyone from your team

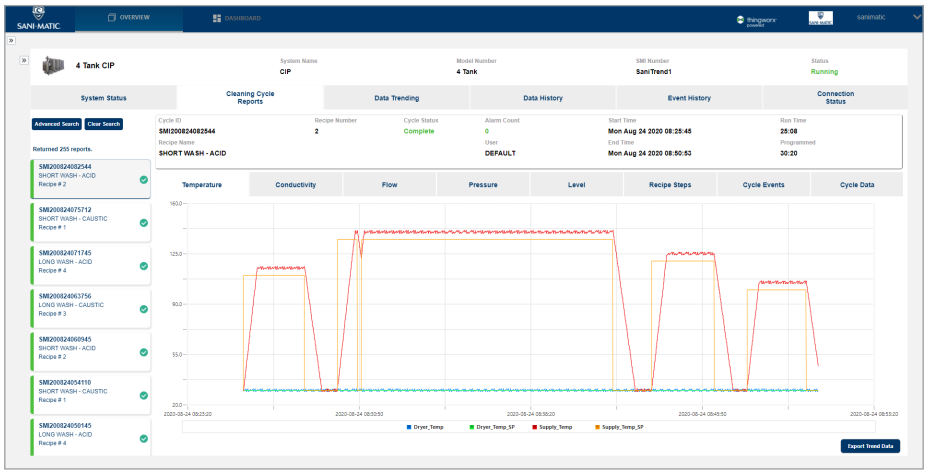
SaniTrend® Cloud – Cleaning Cycle Reports (CR Essentials)

SaniTrend® Cloud Cleaning Records (CR) Insights is an online data software that provides automated, secure data acquisition and reporting of critical cleaning cycle information, along with system operational efficiency insights. Users, having a facility user login account, access SaniTrend Cloud via a web browser.

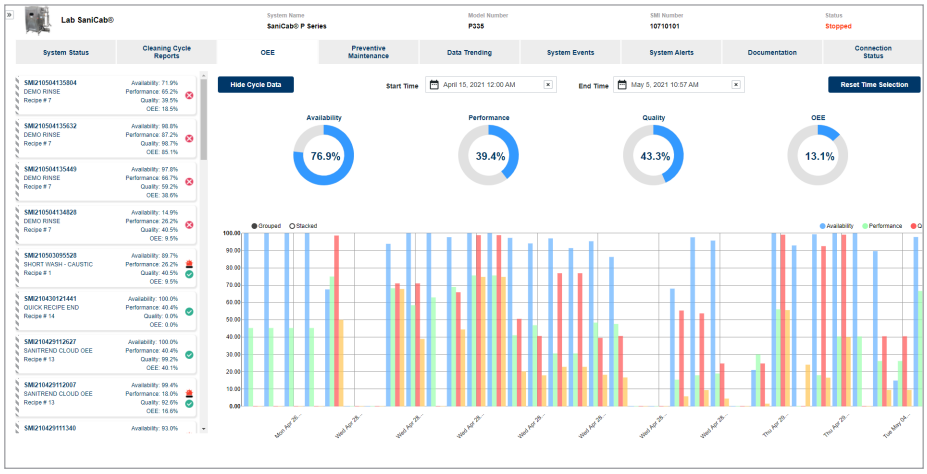
The **Insights** edition of SaniTrend Cloud includes the following:

- (1) Industrial PC / Edge Device to buffer and transmit data to the cloud portal
- Connectivity software installed on the industrial PC / edge device to allow it to connect to the PLC
- SaniTrend Cloud online portal access
- Product features:
  - Cloud Access to Data (Phone, Tablet, Mobile)
  - Unlimited Users
  - Store and Forward Capabilities
  - Cloud Documentation Storage
  - Live Dashboard Views
  - Email & SMS (Text) Notifications
  - Analog & Digital Data Trending

- Cleaning Cycle Reports
    - ◊ Unique Cycle ID
    - ◊ Recipe Name
    - ◊ Analog Values and Setpoints (e.g., temperature, conductivity)
    - ◊ Start Date/Time & Stop Date/Time
    - ◊ Run time (actual)
    - ◊ Downloadable Reports (Print/PDF)
    - ◊ Commenting Feature
    - ◊ Approval Feature
- Additional Cleaning Cycle Report Insights
    - ◊ Recipe Step Information & Duration
    - ◊ Cleaning Cycle Events (Alarms, Messages, Holds)
    - ◊ Run time (programmed)
    - ◊ User ID
- Event Log
- Overall Equipment Effectiveness (OEE) Scores & Trending
- Preventive Maintenance (PM) Tracking



SaniTrend® Cloud – Cleaning Cycle Reports (CR Insights)



SaniTrend® Cloud – OEE Trending (CR Insights)

NOTE:

- SaniTrend® Cloud requires that the equipment be connected to the Internet (by others).
- Find more information and tier comparisons on our SaniTrend® Cloud website page.

11. Accessories

11.1 System Additions

11.1.1 CIP Return Pump Assembly

There are three (3) CIP Return Pump Assembly options available:

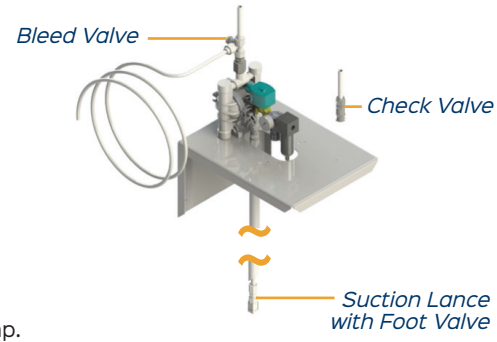
- **CIP Return Pump Assembly – TEFC Motor**
- **CIP Return Pump Assembly – Washdown Motor**
- **CIP Return Pump Assembly – SS Washdown Motor**

A CIP return pump returns the wash solutions from the equipment being washed back to the CIP system. It is used in applications where the equipment being washed has an air break such as a tank. The return pump assembly is mounted to on a portable skid for mobility. The following are specifications for this option:

- One (1) Portable skid with casters
- One (1) Liquid ring return pump
  - Duty: 120 gpm @ 20 psi
  - 2.0" x 2.0" TC Connections
  - 316Lss wetted materials with EPDM elastomers
  - 7.5 HP, 1450 rpm motor
  - TEFC motor / Washdown Motor / SS Washdown Motor (depending on option selection)
- One (1) 7.5 HP Motor starter for the return pump located in the main system control panel

11.1.2 Chemical Pump Assembly, Wilden P.025

The Chemical Pump Assembly, Wilden P.025 is a loose ship package that allows for chemical delivery from a customer supplied container to the system's chemical injection port(s). The 24V DC outputs described in Section 8.5 Automation Interfaces are to be used with the chemical pump assemblies' solenoid valves for metering of the chemical.



The following components are packaged and shipped loose for installation by others:

- One (1) PVC Suction lance (43") with foot valve for placement into a 55-gallon chemical container (container by others).
- One (1) air operated diaphragm pump
  - Duty: 3 GPM @ 45 psi
  - Instrument air requirements: 3 SCFM @ 100 psi
  - Construction: Polypropylene body with PTFE diaphragms
- One (1) 0.25" Solenoid valve (24V DC) with filter / regulator for control of the pump. The pneumatic components and piping are made of brass
- One (1) 304ss wall mounting bracket allowing the pump assembly to be wall mounted near the chemical container
- One (1) Manual bleed valve to aid in priming the pump
- One (1) 0.25" Check valve to prevent the siphoning of the cleaning chemicals
- Thirty (30) feet of 0.5" Polyethylene tubing for the pump's suction and discharge lines
- Eight (8) feet of 0.375" Polyethylene tubing for the pump's bypass/priming line

11.1.3 Hygienic Spray Deflector - Food & Beverage

There are three (3) sizes of Hygienic Spray Deflector – Food & Beverage available:

- **Hygienic Spray Deflector - Food & Beverage - 2.0"**
- **Hygienic Spray Deflector - Food & Beverage - 3.0"**
- **Hygienic Spray Deflector - Food & Beverage - 4.0"**

The Hygienic Spray Deflector is a component that is used on tanks having a spray device to clean their interior such as CIP tanks and CIP target or process tanks. It redirects sprayed solutions back int o the tank without inhibiting port cleaning. When following the recommended spray device operating requirements, the Hygienic Spray Deflector's design reduces solution from exiting open-to-atmosphere tanks. The unit has EPDM gaskets and is made of 316Lss.

Hygienic Spray Deflector - Food & Beverage

Tank Vent Solution Loss During CIP

Hygienic Spray Deflector Preventing Solution Loss During CIP

11.1.4 Passivation - System

Sani-Matic will provide factory passivation of all solution contact surfaces on the system. The citric acid passivation is performed and documented per Sani-Matic's standard procedure (SOP-MA005) which adheres to ASTM A 967-05 requirements. A certificate of passivation (SMI-LOG-007) is provided upon completion.

11.1.5 Seismic Zone Anchorage Calculations

Seismic zone calculations are performed for the anchorage of the equipment to the plant floor. The services are performed by an engineer certified in the state where the system will be installed. The calculations, stamped by the engineer, will be included in the documentation turn over package.

NOTE:

- The standard Stationary skid mobility option must be selected in conjunction with this accessory.
- Due to unique seismic zone considerations for each installation, modifications to the system design and footprint may be required. These modifications may incur an additional charge.

11.1.6 Wi-Fi Connection Package

The Wi-Fi connection package allows the system to connect to the facilities network wirelessly. The following are specifications for this option:

- One (1) Wi-Fi hotspot
  - Washdown rated
  - Panel mounted unit

There are two (2) accessories that can be selected if both networks need access to the system:

- **Wi-Fi Connection Package (Machine Network)**
- **Wi-Fi Connection Package (Business Network with Internet)**

NOTE:

- Two (2) Wi-Fi Connection Packages may be needed if the SaniTrend Cloud and/or the Remote Access Package options are selected.
- One or both options are valid, and it is possible to have one network hardwired and the other via Wi-Fi. The facility may have separate “machine” and “business” networks where the “business” network is connected to the Internet while the “machine” network is not. Select which network(s) will be connected via Wi-Fi.

11.1.7 Remote Access Package

There are two (2) remote access package tiers available:

- **Remote Access Package**
- **Remote Access Package (When Used with SaniTrend Cloud)**

The Remote Access package enables a Sani-Matic technician to access the equipment’s PLC and HMI remotely through a secure connection. The technician can help with troubleshooting problems, assist with recipe updates, or make changes to the PLC and HMI programs. The following are specifications for this option:

- One (1) VPN Router
  - eWON model Cosy 131
- One (1) Additional Ethernet switch, 8-port unmanaged (when used with SaniTrend Cloud)

NOTE:

- This accessory requires that the equipment be connected to the Internet (by others).
- The technicians’ time for remote assistance will be billed at the current service rates on an hourly basis, with a minimum of four (4) hours billed per service.

11.1.8 System Automation

Sani-Matic has an in-house Engineering/Design and Programming team that can customize the equipment to meet unique process needs. Engineering/Design and Programming options are determined based on automation programming engineering hours.

- Custom HMI Screen – A custom HMI screen will be added to the system along with any related PLC programming modifications for functionality. An example of a graphics-based screen would be a P&ID depicting external equipment to the supplied system.
- Additional HMI Security Levels – The system automation will have the number of security levels increased from (3) levels to (5) levels allowing for a greater range of security login groups.
- Operator Badge Reader – A badge reader will be added to the system's control panel, allowing for the system to use badge access by operators. This option includes a HID Proximity Badge Reader, Single Gang, Wiegand Protocol Interface (Mfg. # 5395CG100) and associated programming and integration.
- External System Communications – Sani-Matic electrical project engineers will work with your programming team and execute additional system communications between the Sani-Matic system and other process equipment or systems. PLC and HMI programming, testing, and documentation integration of these communications is all included. This option pricing is per equipment or system.
- External System Communications – With Remote Control Capabilities – Sani-Matic electrical project engineers will work with your programming team and execute additional system communications between the Sani-Matic system and other process equipment or systems. This includes remote operation control signals between the Sani-Matic system and other process equipment or systems. PLC and HMI programming, testing, and documentation integration of these communications is all included. This option pricing is per equipment or system.

- Cleaning Cycle Data (Data Only – No Report) – Cleaning cycle tag data is made available from the PLC, communicated to a customer provided data historian via Ethernet. Reporting is by others.
- Custom System Automation (Hourly) – Custom System Automation requests can be integrated into the operation of the system. Defined custom requirements to be supplied during the detailed design of the project.

11.2 Services & Documentation

The Accessory Category – Services contains services to support smooth and successful installation and validation activities and keep your system maintained for years of reliable service.

All pricing for services is quoted is a budgetary estimate based on the hours and expenses of the activity. The invoice price is based on the actual hours and expenses with a minimum eight (8) hours per day per technician (sum of both onsite and travel time) and with expenses invoiced at Sani-Matic costs. To minimize the time spent onsite and fully utilize the technician's time, it is recommended that the equipment be fully installed and ready for operation prior to scheduling the technician's trip. A checklist is provided to assist in ensuring that the equipment is ready.

NOTE:

- For the field service assistance accessories below, the final invoice is based on the actual hours and expenses with expenses invoiced at Sani-Matic costs.

11.2.1 Installation Supervision (Budgetary)

An on-site Sani-Matic technician assists in installation of the equipment, including ensuring that equipment is verified to be reassembled properly, leveled, and correct utilities connected as required.

This add-on is priced with the assumption of one (1) technician providing twenty (20) hours of weekday on-site time over two (2) days, sixteen (16) hours of weekday travel over two (2) days, and all travel, lodging, and meal expenses. Additional hours and expenses utilized for any onsite activities are billed accordingly.

11.2.2 Start-up & Training (Budgetary)

An on-site Sani-Matic technician assists in installation of the equipment, including ensuring that equipment is verified to be reassembled properly, leveled, and correct utilities connected as required.

This add-on is priced with the assumption of one (1) technician providing forty (40) hours of weekday on-site time over four (4) days, sixteen (16) hours of weekday travel over two (2) days, and all travel, lodging, and meal expenses. Additional hours and expenses utilized for any onsite activities are billed accordingly.

11.2.3 Preventative Maintenance (PM) Program (Budgetary)

The goal of Sani-Matic's preventative maintenance program is to make sure that the system and operators are efficient and to reduce time lost due to unexpected system failures. The one (1) field service trips included with this program is:

- 1-year PM execution (customer procured parts)
  - Check instrument operation
  - Change out elastomers
  - Change pump seals
  - Change out wearables / consumables
  - Review PLC / HMI applications
  - Training

Contact Sani-Matic for other offering levels of PM services.

11.2.4 Recommended Spare Parts Budget (Budgetary)

Sani-Matic will provide a loose ship package of critical Recommended Spare Parts (RSP) for the system (e.g., pump seals, elastomers, rotary bearings). The RSP list is sent for review and approval, after which the final pricing is provided.

11.2.5 Turn Over Package (TOP) - Hard Copy

A hard copy of the equipment Turn Over Package (TOP) will be printed and provided in a series of books (binders). All documentation materials listed in Section 9 are included in the hard copy package.