



SANI-MATIC®

SaniCab® P Series Cabinet Washer

Technical Datasheet



Cleaning Confidence



Model Number Key

Example Model #: P335-110EAS-TM1-213S4-21M110C

1-4	Chamber Model	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	P335 30" W x 35" D x 65" H																									
	P365 30" W x 73" D x 65" H																									
	P565 56" W x 71" D x 54" H																									
5	Wetted Materials / Surface Finish																									
	1 304 Stainless Steel & 32 µin Ra (Standard)																									
6	System Configuration																									
	1 Right Handed (Standard)																									
	2 Left Handed																									
7	Dryer System																									
	0 No Dryer System (Standard)																									
	1 Dryer System - Electric																									
8	Recirculated Heating																									
	S In-Tank Steam Sparger (Standard)																									
	X Heat Exchanger - Steam																									
	E Electric Heater to Maintain Temperature																									
	N No Recirculated Heating																									
9	Pump Type																									
	A Ampco (Standard)																									
	W Waukesha																									
	F Fristam																									
	L Alfa Laval																									
10	Motor Type																									
	T TEFC (Standard)																									
	W Washdown Duty																									
	S Stainless Steel Washdown																									
11	Supply Pressure Monitoring																									
	G Pressure Gauge (Standard)																									
	T Pressure Transmitter																									
12	Supply Flow Monitoring																									
	N No Flow Monitoring (Standard)																									
	S Flow Switch																									
	M Flow Meter																									
13	Chemical Control																									
	0 Timed Chemical Injection (Standard)																									
	1 Wash Conductivity Control																									
14	Controls																									
	2 Allen-Bradley® CompactLogix™ 5370 Controller (Standard)																									
	3 Allen-Bradley CompactLogix 5380 Controller																									
15	HMI Display																									
	1 Allen-Bradley PanelView™ Plus 7 - 7" Operator Terminal (Standard)																									
16	Reporting																									
	0 Electronic Data Only (Standard)																									
	1 1-Pen Chart Recorder, Temperature Recording																									
	2 2-Pen Chart Recorder, Temperature & Conductivity Recording																									
	3 SaniTrend™ Data Acquisition & Management System																									
17	Conduit																									
	P PVC Conduit (Standard)																									
	S Stainless Steel Conduit																									
18	Electrical Utility																									
	4 460V AC, 3PH, 60 Hz (Standard)																									
19	Water Addition																									
	0 Dual Water Ports (Standard)																									
	1 Dual Water Ports with (1) Pneumatic Valve																									
	2 Dual Water Ports with (2) Pneumatic Valves																									
20	Chemical Addition																									
	0 Triple Chemical Ports (Standard)																									
	1 Triple Chemical Ports with (1) Chemical Delivery Skid																									
	2 Triple Chemical Ports with (2) Chemical Delivery Skids																									
	3 Triple Chemical Ports with (3) Chemical Delivery Skids																									
21	Chamber Straining																									
	M Manual Perforated Screen (Standard)																									
	C Automated Conveyorized Mesh Screen																									
22	Recirculated Straining																									
	0 No Recirculated Straining (Standard)																									
	1 Y-Strainer - Wedgewire Element																									
23	Distribution Zones																									
	0 Chamber Rotary Sprays (Standard)																									
	1 Chamber Rotary Sprays & Active Coupler																									
24	Spray Type																									
	0 Flat Fan Nozzles (Standard)																									

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1. Introduction

Technical information provided within this document is for Sani-Matic's SaniCab® P Series cabinet washers in a Configured Design Offering (CDO) serving the food and beverage, personal care, and nutraceutical industries.

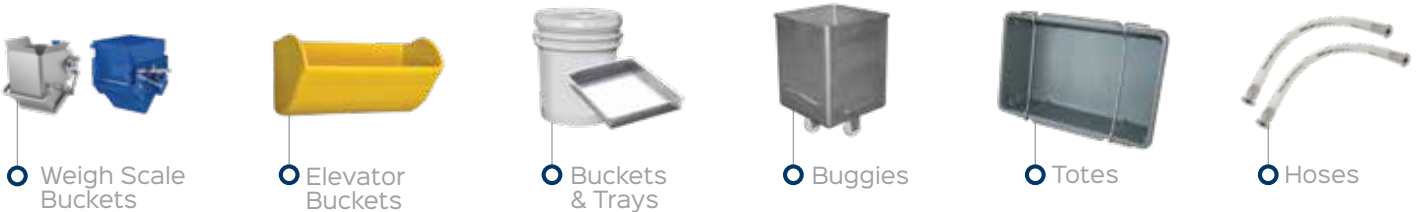
Alternative Design Requests (ADR) for variations in construction, size, component manufacturers, options, orientation, or other technical requirements should be directed to the Sani-Matic sales group for custom quoting and engineering.

The system details described in *Sections 2 through 9* apply to all three chamber models and their standard options, which are designated with "(Standard)" in the model key. The selectable product options within the model key are described in *Section 10*. General, standard, and custom racks are described in *Section 11* and accessories such as rack accessories, system additions, and services and documentation are described in *Section 12*.

2. Applications

The SaniCab P Series cabinet washers are used to wash a variety of process parts, including weigh scale buckets, feed trays, elevator buckets, 3- and 5-gallon buckets, trays, totes, hoses, filling parts, and more. With the addition of the Buggy Inverter, the SaniCab P Series can also wash standard size buggies commonly used for product processing.

For the available usable space dimensions and volumes see *Table 4: Usable Space Dimensions*.



3. Construction

3.1 Certifications and Classifications

- **Electrical Area Classification:** Non-hazardous
- **Electrical Certification:** UL 508A
- **Seismic Design:** None
- **System Certifications:** None

3.2 Structural Framing

- **Design:** Open frame
- **Material:** 304ss angle
- **Surface Finish:** Color cleaned
- Fully welded single piece construction.
- Four (4) adjustable feet for locating the equipment at a fixed location in the facility. The adjustability allows the equipment to be leveled on uneven or sloped surfaces.

3.3 Sanitary Piping

- **Material:** 304ss 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:** Butterfly type with 304ss body, EPDM seat, and pneumatic actuator

3.4 Steam Piping

- **Description:** Steam piping for direct steam injection into the chamber sump
- **Material:** 304ss SCH 40 pipe
- **Surface Finish:** Mill
- **Welding:** Welds are performed manually per ASME B31.3 standards (latest edition)
- **Weld Finish:** Weld color removed OD
- **Valves:** Ball type with 304ss body and pneumatic actuator (control valve), or manual actuator (block and blow-down)

3.5 Electrical Conduit

- **PVC 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

3.6 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

Chamber Model		P335	P365	P565
Water - Supply	Connection Size / Type	1.5" TC	1.5" TC	1.5" TC
	Working Volume (gal)	18	40	26
Drain	Connection Size / Type	3.0" TC	4.0" TC	4.0" TC
	Flow Rate (gpm)	40	70	70
Steam	Connection Size / Type	1.5" FLG	1.5" FLG	1.5" FLG
	Load @ 50 psi (lbs / hr)	790	790	790
Instrument Air	Connection Size / Type	0.5" FNPT	0.5" FNPT	0.5" FNPT
	Volume (scfm)	5	5	5
Electrical	Disconnect Size @ 460V AC (amps)	30	60	60
Chemical	Connection Size / Type	0.25" FNPT	0.25" FNPT	0.25" FNPT
Exhaust	Connection Size / Type	5" x 8.5" FLG	5" x 8.5" FLG	5" x 8.5" FLG
	Volume (acfm)	900	900	900
	Humidity (% RH)	100 Max	100 Max	100 Max

NOTE:

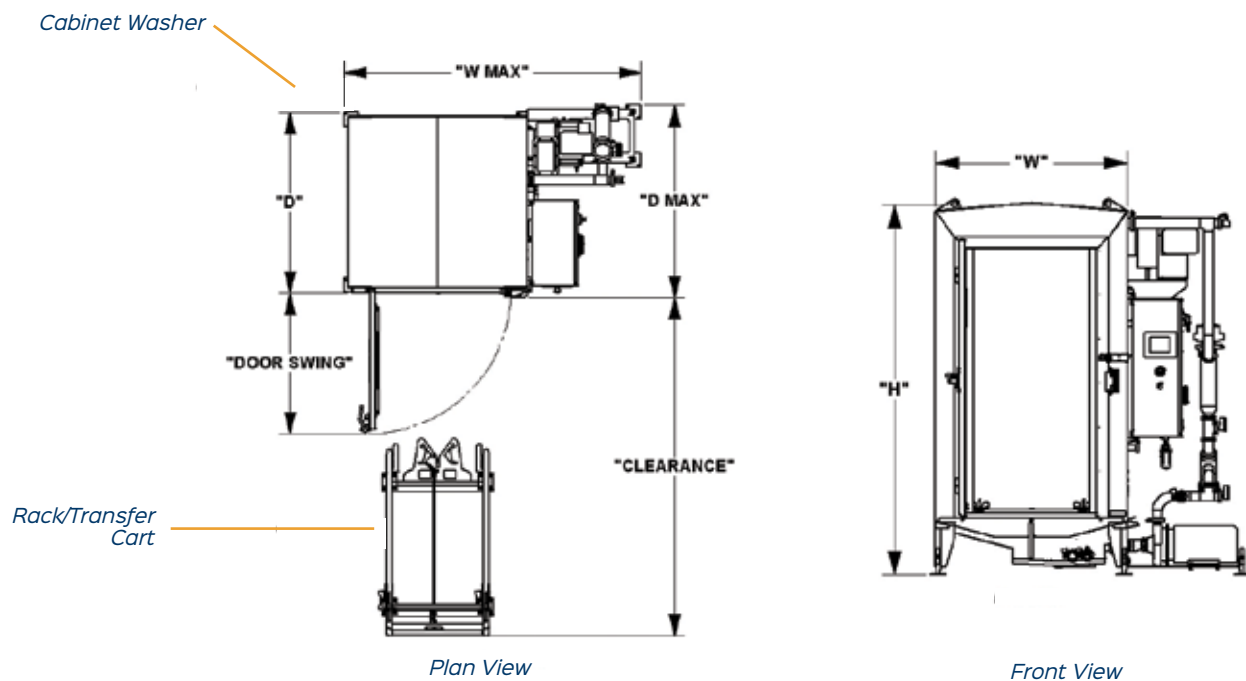
- Drain and exhaust temperatures are variable based on the cycle.
- Water Supply
 - Two (2) Water supply connections are provided.
 - Working volume is the typical chamber water volume required for operation of a single cleaning cycle phase. Rack design and configuration may impact the working volume requirements.
 - Total water volume required per cleaning cycle is dependent on cleaning cycle phases – e.g., a typical P335 cleaning cycle may contain four (4) fills, requiring 72 gallons per cleaning cycle.
 - Varying water supply temperatures are accommodated.
- Chemical
 - Three (3) chemical ports located in the recirculation pump suction manifold are provided.
 - Backflow prevention is required (provided by others).
 - See *Section 10.13 Chemical Addition* for a complete system solution to add chemical pump and container assemblies to the system.
 - See *Section 12.2.2 Chemical Pump Assembly, Wilden P.025* for a loose ship chemical pump system solution.

5. Physical Size & Layout

The following is the approximate overall size of the equipment. The standard system orientation is a right-handed configuration, with the HMI interface, controls, and main external components on the right when viewing the system from the load side.

Table 2: System Size

Chamber Model	System Dimensions			Max System Width - W Max (in)	Max System Depth - D Max (in)	Open Door Depth - Door Swing (in)	Open Door Depth and Cart Length - Clearance (in)	System Weight (lbs)
	W"	D"	H"					
P335	50	48	100	90	54	41	96	1,750
P365	50	86	102	97	91	41	134	2,600
P565	76	84	89	121	89	67	149	2,300



NOTE:

- The **Right Handed** system configuration, featuring some non-standard options, is shown in the above image.
- The "CLEARANCE" dimension includes the length of the chamber door and the associated rack positioned in front of the door.
- System dimensions and system weight listed are for standard options.
- System operating weight is dependent on the construction of the loaded rack.
- All selectable product options within the model key fit within the footprint shown except for the following:
 - **Dryer System – Electric** (See Section 10.2 Dryer System)
 - **Heat Exchanger – Steam** (See Section 10.3 Recirculated Heating)
 - **Triple Chemical Ports with (1) Chemical Delivery Skid** (See Section 10.13 Chemical Addition)
 - **Triple Chemical Ports with (2) Chemical Delivery Skids** (See Section 10.13 Chemical Addition)
 - **Triple Chemical Ports with (3) Chemical Delivery Skids** (See Section 10.13 Chemical Addition)

6. Component Manufacturers

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

Table 3: Component Manufacturers and Models

Component	Manufacturer	Model
Automated Door Lock	Allen-Bradley®	Guardmaster® 440G-LZ
Ball Valve	VNE	90C
Butterfly Valve	VNE	B Series
Chamber	Sani-Matic	—
Chart Recorder	Anderson-Negele	AJ-300
Chemical Delivery - Check Valve	Swagelok	SS-4C2
Chemical Delivery - Container	Pulsafeeder	Series 6000 Light Duty Linear Tank
Chemical Delivery - Level Switch	ifm efector	KI5083
Chemical Delivery - Pump	Wilden	P.025
Conductivity Sensor / Transmitter	Rosemount	225 / 1056
Control Enclosure	Hammond Manufacturing	EN4SD Series
Disconnect Switch	Allen-Bradley	194R
Dryer - Electric Heater	Tutco-Farnam	Flow Torch™ 800
Dryer - Fan	Cincinnati Fan	RBE
Dryer Manifold	Sani-Matic	—
Electric Heater	ASB	D4SB
Electric Heater - Body	Sani-Matic	—
Ethernet Switch	Graceport	E5
Exhaust Fan	Cincinnati Fan	LMS8
Flow Meter	Anderson-Negele	IZMAG
Flow Switch	ifm efector	SI6000
Human Machine Interface Display	Allen-Bradley	PanelView™ Plus 7 - 7" Operator Terminal
Level Transmitter - Chamber	ifm efector	PI2789
PLC	Allen-Bradley	Bulletin 1769 CompactLogix™ 5370 Controller / Bulletin 5069 CompactLogix 5380 Controller
Pressure Gauge	Anderson-Negele	EL
Pressure Transmitter	ifm efector	PI2794
Proximity Switch	ifm efector	IGT202
Pump / Motor	Ampco	DC
Pump / Motor	Waukesha	200
Pump / Motor	Fristam	FPR
Pump / Motor	Alfa Laval	LKH
Solenoid Valves	SMC	SY3000
Spray Assemblies	Sani-Matic / Spraying Systems	—
Steam Heating - Ball Valves	Triac	Series 55 / V Series
Steam Heating - Check Valve	FNW	16B-200
Steam Heating - Pressure Gauge	Ashcroft	1008S
Steam Heating - Pressure Relief Valve	Kunkle	918
Steam Heating - Shell & Tube Heat Exchanger	Enerquip	6x24 BEI
Steam Heating - Sparger	Sani-Matic	—
Steam Heating - Steam Trap	Watson McDaniel	WFT Series
Steam Heating - Strainer	Spirax Sarco	SSY
Steam Heating - Vacuum Breaker	Hoffman Specialty	Model 62
Strainer - Recirculation	Sani-Matic	Y-Strainer
Strainer - Sump (ConveyORIZED)	Sani-Matic	—
Strainer - Sump (Manual)	Sani-Matic	—
Temperature Element / Transmitter	ifm efector	TD2933

7. Equipment Description

7.1 Chamber

Each chamber model contains rotary spray assemblies mounted to the top, sides, and bottom of the chamber. The cleaning solution is delivered to the rotary sprays through the recirculation manifold. The spray assemblies provide repeatable spray coverage to the parts during all phases of the cleaning cycle (pre-rinse, chemical washes, final rinse).

Each spray assembly includes a series of threaded, flat fan spray nozzles sized to deliver the required flow and pressure to the chamber interior. The spray assemblies are fluid driven and constructed of 304ss and UHMW rotary unions. Each spray assembly is easy to remove for inspection and service.



- **Chamber construction**
 - **Installation Type:** Floor Mounted
 - **Insulation:** None
 - **Door:** Manually operated side hinged door with a Lexan polycarbonate viewing window
 - **Design:** Atmospheric
 - **Material:** 304ss wetted- and non-wetted surfaces
 - **Thickness:** 14 ga.
 - **Interior Finish:** 32 µin Ra with welds color cleaned
 - **Exterior Finish:** 32 µin Ra with welds color cleaned
- **Chamber connections and components**
 - One (1) Recirculation system supply connection
 - One (1) Sump outlet connection
 - Six (6) Rotary spray assemblies with flat fan threaded nozzles (P335 model), twelve (12) rotary spray assemblies with flat fan threaded nozzles (P365 model), and eight (8) rotary spray assemblies with flat fan threaded nozzles (P565 model)
 - Two (2) Rail assemblies for rack guidance with load side wheel stops
 - One (1) Manual perforated screen, $\frac{3}{32}$ " perforations
 - One (1) Sump level transmitter with 0-40" range and 4-20 mA output
 - One (1) Steam sparger connection for steam injection, 2" tri-clamp (See *Section 7.3 Heating System* for steam component details)
 - Two (2) Water inlet connections, 1.5" tri-clamp
 - One (1) Overflow port, 2" tri-clamp
 - Tube hangers as required, 304ss
 - One (1) 7.75" Ø Exhaust outlet with centrifugal fan (304ss construction), rated for 900 acfm at 0.25" W.C. with direct drive 0.5 HP TENV motor
 - One (1) Automated door lock with integrated proximity switch.

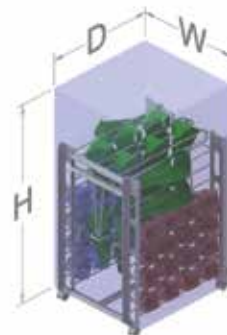
NOTE:

- Some removable chamber components (e.g., rotary spray assemblies) are constructed of pipe with mill or bead blast finish.

Usable chamber dimensions vary by model size, as shown in *Table 4: Usable Space Dimensions*. The usable space dimensions identify the practical space available for parts loading on the rack.

Table 4: Usable Space Dimensions

Chamber Model	Usable Space Dimensions			Usable Space Volume (ft ³)
	W"	D"	H"	
P335	30	35	65	39
P365	30	73	65	82
P565	56	71	54	124



Usable Space Dimensions

7.2 Recirculation System

The recirculation system draws cleaning solution from the chamber sump and distributes it to the chamber's rotary sprays. It is self-contained within the system's footprint.

• Recirculation system components

- One (1) Pneumatic butterfly valve for system draining
- One (1) 3.0" tri-clamp chemical injection port
 - ◇ Tri-clamp cap contains three (3) 0.25" FNPT ports for chemical injection
- One (1) Centrifugal supply pump
 - ◇ 316Lss wetted materials with EPDM elastomers
 - ◇ 3500 rpm, TEFC motor
- One (1) Temperature transmitter with 30-230 °F range and 4-20 mA output
- One (1) Pressure gauge with 0-100 psi range
- One (1) Sanitary piping manifold

Table 5: Pump Data

Chamber Model	HP	Pump Rating	
		gpm	psi
P335	10	200	43
P365	20	400	50
P565	15	300	45

NOTE:

- Pump rating data is based on Ampco pumps. Ratings may change for other pump manufacturers.

7.3 Heating System

Steam is injected directly into the chamber sump to heat the recirculating cleaning solution. The steam assembly contains the following components:

- One (1) Steam sparger assembly
 - **Duty:** See *Table 6: Direct Steam Injection Performance*
 - **Material:** 316ss with welds color cleaned
 - **Insulation:** None
 - **Design:** Direct steam injection
 - **Rating:** Non-ASME
 - **Connections:** Tri-clamp (sump connection), MNPT (steam connection)
- Steam supply piping manifold constructed of uninsulated SCH 40 304ss socket weld pipe and fittings
 - One (1) Pressure gauge with 0-100 psi range anti-siphon and manual block valve
 - One (1) Steam strainer with manual blow-down valve
 - One (1) On/off ball valve with pneumatic actuator
 - One (1) Check valve

Table 6: Direct Steam Injection Performance

Chamber Model	Approx. Heat-up Time 68 °F to 140 °F (min)
P335	2
P365	3
P565	3

NOTE:

- For direct steam injection, the SaniCab P Series requires a steam pressure of 50 psi or less. Installations where the plant supplied steam is more than 50 psi, a pressure reducing valve (PRV) is required (by others).

7.4 Control System

7.4.1 Control Panel

- One (1) UL Listed enclosure, NEMA 4X, 304ss construction with painted carbon steel back plate
- One (1) Allen-Bradley Bulletin 1769 CompactLogix 5380 with associated digital and analog outputs
- One (1) Disconnect switch rated for 30 Amps (P335 model) or 60 Amps (P365 and P565 models)
- One (1) 24V DC, 10 Amp power supply
- One (1) Ethernet switch (unmanaged)
- One (1) Instrument air filter
- One (1) Low air pressure alarm switches
- One (1) Air pressure regulator with gauge

7.4.2 Operator Interface

The PanelView Plus 7 Operator Terminal is mounted on the side of the control panel facing the front of the system for easy operator access.

- One (1) Allen-Bradley PanelView Plus 7 from Rockwell Automation - 7" color touchscreen, Operator Terminal
- 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:** 180 °F (Rinse & Wash Phases)

8.2 Loading and Unloading Operation

- **Loading**
 - Dirty parts are loaded onto the appropriate rack (racks sit atop a transfer cart)
 - The transfer cart is pushed from the process area to the SaniCab P Series system
 - The operator opens the SaniCab P Series door
 - The transfer cart with rack is positioned in front of the SaniCab P Series doorway and is pushed into the rail assembly inside the washer for engagement and locking
 - The transfer cart's rack engagement lock is lifted, and the rack is pushed from the transfer cart into the chamber
 - The operator disengages the empty transfer cart from the rail assembly, pulls the transfer cart away from the chamber, and closes the SaniCab P Series door
 - The operator selects the appropriate cleaning cycle, also known as recipes, from the HMI operator terminal
- **Unloading**
 - The operator opens the SaniCab P Series door at the completion of the cleaning cycle (cleaning cycle completion is indicated on the HMI)
 - An empty transfer cart is positioned in front of the SaniCab P Series door and is pushed into the rail assembly inside the washer for engagement and locking
 - The process parts rack is pulled from the chamber onto the transfer cart
 - The operator disengages the transfer cart from the rail assembly, pulls the transfer cart away from the chamber, and closes the door
 - The transfer cart is pushed from the SaniCab P Series system to the process area
 - Clean process parts are unloaded off the rack

8.3 Cleaning Cycle

The following is an example of a typical SaniCab P Series cleaning cycle with two (2) chemical wash steps. Water fill and drain steps are performed between each rinse or wash phase.

- Rinse
- Caustic Wash
- Rinse
- Acid Wash
- Rinse
- Final Rinse (Sanitizer Injection Optional)
- Heated Drying (Requires **Dryer System - Electric** option)
- Cooling (Requires **Dryer System - Electric** option)

When the dryer system is not selected, the heated drying and cooling phases are replaced with an exhaust phase that removes water vapor and humidity from the chamber after the final rinse phase. All cleaning steps are set up as individual operation codes (Opcodes) enabling full customization of cleaning cycles.

A typical cleaning cycle duration (without heated drying) is between 10 and 30 minutes. A heated drying phase typically adds an additional 10 and 30 minutes to the cleaning cycle duration. The cleaning cycle time required is dependent on many user-defined variables unique to each application, including soil conditions, required number of wash and rinse phases, available utilities, recirculated heating selection, drying requirements, and more.

As standard, the final rinse water is not followed by a drain step to reduce water usage by reusing the water for the next cleaning cycle's first rinse. This water saving step is not recommended for systems with a dryer or when there are concerns of cross-contamination (e.g., allergens) between cleaning cycles.

8.4 System Automation

The system comes with an Allen-Bradley controls package including a programmable logic controller (PLC) and HMI run on Rockwell Automation FactoryTalk® View Machine Edition (ME) software. The programmable controller provides Ethernet communication protocol. Programming of the PLC and screen development of the HMI is completed and tested prior to shipment. Recipe steps are automated by the programmable controller.

The HMI panel is provided with three (3) levels of security. Each security level has varying levels of system control and screen access. Fifty (50) unique user logins are available.

The standard option for the PLC allows up to fifty (50) different user-definable recipes. The system is capable of up to ninety-six (96) unique Opcodes. The system programming will include adjustable high and low alarms for all measured process values.

An operator will have the ability to initiate, monitor and edit (security-level dependent) the recipes via the HMI operator terminal. Opcodes are set up for all typical cleaning cycle steps.

8.5 Automation Interfaces

The standard system reserves for two (2) digital output signals for water fill, as well as three (3) digital output signals for chemical addition. The signals are used to activate external equipment (e.g., water fill valve, solenoid for chemical pump) for water fill and chemical addition cycle steps. The control system monitors and alarms these incoming utilities as required. 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 12.2.7 System Automation* for additional information).

8.6 Reporting

The standard control system can provide access to the process data via Ethernet and/or Serial link for reporting and archiving of the cleaning processes. Tags are available through PLC Ethernet / Serial communications.

The following is a subset of the cleaning cycle data available for reporting and archiving:

- Recipe Name
- Operator Login Information
- Date
- Cycle Start and Stop Time
- Cycle Aborted (Yes / No)
- Chemical Phase Parameters
 - Time
 - Temperature (if applicable)
 - Conductivity (if applicable)
- Alarms
 - Description
 - Event Time

NOTE:

- Electronic data is provided for report generation by others.

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 and maintenance manuals
- Recommended Spare Parts (RSP) list
- Mechanical Bill of Materials (BOM)
- Component vendor documentation
- As-built General Assembly (GA) drawings
- As-built Process and Instrumentation Diagram (P&ID)
- As-built electrical drawings

10. Product Options

The following are selectable product options within the SaniCab P Series Configured Design Offering.

10.1 System Configuration

The **Left Handed** configuration can be selected orienting the HMI interface, controls, and main external components on the left when viewing the system from the load side. This layout is a mirror image of what is shown in *Section 5 Physical Size and Layout*.

10.2 Dryer System

The addition of the **Dryer System – Electric** option allows for heated drying and cooling phases to be included at the end of the cleaning cycle. These phases significantly reduce the amount of residual final rinse water on the parts and rack within the chamber prior to unloading the rack onto a transfer cart.

The dryer skid is a loose ship, stand-alone skid. Air is pulled from the surrounding area where the dryer skid is installed and is discharged through the existing exhaust fan on the chamber.

The following components and necessary controls are added to the system when selecting the dryer:

- Dryer Skid
 - **Components**
 - ◇ One (1) Centrifugal fan
 - 900 acfm at 7" W.C.
 - Direct Drive
 - 3 HP TEFC Motor
 - 304ss construction
 - ◇ One (1) Inline electric heater
 - 45 kW
 - 460V AC, 3PH, 60Hz
 - High temperature thermocouple
 - ◇ 304ss supply ducting with EPDM gasketing
 - ◇ One (1) Temperature transmitter with 30-230 °F range and 4-20 mA output
 - **Framework**
 - ◇ **Design:** Open frame
 - ◇ **Material:** 304ss angle
 - ◇ **Surface Finish:** Bead blast
 - ◇ Fully welded, single piece construction
 - ◇ Four (4) Adjustable feet for locating the equipment at a fixed location in the facility. The adjustability allows the equipment to be leveled on uneven or sloped surfaces.
- Chamber Additions
 - P335 Model: Two (2) 6.0" Ø, 304ss external dryer supply manifolds, supplying four (4) 4.0" Ø, 304ss internal dryer supply manifolds
 - P365 and P565 Models: Three (3) 6.0" Ø, 304ss external dryer supply manifolds, supplying six (6) 3.0" Ø, 304ss internal dryer supply manifolds
 - The internal dryer manifolds contain sanitary pullouts along the length of the manifold to evenly distribute air throughout the chamber
- Electrical Components
 - One (1) Disconnect switch rated for 100 Amps
 - One (1) 3 HP motor starter for the dryer supply fan
 - One (1) Contactor for dryer electric heaters
 - One (1) Controller for dryer electric heater
- Loose Ship Components
 - Up to three (3) 25' lengths of 6.0" Ø flexible thermoplastic rubber tubing
 - Up to six (6) 304ss worm-drive clamps
 - Installation of tubing and clamps for connection from dryer skid to SaniCab system is provided by others

Table 7: Dryer Data

Chamber Model	Dryer Skid Dimensions			Dryer Chamber Addition Weight (lbs)	Electrical - Dryer	Dryer Air - Supply			
	W"	D"	H"		Disconnect Size @ 460V AC (amps)	Connection Size / Type	Volume (acfm)	Temperature (°F)	Humidity (% RH)
P335	28	47	76	206	100	N/A	900	68	70
P365	28	47	86	340	100	N/A	900	68	70
P565	28	47	86	335	100	N/A	900	68	70

NOTE:

- Exhaust utilities are shown in *Table 1: Utility Requirements*.
- All dryer system options add up to 7" in height to the overall SaniCab P Series system dimensions (see *Table 2: System Size*).
- The loose ship dryer skid weight is 575 lbs. The dryer chamber addition weights are to be added to the System Weights (see *Table 2: System Size*).
- The electrical supply requirement listed above is separate from, and in addition to, the main controls disconnect. Interconnecting controls wiring between the dryer skid panel and the SaniCab P Series control panel is provided by Sani-Matic but requires re-installation in field.

10.3 Recirculated Heating

There are three (3) options for changing the design of the base system's method of heating the recirculation system's cleaning solution:

- **Heat Exchanger – Steam**
- **Electric Heater to Maintain Temperature**
- **No Recirculated Heating**

The **Heat Exchanger – Steam** option removes the direct steam injection assembly in the standard system and replaces it with a shell and tube heat exchanger system for heating of the recirculation system.

- Steam Piping Design
 - **Material:** Carbon Steel SCH 80 pipe
 - **Weld Finish:** High-temperature black painted welds and pipe (carbon steel pipe)

The following components are added:

- One (1) Steam heat exchanger with the following specifications:
 - **Duty:** See *Table 8: Steam Heat Exchanger Data*
 - **Material:** 316Lss wetted surfaces / 304ss non-wetted surfaces
 - **Design:** Shell & tube
 - **Rating:** ASME
 - **Connections:** Tri-clamp (sanitary) / NPT (non-sanitary)
- One (1) Condensate return piping manifold constructed of non-insulated SCH 80 carbon steel socket weld pipe and fittings
 - One (1) Y-strainer with blow-off valve
 - One (1) Pressure gauge with 0-100 psi range, anti-siphon, and manual block valve
 - One (1) Modulating control ball valve with pneumatic actuator and positioner
 - One (1) Pressure relief valve (set at 125 psi) piped to the floor
 - One (1) Vacuum breaker with brass construction
- One (1) Condensate return piping manifold constructed of non-insulated SCH 80 carbon steel socket weld pipe and fittings
 - One (1) Manual ball valve for condensate drain
 - One (1) Float and thermostatic steam trap

Table 8: Steam Heat Exchanger Data

Chamber Model	Skid Dimensions			Approx. Heat-up Time 68 °F to 140 °F (min)	Connection Size / Type (Steam Supply)	Connection Size / Type (Condensate Return)	Load (lbs/hr)
	W"	D"	H"				
P335	20	50	70	3	2" FLG	1.5" FLG	966
P365	20	50	70	6	2" FLG	1.5" FLG	966
P565	20	50	70	5	2" FLG	1.5" FLG	966

NOTE:

- 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) installed (by others).

The **Electric Heater to Maintain Temperature** option removes the direct steam injection assembly from the standard system and replaces it with an electric immersion heater within the recirculation system. The heater is sized to maintain temperature of a cleaning cycle step – as such, the incoming water temperature should be equal to or greater than the highest desired cleaning cycle water temperature required. The following components are added:

- One (1) Hygienic heater housing assembly
- One (1) Inline electric immersion heater
 - **Duty:** Temperature maintenance only
 - **Material:** 316Lss (wetted)
 - **Connections:** Tri-clamp
 - **Size:** See *Table 9: Electric Heater Data*
 - **Protection:** High temperature thermocouple

Table 9: Electric Heater Data

Chamber Model	Electric Heater Size (kW)
P335	9
P365	18
P565	22

NOTE:

- Maximum maintenance temperature is 140 °F for the P335 model and 160 °F for the P365 and P565 models based on ambient (68 °F) room temperature.
- Typical temperature drop of incoming water is 20 °F due to required heating of cabinet, rack and parts. The electric heater will take approximately 5 minutes per cleaning cycle step to recuperate this initial heat loss.

The **No Recirculated Heating** option removes the direct steam injection assembly from the standard system. The recirculation system temperature transmitter is also removed. No cleaning cycle temperature control or monitoring capabilities are included in the system with this option.

10.4 Pump Type

These options replace the standard Ampco recirculation pump with a different manufacturer.

- **Waukesha**
- **Fristam**
- **Alfa Laval**

10.5 Motor Type

These options replace the recirculation pump's standard TEFC motor with an upgraded rating.

- **Washdown Duty**
- **Stainless Steel Washdown**

10.6 Supply Pressure Monitoring

The **Pressure Transmitter** option replaces the pressure gauge in the recirculation system with a diaphragm type pressure transmitter with local indication. The pressure transmitter has a 0-100 psi range and 4-20 mA output. This option adds system monitoring and alarming capabilities for the recirculation system pressure.

10.7 Supply Flow Monitoring

The **Flow Switch** option adds an insertion probe style flow switch to the recirculation system. The flow switch has a discrete output. This option adds system monitoring and alarming capabilities for the recirculation system flow, based on the discrete output.

The **Flow Meter** option adds a magnetic flow meter with local indication to the recirculation system. The flow meter has a 0-300 gpm range on the P335 model, 0-800 gpm on the P365 and P565 models, and 4-20 mA output. This option adds system monitoring and alarming capabilities for the recirculation system flow.

10.8 Chemical Control

The **Wash Conductivity Control** option allows any chemical wash phase of the cleaning cycle to be controlled, monitored and alarmed with conductivity. This allows for higher control of wash cycle chemical concentration. The option adds the following components to the system:

- Recirculation System
 - One (1) Toroidal conductivity sensor with 0-100 mS/cm range
- Control System
 - One (1) Conductivity analyzer – single channel with a 4-20 mA output (mounted in the face of the control panel)

NOTE:

- The **Wash Conductivity Control** option is required when selecting the **2-Pen Chart Recorder, Temperature & Conductivity Recording** reporting option.
- When the **Wash Conductivity Control** option is selected along with the **SaniTrend™ Data Acquisition & Data Management System** option, the reporting feature can record conductivity of wash cycles.
- Conductivity control is used for chemicals that can register a controllable conductivity value (e.g., caustic, acids). Chemicals or conditions that are unable to register and control a conductivity value (e.g., sanitizers, low conductivity acids used with high conductivity water) will use timed chemical injection.

10.9 Controls

The **Allen-Bradley CompactLogix 5380 Controller** option replaces the standard **Allen-Bradley CompactLogix 5370 Controller** and its I/O modules with an Allen-Bradley Bulletin 5069 CompactLogix 5380 Controller and corresponding I/O modules.

10.10 Reporting

Three (3) reporting options are available for recording the critical cleaning cycle parameters of the SaniCab P Series:

- **1-Pen Chart Recorder, Temperature Recording**
- **2-Pen Chart Recorder, Temperature & Conductivity Recording**
- **SaniTrend Data Acquisition and Management System**

Chart recorders utilize circular paper charts to record selected cleaning parameters of the SaniCab P Series over a 24-hour period.

- **1-Pen Chart Recorder, Temperature Recording**
 - A 1-Pen chart recorder for recording temperature is mounted to the system
- **2-Pen Chart Recorder, Temperature & Conductivity Recording**
 - A 2-Pen chart recorder for recording temperature and conductivity is mounted to the system

NOTE:

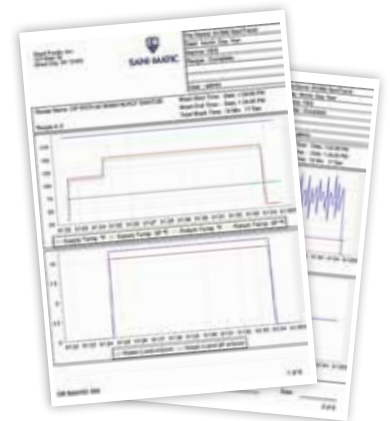
- The **1-Pen Chart Recorder, Temperature Recording** option is not available with the **No Recirculated Heating** option.
- The **2-Pen Chart Recorder, Temperature & Conductivity Recording** is not available with the **No Recirculated Heating** option and requires the **Wash Conductivity Control** option.

The **SaniTrend Data Acquisition and Management System** reporting option provides a means of storing, retrieving and printing the SaniCab P Series cleaning cycle data with a desktop PC.

The PC-based **SaniTrend Data Acquisition and Management System** 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.



Sample SaniTrend Printout

NOTE:

- The **SaniTrend Data Acquisition and Management System** will only capture the data available from the selected system configuration.

10.11 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

10.12 Water Addition

The water addition options (**Dual Water Ports with (1) Pneumatic Valve** and **Dual Water Ports with (2) Pneumatic Valves**) add one (1) or two (2) 1.5" tri-clamp pneumatically actuated ball valve(s) to the chamber water inlet ports for automatic water feed control.

10.13 Chemical Addition

The **Triple Chemical Ports with (1) Chemical Delivery Skid** option adds one (1) chemical addition assembly skid, which dispenses chemical into the chamber as required by the cleaning cycle. The assembly includes:

- Chemical Delivery Skid
 - Framework
 - ◇ **Design:** Open frame
 - ◇ **Material:** 304ss angle
 - ◇ **Surface Finish:** Bead blast
 - ◇ Fully welded single piece construction
 - ◇ Four (4) Adjustable feet for locating the equipment at a fixed location in the facility. The adjustability allows the equipment to be leveled on uneven or sloped surfaces.
 - One (1) 15-gallon chemical container
 - One (1) PVC suction lance with foot valve for placement into the chemical container
 - One (1) Low level, adjustable height proximity switch with discrete output
 - 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) Manual bleed valve to aid in priming the pump
- Loose Ship Components
 - Thirty (30) Feet of 0.5" polyethylene tubing for chemical supply
 - One (1) 0.25" check valve installed at the chemical injection port



Single Chemical Delivery Skid

The **Triple Chemical Ports with (2) Chemical Delivery Skids** option adds a second chemical addition delivery system as described above. The **Triple Chemical Ports with (3) Chemical Delivery Skids** option adds a third chemical addition delivery system as described above.

NOTE:

- All chemical delivery skids are to be mounted within thirty (30) feet of the SaniCab P Series chemical injection ports. Installation of the loose ship pneumatics and wiring between the cabinet washer and the chemical delivery skid, as well as chemical skid location and installation, is by others.

10.14 Chamber Straining

The **Automated Conveyorized Mesh Screen** option replaces the manual perforated screen tray strainer with a conveyorized strainer to the sump of the washer. This option is used for applications with large soil loads that do not dissolve in the initial rinse water. The soils are rinsed off the parts during the first rinse phase of the cleaning cycle and automatically conveyed out of the chamber. The following major components make up the strainer:

- Mesh strainer screen (1000 micron Mesh size)
- 304ss strainer cover / guard with EPDM flap
- 1/3 HP painted steel gear drive

See *Section 12.2.4 Conveyorized Strainer Catch Pan* for an accessory to catch soils from the automated strainer. Customer supplied waste totes can also be used to catch accumulated soils. The maximum particulate height is 1 1/8" due to external opening gap.



Automated Conveyorized Mesh Screen - Outside View

10.15 Recirculated Straining

The **Y-Strainer – Wedgewire Element** recirculated straining option adds an additional level of straining that further protects the recirculation system's rotary spray hubs and spray nozzles from excessive soil loading. The following components are added to the recirculation line downstream of the pump outlet:

- One (1) Y-Strainer body with tri-clamp connections
- One (1) Strainer Insert (0.010" wedgewire)
- One (1) Pressure gauge with 0-100 psi range
 - The pressure gauge is added so that the system contains two (2) pressure measurement indicators; one upstream and one downstream of the Y-Strainer. This allows for monitoring of the soil loading of the Y-Strainer through the differential pressure.

10.16 Distribution Zones

The **Chamber Rotary Sprays & Active Coupler** option adds an active coupler distribution zone to the cabinet washer supply.

This zone, when combined with an active rack, allows for cleaning of hard-to-access areas of container-like parts (e.g., jugs with narrow openings), the insides of long narrow parts (e.g., hoses), and other complex parts. The following components are added to the system:

- Two (2) Pneumatic butterfly valves for zoning of the chamber sprays and the active coupler
- One (1) Active coupler, spring-loaded
- Associated process piping
- System automation for added zone valves



11. Racks and Transfer Carts

The following are detailed descriptions of the SaniCab P Series general, standard, and custom racks and transfer carts.

11.1 Racks

This section contains information on three different rack design tiers: general, standard, and custom racks.

Racks are used within the SaniCab P Series chamber to hold the process parts to be washed. The rack's support framework is manufactured of 304ss with a bead blast finish. The racks are manually rolled on wheels from a transfer cart to the cabinet chamber.

All custom rack development requires 3D part models of all parts. Two (2) different 3D modeling service options are provided in *Section 12* for developing process part 3D models. The detailed design of the custom racks and finalized pricing occurs after end-user part loading constraints are established and all process parts are 3D modeled. Racks are designed to fit certain SaniCab P Series model(s) as shown in *Sections 11.1.1 through 11.1.3*.

Table 10: Rack Use with Chamber Models

Rack Name	Applicable Chamber Models		
	P335	P365	P565
P335 Rack (General, Standard, or Custom)	x	x	
P365 Rack (General, Standard, or Custom)		x	
P565 Rack (General, Standard, or Custom)			x

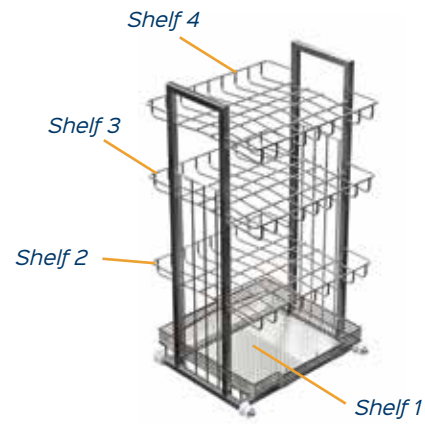
NOTE:

- Racks listed in *Section 11.1.3 Custom Racks* are to be used as budgetary placeholders until the custom rack design is finalized and approved.

11.1.1 General Racks

Table 11: P335/P365 General Racks

Rack Name	Description	Part Number
<p>General 4-Shelf Rack</p>	<p>A General Rack designed with four (4) shelves to hold miscellaneous parts.</p> <ul style="list-style-type: none"> • Shelf 1 <ul style="list-style-type: none"> - Construction: Sheet, 1/4" perforated - Part Usable Space: 30" W x 29" D x 14" H • Shelf 2 <ul style="list-style-type: none"> - Construction: Round Bar, 4" Spacing on Depth - Part Usable Space: 30" W x 32" D x 18" H • Shelf 3 <ul style="list-style-type: none"> - Construction: Round Bar, 4" Spacing on Depth - Part Usable Space: 30" W x 32" D x 14" H • Shelf 4 <ul style="list-style-type: none"> - Construction: Round Bar, 4" Spacing on Depth - Part Usable Space: 30" W x 32" D x 8" H <p>• One (1) rack fits in the P335 and two (2) racks fit in the P365</p>	<p>288521</p>



NOTE:

- The general rack is not customized to specific part requirements. Drainability and cleaning performance of racks may be inhibited by variable loading conditions. The rack is typically used for non-process contact parts such as tools, clamps, or other items where repeatable cleaning is not critical.

11.1.2 Standard Racks

Standard rack designs accommodate common clean-out-of-place process parts such as weigh scale buckets (manufacturer and model specific), 3- and 5-gallon buckets, pallets, small and large totes, trays, and buggies.

Standard racks are available for use with the SaniCab P Series P335 and P365 chamber models (one (1) rack fits in the P335 and two (2) racks fit in the P365), as well as the P565, see *Section 11.1, Table 10: Rack Use with Chamber Models* for clarification.

Table 12: P335/P365 Standard Racks



Rack Name	Description	Part Number
<p>Buggy Standard Active Rack</p>	<p>A Standard Rack designed to hold an inverted Buggy. The Buggy Inverter accessory is required to invert the buggy from the ground onto this rack. This is an Active Rack that is equipped with one (1) TANKO® S rotary spray device that sits inside the inverted buggy for direct and thorough spray into the primary product contact areas of the buggy. This Active Rack requires the Active Coupler connection option on the SaniCab P Series system.</p> <ul style="list-style-type: none"> • Holds qty. one (1) buggy (200 to 600 lb capacities) • Approx. Buggy Size Requirements: <ul style="list-style-type: none"> - Length: 11" to 31" - Width: 26" - Depth: 26" <p>NOTE:</p> <ul style="list-style-type: none"> • The P335 Buggy Standard Active Rack can be used in a SaniCab P365 with an Active Coupler along with a P335 non-active rack, as long as the Buggy Standard Active Rack is loaded into the washer before the P335 non-active rack. Two (2) P335 Buggy Standard Active Racks cannot operate in a P365 at the same time. 	 <p>294094</p>
<p>3- and 5-Gallon Bucket Standard Rack</p>	<p>A Standard Rack designed to hold 3- or 5-gallon buckets. A combination of each size can be loaded and cleaned in the same cleaning cycle.</p> <ul style="list-style-type: none"> • Holds qty. twenty-four (24) of 3- or 5-gallon buckets and twenty-four (24) lids • 3-gallon bucket size requirements: <ul style="list-style-type: none"> - Bottom Diameter Range: 6" to 11" - Top Diameter Range: 7" to 12 1/2" - Height Range: 9 1/2" to 10 3/4" • 5-gallon bucket size requirements: <ul style="list-style-type: none"> - Bottom Diameter Range: 9 1/2" to 11" - Top Diameter Range: 11 1/2" to 12 1/2" - Height Range: 14 1/8" to 15 1/16" • Lid Size Requirements: <ul style="list-style-type: none"> - Diameter Range: 8 5/8" to 12 3/4" - Width Maximum: 1 3/8" 	 <p>293857</p>

Table 12: P335/P365 Standard Racks

Rack Name	Description	Part Number
<p>MULTIPOND Series 1000 Weigh Hopper Standard Rack</p>	<p>A Standard Rack designed to hold MULTIPOND Radial Combination Weigher tooling. This rack is designed for the pre-feed and weigh hoppers.</p> <ul style="list-style-type: none"> • For use with MULTIPOND Radial Combination Weigher Series 1000 • Holds up to qty. 35 pre-feed hoppers • Holds up to qty. 35 weigh hoppers 	<p>293704</p>
<p>Small and Medium Tote Standard Rack</p>	<p>A Standard Rack designed to hold small to medium sized totes. A combination of each size can be loaded and cleaned in the same cleaning cycle.</p> <ul style="list-style-type: none"> • Holds qty. eight (8) totes • Tote Size Requirements: <ul style="list-style-type: none"> - Length Range: 20 7/8" to 26" - Width Range: 12 3/4" to 18" - Depth: 6" 	<p>293143</p>
<p>Large Tote Standard Rack</p>	<p>A Standard Rack designed to hold large size totes.</p> <ul style="list-style-type: none"> • Holds qty. eight (8) totes • Tote Size Requirements: <ul style="list-style-type: none"> - Length: 26" - Width: 18" - Depth: 15" 	<p>293753</p>

Table 13: P565 Standard Racks

Rack Name	Description	Part Number
<p>Pallet Standard Rack</p>	<p>A Standard Rack designed to hold shipping pallets.</p> <ul style="list-style-type: none"> • Holds qty. seven (7) standard size pallets • Standard Size Pallet Requirements: <ul style="list-style-type: none"> - Up to 48" Length x 48" Width - Up to 6" Height • Pallet Weight = 50 lbs (max) each 	<p>293952</p>
<p>Tray Standard Rack</p>	<p>A Standard Rack designed to hold trays (e.g., bakery trays, freeze dry trays, etc).</p> <ul style="list-style-type: none"> • Holds qty. eighty (80) trays • Adjustable and removable bar contains trays and accommodates different tray lengths • Standard Tray Size Requirements: <ul style="list-style-type: none"> - Outside Length Range: 25" to 28 1/4" - Width Range: 18" to 22 1/2" - Depth Range: 1" to 1 5/8" 	<p>293990</p>

NOTE:

- Standard racks are designed to fit common process part dimensions, as defined in the descriptions above. For custom solutions to accommodate similar process parts with minor alterations or for a fully engineered custom solution, see *Section 11.1.3 Custom Racks*.

11.1.3 Custom Racks

Custom racks follow three design tiers:

- **Customization - Standard Rack.** Custom alterations accommodate slight part model differences to ensure parts fit within the Standard Design racks.
- **Custom Rack.** Custom-designed Racks are engineered and designed to hold a specific list of varied customer parts.
- **Custom Active Rack.** Custom-designed Active Racks are engineered and designed to hold a specific list of varied customer parts. These Active Racks have a receiver that automatically engages with a SaniCab P Series chamber that has the Active Coupler option. The Active Rack is piped with sanitary 304ss tubing and fittings that supplies cleaning solutions to parts with hard to reach or recessed surface areas. Depending on the parts and soils, active racks can utilize a combination of static spray balls, static spray nozzles, rotary sprays, and/or flow through connections (e.g., direct flow through hoses).

Custom-designed racks are engineered and designed with final detailed drawings being sent to the customer for approval before fabrication.

The list of custom racks available are as follows:

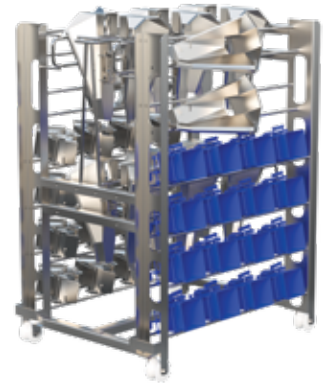
- **P335 Weigher Feed Tray Custom Rack (Budgetary)**
 - This rack is custom designed to hold varying size and quantities of weigh scale system feed trays.
- **P335 Custom Rack (Budgetary)**
- **P365 Custom Rack (Budgetary)**
- **P565 Custom Rack (Budgetary)**
- **P335 Custom Active Rack (Budgetary)**
- **P365 Custom Active Rack (Budgetary)**
- **P565 Custom Active Rack (Budgetary)**

When designing Custom Racks or Custom Active Racks, **Heavy Duty Wheels** are required when rack and part load weight exceed 400 lbs.

As with the General and Standard Racks, Custom Racks are designed to fit specific SaniCab P Series model(s), see *Section 11, Table 10: Rack Use with Chamber Models*.

NOTE:

- Custom Racks and Custom Active Racks are priced as budgetary until the custom rack design is finalized and approved.
- Two (2) P335 racks can fit into a P365 chamber model – each rack requires a transfer cart. Only one (1) P335 Active Rack can be used in a P365 chamber at one time.
- 3D part models are required for the design of a custom rack.
- The type and quantity of parts that each custom rack can hold is finalized during detailed rack design.



P335 Custom Rack



P335 Custom Active Rack



P335 Weigh Feed Tray Custom Rack



P565 Custom Active Rack

11.2 Transfer Carts

Transfer carts hold and transfer racks into and out of the chamber, as well as transport the racks between the SaniCab P Series and process equipment in other areas of the facility.

Three (3) transfer cart sizes are available for use with the SaniCab P Series cabinet washer:

- **Transfer Cart – P335**
- **Transfer Cart – P365**
- **Transfer Cart – P565**

Each transfer cart is designed to hold one (1) rack of the same size (e.g., one (1) **Transfer Cart – P335** will hold one (1) P335 rack).



Transfer Cart - P335



Transfer Cart - P565

Table 14: Transfer Cart Data

Transfer Cart Name	Cart Dimensions			Loading Rail Height (in)
	W"	D"	H"	
Transfer Cart - P335	32	56	44	17
Transfer Cart - P365	32	94	44	17
Transfer Cart - P565	41	94	44	17

The transfer carts are manufactured of open frame, 304ss angle, and solid bar with a bead blast finish. Carts are supported by two (2) straight and two (2) locking swivel casters of solid polyurethane material. The carts have safety locking features to secure the rack on the transfer cart during transport and lock the cart into the SaniCab P Series during rack loading and unloading.

12. Accessories

The following are detailed descriptions of the accessories available to accompany the SaniCab P Series cabinet washer.

The accessories are separated into three categories – racks, system additions, and services and documentation.

12.1 Accessory Category - Racks

The Racks category of accessories contains information on rack passivation and part modeling services.

All custom rack development requires 3D part models of all parts. Two (2) different 3D modeling service options are provided in this section for developing process part 3D models. The detailed design of the custom racks and finalized pricing occurs after end-user part loading constraints are established and all process parts are 3D modeled. The cost difference between the budgetary value and finalized custom design, if applicable, is adjusted during the project.

12.1.1 Passivation - Rack

Sani-Matic will provide passivation of all surfaces of the selected rack. A certificate of passivation is provided upon completion.

12.1.2 Part 3D Modeling - Design Cost (per Part)

This service is for generating a 3D model of each unique customer part to be cleaned on a rack. The modeling will allow specific design elements to be incorporated into the rack and allow for repeatable part placement on the rack. The modeling will take place at Sani-Matic's facility. This requires customers to provide drawings or to ship process parts. Shipping the components to and from Sani-Matic will be at the customer's expense. Identical process parts will only require one (1) modeling fee.

NOTE:

- If 3D model files are available or Sani-Matic already has the applicable part model, this design cost is waived.
- Parts either need to be shipped to Sani-Matic's facility (preferred) or detailed drawings and pictures sent electronically. If only pictures with rough dimensions are received, rack fit-up for the parts is not ensured by Sani-Matic.

12.1.3 Part 3D Modeling - Trip (Budgetary)

This service sends a Sani-Matic design engineer to the customer location to perform the 3D modeling described in *Section 12.1.2 Part 3D Modeling - Design Cost (per Part)*. Modeling at the customer's facility reduces the amount of time that the parts are unavailable for production. Generally, three components can be modeled per hour. The number of components that can be modeled in the allotted time varies dependent on component complexity and availability to the technician. This option is a budgetary value based on the provision of one (1) Sani-Matic design engineer for two (2) ten-hour days, sixteen (16) hours of travel, and four (4) days of expenses.

NOTE:

- If selecting this accessory, the per part cost described in *Section 12.1.2 Part 3D Modeling - Design Cost (per Part)* does not apply.
- The final invoice is based on the actual hours and expenses with the expenses invoiced at Sani-Matic's cost.

12.2 Accessory Category - System Additions

The System Additions accessories can be added to any SaniCab P Series Configured Design Offering system configuration.

12.2.1 Passivation - System

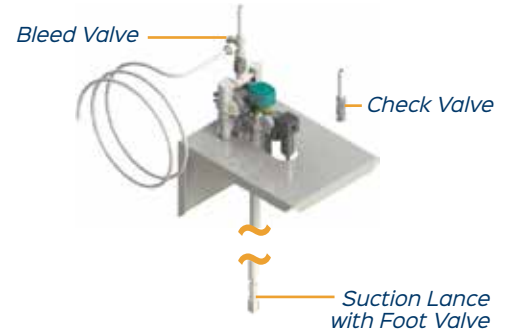
Sani-Matic will provide factory passivation of all solution contact surfaces on the system. The citric acid passivation is performed and documented per Sani-Matic's standard procedure (SOP-MA005), which adheres to ASTM A967-05 requirements. A certificate of passivation (SMI-LOG-007) is provided upon completion.

12.2.2 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 SaniCab cabinet washer's chemical injection port(s). The 24V DC outputs described in *Section 8.5 Automation Interfaces* are to be used with the chemical pump assembly's 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 in 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



12.2.3 Spray Gun Assembly

The spray gun assembly is used to manually pre-rinse heavy soils off parts prior to being loaded into the SaniCab. The following components are shipped loose for installation by others:

- One (1) Spray Gun Assembly
- One (1) Water inlet connection assembly; 1.5" tri-clamp reduced to a ½" FNPT manual ball valve
- One (1) 40' long hose with MNPT swivel connections on each end
- One (1) Quick connect adapter for hose connection to spray gun
- One (1) Hose rack

12.2.4 Conveyorized Strainer Catch Pan

The Conveyorized Strainer Catch Pan is attached to the conveyorized strainer outlet and is intended to catch the solids that are automatically strained from the SaniCab P Series. The catch pan is fabricated of 304ss with welds color cleaned and holds approximately 0.6 cubic feet of soils.



NOTE:

- This accessory requires the **Automated Conveyorized Mesh Screen** recirculated straining option.

12.2.5 Exhaust Ducting Components

Exhaust ducting components are utilized to connect the exhaust fan outlet of the chamber, transition to 12" Ø round ducting, and direct exhaust air to a suitable location (e.g., through a roof penetration). The components are loose shipped and installed by others.

Table 15: Exhaust Ducting Accessories

Accessory Name	Informational Data			
	L x W / Diameter	Length	Bend Radius	Description of Use
Exhaust Ducting - Transition (5" x 8.5" to 12" Ø)	5" x 8.5" to 12" Ø	12.269"	N/A	Connect exhaust fan outlet to round ducting
Exhaust Ducting - Elbow (90°)	12" Ø	N/A	18.0675"	90° transitions
Exhaust Ducting - Elbow (45°)	12" Ø	N/A	14.5"	45° transitions
Exhaust Ducting - Straight (5')	12" Ø	5'	N/A	Straight run for round ducting
Exhaust Ducting - Seal Kit (5" x 8.5")	N/A	N/A	N/A	Gasket (EPDM) and hardware for fan outlet connections
Exhaust Ducting - Seal Kit (12" Ø)	N/A	N/A	N/A	Gasket (EPDM) and hardware for all round ducting connections

NOTE:

- All SaniCab P Series exhaust fan connections are 5" x 8.5".

12.2.6 Buggy Inverter

The Buggy Inverter accessory allows buggies to be inverted and placed onto the P335 Buggy Standard Active Rack when it is loaded onto a transfer cart for transport to the SaniCab P Series system for automated, thorough cleaning. After being cleaned and unloaded from the cabinet, the Buggy Inverter reverts the buggy from the rack back onto the ground. The Buggy Inverter is a loose ship, standalone skid with the following specifications:

- Framework
 - **Material:** 304ss
 - **Surface Finish:** Bead blast
 - **Maximum Buggy Weight:** 110 lbs
 - **Footprint Dimensions:** 70" W x 70" L x 90" H
 - **Foot Pad Dimensions:** 17" L x 23" W
 - Allow for at least 6-feet clearance in front of the Buggy Inverter for Transfer Cart engagement with the system, along with at least 2-feet clearance behind the Buggy Inverter for Buggy engagement with the system
 - Right-hand or left-hand dump side design available
 - Stationary design with fixed base to reduce occupied floor space
 - Flexible buggy height coupling allows inversion of various sizes
- Operation
 - The transfer cart's alignment is assisted by a floor-mounted angle iron rail that includes a 0.75" pin for locking the cart in place.
 - The cart is locked into place with the inverter. The buggy is then inverted and rested upon the rack that is atop the transfer cart. Once the cart is safely positioned on the transfer cart, the operator releases the cart.
 - The buggy receiver stays in position waiting for the cart and buggy's return after the completed wash cycle.
 - The buggy receiver rotates 180° with position monitoring limit switches.
- Electrical Controls
 - Drive
 - ◇ 460 V AC, 3PH, 60 Hz, 2 HP, TEFC drive motor with electric brake
 - Receiver Rotation
 - ◇ Column Lift has a cycle time of approximately 45-60 seconds
 - Controls
 - ◇ NEMA 4X, 304ss enclosure with sloped top
 - ◇ Raise/off/lower 3-position spring-centered switch for operator safety
 - ◇ Two hand, pushbutton control for operator safety, ensuring both hands will be away from the mechanical part of the machine during operation
 - ◇ Banner TL50BL stacking light assembly with mounting bracket, pipe cover, and pipe standoff

12.2.7 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 system automation requests can be added before system development. Defined custom requirements to be supplied during the detailed design of the project.

- **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 text-based screen would be an operator prompt for manual intervention.
 - An example of a graphics-based screen would be a P&ID depicting equipment external to the washer.
- **Additional HMI Security Levels.** The system automation will have the number of security levels increased from three (3) levels to five (5) levels allowing a greater range of security login groups.
- **Additional External Control Operation.** The system automation will have an additional external control added (e.g., external exhaust fans, additional utility valves).
- **Active Directory User Authentication.** The standard security levels and user logins will be replaced with active directory control of user authentication from the facility's domain controller.

12.3 Accessory Category - Services & Documentation

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

All pricing 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 on-site and travel time) and with expenses invoiced at Sani-Matic costs. To minimize the time spent on-site 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.

NOTE:

- For the field service assistance accessories (see *Sections 12.3.1 through 12.3.3*), the final invoice is based on the actual hours and expenses with expenses invoiced at Sani-Matic costs.

12.3.1 Installation Supervision (Budgetary)

An on-site Sani-Matic technician assists with equipment installation, to ensure the equipment is reassembled properly and verified, leveled, and the correct utilities are 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 on-site activities are billed accordingly.

12.3.2 Start-up and Training (Budgetary)

A Sani-Matic technician will be on-site and can assist in start-up and training activities. The technician will assist with general start-up procedures, and training activities can include operational and HMI training of operators, engineers, and/or maintenance technicians.

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 on-site activities will be billed accordingly.

12.3.3 Preventive Maintenance (PM) Program (Budgetary)

The goal of Sani-Matic's Preventive Maintenance (PM) Program is to make sure that the equipment and operators are running efficiently and to reduce time lost due to unexpected equipment failures. The one (1) field service trip included with this program is:

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

Contact Sani-Matic for other PM service options.

12.3.4 Recommended Spare Parts Budget (Budgetary)

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

12.3.5 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.