

COMPACT CIP CONTROL SYSTEMS



CSI

INSTALLATION / OPERATION / MAINTENANCE
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TABLE OF CONTENTS

Contents	2
The meaning of DANGER, WARNING, and CAUTION in these instructions.	3
About This Manual	4
Application	4
Technical Data	4
At A Glance (Equipment Overview)	5
Built-in Safety	6
Disclaimer of Liability	7
Air Connections	7
Control Panel	8
System Start	8
Wash Settings	11
System Options	12
Tank Settings	13
Wash Types and Wash Commands	16
Starting your first Wash Cycle	17
Trend Screen	18
History Screen	18
Alarm Screen	19
Alarm Statuses Explained	20
Pump VFD Fault	20
High Temp Alarm	20
High Cond Alarm	20
Low Flow Alarm	20
Tank High Level Alarm	20
Tank Low Level Alarm	20
Transmitter Errors - Return Temp, Supply Temp, Conductivity, Flow, Level	20
Interlocks Explained	21
Interlock - CIP Supply Pump	21
Interlock – Electric Heater (If Equipped)	21
Interlock – Chemical Pumps (If Equipped)	22
E-Stop Active	22
USB Flash Drive Recording	23
Maintenance Checklist	24
Replacing Components	25
Replacing Poly Tubing	25
Replacing Pressure Regulator Filter Element	26
Replacing the Solenoid Valve	27
Troubleshooting	28
Warranty	29–30



IMPORTANT SAFETY INFORMATION

The Compact CIP Manual includes essential information for installing, operating, and maintaining equipment properly and in a safe manner. Failure to do so could result in personal injury and/or equipment damage.

DO NOT attempt to remove and/or modify Compact CIP products or programming. Doing so can create unsafe conditions for operator(s) and surrounding persons. Changes to Compact CIP products or programming void all warranties.

DO NOT place any Compact CIP product in an application where general product service ratings are exceeded. Doing so puts operator(s) and surrounding persons at risk of personal injury and may result in equipment damage.

THE MEANING OF DANGER, WARNING, AND CAUTION IN THESE INSTRUCTIONS

Danger: Indicates an imminently hazardous situation which, if not avoided, has a high likelihood of resulting in death or serious injury. The word Danger indicates the most extreme cases of risk that warrant immediate action.

Warning: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. The word Warning is used for moderately at-risk cases that warrant immediate action.

Caution: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. "Caution" may also indicate an unsafe operating or maintenance practice.

If at any point during operation, a Danger, Warning, or Caution indication is present, the operator should immediately take steps to resolve the problem and notify a supervisor.

Do not remove warning labels on any Compact CIP product. Immediate replacement of missing labels is important to the safety of all users.



INTRODUCTION

Thank you for purchasing a Compact CIP Product!

This manual contains operation instructions for the Compact CIP Control System.

ABOUT THIS MANUAL

This manual covers the complete line of Compact CIP systems.

All Compact CIP systems are available with optional equipment that can provide additional functionality.

Please contact **CSI at 800.721.2394 or 417.831.1411** for assistance.

APPLICATION

CSI's Compact CIP regulates the operation of your Clean-in-Place system. Compact CIP takes the guesswork out of configuring and controlling the start, stop, flow, temperature, and chemical concentration required for a successful clean-in-place cycle. If used properly, your Compact CIP system can be a source of savings and a vital step in ensuring product quality through rapid and effective cleaning.

TECHNICAL DATA

- Compressed air pressure: 90–100 psig (requires at least 90, no more than 100)
- Air inlet size: 1/2" FNPT
- Maximum product pressure: 145 psig
- Product Temperature range: 0°F–180°F
- Electrical Requirement: AC 480V, 60Hz +/- 6%
- Amperage requirement based on system configuration: 20Amps without electric heat, 57 Amps with electric heater option.



AT A GLANCE

- 1 Control Panel
- 2 Touchscreen
- 3 Emergency Stop (E-Stop)
- 4 Power Disconnect Switch
- 5 Return Temperature & Conductivity Transmitter
- 6 Flow Transmitter
- 7 Electric Heater (optional)
- 8 Supply Temperature Transmitter
- 9 Pressure Gauge
- 10 Tank
- 11 Chemical Reservoirs
- 12 Air Pressure Regulator
- 13 Tank Level Transmitter



SAFETY



BUILT-IN SAFETY

The CSI Compact CIP control package includes built-in safety features including air lockout and emergency stop capabilities. The control units can also incorporate system timeouts for added operator safety.

AIR LOCKOUT CAPABILITY

1 The photo on the left shows the air control in the Supply (SUP) position. To prevent accidental operation, turn the air control to the OFF position and lock it with a padlock (OSHA lockout/tagout standard for control of hazardous energy).



E-STOP CAPABILITY

Activate E-Stop to turn off all operations.

To release the E-Stop, twist clockwise until it pops up.



INSTALLATION

The Compact CIP control cabinet arrives mounted to the skid and pre-wired to instruments installed on the skid. Typical installation requires a dedicated 480V 3-Phase with Branch Circuit Protection with amperage requirement based on system configuration: 20 Amps without electric heat, 57 Amps with electric heater option. Electrical schematics provided with the control panel indicate the location, voltage and amperage requirement for the panel. The Compact CIP system is designed to work as a standalone system and does not require integration with the plant's infrastructure.



WARNING

To avoid electrocution, ALL electrical work should be done by a registered electrician, following industrial safety standards and local codes. All power must be OFF and safely locked out during installation.

DISCLAIMER OF LIABILITY

CSI does not assume responsibility and expressly disclaims liability for loss, damage, or expenses that arise in any way from the installation, operation, use, or maintenance performed in accordance with this manual. CSI assumes no responsibility for any infringement of patents or other rights of third parties that may result from use of the module. No license is granted by implication or otherwise under any patent or patent rights.

CSI reserves the right to make changes to the product, specifications, or this manual without prior notice

AIR CONNECTIONS

Note: CSI recommends that the control cabinet be supplied with clean instrument air at the minimum pressure of 90 psig.

AIR INPUT TO CABINET

- 1 Air connection 1/2" NPT Female



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CONTACT CSI FOR MORE INFORMATION | CSIDESIGNS.COM | SALES@CSIDESIGNS.COM | +1.417.831.1411



OPERATION

CONTROL PANEL

Use the touchscreen control panel to select wash parameters and cleaning cycle. Operators should take a moment to familiarize themselves with the items in bold below.

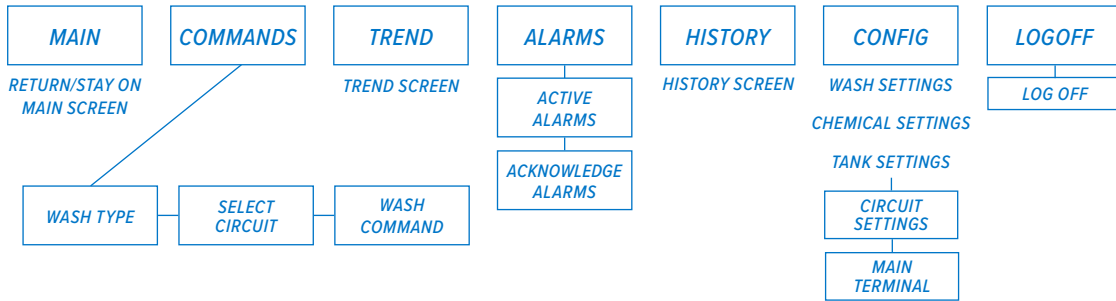
SYSTEM START

1. Verify all Swing, Hose, and Piping Connections are secure.
2. Verify the **Air Relief Valve** is in the **On** position.
3. Verify the **E-Stop** is not activated.
4. To change wash parameters, press the **Config** button.
On the user login screen—
 - a. Input your username and password.
 - b. Default login to change configuration parameters:
User: engineer
Pass: engineer
 - c. Adjust wash settings (e.g., Temperature, Flow, Chemical Concentration)
 - d. Make the desired configuration changes and press the Logoff button.
5. To start the system, ensure it is fully connected in a safe manner and press the **Commands** button. The system presents the available washes.
 - a. Select the desired wash type on the left
 - b. Select the desired circuit in the middle.
 - c. Press the **Start** button on the right.
 - d. Press the **Abort** button to stop and cancel the current wash if needed during the wash.
 - e. Press the **Hold** button to pause the current wash sequence and keep its current position and time remaining. Press the **Restart** button to resume operation.
6. When the system is started, it automatically opens the water fill valve and maintains tank level according to Tank settings located on the **Config** screen.
7. The system continues to run in Automatic mode until the Operator stops the system by pressing the **Abort** button, **Hold** button, **E-Stop** button, or the system goes into an Alarm state.
 - a. If the system goes into Alarm, the issue that caused the alarm must be resolved before continued operation.
 - b. Transmitter errors and tank low level limit alarms are indicated on the screen by a yellow rectangle warning symbol and will auto-acknowledge themselves once the problem has been resolved.

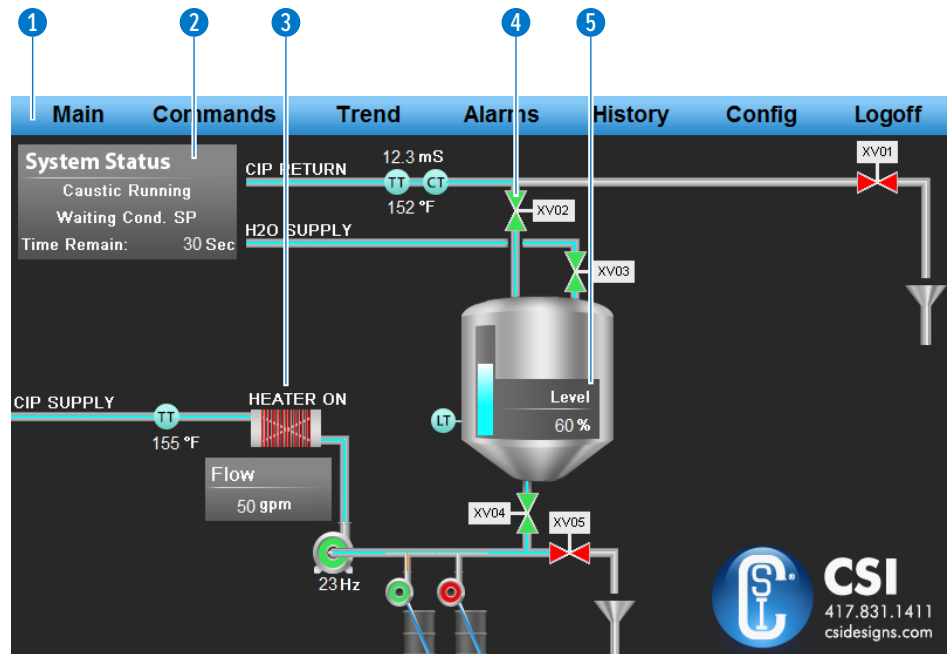
	Displays when a piece of equipment is in an alarm state
	Displays when there is a transmitter error or tank low level limit alarm



HMI MENU: QUICK REFERENCE





OPERATOR INTERFACE SCREENS: MAIN SCREEN



The main screen displays system status.

- 1 The main navigation bar is located at the top of every screen for easy navigation.
- 2 System status area includes the following possibilities:
 - Current Wash Phase** – System Idle, Pre-Rinse Running, Caustic Running, Rinse Running, Acid Running, System Draining, Final Rinse Running, Sanitizer Running
 - Current Wash Conditions** – Waiting Cond. SP, Waiting Temp SP, Waiting Temp & Cond. SP, Wash Conditions Met, Waiting Flow SP, Waiting Flow & Temp. SP, Waiting Flow & Cond. SP, Waiting Flow & Temp. & Cond. SP, Waiting for Tank to Drain
 - Time Remaining** – The time remaining, in seconds, of the current wash phase. If the timer is not counting down while the system is running, then the system is waiting for a wash condition such as Temperature, Flow, or Conductivity to be met. (See Wash Settings on page 11.)
- 3 Displays “Heater Enabled” when power is supplied to the heater. The heater turns red when heat is being applied.
- 4 Equipment indicators change color to green when they are open or running. When the system is sitting idle and there are no active alarms, operators are allowed a small amount of manual control of the system as long as built-in interlock criteria are met. Touch the equipment indicator icon you would like to open or turn on and it will comply if the interlock permissions are met. Press again to close or shutoff the valve. (Refer to Alarms/Interlocks on page 21 & 22.)
- 5 The system auto-maintains its tank level according to the tank settings configured on the Config screen.
 - The water supply to the skid must be capable of filling at the same or greater rate as the CIP supply pump for effective rinsing. For example, the standard pump is rated for 50gpm, therefore the supply water to the skid should be at least 50gpm to maintain level.

	Green indicates equipment is open or running
	Red indicates equipment is closed or stopped

OPERATOR INTERFACE SCREENS: CONFIG SCREEN

The screenshot shows the 'Config' screen of the CSI Compact CIP system. The top navigation bar includes 'Main', 'Commands', 'Trend', 'Alarms', 'History', 'Config', and 'Logoff'. The main content area is divided into three sections:

- Wash Settings:** A table with columns for Pre-Rinse, Caustic, Rinse, Acid, Drain, Final Rinse, and Sanitizer. Rows include Temp SP and Cond SP with values and units. Below the table are buttons for 'Circuit Settings' and 'Main Terminal'.
- Tank Settings:** A table with columns for Level %, High Limit, Stop Fill, Start Fill, and Low Limit, with corresponding values.
- Chemical Settings:** A table with columns for Cycle Time, Pulse Caustic, and Pulse Acid, with values for Chem SP.

Numbered callouts 1 through 7 point to the following parameters:

- Pre-Rinse Cond SP
- Caustic Temp SP
- Rinse Cond SP
- Acid Temp SP
- Drain Cond SP
- Final Rinse Cond SP
- Sanitizer Cond SP

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The configuration screen displays the overall system settings that can be adjusted to the desired CIP wash parameters by allowed users.

WASH SETTINGS

Wash settings include Temperature (Temp) and Conductivity (Cond) Setpoints (SP) for each wash phase—from Pre-rinse to Sanitizer. The Compact CIP will not advance to the next step in the wash cycle until the system is either above or below the setpoint.

- 1 Pre-rinse** — waits until the system is below Cond SP and at Flow SP.
- 2 Caustic** — waits until the system is at or above Temp SP, Cond SP, and Flow SP.
- 3 Rinse** — waits until the system is below Cond SP and at Flow SP.
- 4 Acid** — waits until the system is at or above Temp SP, Cond SP, and Flow SP.
- 5 Drain** — waits until the tank is below 5%.
- 6 Final Rinse** — waits until the system is below Cond SP and at Flow SP.
- 7 Sanitizer** — waits until the system is below Cond SP and at Flow SP.

For example, in the screenshot shown above, the Pre-rinse phase will not advance to the Caustic phase until the Cond SP is below 1.0. The Temp SP has a value of N/A which indicates that there is neither a minimum nor maximum requirement for the Pre-rinse Temperature (Temp SP) and therefore will not delay advancement to the next phase.



OPERATOR INTERFACE SCREENS: CONFIG SCREEN

The screenshot shows the 'Config' screen with the following settings:

Wash Settings								Tank Settings		
	Pre-Rinse	Caustic	Rinse	Acid	Drain	Final Rinse	Sanitizer		Level %	
Temp SP	N/A	140.0	N/A	140.0	N/A	N/A	N/A	(F)	High Limit	100.0
Cond SP	1.0	10.0	1.0	5.0	N/A	1.0	1.0	(mS)	Stop Fill	45.0
	(below)	(above)	(below)	(above)	(below)	(below)	(below)		Start Fill	25.0
									Low Limit	10.0

Chemical Settings			
	Cycle Time	Pulse Caustic	Pulse Acid
Chem SP	10.0	2.0	5.0

Buttons: Circuit Settings, Main Terminal

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- 1 **Temp SP** –The Caustic and Acid wash phases require a temperature setpoint be reached before the timer can count down.
- 2 **Cond SP** – The desired SP of the chemical conductivity level for the desired concentration. Caustic and Acid Phases must be over their configured setpoints; Pre-Rinse, Rinse, Final-Rinse and Sanitizer phases must be below their configured setpoints.

Note: Pump speed is controlled automatically based on Flow SP. For example, when a Flow SP of 50.0 is entered on the Config screen, the pump flow control will actually try to achieve and maintain 55 gpm to ensure that the flow is always above the minimum target (or SP).

Note: Temperature is controlled in a similar way. For example, when a Temp SP of 160 is entered on the Config screen, the heat exchanger will actually try to achieve and maintain 165°F to ensure that the temperature is always above the minimum target (or SP).

Note: Most sanitizers used in the sanitary industry don't have a good conductivity profile, so typical operation of this system is to dose the desired amount of sanitizer in the tank during the Sanitizer wash phase.

OPERATOR INTERFACE SCREENS: CONFIG SCREEN

The screenshot displays the 'Config' screen with the following sections:

- Wash Settings:**

	Pre-Rinse	Caustic	Rinse	Acid	Drain	Final Rinse	Sanitizer	
Temp SP	N/A	140.0	N/A	140.0	N/A	N/A	N/A	(F)
Cond SP	1.0	10.0	1.0	5.0	N/A	1.0	1.0	(mS)
	(below)	(above)	(below)	(above)	(below)	(below)	(below)	
- Tank Settings:**

	Level %
High Limit	100.0
Stop Fill	45.0
Start Fill	25.0
Low Limit	10.0
- Chemical Settings:**

	Cycle Time	Pulse Caustic	Pulse Acid
Chem SP	10.0	2.0	5.0

Buttons for 'Circuit Settings' and 'Main Terminal' are visible. The CSI logo and contact information (417.831.1411, csidesigns.com) are in the bottom right corner. A small version number 'CSI-Compact-CIP-Rev18 6/22/2023' is at the bottom left.

TANK SETTINGS

Configures how the Tank Level operates when the system is Active.

- 1 **High Limit** – Tank High Level Fill Alarm setpoint. System alarms and aborts current washes in the event the tank gets overfilled.
- 2 **Stop Fill** – When the system is refilling with fresh water, it stops filling at this setpoint to prevent overfilling the tank.
- 3 **Start Fill** – When the system is running and the tank volume falls below this amount, the water inlet valve opens and starts refilling the system until it reaches the configured Stop Fill amount or the current wash phase completes.
- 4 **Low Limit** – Tank Low Level Limit Alarm setpoint. The system outputs a warning if the tank volume falls below this amount and the pump is prevented from running until the level in the tank is returned to a normal amount. This is by design to prevent the pump seals from running dry.



OPERATOR INTERFACE SCREENS: CONFIG SCREEN

The screenshot displays the 'Config' screen with the following sections:

- Wash Settings:**

	Pre-Rinse	Caustic	Rinse	Acid	Drain	Final Rinse	Sanitizer	
Temp SP	N/A	140.0	N/A	140.0	N/A	N/A	N/A	(F)
Cond SP	1.0	10.0	1.0	5.0	N/A	1.0	1.0	(mS)
	(below)	(above)	(below)	(above)	(below)	(below)	(below)	
- Tank Settings:**

	Level %
High Limit	100.0
Stop Fill	45.0
Start Fill	25.0
Low Limit	10.0
- Chemical Settings:**

	Cycle Time	Pulse Caustic	Pulse Acid	Caustic Pump Runtime	Acid Pump Runtime
Chem SP	10.0	2.0	5.0	5	5

At the bottom of the screen, five callout numbers (1-5) are positioned below the Chemical Settings table, corresponding to the following definitions:

CHEMICAL SETTINGS

If the system is configured for automated chemical dosing, the following settings appear: Chemical (Chem) Setpoints (SP) for Cycle Time, Pulse Caustic, and Pulse Acid. This system is designed to pulse in small amounts of chemicals at a time and bring the whole CIP loop up to concentration rather than initially dosing a large amount of chemicals and potentially overshooting concentration targets.

- 1 **Cycle Time** — the total duration for a complete sequence of the dosing system's operation, repeating every set period.
- 2 **Pulse Caustic** — the specific duration within the cycle time that the system doses caustic solution, for example, dosing for 2 seconds in a 10-second cycle.
- 3 **Pulse Acid** — the specific duration within the cycle time that the system doses acid solution, for example, dosing for 5 seconds in a 10-second cycle.
- 4 **Caustic Pump Runtime** — a time setting that will allow the caustic pump to run for a set amount of time and shut off, rather than looking to achieve a set conductivity level. (This setting is only visible if the system is configured to dose by time rather than conductivity.)
- 5 **Acid Pump Runtime** — a time setting that will allow the acid pump to run for a set amount of time and shut off, rather than looking to achieve a set conductivity level. (This setting is only visible if the system is configured to dose by time rather than conductivity.)



OPERATOR INTERFACE SCREENS: CONFIG SCREEN

Main **Commands** **Trend** **Alarms** **History** **Config** **Logoff**

Wash Settings

	Pre-Rinse	Caustic	Rinse	Acid	Drain	Final Rinse	Sanitizer	
Temp SP	N/A	140.0	N/A	140.0	N/A	N/A	N/A	(F)
Cond SP	1.0 (below)	10.0 (above)	1.0 (below)	5.0 (above)	N/A (below)	1.0 (below)	1.0 (below)	(mS)

Tank Settings

	Level %
High Limit	100.0
Stop Fill	45.0
Start Fill	25.0
Low Limit	5.0

Chemical Settings

	Cycle Time	Pulse Caustic	Pulse Acid
Chem SP	10.0	2.0	2.0

Circuit Settings 1

Main Terminal

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CIRCUIT SETTINGS SCREEN

Circuit Settings

	Pre-Rinse (sec)	Caustic (sec)	Rinse (sec)	Acid (sec)	Drain (sec)	Final Rinse (sec)	Sanitizer (sec)	Flow (Gpm)
Circuit #1	0	0	0	0	0	0	0	0
Circuit #2	0	0	0	0	0	0	0	0
Circuit #3	0	0	0	0	0	0	0	0
Circuit #4	0	0	0	0	0	0	0	0
Circuit #5	0	0	0	0	0	0	0	0

Return to Config

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CIRCUIT SETTINGS

Circuit settings include setpoints for each wash phase. (For descriptions of each wash phase, refer to page 11.)

- 1 Select **Circuit Settings** to configure Circuits.
- 2 Configure the times for each phase (in seconds) in the wash cycle.
- 3 **Flow** – The desired flow rate of the CIP system for all wash phases.



OPERATOR INTERFACE SCREENS: COMMANDS SCREEN



WASH TYPES

Wash Types 1–5 are available to customers who have purchased the Caustic and Acid Compact CIP. For those who have opted for the Caustic and Sanitizer Compact CIP, only Wash Types 1, 2, and 5 are available.

- 1 **Caustic Wash Phases:** Pre-Rinse, Caustic, Drain, Final-Rinse
- 2 **Caustic Sanitizer Wash Phases:** Pre-Rinse, Caustic, Drain, Final-Rinse, Sanitizer
- 3 **Caustic Acid Wash Phases:** Pre-Rinse, Caustic, Drain, Rinse, Acid, Drain, Final-Rinse
- 4 **Caustic Acid Sanitizer Wash Phases:** Pre-Rinse, Caustic, Drain, Rinse, Acid, Drain, Final-Rinse, Sanitizer
- 5 **Sanitizer Wash Phases:** Sanitizer

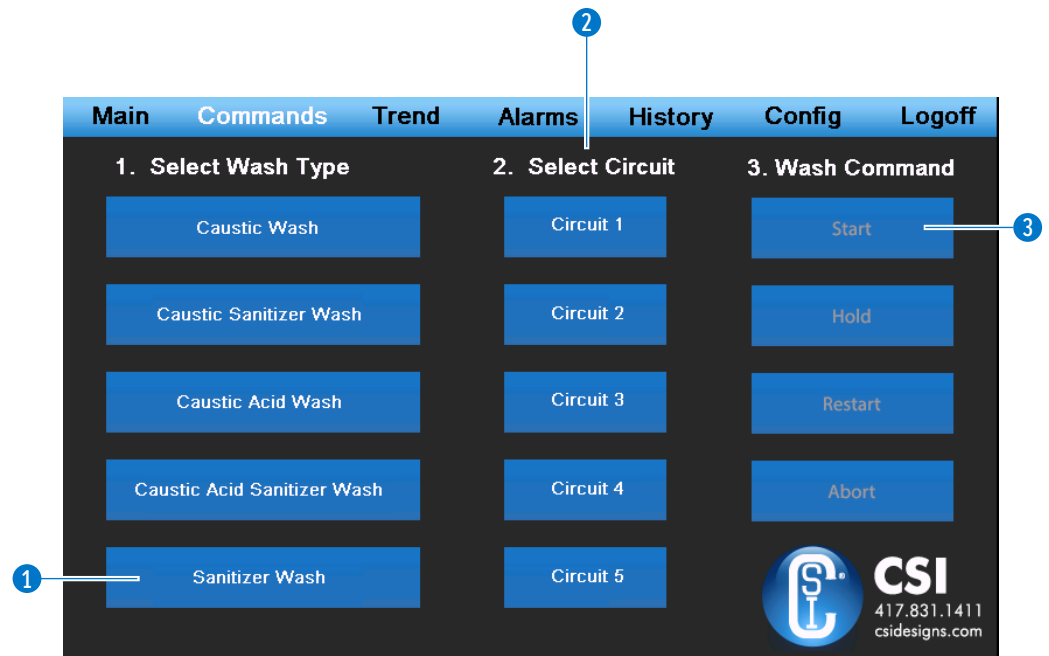
CIRCUITS

- 6 Enables selection of the preferred wash circuit. Circuit configurations are customizable via the Config/Circuit Settings menu.

WASH COMMANDS

- 7 **Start:** Starts the automated sequence of the selected wash type.
- 8 **Hold:** When the system is running, the operator can put the system in a Hold to stop the active wash but maintain the current timers so the system can restart from where it was paused without starting the sequence over.
- 9 **Restart:** When the system is in the Hold position the operator can resume the current wash from where they left off.
- 10 **Abort:** Shuts down the system, canceling the active wash and putting the system into an Idle state. This may also happen if a High Limit Alarm goes active or an operator presses the E-Stop button on the control panel.

STARTING

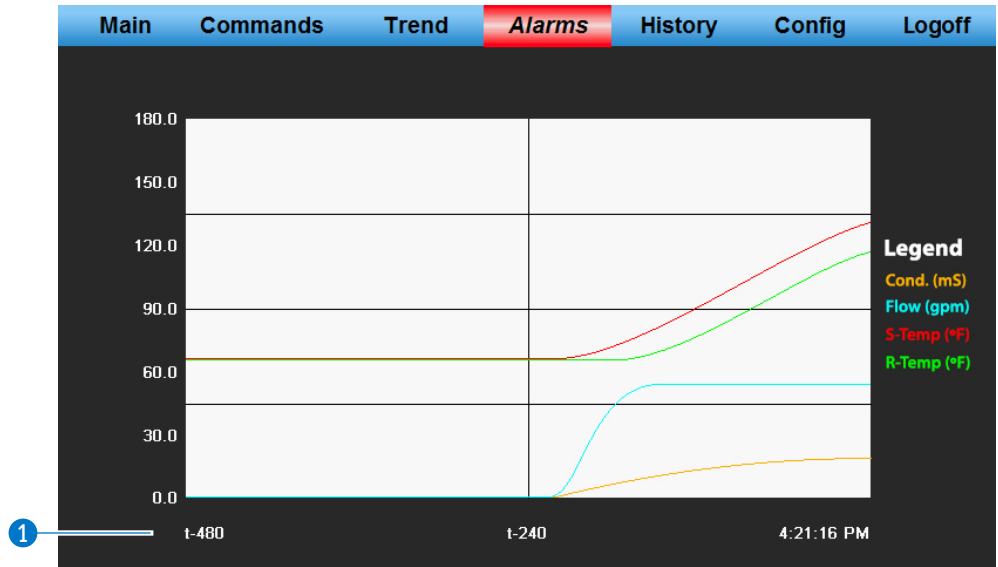


STARTING YOUR FIRST WASH CYCLE

- 1 Select the desired wash type. The selected wash is now displayed at the top. Prior to starting the wash, the operator can change the desired wash type by deselecting the current option before selecting the new option.
- 2 Select the desired circuit for the wash.
- 3 Press the Start command. The Start button turns green.
- 4 Once the system is running, the Hold and Abort buttons are available if needed during the wash cycle, and the operator can return to the Main Screen to monitor skid operation.



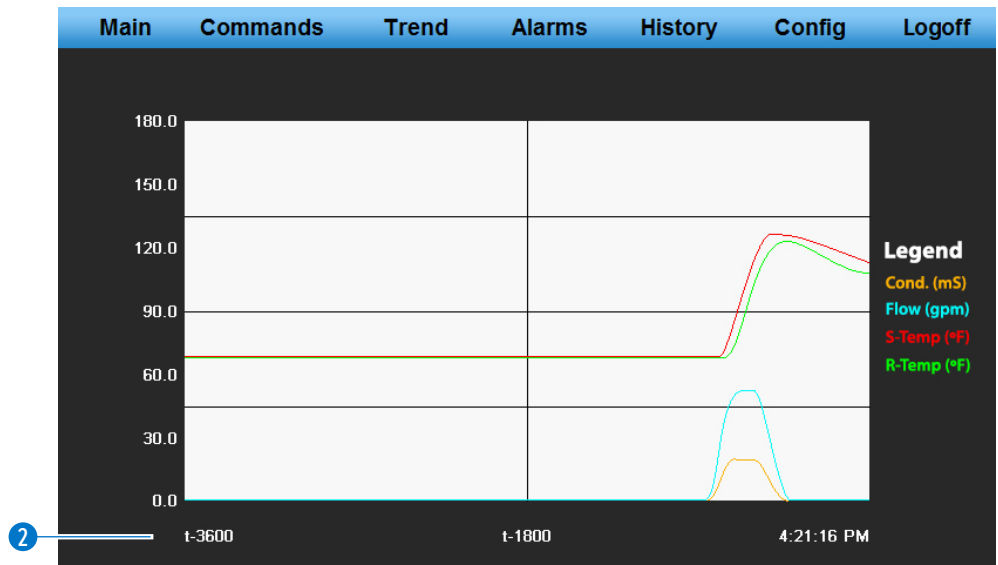
TREND SCREEN



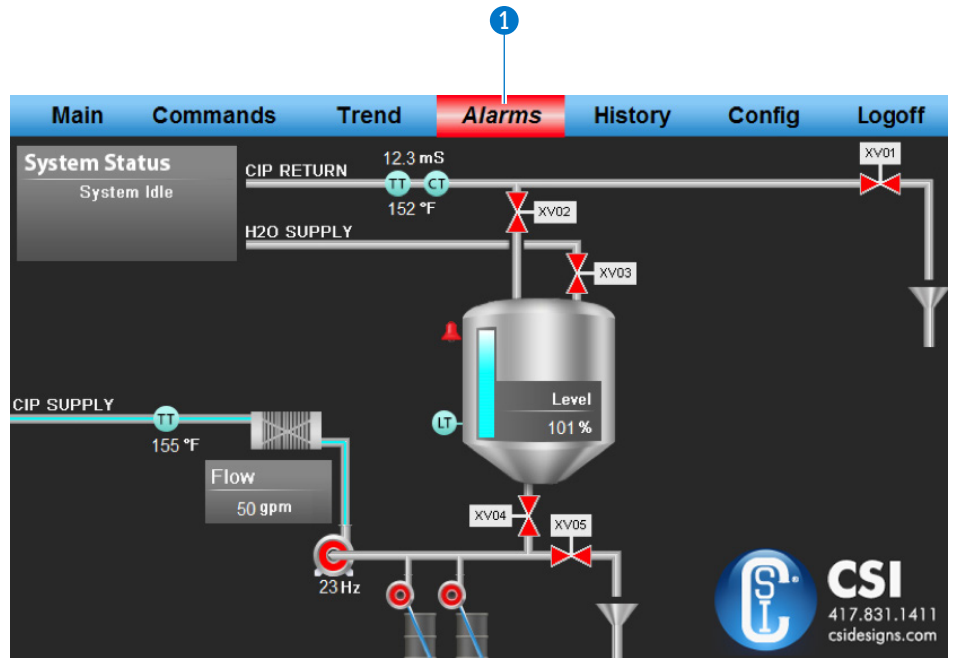
1 The Trend screen logs the actual process values of Supply Flow (Flow), Supply Temperature (S-Temp), Return Temperature (R-Temp), and Return Conductivity (Cond). These data points are sampled every second and plotted on the same graph for wash monitoring. This graph will display up to 8 minutes (480 seconds or t-480) of data.

2 The History screen logs the actual process values of Conductivity (Cond), Supply Flow (Flow), Supply Temperature (S-Temp) and Return Temperature (R-Temp). These data points are sampled every eight seconds allowing for monitoring a longer time frame such as a complete wash cycle. This graph will display up to 1 hour (3600 seconds or t-3600) of data.

HISTORY SCREEN

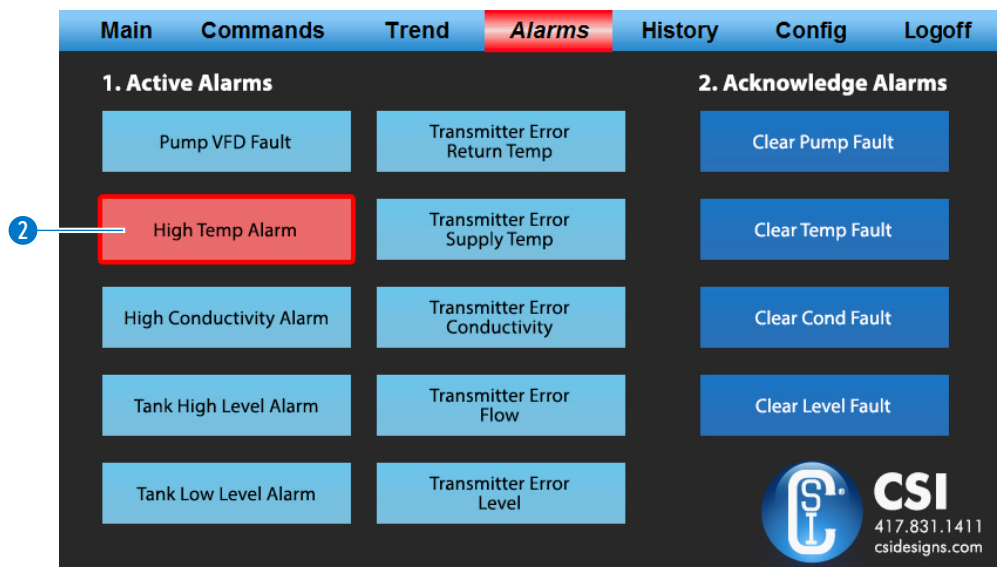


ALARM SCREEN



1 When the system has an active alarm, the Alarm button flashes red on every screen indicating a system problem. The skid aborts current washes and returns itself to an idle state. Pressing the Alarm button on the main navigation screen activates the Alarm screen. On the Main screen a small red bell also displays next to the piece of equipment currently in an alarm state.

2 The alarm screen displays the system alarms built into the Compact CIP system. Any active alarms turn Red with an illuminated border. Transmitter errors and tank low level alarms auto-acknowledge once the problem has been resolved; however, there are an additional four alarms that require an operator to acknowledge the alarm before the system can operate again. If the alarms do not clear, then the issue that caused the alarm is still in effect.



ALARM SCREEN

ALARM STATUSES EXPLAINED

PUMP VFD FAULT

The VFD in the control panel has a fault. This can be loss in Ethernet communication such as when a new program is downloaded. It could also be a true VFD fault such as motor overcurrent.

HIGH TEMP ALARM

In the event temperature exceeds 190°F, the High Temp Alarm activates and current washes abort.

HIGH COND ALARM

In the event chemical conductivity exceeds 55mS/cm, the High Cond Alarm activates and current washes abort.

TANK HIGH LEVEL ALARM



The system has a configurable Tank High Level limit which is set to 100% as default. Tank level of 100% is set at the factory to be about 2-3" below the overflow in the tank. In the event the tank level reaches higher than the configured setpoint the High Tank Level Alarm activates and any current washes abort.

TANK LOW LEVEL ALARM

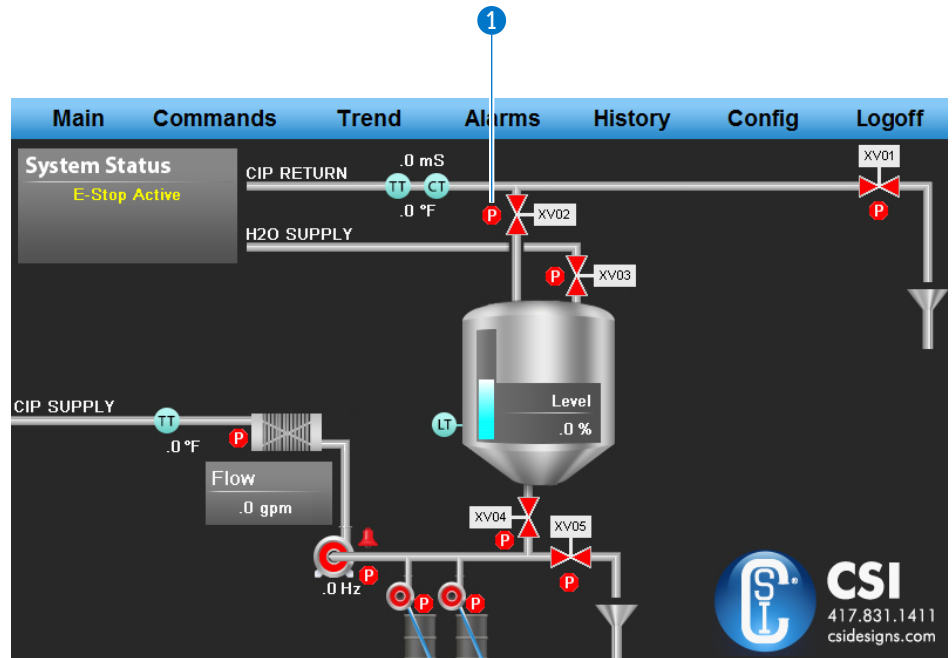
The system has a configurable Tank Low Level limit which is set to 10% as default. In the event the tank level drops below the configured setpoint, the Supply Pump interlocks to prevent it from running, and the Low Level Warning Alarm activates. The current wash does not abort with this alarm but holds the system and waits for the tank level to return in order to complete the wash. (Note* The water supply to the skid must be capable at filling the same or greater rate as the CIP supply pump for effective rinsing. For example, the standard pump is rated for 50gpm so the supply water to the skids should be at least 50gpm to maintain level.)

TRANSMITTER ERRORS - RETURN TEMP, SUPPLY TEMP, CONDUCTIVITY, FLOW, LEVEL

If the analog signal goes below or above the normal operating range of 4-20mA the system assumes there is a problem with the transmitter and the Transmitter alarm activates and current washes abort. Once the transmitter is fixed and receiving the 4-20mA analog range the alarm automatically clears itself.

	Displays when a piece of equipment is in an alarm state
	Displays when there is a transmitter error or tank low level limit alarm

ALARM STATUS: INTERLOCKS



Displays when there is an interlock

INTERLOCKS EXPLAINED

1 When an interlock is active on a device in the system a small stop sign with a “P” displays on the screen next to the piece of equipment that has an active interlock. The P stands for permission. Some of the devices have more than one interlock criteria and that are explained in more detail below.

INTERLOCK – CIP SUPPLY PUMP

The CIP supply pump has the following interlock criteria that must be met prior to the pump operating.

1. The system is not in an E-Stop condition.
2. The pump is not in Alarm.
3. The tank discharge valve is commanded to be open.
4. The tank level has more liquid than the minimum configured tank Low Limit set under Tank settings on the Configuration screen. (Default is 10% level).

INTERLOCK – ELECTRIC HEATER (IF EQUIPPED)

The electric heater has the following interlock criteria that must be met prior to the heater being allowed to operate.

1. The system is not in an E-Stop condition.
2. The heater is not in Alarm.
3. The CIP system is in a Running State status.
4. The CIP supply flow is greater than 10gpm.
5. The CIP supply temperature is less than 190°F.



ALARM STATUS: INTERLOCKS

INTERLOCK – CHEMICAL PUMPS (IF EQUIPPED)

The chemical pumps have the following interlock criteria that need to be met prior to them being allowed to operate.

1. The system is not in an E-Stop condition.
2. The heater is not in Alarm.
3. The CIP system is in a Running State status.
4. The CIP supply flow is greater than 10gpm.
5. The CIP Return chemical conductivity is less than 55mS/cm.

E-STOP

E-STOP ACTIVE

The system is powered on and the E-Stop button has been activated. The system shuts down and inhibits all devices from operating until the E-Stop button is released by the operator turning the button clockwise. An E-Stop active status appears on the screen.



USB FLASH DRIVE RECORDING

An additional feature of the Compact is the ability to connect a USB flash drive to the back of the HMI, as seen in Fig. 1, and have all the trending data recorded as a comma separated value (.csv) file. This occurs automatically once a flash drive is inserted. Each additional wash is concatenated to the file.

The CSV contains columns for Time, Date, Conductivity, Flow(gpm), Supply Temperature and Return Temperature. To retrieve this data, remove the flash drive and access its contents using File Explorer (Fig. 2).



FIG. 1 - USB CONNECTION TO HMI

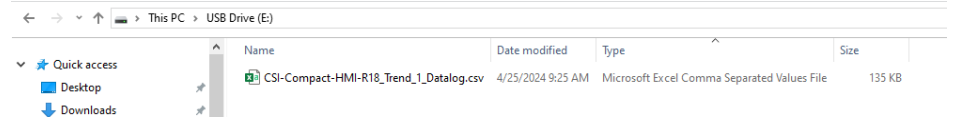


FIG. 2 - FILE EXPLORER

The data can be opened in Microsoft Excel and used directly for record-keeping or to generate charts (Fig. 3).

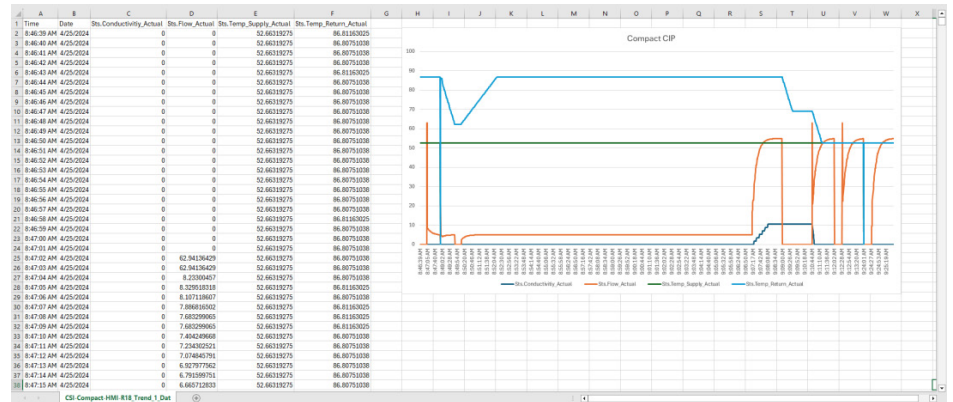


FIG. 3 - MICROSOFT EXCEL



MAINTENANCE



WARNING

Warning: Employees should not perform maintenance on the CIP control system before ensuring a safe work environment.

To ensure a safe work environment, it is recommended, but not limited to, verifying the following precautions are met:

- Power to the control panel should be OFF and Locked Out
- Remove or Lock Out the inbound air supply from the pressure regulator

General cleanliness extends the life of your control panels and its components. The area should be kept free of spills and loose debris. Under NO circumstance should the panel be sprayed down or cleaned with any wet fluids. Doing so could damage the electrical and/or pneumatic equipment.

If hardware issues exist, cease all use of the CIP Control Panel until all issues are resolved.

MAINTENANCE CHECKLIST

- Check air lines for cracks and leaks.
- Check pressure drop across air filter; if pressure drop exceeds maximum allowable, the filter must be cleaned or replaced.
- Check for loose connections or connectivity with solenoid valves

Note: The pressure drop should not exceed 14psig; if the pressure drop exceeds the maximum allowable the filter needs to be cleaned or replaced.

Note: A solenoid valve does not typically give advance warning before failing.



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MAINTENANCE

REPLACING COMPONENTS

The instructions below describe how to replace components used in the manufacturing of a Compact CIP control system.

REPLACING POLY TUBING

1. Ensure that the Control Panel is powered down.
2. Disconnect the inbound airline at the pressure regulator.
3. Press in the outer ring of the pneumatic fitting, and then gently pull the cracked or leaking airline from the fitting.
4. Repeat the same procedure for the other end of the airline.
5. Use the cracked or leaking airline as a guide for the length of the new airline.
6. Trim the new section of airline to the appropriate length.
7. Install airline by pressing each end into pneumatic fittings.

Note: Make certain the outer rings on the pneumatic fittings extend after the new line is pressed in. If fittings are not fully extended outward, the hose could be blown out from its seated position when subjected to sufficient pressure.



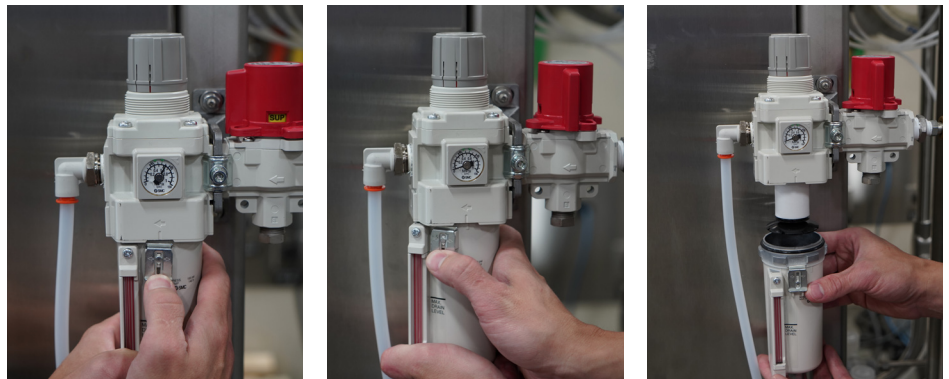
MAINTENANCE

REPLACING PRESSURE REGULATOR FILTER ELEMENT

SMC, the manufacturer of the supplied filter regulator, recommends the filter element be changed every two years or when the pressure drop across the element exceeds 14 psig.

1. Locate the spring-loaded release on the front of the pressure regulator.
Note: Before proceeding to the next step, ensure the air supply is shut off and disconnected before removing the filter casing.
2. Press the release down and hold.
3. Turn the portion of the pressure regulator body below the spring-loaded release.
 - This may be more easily accomplished by holding the release with the thumb of the hand with which you intend to turn the body.
 - The pressure regulator body should only need to turn approximately half of a revolution before gently pulling it free.

Note: If you only turn the body a quarter of a turn, the release may try to extend back into place.



4. Once the body of the regulator is removed, the element can be easily removed and replaced.
5. Put the body back on and turn it back into position directly opposite of how you removed it. This should seat the body exactly where it began.

MAINTENANCE

REPLACING THE SOLENOID VALVE

Although solenoid valves used by Compact CIP are rated for one million cycles, there are no performance guarantees for these items. While we do not guarantee a particular number of cycles, we are confident the valves are free from manufacturer defects.

1. Remove retaining screws from the existing solenoid valve.

Note: Keep them until you are certain new screws have been provided.

2. Gently remove the solenoid valve from the mounting pad.
3. Take note of how the solenoid valve is oriented.
4. Take note of all O-rings, as there may be small O-rings on sealing surfaces.

5. In some cases, the top or bottom of the solenoid valve may need to come out first.

6. Verify the O-rings are properly placed on the new solenoid valve.

Note: It may be necessary to insert or seat one end of the solenoid valve before the other end seats properly.

Note: It should never be necessary to force the new solenoid valve into place.

7. Install the retaining screws that you removed in step (a). If new retaining screws were provided, use them and discard the screws from step (a).



TROUBLE- SHOOTING

Q. WHAT SHOULD I DO IF THE AUTOMATED VALVES ARE NOT OPERATING?

Ensure that the OSHA Air Dump valve is in the ON position and the supply pressure is over 90psi.

Q. WHAT SHOULD I DO IF I CAN'T RUN THE CIP PUMP?

Check the CIP Supply pump interlocks and ensure all the criteria to operate have been met.

Ensure the VFD is not faulted and the E-Stop is not inhibiting its operation.

The supply pump can sometimes airlock when the system first starts and the process lines are dry. Command the current wash to hold and wait for the pump to stop; then press the resume command. Many times, Hold/Resume clears the air lock.

Ensure the pump is rotating with the correct rotation and with the system safely locked out, then ensure the pump impeller spins freely without interference or resistance.

Q. WHAT SHOULD I DO IF I CAN'T RUN THE HEATER?

Verify that the supply flow is greater than 10 GPM, which is a safety feature that ensures enough water flow for the heater to run.

Ensure the control system temperature setpoint is set on the desired temperature and that the return temp is lower than that value.

Please Note: For questions or concerns regarding your CIP Control System, please contact CSI at **800.721.2394** or **417.831.1411**.



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WARRANTY

- A. **GENERAL PROVISIONS:** Central States Industrial Equipment & Service Inc. (the “Company”) warrants exclusively to the original purchaser (the “Customer”) that equipment or parts thereof manufactured and sold by the Company will be free from defects in material and workmanship only, under normal use and service, for a period of one (1) year from the original shipment date. The Company shall not be liable for any loss of revenue or profit, loss by reason of plant shutdown, non-operation or increased cost of operation, loss of products or materials, or other special or consequential loss or damages resulting from any such warranted defects. This warranty will not apply to any equipment or parts which has been subjected to accident, alteration, abuse, or misuse. This warranty is in lieu of all other warranties. All other warranties, both express or implied (including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose) warranties are hereby excluded and waived. The Company’s only obligation and liability shall be to fulfill the warranty specifically stated herein. The Company will neither assume nor authorize any other person to assume for it any other obligation or liability in connection with the equipment or parts. In the event of a claim under this warranty, the Company’s sole and exclusive liability for any warranted equipment or parts shall be, at the Company’s option, limited to the following (a) the purchase price of the equipment or parts that are defective, (b) replacement of the defective equipment or parts or (c) repair of the defective equipment or parts.
- B. **RETURN OF PARTS OR EQUIPMENT TO COMPANY PLANT:** In the event the Company elects to inspect the alleged defective equipment or parts for possible repair, Company will notify Customer in writing, and the equipment or parts must be returned with transportation cost prepaid by the Customer. In the event the Company’s inspection confirms defective equipment or parts covered by this warranty, the Company shall have the option to select any of the remedies described in Section A above. No transportation for returned or replaced items will be paid by the Company unless written approval for transportation charges is given by the Company.
- C. **COMPONENTS NOT MANUFACTURED BY THE COMPANY:** Components not manufactured by the Company, but furnished as part of its equipment (for example: valves, controls, gauges, electrical switches or instruments, etc.) will be warranted by the Company only to the extent of the component manufacturer’s warranty.



WARRANTY

D. REPAIR OF EQUIPMENT INSTALLED IN THE CONTINENTAL UNITED STATES:

In the event the Company elects to repair a covered item and it is, in the judgment of the Company, impractical to return the equipment or parts for repairs, the Company may arrange for the repairs to be made by its personnel or, at its option, subcontract such repairs to a qualified company. The Customer will be expected to cooperate by making the equipment or parts available and accessible when the work is scheduled and is expected to provide the necessary utilities. If local labor conditions prohibit such work being done by Company personnel under the conditions and at the rates payable by its contracts with its employees, the Company obligation shall be limited to supervision of the work, replacement of defective parts, and labor costs in an amount equal to the amount which would be payable for a reasonable number of hours required to make the repairs at the rates payable under the terms of Company contracts with its employees. In such event, all labor costs shall be paid by the Customer and the Company will reimburse the Customer to the extent set forth above.

E. REPAIR OF EQUIPMENT INSTALLED OUTSIDE THE CONTINENTAL UNITED STATES:

In the event the Company elects to repair a covered item for a Customer located outside the continental United States and it is, in the judgment of the Company, impractical to return the equipment for repairs, the Company shall have the additional options (in addition to the other options described herein) of either sending a service representative to repair (or supervise the repairs) or paying Customer a reasonable amount to allow the Customer to have the repairs made locally; provided, that in such situation, Company shall have no obligation to repair or replace equipment or parts that are repaired on by third party contractors selected by Customer.

