
PCT-ADW-D SERIES
AUTOMATIC CYLINDER INVERTER/DRIER
INSTRUCTION MANUAL



MANUAL NUMBER 21-11-1009

Issued November 2011

Copyright 2011, Galiso, Inc.
22 Ponderosa Ct., Montrose, CO 81401
(970) 249-0233 (800) 854-3789
www.galiso.com

TABLE OF CONTENTS

Section/Title	Page
1.0 Introduction	1-1
2.0 Safety	2-1
2.1 General Safety	2-1
2.2 Unusual Dimension Cylinders	2-2
3.0 Installation.....	3-1
3.4 Receiving and Placement.....	3-1
3.5 Utility Connections.....	3-1
3.6 Use of Gasses Other Than Compressed Air	3-2
3.7 Air Lubricator Fill.....	3-3
3.8 Changing Cylinder Load Direction	3-4
4.0 PCT-ADW-D Operations	4-1
4.1 Invert/Wash/Dry Control Panel Components.....	4-1
4.2 Automatic Operation	4-4
4.3 Manual Operation	4-5
4.4 Cylinder Clamp Arm Adjustment.....	4-6
4.5 Loading of Unusual Dimension Cylinders.....	4-7
4.6 Detergent Supply Adjustment.....	4-8
5.0 Maintenance.....	5-1
5.1 General.....	5-1
5.2 Electronic Controller Replacement	5-1
5.3 Troubleshooting.....	5-1
5.4 PCT Cylinder Inverter Spare Parts	5-3

1.0 INTRODUCTION

Galiso PCT-ADW-D series Automated Cylinder Inverter/Driers are designed to provide a safe, economical method for draining and drying heavy, water filled cylinders before or after the hydrostatic test. All of the PCT models can be fitted with a wash option which allows the operator to flush the cylinder interior with detergent solution and hot water.

PCT-ADW-D series Inverter/Driers are available in several different configurations for simultaneously servicing one or more cylinders. This instruction manual discusses the PCT-15-ADW-D and the PCT-122-ADW-D Automated Inverter/Driers. The PCT-15-ADW-D will accept one cylinder up to 15 inches in diameter, and the PCT-122-ADW-D will accept two cylinders with diameters up to 12 inches. Other configurations allow servicing three or four cylinders simultaneously, and servicing of cylinders with unusual dimensions.

All PCT machines are equipped with a powerful pneumatic clamp assembly that firmly grasps the cylinder, and then securely inverts it a full 180 degrees. Upon complete inversion of the cylinder, a stream of filtered air is injected to rapidly purge water left over from the hydrostatic test. Hot water is then sprayed into the cylinder interior to heat the cylinder to 180 degrees Fahrenheit. Air is once again injected into the cylinder to quickly evaporate any residual water from the cylinder interior. The entire operation takes only three minutes or less, depending upon the size of the cylinder that is being serviced.

The PCT-ADW-D allows very efficient use of work space by eliminating the need for a cylinder vise, dump rack, and hot air drying manifold. In addition to draining and drying the cylinder, the PCT-ADW-D also functions as a heavy duty cylinder vise for stamping cylinders or removing valves. If you clean cylinders by tumbling with abrasive media, the PCT-ADW-D is an ideal tool for rinsing and drying the freshly cleaned cylinders. The PCT-ADW-D can flush out residual tumbling media and then dry the cylinder interior before flash rusting can occur. Use of this machine may also reduce the possibility of operator injury related to handling large cylinders on a manual cylinder dump rack.

This page intentionally left blank.

2.0 SAFETY

Read all instructions before attempting to install or operate this machine. GALISO, INCORPORATED IS NOT RESPONSIBLE FOR DAMAGE OR INJURY CAUSED BY UNSAFE USE, MAINTENANCE, APPLICATION, MODIFICATION OR IMPROPER INSTALLATION OF THIS MACHINE. Please contact Galiso, Inc. for guidance when you are in doubt as to the proper safety precautions to be taken when installing or operating this machine.

2.1 General Safety

- A. The PCT-ADW-D is capable of producing considerable clamping force to rapidly clamp and rotate the cylinder. Stay safely behind control panels during machine operation.
- B. Always wear gloves, eye protection and foot protection while operating the PCT-ADW-D.
- C. Provide sufficient water drainage on the discharge side of the machine to prevent water from splashing, onto the floor or working area, and the possibility of subsequent accident.
- D. Although the PCT-ADW-D is free standing, Galiso, Inc. recommends securing the machine to the shop floor. PCT-24-ADW machines MUST be secured to the floor.
- E. Galiso, Inc. recommends marking off the area surrounding the PCT-ADW-D with yellow and black safety tape. The safety area should extend at least 36" on the loading side and 36" on the discharge side of the machine, to indicate the area occupied by the swing of the cylinder as it is inverted. All personnel should stay clear of the safety area while the machine is operating. Safety area may need to be extended to accommodate taller cylinders.
- F. The PCT-ADW-D features a safety circuit that prevents the machine from inverting if the clamp is not engaged. The safety circuit also prevents the machine from unclamping once the cylinder has been lifted off of the ground.
- G. Never operate the PCT-ADW-D without first loading a cylinder into the clamp grips and installing the injection probe(s). If the hot water injection phase of the operation cycle is performed without a cylinder in the clamp grips or the probes installed, hot water will be sprayed into the air, endangering the operator. If the hot water injection cycle is started without a cylinder in the clamp grips, immediately press the Emergency Stop Switch.

2.1 General Safety, continued

- H. In the event of loss of power or air pressure, the inverter will remain in the position that it was in at the time of loss and stay clamped until power and/or air is restored to the unit.
- I. To immediately stop the PCT-ADW-D operation cycle, press the Emergency Manual Stop Switch. The PCT-ADW-D will instantly stop all processes including cylinder rotation. The cylinder will remain clamped, and stay at the position it was in at the time the button was pressed. To resume operation: follow the procedures described in Section 4.0, Operations.
- J. To refill the Detergent Supply Cylinder: Make certain that all pressure has been released from the Detergent Supply Cylinder before attempting to remove the detergent and water control valve from the cylinder.

2.2 Safety, Unusual Dimension Cylinders

- A. Testing round bottom cylinders, such as Compressed Natural gas, requires the use of a suitable base that will hold the cylinder in an upright position. Due to the additional weight of these cylinders, a Drain Probe (Part Number 25-41-9352) must be used to partially empty any natural gas cylinder over 42" in height. Read Section 6 for complete operating instructions.
- B. Testing large diameter (over 15") L.P. or natural gas cylinders require clamping the cylinder at its vertical center. The use of a base or platform of the appropriate height may be necessary to accomplish this. Cylinder bases and L.P. cylinder stands are available from Galiso, Incorporated.
- C. The air pressure regulator must be set at 110 psi to insure proper operation of the equipment.

!! WARNING !!

Failure to follow the requirements of Section 2.2 could result in a cylinder being dropped, causing extreme personal injury and/or damage to the equipment.

3.2 Utility Connections, continued

- B. Connect the Clean Air Supply Line to the port labeled "Clean Air In" (1/2" FPT, see figure 3-1). The "Clean Air" supply must be clean gas (e.g. air or Nitrogen) to prevent contamination of cylinders. If compressed air is used, a filter system that will provide breathing air quality output with a contaminant level of no more than 0.03 parts per million must be installed in the Clean Air Supply Line. A filter system that will clean the air to a contaminant level of 0.01 parts per million is available from Galiso, Incorporated. See Section 3.3 for use of gasses other than compressed air.
- C. Connect your hot water source to the port labeled "Hot Water In" (1/2" FPT, see figure 3-1). An 80 gallon industrial water heater with a recovery rate of 125 gallons per hour at 140⁰ F minimum is recommended to achieve the maximum rate of approximately 40 large steel cylinders per hour. The temperature control on the water heater should be set at 180⁰ F. In applications where cylinder output requirements are not as high, a water heater with a lower recovery rate may be used. Galiso can provide you with a water heating system that has been tested and proven to work well in this application. Alternate hot water sources may be used provided they meet the supply specifications.
- D. Plug in the PCT GFCI power cord, appropriate for your electrical requirements. Power supplies are either 120Volt, 60 Hz, or 230Volt, 50 Hz
- E. If desired, connect a suitable detergent supply reservoir to the port labeled Detergent In (1/2" FPT). See Section 5.0, Detergent Supply, for additional details regarding installation and operation of the detergent supply reservoir.

3.3 Use Of Gases Other Than Compressed Air

If gasses other than compressed air are to be used, adequate ventilation must be provided, or the exhaust from the PCT-ADW-D must be piped to the outdoors to prevent accumulation of dangerous concentrations of gas in the work area. Note that if an extremely long exhaust line is used to pipe exhaust to the outdoors, the PCT-ADW-D may not be able to provide maximum clamping force due to the increased back pressure. Accumulation of exhaust gas can deplete the supply of breathing air, resulting in the danger of suffocation.

3.3 Use Of Gases Other Than Compressed Air, continued

If Carbon Dioxide or Nitrogen is used to power the unit, the following additional precautions must be taken:

- A. A high volume Carbon Dioxide regulator must be installed at the storage unit to reduce the line pressure to between 100 and 120 PSI.
- B. Approximately 20 to 30 feet (6.1m to 9.1m) of 1/2" to 3/4" (12.7mm to 19.05mm) pipe or tubing must be run between the regulator and the connection to the PCT-ADW-D. The purpose of the line is to allow the Carbon Dioxide gas to warm up to ambient temperatures to prevent the drive motor from freezing or sticking.
- C. In the event that the ambient temperature is too low to provide adequate warm up of the gas prior to entering the unit, auxiliary heat of some type should be used to warm the gas to at least 100°F (38°C) before it enters the machine.

3.4 Air Lubricator Fill

Fill the air lubricator in accordance with the following instructions.

- A. Disconnect the shop air supply to the inverter cabinet, open the access panel and bleed all entrapped air by turning the air regulator all the way off. Verify the air pressure reads 0 psig on the inverter top panel air pressure gauge.
- B. Locate the oil reservoir, remove and fill with 10 weight non-detergent oil.
- C. Replace the oil reservoir. The oil feed should already be factory adjusted to approximately one drop per minute at full speed air flow. See figure 3-2 if oil flow adjustment is required.
- D. Re-adjust the air pressure regulator to the proper air pressure. Close the inverter access panel and re-connect the air supply.

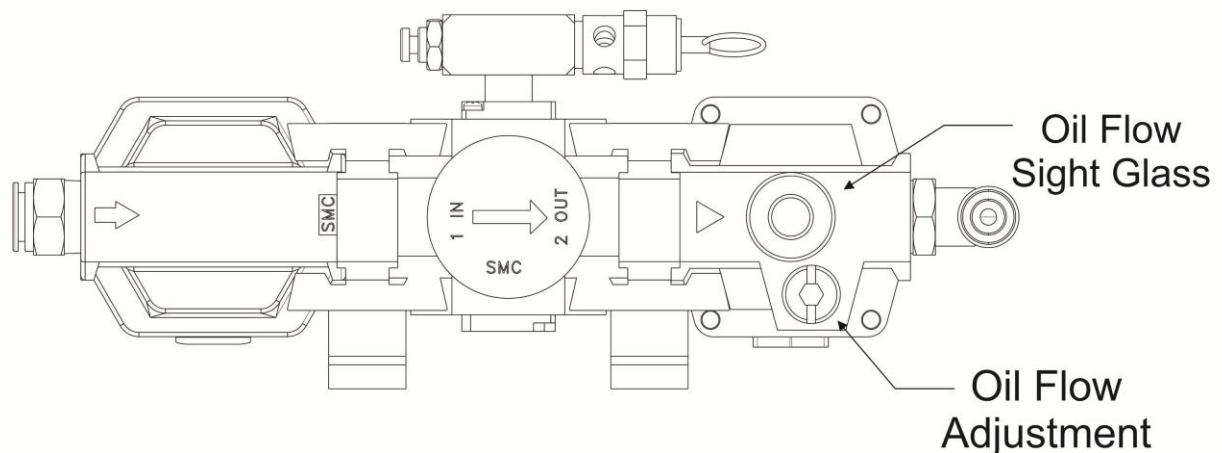


Figure 3 - 2 Top View - Air Lubricator

3.5 Changing Cylinder Load Direction

PCT-ADW-D units are normally configured at the factory to load cylinders from the right hand side of the unit (when facing the control console). The side from which cylinders are loaded may be reversed on PCT-ADW-D units. In other words, cylinders may be loaded either from the right side or the left side of the machine. The following steps describe the procedure for changing the side from which cylinders are loaded into the PCT-ADW-D. Refer to figures 3-3 and 3-4 as necessary for clarification.

- A. Remove any cylinders and injection probes from the PCT-ADW-D. Turn off and/or disconnect the Clean Air supply, Hot Water supply and Detergent supply.
- B. Press the Manual button on the touch screen controller or the F5 key. Press CLAMP on the screen or the F1 Button to Clamp the clamp arm grips. Press the F4 Button or Invert on the Screen to Invert the clamp assembly. Next cycle between F1, F2 and F3 to eject any residual hot water, detergent and/or air pressure from the machine.
- C. Turn the On/Off switch to the OFF position. This will revert the clamp arm assembly, but will not unclamp the cylinder grips.

3.5 Changing Cylinder Load Direction, continued

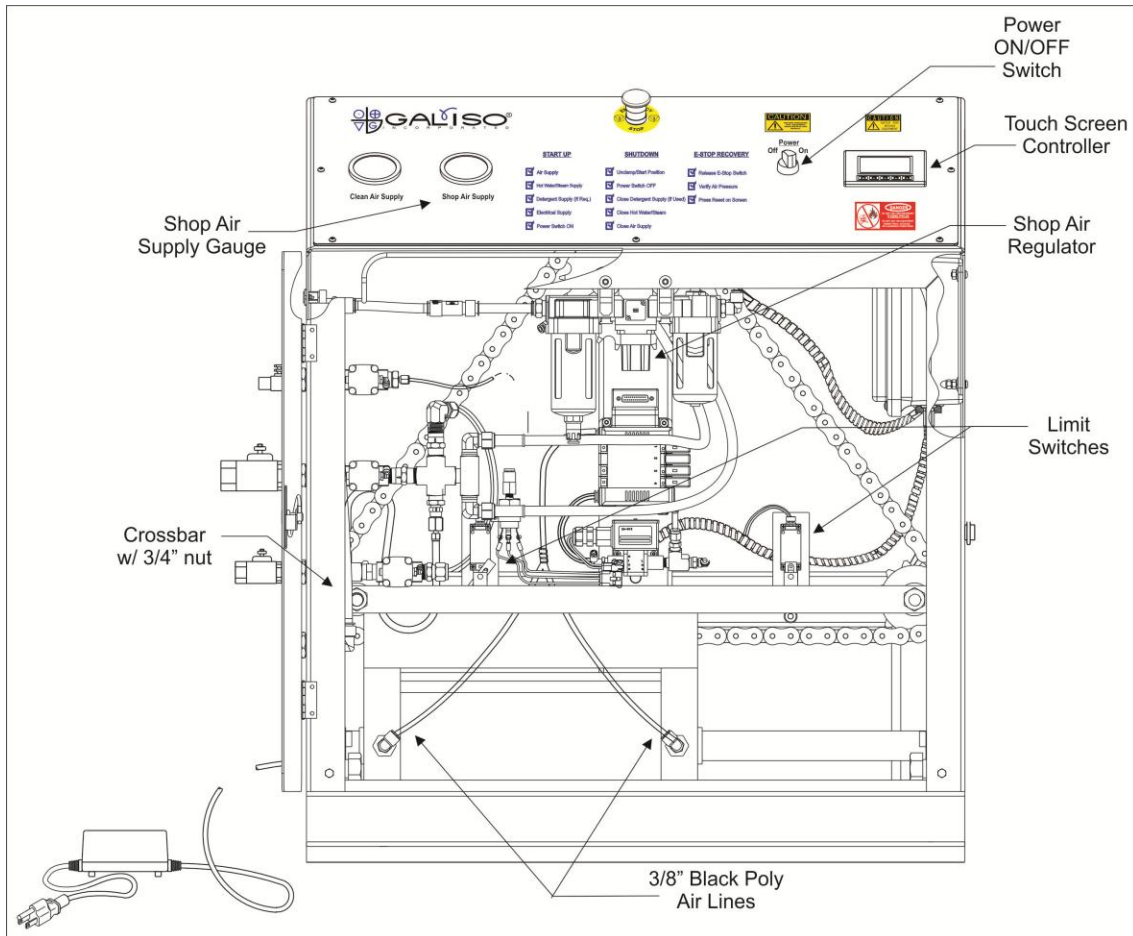


Figure 3 - 3, Cylinder Load Direction

- D. Turn off or disconnect the Shop Air supply to the machine. Open the Shroud door panel and locate the Shop Air Regulator. Turn the regulator knob counter-clockwise until the Shop Air pressure gauge reads zero psig.
- E. Turn the ON/OFF switch to the ON position. Press MANUAL on the touch screen or the F5 button. Press the F1 or UNCLAMP on the screen to unclamp the cylinder clamp grips. Since the air pressure has been released from the system (step B.), the clamp mechanism should not move. This step verifies that all the air pressure has been released from the system.
- F. Turn the ON/OFF switch to the OFF position, and disconnect the GFCI power plug from the utility outlet.
- G. Open the Shroud door panel and locate the two limit switches, then locate the cross bar in front of the switches, see figure 3-3. Remove the $\frac{3}{4}$ " (19 mm) nuts holding the cross bar, and then remove the crossbar. Retain all items for re-assembly.

3.5 Changing Cylinder Load Direction, continued

- H. Remove the Limit Switches (4 ea. screws with nuts) and interchange (swap) them, re-tightening with the screws and nuts. Cut and remove ties and wire wraps as necessary to reposition the Limit Switches. Make sure that the wires are properly routed and supported after repositioning the switches.
- I. Replace the crossbar using the $\frac{3}{4}$ " (19mm) nuts.
- J. Locate the black poly (invert cylinder) air lines connected to the invert cylinder. Mark the lines and cylinder fittings so as to be able to identify the "as found" condition. Disconnect the lines by pushing the Quick Connect retainer into the fitting, holding the retainer in and then removing the tubing.
- K. Interchange (swap) and reconnect the black poly air lines to the invert cylinder.
- L. With the machine still off, connect and open the Shop Air supply to the machine. This will automatically cause the clamp arm assembly to rotate to the other side of the clamp arm invert pivot bar.

! CAUTION !

Stay clear of the clamp arm assembly when supplying Shop air to the machine. The clamp arm rotates with considerable force and could cause personal injury.

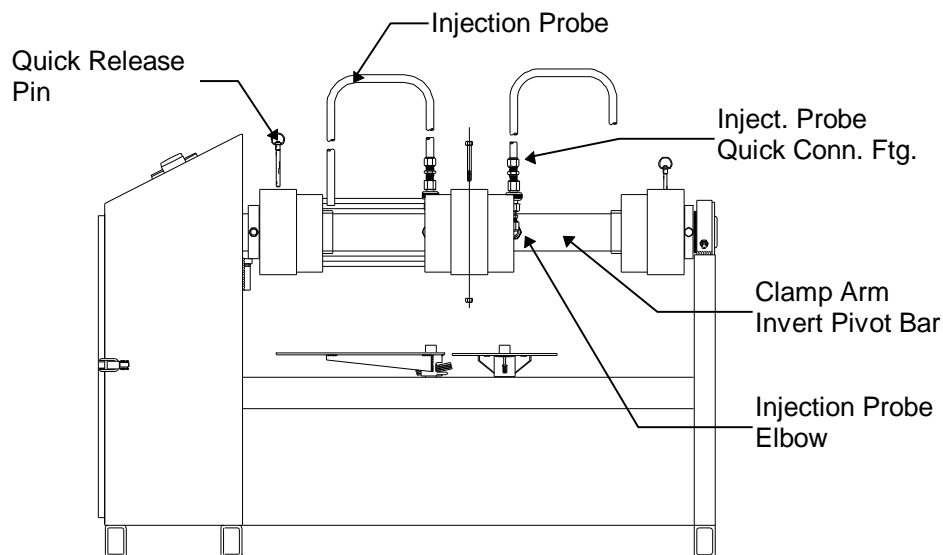


Figure 3 - 4 Clamp Arm and Pins

3.5 Changing Cylinder Load Direction, continued

- M. Remove and re-install the quick release pins from underneath the cylinder grips to the top side of the grips.
- N. Locate the Injection Probe fittings on the main cylinder invert pivot bar. Remove the hose fitting and bulk head adapter. Reassemble 180°, pointing the Quick Connect fittings upward.
- O. Re-connect the power supply plug and turn the power switch to the ON position.
- P. Select the MANUAL on the screen or press the F5 button and continue by verifying that the Clamp and Unclamp functions are properly operating by pressing CLAMP/UNCLAMP on the screen or the F1 button.
- Q. Verify that the invert mechanism is properly operating by pressing Invert or the F4 key while the cylinder arm is in the Clamp position.

! CAUTION !

In the event of any unusual noise, vibration and/or motion, press ABORT or the F5 key immediately to Revert and Unclamp the machine, or press the Emergency Stop Switch to completely shut down. Disconnect the air and power supplies and contact your Galiso, Inc. customer service representative for further instructions.

- R. Reconnect the Hot Water Detergent and Clean air supplies and proceed to cylinder operations as described in Section 4.0.

This page intentionally left blank

4.0 PCT-ADW-D OPERATIONS

This section describes the automatic and manual modes of operation and discusses various controller and/or equipment adjustments, which may be necessary for proper system operation.

4.1 Control Panel Components

The invert/wash/dry controls and indicators for the PCT-ADW-D are shown below.

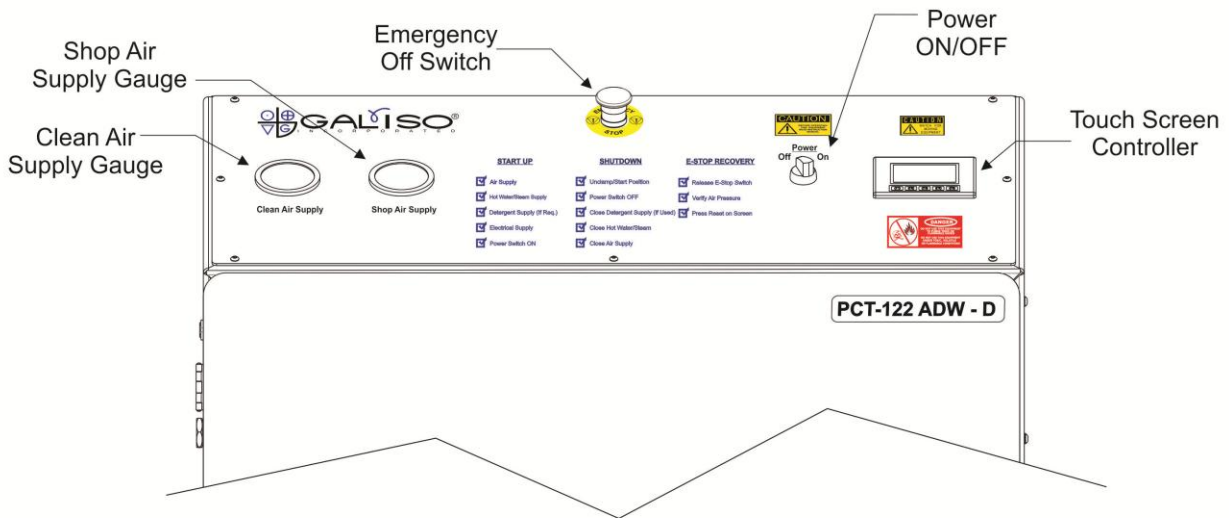


Figure 4 - 1 PCT-ADW-D Inverter Control Panel

4.1.1 Shop and Clean (Injection) Air Supply Gauges

The Shop Air pressure determines the amount of force applied to the cylinder clamp and the Cylinder Inverter. A shop air regulator is located inside the control enclosure for adjustment of the Shop Air supply pressure. Generally, an 80 to 90 psi (5.51 to 6.21 bar) air pressure setting is adequate for most steel cylinder(s), higher for larger volume cylinders.

The Clean or Injection Air supply gauge monitors the cylinder probe injection pressure. This air must be clean and dry. Use of 5 micron, Grade D, Oil Free, Dry, filtered air is recommended.

4-1 Panel Components, continued

4.1.2 Emergency Manual Override Button

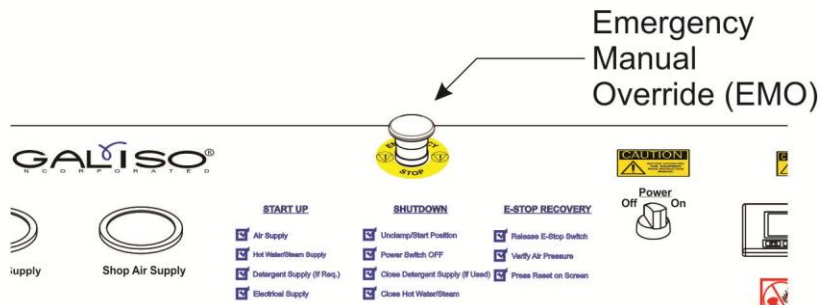


Figure 4-2 Emergency Manual Override (EMO)

The Emergency Manual Override Button can be pressed at any time during manual or automatic operation to instantaneously stop all operations. When this Emergency Stop is pressed, all processes including rotation will immediately stop. The cylinder will remain clamped until the EMO button is released.

To release the Emergency Manual Override Button, twist the button clockwise (to the right). The button will then popup and back into the original position.

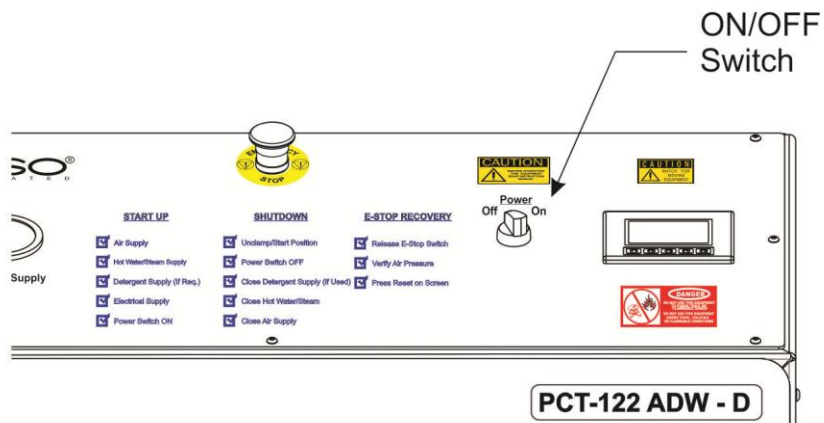


Figure 4-3 On/Off Switch

4.1.3 Machine ON/OFF Switch

The ON/OFF Switch (see figure 4-3) is a simple two position power switch. Power to the PCT-ADW-D is either ON, or OFF.

4.1.4 Touch Screen Controller

The location of the Touch Screen Controller is shown in figure 4-1. This Controller provides the operator with two choices of operation, either manual or automatic. Recommended values have been pre-programmed for Water/Detergent/Air times. The time values should be adjusted according to cylinder types and sizes. Preset time values for the Automatic cycle are available, or time values can be input and/or adjusted manually. Preset times are not in effect when operating in manual mode.

Included with the PCT-ADW-D are Screen Protectors. Due to shop environments, Galiso recommends placing a Protector on the Touch Screen. Additional Screen Protectors (P/N 96-11-6008) are available from Galiso by phone (800) 854-3789, or online at www.galiso.com. One Screen Protector has been installed at the factory.



Figure 4 - 4 PCT-ADW-D Touch Screen Controller -HOME

A. SETTINGS

- 1) At the Home screen the operator has the opportunity to adjust the Audio and Visual settings of the Control Screen. After pressing SETTINGS at the HOME Menu, sound and contrast options are available. To turn the “BEEP” sound on or off press the area on the touch screen immediately above “BEP” or Press F2. Both of these buttons act as a toggle switch and the “BEEP” sound is either on or off. Refer to Figure 4-4.
- 2) To change the contrast value of the touch screen, press the UP ARROW on the touch screen or F4 to raise the value (1-5) to darken the contrast of the screen 5 being the darkest. Press the DOWN ARROW or F5 to lighten the screen, 1 being the lightest.

4.1.4 Touch Screen Controller, continued

B. CYCLE TIMES (entry and adjustments)

Cylinder size selection or cycle time values can be input prior to starting either mode of the operating processes (Automatic or manual). Changes can be made to suit a particular cylinder size or application. To change Cylinder size selection and use pre-set cycle times, switch the PCT power on, then on the touch screen press the TIMES button on the touch screen controller (or F2). Reference figure 4-4, Home Screen.

- 1) The first selection in the TIMES menu is cylinder size. Size options from ex-small to ex-large are pre-programmed with the following recommended cycle times:

Program	Drain Air	Water	Dry Air
Ex-Small	5	30	30
Small	5	30	60
Medium Small	10	45	45
Medium Large	10	45	60
Large	15	45	60
Ex-Large	15	60	60

Table 4-1, Recommended Cycle Times

- 2) To select a cylinder size with pre-set cycle time values, from the home menu, press TIMES on the touch screen or the F2 button.
- 3) The TIMES menu now gives a cylinder size selection on the left side of the screen (See Figure 4-5). The right-side shows the last active cylinder size that was loaded into the controller.



Figure 4-5, Times Menu

- 4) Select the cylinder size to be processed on the left side of the menu, using the up or down arrows or, the F1 and F2 buttons. When the desired cylinder size has been selected, press LOAD (or F4) to enter that size and set as the Active program.
- 5) Cycle times for the cylinder size showing in the Active window will now process.

B. CYCLE TIMES (entry and adjustments)

- 6) **Changing cycle times:** From the Home menu press TIMES (or F2) and select the cylinder size using the ARROWS (or F1 &F2). Press EDIT (or F3). The Edit Times menu should be displayed. See figure 4-6.



Figure 4-6, Edit Times Menu

- 7) **Numeric Keypad Screen:** After Drain, Detergent, Water or Air is pressed to indicate changes, a screen showing a numeric keypad and generic editing keys will appear. See Figure 4-7, below.



Figure 4-7, Numeric Keypad

Pressing any number on the Numeric Keypad will place that number in the upper right area (data entry window) of the screen. Traditional keyboard editing keys; Escape (ESC), Backspace (BS), Clear (CL), and Enter (ENT) are also shown and active.

ESC: will take the operator back 1 screen (i.e. the Edit Times screen) and leaves the prior input time as valid.

BS: will erase the first number to the left of the cursor.

CL: will erase any numbers in the data entry window.

ENT: will enter the numbers in the data entry window as the valid runtime for the selected operation.

B. CYCLE TIMES (entry and adjustments), continued

On screen definitions for the F1-F5 Buttons are not available but are as follows:

F1 will take the operator back 2 screens (i.e. to the Times Menu.

F2 has no function.

F3 acts as ESC and will take the operator back 1 screen (the Edit Times screen) and leaves the prior input time as valid.

F4 acts as ESC and will take the operator back 1 screen (the Edit Times screen) and leaves the prior input time as valid.

F5 acts as ESC and will take the operator back 1 screen (the Edit Times screen) and leaves the prior input time as valid.

- 8) Drain Air Injection Time: At the Edit Time menu Press Drain on the touch screen (or F2). The next screen acts as a numeric keypad including keys for ESCAPE, BACKSPACE, CLEAR, and ENTER. Enter the 3 digits representing the time value in seconds. For example, for a 15 second air injection time, enter 15 (up to 999 seconds). Press ENTER to set the time value in memory Pressing the ESCAPE key will exit back to the TIMES screen and will leave the last entered time as the valid Drain Air Injection time.
- 9) Detergent Injection Time: Press SOAP on the touch screen (or F3). Enter the 3 digits representing the desired time value in seconds. For example, for a 10 second detergent injection time, enter 010 (up to 999 seconds). Press ENTER to set the time value in memory. Pressing the ESCAPE key will exit back to the TIMES screen and will leave the last entered time as the valid Detergent Injection time. To eliminate the detergent injection cycle, enter 0 seconds and press the ENTER key. Refer to Section 4.6 for additional information regarding detergent injection.
- 10) Hot Water Injection Time: Enter the 3 digits representing the desired time value in seconds. For example, for a 50 second water injection time, enter 50 (up to 999 seconds). Press ENTER to set the time value in memory. Pressing the ESCAPE will exit back to the TIMES screen and will leave the last entered time as the valid Hot Water Injection time.
- 11) Drying Air Injection Time: Enter the 3 digits representing the desired time value in seconds. For example, for a 60 second Air injection time, enter 60 (up to 999 seconds). Press ENTER to set the time value in memory. Pressing the ESCAPE key will exit back to the TIMES screen and will leave the last entered time as the valid Dry Air Injection time.

C. Recommended Automatic Cycle Times:

Program	Drain Air	Water	Dry Air
Ex-Small	5	30	30
Small	5	30	60
Medium Small	10	45	45
Medium Large	10	45	60
Large	15	45	60
Ex-Large	15	60	60

Table 4-2, Recommended Automatic Cycle Times

The automatic process steps and recommended cycle times for standard steel cylinders are as follows:

- 1) Clamp and invert cylinder(s).
- 2) Drain/drying air on for 15-20 seconds.
- 3) Air off, and hot water on for 50-60 seconds (This includes detergent injection for the first 5-10 seconds, if used).
- 4) Water off and drying air on for 50-60 seconds.
- 5) Re-invert and unclamp cylinder(s).

For welded cylinders, a cylinder invert with a 10 second air injection cycle may be repeated three or six times at the end of the automatic invert/wash/dry cycle to insure complete drying of cylinder(s). For specific instructions regarding welded cylinders, Refer to 4.2.1

4.2 Automatic Operation

- A. Load the cylinder(s) into the clamp grips and insert the Injection Probe(s) into the neck of the cylinder(s). Connect the base of the Injection Probe to the Injection Outlet located on the Cylinder Clamp Arm.
- B. Turn the Power Switch to the ON position.

NOTE:

If the ON/OFF Switch is accidentally turned to OFF, (during operation), the clamp Arm will stop any in-progress rotation immediately, while keeping the cylinder clamped.

ATTENTION!

If the Power Switch is in the ON position, there is loss of power or loss of air pressure (<85 psi, or 5.9 Bar) the PCT-ADW-D will instantly stop all processes, including cylinder rotation. A red message on the Touch Screen requests the air pressure be returned to over 85 psi or 5.9 bar. When the air or power is returned, a yellow screen displaying RESET will appear. Press RESET on the touch screen and continue processing the cylinder.

- C. At the Home Menu, select SETTINGS and LOAD the cylinder size to be processed. If cycle times need to be edited, refer to Section 4.1.4 Changing Cycle Times.



Figure 4-8 Auto Cycle Menu

- D. After the time parameters have been set (see 4.1.4) Press AUTO or F1 to reach the Auto Screen. The operator is now able to add/change additional flip cycles (used for welded or unusual size cylinders) see section 4.5 Loading of Unusual size cylinders.

4.2 Automatic Operation, continued



Figure 4-9, Extra Flip Settings Screen

- E. To set the number of extra Flip Cycles, Press the ARROW UP (or F1) or ARROW DOWN (or F2) on the touch screen. Additional Air Time can be added here also. Drain Air time can be changed by pressing the data field under the words “Drain Air”, or by pressing F4. A numeric keypad will show on the touch screen (see fig. 4-7, Numeric Keypad). After data has been entered for the extra flip cycles, press BACK (or F5) to return to the Auto Cycle Screen and proceed with operations. The extra flip and air cycles will be performed after the regular cylinder cycles have processed.
- F. If a cylinder clamp and HOLD is desired, that process can be performed by pressing HOLD (or F4) at the Auto Time menu. After pressing HOLD (or F4) on the Auto Time Menu you will see the following Menu:



Figure 4-10 Hold Screen

- G. To make a selection for a hold to occur, press BEFORE INVERT (or F3), or AFTER INVERT (or F4). Both BEFORE and AFTER can be enabled to allow a hold to occur before and after cylinder inversion. An ON/OFF toggle switch is shown on the screen. Press ON/OFF to turn a hold option ON (or press again to turn the option off). After selections have been made, Press BACK (or F5) and the screen will return to the AUTO menu.

4.2 Automatic Operation, continued

- H. If all cycle times are set to the desired settings, press START or F1 to begin the Automatic processes. The PCT will now clamp the cylinder and display the following Screen:



Figure 4-11 Auto Process Time Screen

- I. During the automatic operation the screen will change for each cycle, displaying the current cycle, total Process time and a running count down of cycle time remaining. Refer to Figure 4-11.
- J. After all cycles have been automatically run, the PCT will revert the cylinder back to the original position. The cylinder will remain clamped until the operator presses UNCLAMP.

ATTENTION!

If, at any time during processing, a situation should occur in which the operator would need to stop the PCT-ADW-D during operation, the F5 button, or Abort, is available to stop the process. After F5 or Abort is pressed, the PCT-ADW-D will immediately stop the process, and keep the cylinder clamped.

WARNING!

Always remember to use the EMERGENCY STOP SWITCH during an emergency situation! The Abort key can be pressed at any time, but Galiso, Inc. recommends using the EMERGENCY STOP SWITCH for instantly stopping all PCT processes, including stopping any rotation of the cylinder. This switch should be used in situation that could cause personal injury, or damage to the equipment or area. See Section 4.1.2 for operation and reset of the Emergency Override Button.

4.3 Manual Operation

NOTE: When operating in Manual mode the Cycle Times parameters are not in effect. Each process will only start upon pressing the next cycle key.

- A. Load the cylinder(s) into the clamp grips and insert the Air Injection Tube(s) into the neck of the cylinder(s). Connect the base of the Air Injection Tube to the Injection Outlet located on the Cylinder Clamp Arm.
- B. Turn the power switch to the ON position.
- C. From the Home Screen, Press MANUAL. The next screen gives the option of Home CLAMP see Figure 4-12, below.



Figure 4-12, Manual Cycle Clamp Screen

- D. Press the CLAMP on the touch screen or F1 to clamp the cylinder.



Figure 4-13, Manual Cycle Clamping in Progress

- E. During the manual process, the current cycle in progress will flash on the screen. During a cycle, ABORT or (F5) is given as an option for stopping the process. If ABORT or (F5) is pressed, the PCT will stop the current process revert and unclamp the cylinder.

ATTENTION!

If, at any time during operation, a situation should occur in which the operator would need to stop the Manual Process, F5 or Abort is available to stop the process. After F5 or Abort is pressed, the PCT-ADW-D will stop the process, revert and unclamp the cylinder.

4.3 Manual Operation, continued

WARNING!

Always remember to use the EMERGENCY STOP SWITCH during an emergency situation! The Abort key can be pressed at any time, but Galiso, Inc. recommends using the EMERGENCY STOP SWITCH for instantly stopping all PCT processes, including stopping any rotation of the cylinder. This switch should be used in any situation that could cause personal injury, or damage to the equipment or area. See Section 4.1.2 for operation and reset of the Emergency Override Button.

ATTENTION!

If the Power Switch is in the ON position, there is loss of power or loss of air pressure (<85 psi, or 5.9 Bar) the PCT-ADW-D will instantly stop all processes, including cylinder rotation. A red message on the Touch Screen requests the air pressure be returned to over 85 psi or 5.9 bar. When the air or power is returned, a yellow screen displaying RESET will appear. Press RESET on the touch screen and continue processing the cylinder.



Figure 4-14, Manual Cycle, Invert Screen

- F. After the cylinder has been clamped, press INVERT or F4. Once the cylinder begins inverting, the screen will flash “inverting” until complete. At this time the operator has the option of ABORT (or F5) to stop the invert and return to home (and cylinder unclamped) position.



Figure 4-15, Manual Cycle, Operation Screen

- G. The next menu gives the operator cycle options See Figure 4-13. Pressing any of the selections will start that cycle i.e.; pressing AIR (or F1) will start the air injection cycle. The cycle will run continuously until the next process key is pressed. The numeric value is a timer showing how long the current cycle has run.

4.3 Manual Operation, continued

- H. If the cylinder requires washing, press the SOAP (or F2) Detergent Injection Control key. When the cylinder is clean, press the SOAP or F2) key again to stop detergent injection. See Section 4-6, Detergent Supply Reservoir for instructions for adjusting the detergent injection concentration.

NOTE:

At any point when SOAP is selected, a combination of both detergent and hot water will be injected. Only the word “SOAP” is displayed.

- I. Press the WATER (or F3) Hot Water Injection Control key to inject hot water into the cylinder. Allow the hot water injection to remain on long enough to rinse the detergent from the cylinder, and then press the WATER (or F3) Hot Water Injection Control key to stop the hot water injection.
- J. If the cylinder does not require washing, allow the hot water injection to heat the cylinder for approximately one (1) minute, and then press the WATER (or F3) key again to stop hot water injection time. The time required to sufficiently heat a cylinder will vary with the cylinder size. If the cylinder is not dry at the end of the operation cycle, then the hot water injection time needs to be increased. Smaller cylinders will require a shorter hot water injection time and larger cylinders will require a longer hot water injection time.
- K. Press the AIR (F1) Air Injection Control key again, to drain and dry the cylinder. Allow the air to dry the cylinder for approximately one (1) minute and then press the AIR (F1) key again to stop the air injection.
- L. Press the REVERT (or F4) Invert Control key to return the cylinder to the upright position.
- M. Press the UNCLAMP (or F1) Clamp Control key to release the cylinder from the cylinder clamp, then disconnect the Air Injection Tube and remove the cylinder from the machine.

4.4 Cylinder Clamp Arm Adjustment

The PCT-15-ADW, PCT-122-ADW and the PCT-24-ADW, feature an adjustable cylinder clamp to allow the machine to accept a wide variety of cylinder sizes. The PCT-15ADW has an adjustable inner clamp arm, which allows the clamp to be repositioned for servicing cylinders from 4 inches to 15 inches in diameter.

The PCT-122-ADW features a slightly different clamp arm configuration. The center clamp is removable to allow the PCT-122-ADW to service larger cylinders. Normally, the PCT-122-ADW will accept two cylinders from 5 inches to 12 inches in diameter. When the center clamp arm is removed, the PCT-122-ADW, (with an optional set of clamp arms), will accept one cylinder, up to 15 inches in diameter.

The clamp arm adjustment procedures for both the PCT-15-ADW, and the PCT-122-ADW, are described below.

4.4.1 PCT-15-ADW Clamp Arm Adjustment:

The inner Cylinder Clamp Arm of the PCT-15-ADW may be set in three different positions to allow the PCT to accept cylinder from 4 inches to 15 inches in diameter. To adjust the Cylinder Clamp Arm, proceed as follows:

- A. Position a cylinder between the Cylinder Clamp Grips.
- B. Remove the pin that secures the inner Cylinder Clamp Arm to the Cylinder Clamp Shaft. Move the inner Cylinder Clamp Arm to the appropriate position and replace the retaining pin. Remove the cylinder from the Clamp Grips.

4.4.2 PCT-122-ADW Clamp Arm Adjustment:

The center Cylinder Clamp Arm of the PCT-122-ADW is removable to allow the PCT-122-ADW to service a single 12 inch to 15 inch diameter cylinder instead of two standard size cylinders. To remove or replace the center Cylinder Clamp Arm, proceed as follows:

- A. Position a cylinder next to the Cylinder Clamp Grips.
- B. Remove the bolts which secure the center Cylinder Clamp Arm to the Cylinder Clamp Shaft. Safely store the center Cylinder Clamp Arm and retaining bolts until they are needed again.
- C. To replace the center Cylinder Clamp Arm, first remove the cylinder from the Cylinder Clamp. Reinstall the center Cylinder Clamp Arm and replace the retaining bolts. Tighten the bolts to securely fasten the center Cylinder Clamp Arm to the Cylinder Clamp Shaft.

4.5 Loading of Unusual Dimension Cylinders

4.5.1 Large Diameter Cylinders:

Large diameter (over 12") L.P. or compressed natural gas cylinders require special handling. Cylinders must be clamped at its vertical center to assure proper balance. A suitable base or platform may be needed to accomplish this.

Round bottom compressed natural gas cylinders require using a base that will support the cylinder in a vertical position.

L.P. or natural gas cylinders over 42" high require partial draining prior to inverting. This is accomplished by the use of a Drain Probe Assembly (Part Number 25-41-9352).

The operating air pressure regulator should be set at 110 psig to assure proper operation of the equipment.

4.5.2 Loading of cylinders under 42" high:

- A. Position cylinder between the cylinder grips on top of the appropriate base or platform
- B. Insert the injection probe into the neck of the cylinder and connect the base of the probe to the injection outlet located on the cylinder clamp arm.
- C. Proceed with manual or automatic operations as desired.

4.5.3 Loading of Cylinders 42" and Over in Height:

- A. Position the cylinder between cylinder grips on top of the appropriate base or platform.
- B. Press the MANUAL (or F5) key to start manual mode, and then press CLAMP (or F1) to clamp the cylinder.

4.5.3 Loading of Cylinders 42" and Over in Height, continued

- C. Insert and tighten Injection Probe Assembly, (part number 25-41-9352) to the cylinder and attach the air supply line to the male quick connect fitting at the top of the assembly (air pressure should be 80 to 90 psi). When empty, disconnect the air supply and remove the Drain Probe Assembly.

NOTE:

Drain Probe can be cut to a length, which will allow the cylinder to remain partially full. The amount of water left in the cylinder will be determined by the ability of the cylinder grips to support the cylinder without slipping.

- D. Insert injection probe into the neck of the cylinder and connect the base of the probe to the injection outlet, located on the cylinder clamp arm.
- E. Proceed to either the automatic or manual operations as desired.

!! WARNING !!

Failure to follow the above procedures could result in a cylinder being dropped, resulting in extreme personal injury and/or damage to the equipment.

4.6 Detergent Supply Adjustment

The following sections provide instructions for adjusting the detergent injection, shutting down the detergent supply and re-filling the detergent supply reservoir.

4.6.1 Detergent Injection Adjustment

- A. Press the MANUAL (or F5) key to start manual operation).
- B. Load an empty cylinder into the Clamp Jaws, insert the Injection Probe into the neck of the cylinder and connect the base of the probe to the Injection Outlet, located on the Cylinder Clamp Arm. Press CLAMP (or F1) Clamp Control to clamp the cylinder.
- C. Press the INVERT (or F4) key (Invert Control) to invert the cylinder.
- D. Press the WATER (or F3) key to start hot water injection into the cylinder.
- E. Press the SOAP (or F2) to start detergent injection into the cylinder. Turn the Detergent In Valve and the Hot Water In Valve to adjust the concentration of detergent injected into each cylinder. The detergent injection rate should be high enough to remove any contaminants, but not so high that an inordinately long hot water injection time is required to rinse the detergent from the cylinder after washing.

4.6 Detergent Supply Adjustment, continued

- F. After allowing the hot water injection to rinse all detergent from the cylinder, press the WATER (or F3) key to stop hot water injection.
- G. Press the AIR (or F1) air injection control key to drain and dry the cylinder. Next, press the REVERT (or F4) key to return the cylinder to the upright position. Press the UNCLAMP (or F1) key to release the cylinder from the clamp.
- H. Disconnect the Injection Probe and remove it from the cylinder.
- I. The screen should now show the Home Menu and the operator can choose to Press AUTO (or F1) Automatic Operation position to use computer-controlled operation, or MANUAL (F5) Manual Operation to proceed with manual operation.

4.6.2 Detergent Reservoir Fill

To refill the Detergent Supply Reservoir, proceed as follows:

- A. Close the Detergent Reservoir Clean Air In Control Valve and the Detergent Reservoir Clean Air Supply Line Regulator located on the SRC-1.
- B. Next, remove the Clean Air Supply Line and the Detergent Supply Line from the SRC-1.
- C. Open the Clean Air In Control Valve on the SRC-1 and allow all air pressure to escape from the Detergent Supply Reservoir. Close the Clean Air In Control Valve.

! CAUTION !

Make certain that all pressure has been released before removing the SRC-1 Detergent Reservoir Control Valve from the cylinder.

- D. Remove the SRC-1 from the cylinder neck and refill the Detergent Supply Reservoir as described in Section 4.5.

4.6 Detergent Supply Adjustment, continued

4.6.3 Detergent Supply Shutdown

To shut down the Detergent Reservoir at the end of a period of operation, proceed as follows:

- A. Close the Soap and Water Control Valve and the Clean Air In Control Valve.
- B. Close the Detergent Reservoir Clean Air supply line regulator.
- C. Remove the Detergent Reservoir clean air supply line from the SRC-1 and open the Clean Air In Control Valve and allow all pressure to bleed from the reservoir. Replace the Detergent Reservoir clean air supply line after all pressure has escaped from the Detergent Reservoir.
- D. Close the Clean Air In Control Valve.

5.0 MAINTENANCE

5.1 General

- A. Lubricate the Clamp Arm, Clamp Arm Bearings, Chain and Sprocket once per month with moly grease.
- B. Check the air supply line filter and lubricator twice per week for proper operation.
- C. If compressed air is used for injection, check filters daily for proper operation.
- D. Galiso recommends that the Air Filter element be replaced every six (6) months. The Air filter element may be purchased from Galiso under part number 80-11-0068.

5.2 Electronic Controller Replacement

A Galiso Manual (No. 21-11-1148) is provided, should it become necessary to replace the electronic controller.

5.3 Troubleshooting

In the event that the unit fails to respond to Touch Screen input, there are two primary causes. First, electrical power surges may cause the electronic controller to shut down, disabling both automatic and manual control. Second, the Touch Screen itself may have developed a malfunction.

A. Controller Reset:

If the Touch Screen is not responding, disconnect power to the machine, let rest for 1 minute and reconnect power. The controller is located inside the main enclosure on the right hand side and should reset during this process. The Touch Screen should now be active. If it is not, proceed to troubleshoot the Touch Screen as described in 5.3.B, below.

B. Touch Screen:

The Touch Screen is connected to the PCT-ADW-D controller with an RJ12 (phone type) connection.

- A. Disconnect the RJ12 connector from the Touch Screen and then reconnect.

5.4 PCT Cylinder Inverter Spare Parts:

A spare parts list for the PCT cylinder inverter is provided in Table 5-1. Figures 5-2 and 5-3 depict the primary component spare parts locations for the PCT.

Item	Part No.	Description
1	87-11-0150	Emergency Manual Off Knob
2	87-11-0160	ON/OFF Switch
3	86-41-6007	Touch Screen Controller
4	25-41-8772	PLC Enclosure Assy
5	91-41-1090	Main Harness cable
6	25-42-9317	Valve Stack
7 & 9	25-41-4058A	Limit Switches
8	25-41-0535	Pressure Switch
10	81-11-0009	½" Ball Valve
11	81-11-0009	½ " Ball Valve
12	81-11-0216	Plug Valve 1/4 (for Soap Option)
13	80-11-0108	Filter
14	36-11-0520	Gauge
15	36-11-0520	Gauge
16	37-11-3076	Regulator
17	80-11-4029	Lubricator
18	25-43-9339	6.25" Radius Injection Probe
19	25-43-9338	5" Radius Injection Probe
20	69-00-0003	Quick Connect, Male Plug
21	69-11-0002	Quick Connect Coupler
22	69-94-0028	Quick Connect Washer
23	14-33-0045C	Cylinder Grip
24	66-33-7001	Quick Release Pin
25	50-00-0027	Thrust Race
26	50-00-0025	Thrust Bearing
27	50-00-0021	3" Roller Bearing

Table 5 - 1 PCT Cylinder Inverter Spare Parts

5.4 PCT Cylinder Inverter Spare Parts, continued

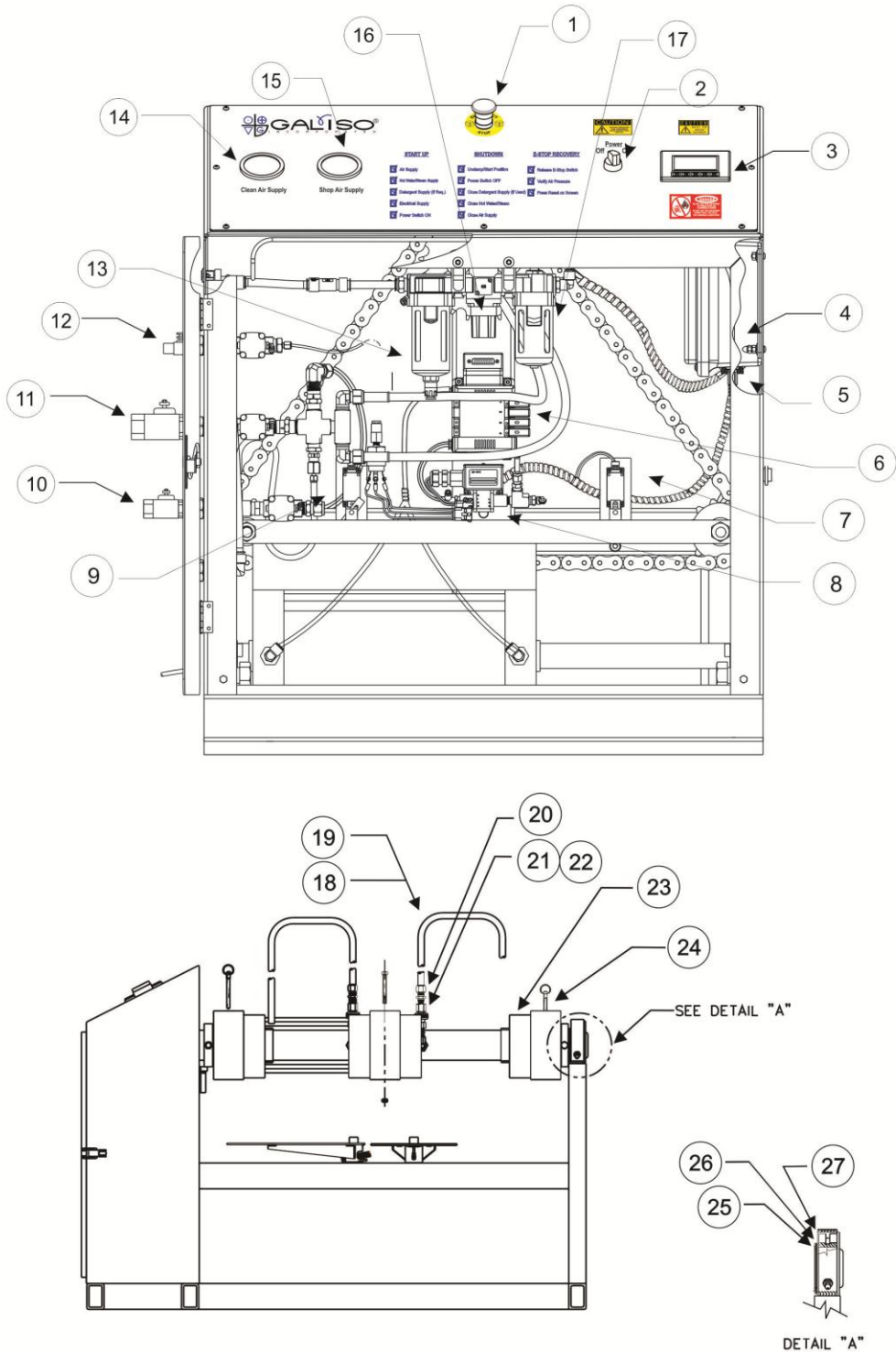
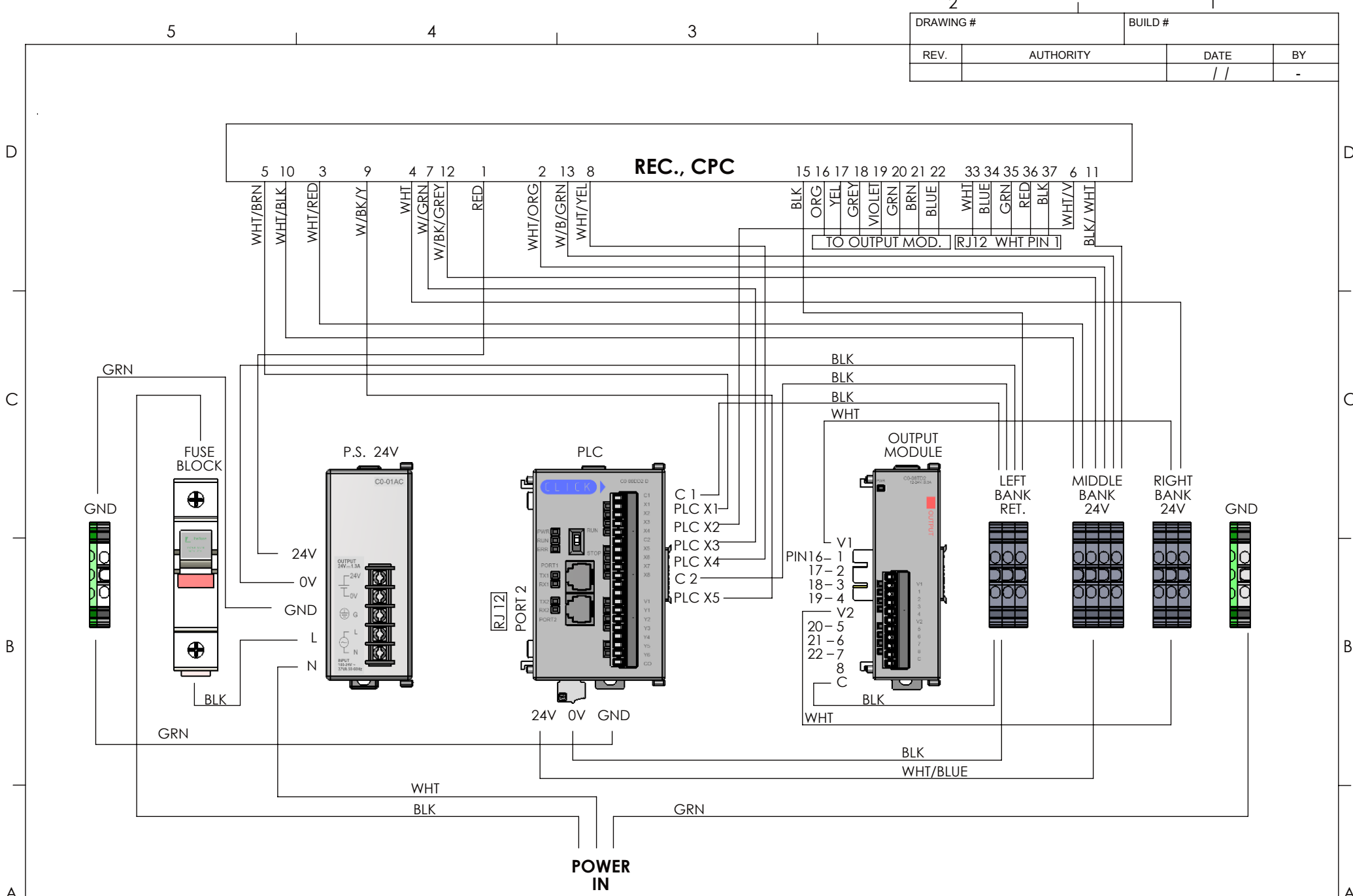


Figure 5 - 1 Spare Parts 1

This page intentionally left blank

DRAWING #		BUILD #	
REV.	AUTHORITY	DATE	BY
		//	-



MONTROSE, CO
 (970) 249-0233 PHONE
 (970) 249-0607 FAX

PROPRIETARY NOTICE
 THIS DOCUMENT CONTAINS
 PROPRIETARY INFORMATION WITH
 ALL RIGHTS AND TITLES
 RESERVED AND MAY NOT BE
 REPRODUCED OR TRANSFERRED IN
 WHOLE OR IN PART IN ANY
 MANNER OR FORM WITHOUT THE
 EXPRESSED WRITTEN CONSENT OF
 GALISO, INCORPORATED

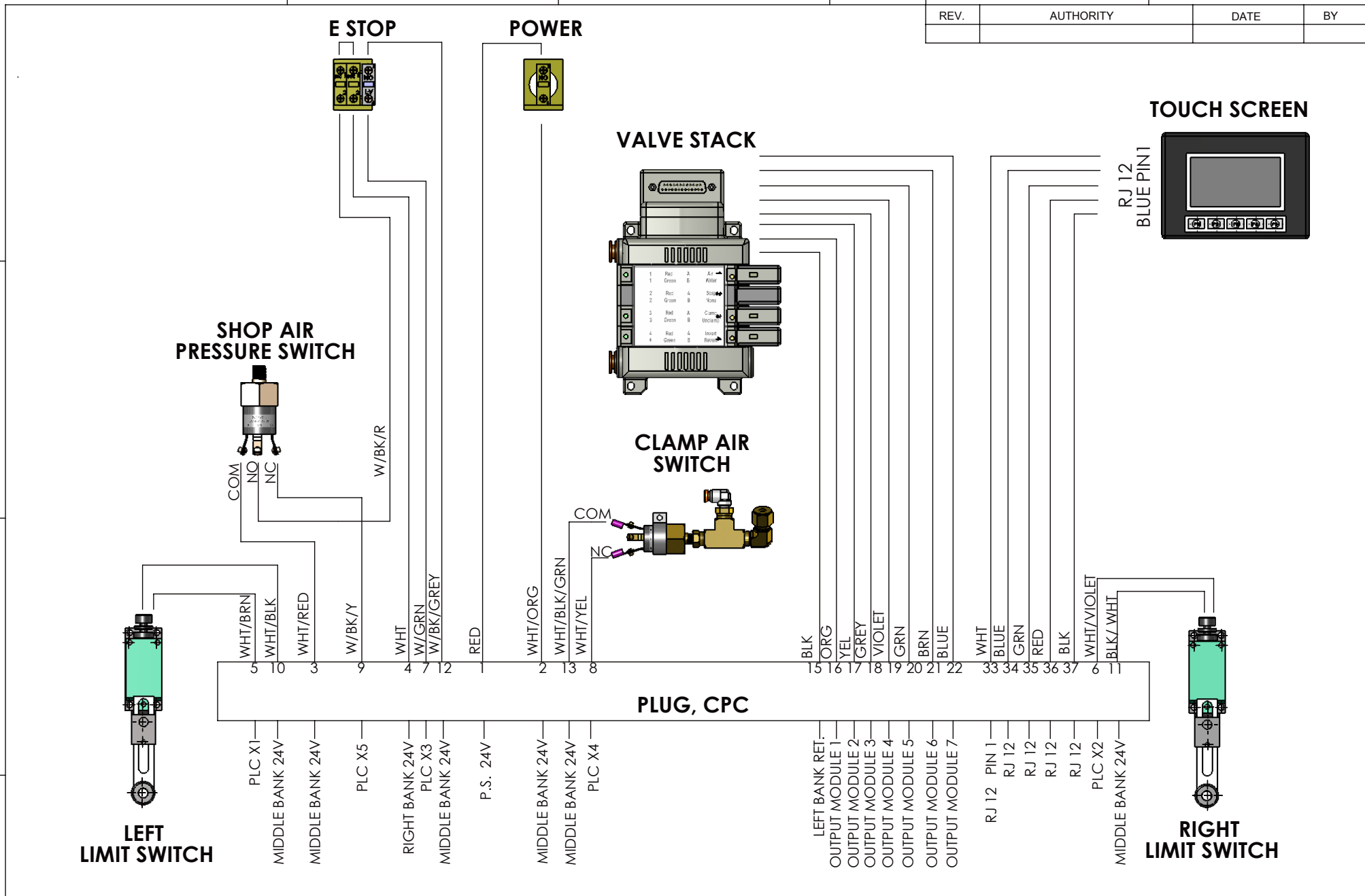
INTERPRET THIS DRAWING
 IN ACCORDANCE WITH ANSI
 Y14.5

UNLESS OTHERWISE SPECIFIED,
 DIMENSIONS ARE IN INCHES.
 TOLERANCES:
 .X ± .03
 .XX ± .015
 .XXX ± .005
 ANGLES ± 1°
 SURFACE ROUGHNESS - √

APPROVAL	
SIGNATURE	DATE
DRAWN BY: DON MORTON	10/20/11
PRODUCTION	
ENGINEERING	
QUAL. ASSURANCE	

TITLE:		ELECTRICAL LAYOUT		
		PCT-122-ADW-D CONTROLLER		
DRAWING #	BUILD #	REV.	EXT. SLDDRW	SHEET 1 OF 2

DRAWING # 2		BUILD # 1	
REV.	AUTHORITY	DATE	BY



MONTROSE, CO
 (970) 249-0233 PHONE
 (970) 249-0607 FAX

PROPRIETARY NOTICE
 THIS DOCUMENT CONTAINS
 PROPRIETY INFORMATION WITH
 ALL RIGHTS AND TITLES
 RESERVED AND MAY NOT BE
 REPRODUCED OR TRANSFERRED IN
 WHOLE OR IN PART IN ANY
 MANNER OR FORM WITHOUT THE
 EXPRESSED WRITTEN CONSENT OF
 GALISO, INCORPORATED

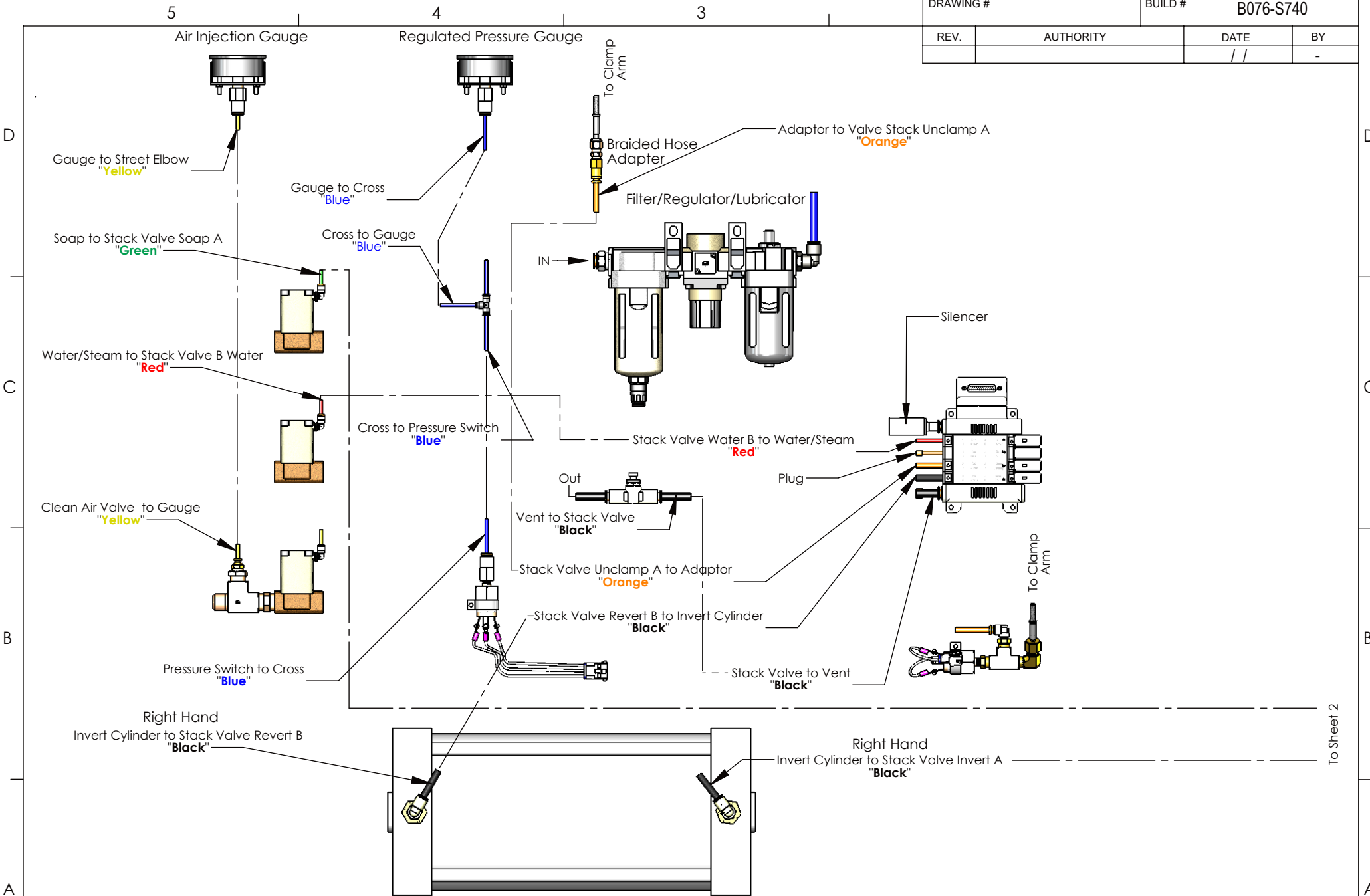
INTERPRET THIS DRAWING
 IN ACCORDANCE WITH ANSI
 Y14.5

UNLESS OTHERWISE SPECIFIED,
 DIMENSIONS ARE IN INCHES.
 TOLERANCES:
 .X ± .03
 .XX ± .015
 .XXX ± .005
 ANGLES ± 1°
 SURFACE ROUGHNESS - √

APPROVAL	
SIGNATURE	DATE
DRAWN BY: DON MORTON	10/20/11
PRODUCTION	
ENGINEERING	
QUAL. ASSURANCE	

TITLE: ELECTRICAL LAYOUT PCT-122-ADW-D		DRAWING #	BUILD #	REV.	EXT. SLDDRW	SHEET 2 of 2
--	--	-----------	---------	------	----------------	-----------------

DRAWING #		BUILD #	
		B076-S740	
REV.	AUTHORITY	DATE	BY
		//	-



MONTROSE, CO
 (970) 249-0233 PHONE
 (970) 249-0607 FAX

PROPRIETARY NOTICE
 THIS DOCUMENT CONTAINS
 PROPRIETARY INFORMATION WITH
 ALL RIGHTS AND TITLES
 RESERVED AND MAY NOT BE
 REPRODUCED OR TRANSFERRED IN
 WHOLE OR IN PART IN ANY
 MANNER OR FORM WITHOUT THE
 EXPRESSED WRITTEN CONSENT OF
 GALISO, INCORPORATED

INTERPRET THIS DRAWING
 IN ACCORDANCE WITH ANSI
 Y14.5

UNLESS OTHERWISE SPECIFIED,
 DIMENSIONS ARE IN INCHES.
 TOLERANCES:
 .X ± .030
 .XX ± .015
 .XXX ± .005
 ANGLES ± 1°
 SURFACE ROUGHNESS - √

APPROVAL	
SIGNATURE	DATE
DRAWN BY: D. ROYBAL	//
PRODUCTION	
ENGINEERING	
QUAL. ASSURANCE	

TITLE: PNEUMATIC LAYOUT PCT-122-ADW-D				
DRAWING #	BUILD #	REV.	EXT.	SHEET
	B076-S740		SLDDRW	1 OF 2

A

B

C

D

A

B

C

D

5

4

3

2

1

5

4

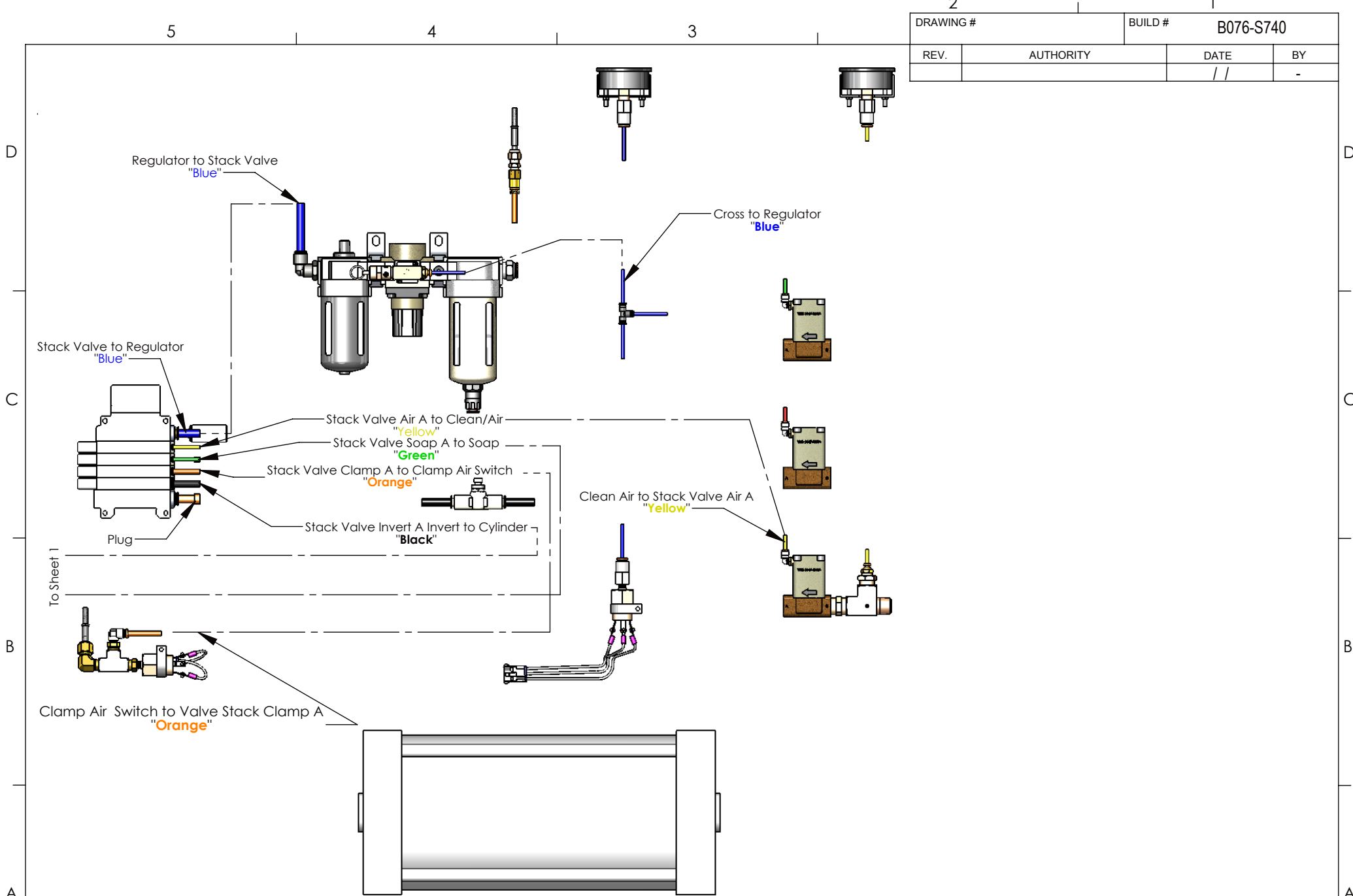
3

2

1

To Sheet 2

DRAWING #		BUILD #	
		B076-S740	
REV.	AUTHORITY	DATE	BY
		//	-



MONTROSE, CO
 (970) 249-0233 PHONE
 (970) 249-0607 FAX

PROPRIETARY NOTICE
 THIS DOCUMENT CONTAINS
 PROPRIETARY INFORMATION WITH
 ALL RIGHTS AND TITLES
 RESERVED AND MAY NOT BE
 REPRODUCED OR TRANSFERRED IN
 WHOLE OR IN PART IN ANY
 MANNER OR FORM WITHOUT THE
 EXPRESSED WRITTEN CONSENT OF
 GALISO, INCORPORATED

INTERPRET THIS DRAWING
 IN ACCORDANCE WITH ANSI
 Y14.5

UNLESS OTHERWISE SPECIFIED,
 DIMENSIONS ARE IN INCHES.
 TOLERANCES:
 .X ± .1
 .XX ± .03
 .XXX ± .015
 ANGLES ± 1°
 SURFACE ROUGHNESS - √

APPROVAL	
SIGNATURE	DATE
D. Roybal	//
PRODUCTION	
ENGINEERING	
QUAL. ASSURANCE	

TITLE:				
PNEUMATIC LAYOUT				
PCT-122-ADW-D				
DRAWING #	BUILD #	REV.	EXT.	SHEET
	B076-S740		SLDDRW	2 OF 2