



MultiLine[®]
FRESH VAC[®]
MODEL A200 52" (132 cm)
SEALING HEAD

**MODIFIED ATMOSPHERE
PACKAGING MACHINE**

USERS GUIDE

CVP P/N M-1110-0278 REV A

SERIAL #: _____

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SECTION: 1

OVERVIEW

FOREWORD

This manual contains information which is vital to the proper installation, operation, and maintenance of the CVP A200 FRESH VAC® Modified Atmosphere Packaging (MAP) Machine. Failure to follow the procedures herein outlined shall void the limited warranty.

Additions, modifications, or deletions from the procedures herein outlined may be made by CVP Systems Inc., at its sole option, without liability of any sort accruing to CVP Systems Inc.

This manual shall be considered current as of the date of any such addition, modification or deletion.

Photos, drawings, and illustrations used in this manual are representative and may vary from your equipment.

CUSTOMER SERVICE

When calling, either for parts or service, have the model and serial numbers available for our customer service representative. This will allow us to more accurately assist you with your machine.

The serial number tag for the A200 Multiline XT sealing head is located on the inside door of the rear control enclosure.

Ordering Parts

Ordering parts from CVP Systems can be accomplished in three different ways; by phone, fax or e-mail. Please include model and serial numbers in all correspondents to CVP Systems.

Phone: 800-422-4720 (US, Canada, & Mexico)
630-852-1190 (All others)

Fax: 630-852-1386

E-Mail: spareparts@cvpsystems.com

USING THE MANUAL

The following sections of this manual provide an overview for your A200 Multiline XT sealing head installation. They describe the requirements for site installation and provide basic installation instructions.

Information about basic machine operation and maintenance is also provided. It is recommended that anyone involved with the operational mechanics of this machine read the manual before operating or servicing the unit.

The prints and manuals included with the machine contain information which is important to service the unit. They should be stored in a cool, dry location away from the machine so that they are not exposed to high humidity and harsh chemicals.

SAFETY

Safety Precautions

It is important that all SAFETY PRECAUTIONS are followed closely when working with machinery. The A200 Multiline XT sealing head is simple and safe to use when properly operated.

Get acquainted with all of the warning labels and safety features of the machine. They are provided for your safety and benefit.

- ONLY ONE OPERATOR MAY USE THIS MACHINE AT ANY ONE TIME.
- THE RED BUTTON IS THE EMERGENCY STOP.
- DO NOT PUT HANDS INTO ANY PINCH POINTS, (areas where two or more parts intersect), SUCH AS THE MANIFOLDS.
- IN CASE OF EMERGENCY DO NOT DISCONNECT AIR.
- DO NOT OPERATE EQUIPMENT WITH BROKEN AND/OR MISSING PARTS.
- DO NOT WORK ON MACHINE WHILE POWER IS ON, UNLESS INSTRUCTED TO DO SO BY OUTLINED PROCEDURES WITHIN THIS MANUAL, OR BY QUALIFIED CVP SERVICE PERSONNEL.

SERIOUS INJURY OR DEATH COULD RESULT IF THE POWER SUPPLY IS NOT TURNED OFF BEFORE WORKING WITH CERTAIN COMPONENTS SUCH AS HIGH VOLTAGE LEADS!!!

- DO NOT BYPASS OR ALTER ANY SAFETY COMPONENT.
- DO NOT LEAN ON OR OTHERWISE PLACE BODY PARTS NEAR, ANY MOVING PARTS OF THE EQUIPMENT.
- WHEN POSSIBLE, USE RECOMMENDED TOOLS FOR REPAIR AND ADJUSTMENT.

Operational Safety

It is important to develop good safety habits to ensure a safe and efficient packaging process. Please adhere to the following:

- USE MACHINE AS DIRECTED BY THIS MANUAL AND CVP PERSONNEL.
- KEEP SURROUNDING AREA FREE OF CLUTTER AND HIGH VOLUMES OF TRAFFIC.
- ONLY USE MACHINE FOR PURPOSE INTENDED.
- FOR APPLICATIONS OTHER THAN PACKAGING, PLEASE CONSULT WITH YOUR CVP SALES REPRESENTATIVE.

MSDS SHEETS

A Material Safety Data Sheet (MSDS) is an instructional sheet concerning a specific chemical that explains hazards and emergency procedures.

CVP provides MSDS sheets for vacuum pump oils we sell upon request.

Before using vacuum pump oil or any other chemical supplied by CVP, read its MSDS sheet to learn the following:

Physical and Chemical Changes

- Normal appearance and odor
- Temperature, boiling or melting point, at which its form changes
- How fast it evaporates and rises in air
- Solubility in water

Fire and Explosion Risks

- Lowest temperature at which vapors catch fire
- Highest and lowest vapor concentrations that can catch fire or explode
- Fire fighting instructions

Reactivity Risks

- Chance of chemical change or disintegration
- Dangerous reactions to air, water, or specific chemicals
- Decomposition by-products

Exposure Health Risks

- Hazards and symptoms of inhaling, swallowing, skin, or eye contact
- Fast (acute) or gradual (chronic) appearance of health problems
- Cancer hazard
- Health conditions exposure could make worse
- First aid until medical help arrives

Precautions to Reduce Risks

- Controls such as ventilation and hygiene
- Respirators, gloves, or other personal protective equipment (PPE)
- Handling spills, leaks, or accidental release

FEATURES

Front of Machine The figure below shows several of the major assemblies of your A200 Multiline XT sealing head as viewed from the front.

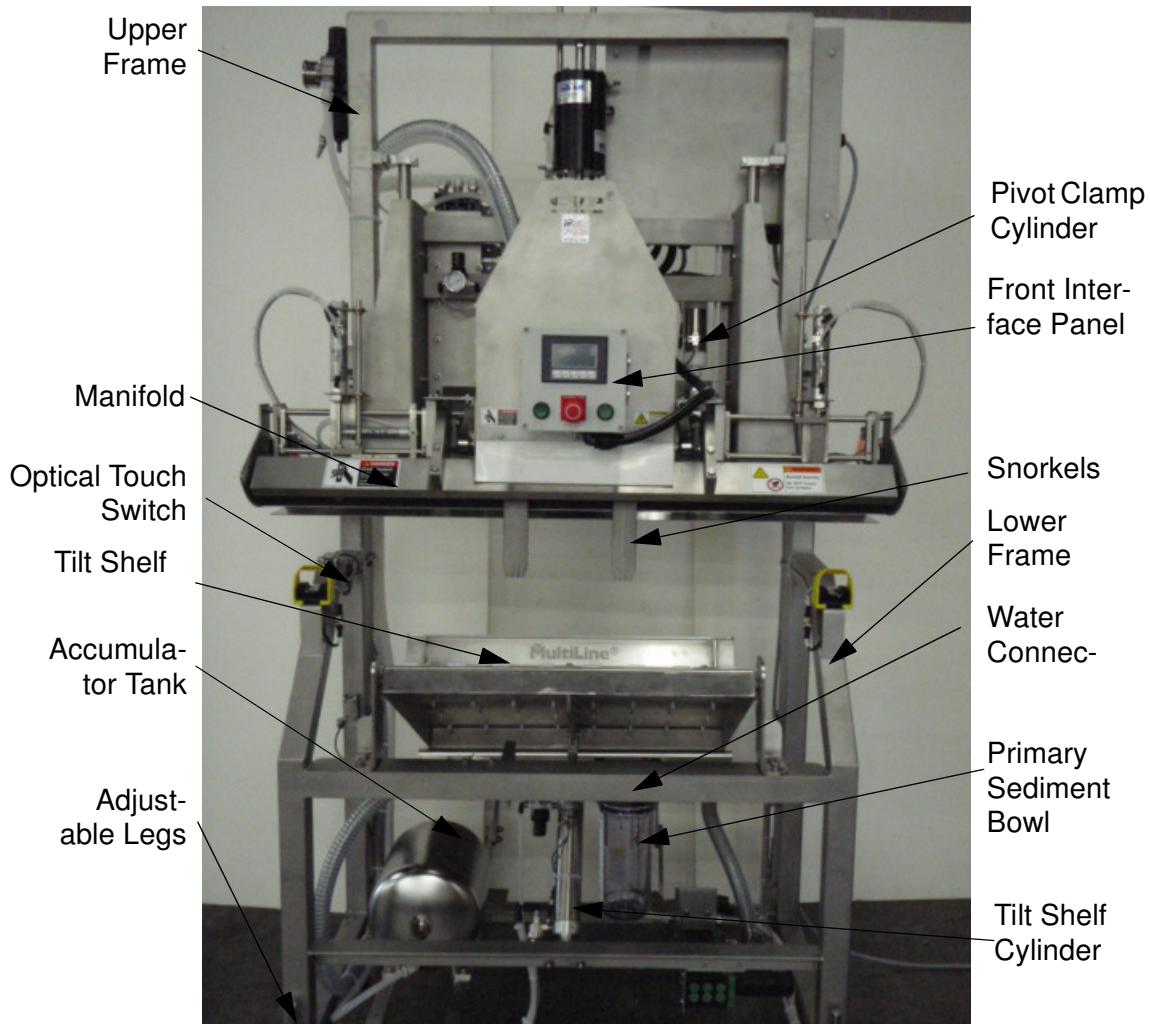


Figure 1-1. A200 Multiline XT Front View

Rear of Machine The figure below shows some of the major components of the A200 Multiline XT as viewed from the rear.

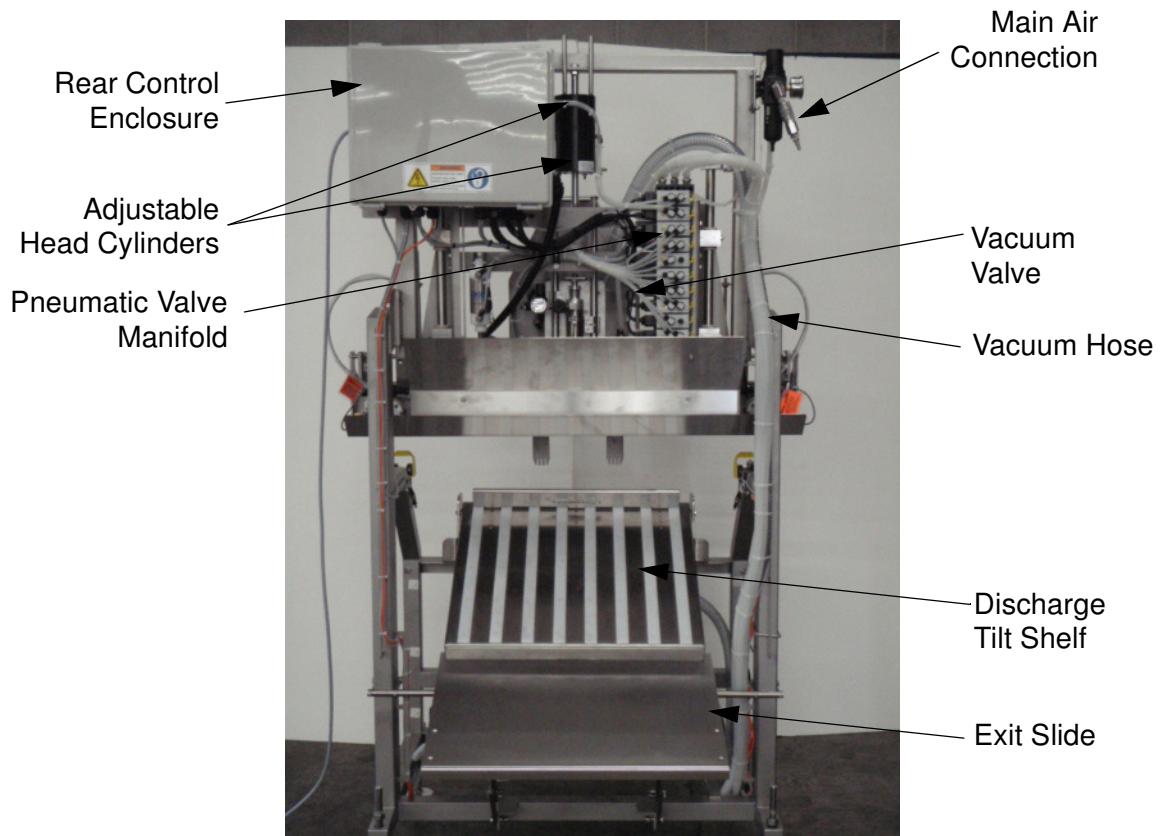


Figure 1-2. A200 Multiline XT Rear View

The figure below shows the components of the A200 Multiline XT sealing head's electrical panel.

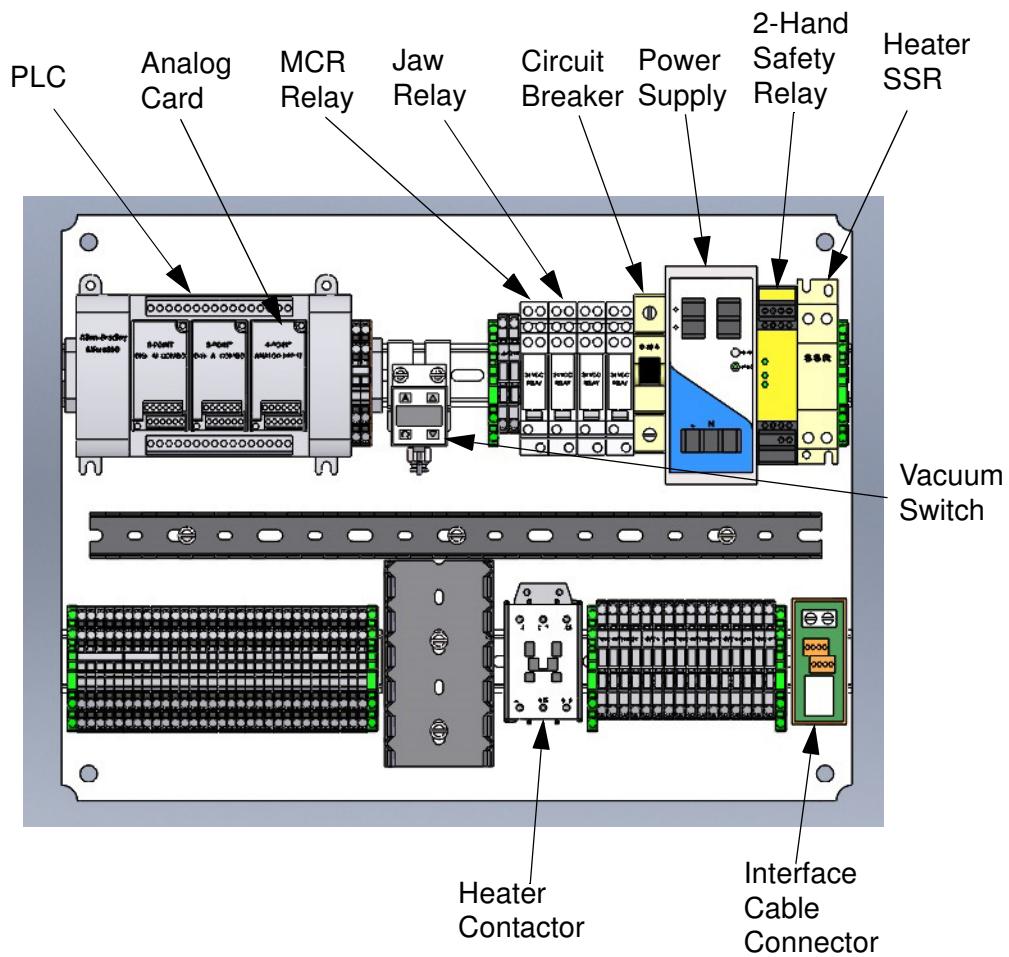


Figure 1-3. Electrical Enclosure

Note the location of the machine's electrical, air, gas and water connections in the above photos before proceeding.

MACHINE UTILITIES

Electrical

The site should have power as indicated on the serial number plate. The A200 Multiline XT sealing head requires a dedicated service.

This machine comes with a plug-in, power cord located on the back side of the electrical enclosure. The plug may be replaced with one to match your plant standard. Your supply and conductors must be capable of delivering the specified power to the A200 Multiline XT sealing head. Make sure the plug and receptacle are waterproof. This type of connection will make your machine more convenient to move and adjust when necessary.

Power Requirements are as follows:

- 120 Volts, 1 Phase, 20 Amps or
- 220 Volts, 1 Phase, 15 Amps

Compressed Air

A supply of clean, dry, compressed air is required for proper functioning of the A200 Multiline XT sealing head. The air supply regulator is factory pre-set to the recommended pressure.

The size of the air supply line is critical to the performance of the machine. Before connecting air to the machine, make sure the supply line can supply adequate air pressure to the machine. The supply lines noted below in the air requirements are based on a main supply line running within 50 feet (15.2 m) of the machine.

Air consumption of the machine varies depending on the type of vacuum pump being used. Standard machines with an electric vacuum pump or no pump use approximately 1 CF (28.3 L) of compressed air per cycle. Machines with a venturi vacuum pump will use, in addition to the 1 CF/cycle, 1/2 CFM (14.2 L/min) every second the vacuum pump is operating.

Estimated compressed air requirements are as follows:

- Standard machines - 80 PSI* (5.4 bar), 4 CFM (113.2 L/min), 3/8" (9.5 mm) supply line
- Venturi pump machines - 87 PSI* (5.9 bar), 12 CFM (340 L/min), 1/2" (12.7 mm) supply line

*The recommended air pressure supplied to the machine is 100 PSI (6.8 bar). The indicated air pressure is the regulator setting.

Note: In cold rooms where water is present in the air supply, ice may develop in the pump. Use clean, dry air when using this pump in cold areas.

Gas Supply

The A200 Multiline XT sealing head is equipped to backflush gas into the bag. The gas supply connects to the accumulator tank mounted under the discharge tilt shelf. Gases, such as Nitrogen or Carbon Dioxide, is supplied to the sealing head by connecting to a distribution manifold on the conveyor.

CVP recommends 80 PSI (5.4 bar) minimum pressure into the regulator within 10 feet (3 m) of the main gas connection. A ball type shut off valve should be used ahead of the gas regulator when using a bulk gas system.

For more information on the gas system see Section 6, "GAS SYSTEM".

Recommended supply line size from a bulk source to the regulator should be as follows:

- 100 to 299 feet (30.5 m to 91.1 m) of run = 3/4" (19 mm) nominal pipe
- 300 to 499 feet (91.4 m to 152.1 m) of run = 1" (25.4 mm) nominal pipe
- Over 500 feet (152.4 m) of run = 1-1/4" (31.8 mm) nominal pipe

Contact CVP for information on the type and amount of gas to be used with your product. As an example, CVP recommends 100% CO₂ gas for packaging fresh poultry at 15 standard cubic inches per pound (0.5 L/kg.). A rough method of determining the cubic inches of gas is to vacuum then gas an empty bag. Calculate volume by multiplying the height x length x width in inches while pressing the bag slightly between two flat surfaces. Adjust the gas time to change the cubic inches and achieve 15 cubic inches per pound of chicken that will be in the bag.

Water Connection

A permanent hot water connection can be plumbed to the machine's water inlet if desired. Hot water is used only to backflush the machine's vacuum lines. The clear vacuum hose must be moved to the front (CLEAN) position on the quick-connect bulkhead below the discharge tilt shelf. Otherwise, use the supplied female hose adapter fitting on the connection to connect a temporary hot water hose whenever cleaning.

BAG AND CONTAINER INFORMATION

Bag and Container Sizes

When a container is on the conveyor, there should be some clearance between the top of the container, (If using a box with flaps, fold the flaps down), and the lowest point of the unit.

If the unit came equipped with the optional adjustable head, make your initial height adjustments with head in the extreme "UP" position and your tallest container in position. After this adjustment has been set, check clearance of the head in lower positions with smaller containers.

The correct bag size is important for packaging products. There are 4 factors to determine the size of a bag:

- Width of Container
- Length of Container
- Height of Container
- Container Style (End or Top Load)

Note: The A200 Multiline system is designed to be used with a top loaded container only.

Top Loaded Bag Formula

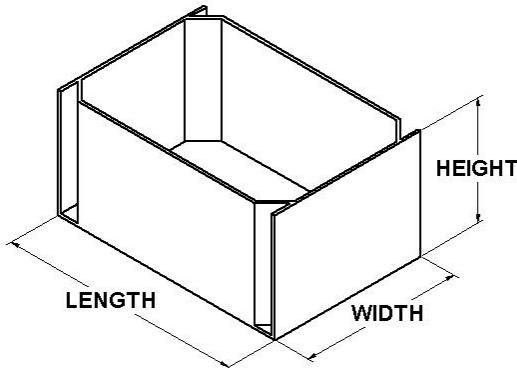


Figure 1-4. Top Loaded Container Dimension Reference

Bag Width (Opening) = Width (Container) + Length (Container) + 2" (50.8 mm)

Bag Length = Width (Container) + Height (Container) + 6" (152.4 mm)

EXAMPLE:

Using the formula a bag size will be determined based on an end loaded container with the following dimensions:

Length = 21 inches

Width = 15 inches

Height = 10 inches

Bag Width (Opening) = 15 (Container Width) + 21 (Container Length) + 2 = 38 inches

Bag Length = 15 (Container Width) + 10 (Container Height) + 6 = 31 inches

BAG SIZE = 38 inch (W) X 31 inches (L)

With the bag in the container, check to see that the end of the bag will reach above the heat seal bar. The bag should extend a short distance above the top surface of the rear manifold rubber support.

SECTION: 2

INSTALLATION

INSTALLATION PREPARATION AND REQUIREMENTS

To ensure a successful installation, it is important to adhere to the requirements for installation. Be sure that you can meet all of these requirements so that your installation will go as smooth as possible.

Work Area

The area used to setup the A200 Multiline XT sealing head should be open and clear for you to work, allowing room for a fork truck to lift the machine. If you are not able to setup the machine where it will be used, make sure you can get the machine to that location after it is assembled.

Required Equipment

Below is a list of equipment and tools needed to uncrate and install the A200 Multiline XT:

- **FORK LIFT** (To lift the machine off the crate and move in place)
- **C-CLAMP** (To clamp machine to forks)
- **ADJUSTABLE WRENCH** (10 or 12 inch).
- **COMBINATION WRENCH** (3/4 inch).
- **PLIERS** (standard or channel lock).
- **SCREWDRIVERS** (large standard tip & #2 Phillips)
- **VOLTMETER** (minimum rating of 500 VAC)
- **SIDE CUTTERS** (to cut wire ties)

Utilities

Run the utilities to the operating location prior to setting the machine in place. Refer to Section 1 for details.

UNPACKING THE A200 Multiline XT

Note: There is a “Tip Indicator” on the outside of the shipping container. Upon receiving your machine, if you find that the indicator shows that the container has been mishandled, please make note of any visible damage to the box or equipment and contact CVP SYSTEMS at 1-800-422-4720.

Uncrating

In most cases, this step has already been completed by the time you are reading this manual. However, in the event you received the manual prior to the machine, follow the next steps to uncrate the machine:

1. Cut the steel band wrapped around the corrugated container.
2. Remove the screws holding the bottom of the corrugated container to the pallet base and lift the corrugated box off the machine.
3. Unscrew the four lag bolts holding the machine to the crate. These are located at the four corners of the base.

Contents of the Crate

Before continuing, inspect the contents of the crate and the condition they are in. Below is a list of what you will find with the machine:

1. Electrical schematic and Pneumatic drawings for the machine. (Located inside the electrical enclosure)
2. Parts Box

Before continuing, check the contents of the parts box. You should find the following items:

1. Adjustable Legs (Qty - 4): Position in the base of the machine stand to adjust the height of the machine.
2. Spare fuses (5 commonly): One for each used on the machine.
3. Polyflo tubing (10 ft; 3 m): Supplied to connect gas supply from the Multiline conveyor to the gas accumulator tank inside the Multiline stand.

There may be additional items inside the crate depending on the options purchased with the machine.

Spare Parts

In addition to the spare fuses an optional New Customer Spare Parts Kit is also available. A list of these parts is available upon request.

ASSEMBLING THE A200 Multiline XT

Mounting and Adjusting the Legs

Follow these steps to safely mount the adjustable legs

1. Using a forklift, raise the machine off the crate and clamp the stand to the forks to prevent the machine from tipping. Move the machine into the area where it will be operated.
2. While the machine is raised, place the four adjustable legs through the base and thread the nut on to the adjusting rod
3. Set the machine back down on the floor and position in front of the Multi-line conveyor.
4. Connect the air supply to the machine head and set the discharge tilt shelf in the up position.
5. Adjust the height of the machine until the containers transfer smoothly from the upper conveyor to the tilt shelf.
6. With a container on the tilt shelf, lower the shelf to allow the container to transfer to the lower conveyor.
7. Adjust the exit slide until the container transfers smoothly. Make sure the tallest container clears the transfer conveyor on the side of the upper conveyor.

Further height adjustment is covered in the “UPPER FRAME ADJUSTMENT” later in this section. Refer to these topics to be sure you set the machine to the proper operating height.

Removing Shipping Material

The machine is shipped with several tie downs and shipping blocks. The manifold has two wood blocks in the pivot clamp assemblies keeping the upper manifold in the open position. The snorkels and bag stretchers are tied in the up position. A support board is tied under the tilt shelf to prevent damage to the tilt cylinder. Be sure all blocks and ties are removed before operating the A200 Multiline XT sealing head.

CONNECTING UTILITIES

Electrical Connections

The electrical connections for the A200 Multiline XT sealing head machine are shown below:

1. Plug the power cord into a dedicated 20 amp rated receptacle (for 120V) or 15 amp rated receptacle (for 220V).

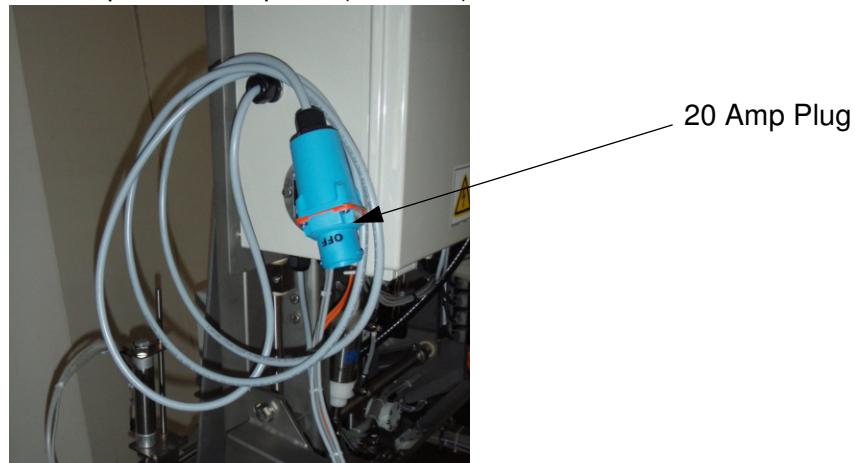


Figure 2-5. Power Cord

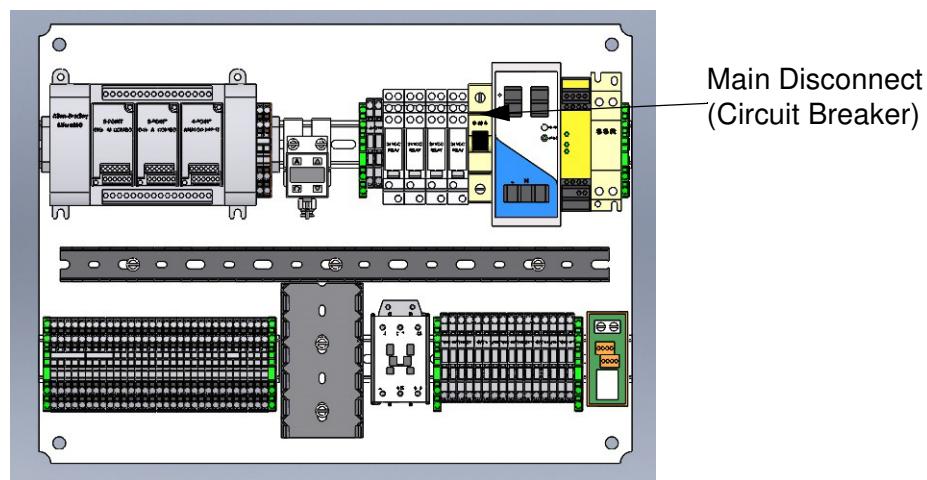


Figure 2-6. Main Disconnect

2. Verify that the power supply is properly grounded to the ground lug at the bottom of the electrical panel.
3. Plug in electrical power to the unit.

4. Check the position of the “EMERGENCY OPEN” switch, located on the push-button station at the front of the unit. For testing purposes keep this switch pushed in, “OPEN” position.

Main Air Supply

Connect your air supply line to the tube fitting on the filter regulator assembly on the top of the machine. Turn the air supply line “ON” and check regulator. It must read a minimum of 80 PSI (5.4 bar) for the machine to operate correctly.

**Warning:**

USE COMPRESSED AIR ONLY ON VENTURI VACUUM PUMP MACHINES! USING OTHER GASSES SUCH AS CARBON DIOXIDE FOR MACHINE OPERATION CREATES AN ASPHYXIATION HAZARD.

Venturi Vacuum Pump Air Supply

When a venturi vacuum pump is used, the main regulator should be set to 87 PSI (5.9 bar) and the supply line size should be a minimum of 1/2" (12.7 mm).

Gas Connection

Install a high flow gas regulator to the gas supply run on the Multiline conveyor. If the gas supply is a bulk system, install a ball valve in front of the gas regulator for maintenance purposes.

Connect the regulated gas supply to the gas manifold block on the lower Multiline conveyor, behind the electrical enclosure. Connect the individual gas accumulator tanks on the sealing heads to the gas manifold blocks located at each station on the conveyor using the supplied 1/2" tubing. The tubing connectors on the conveyor’s gas manifold blocks have integral shut-off valves.

Turn the gas supply on and set the gas regulator at 60 to 80 PSI (4.0 to 5.4 bar). Check to see if gas is filling the accumulator by pulling the ring on the pressure relief valve. Gas should expel from the valve if the tank has pressure.

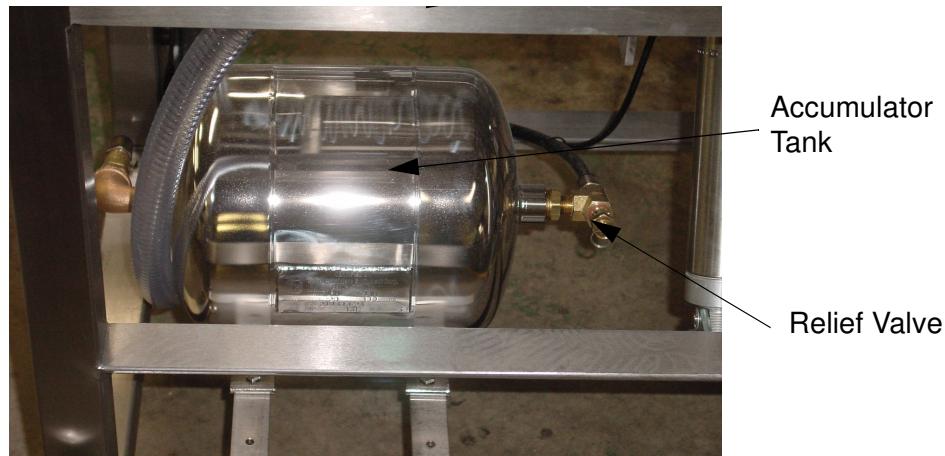


Figure 2-7. Accumulator tank

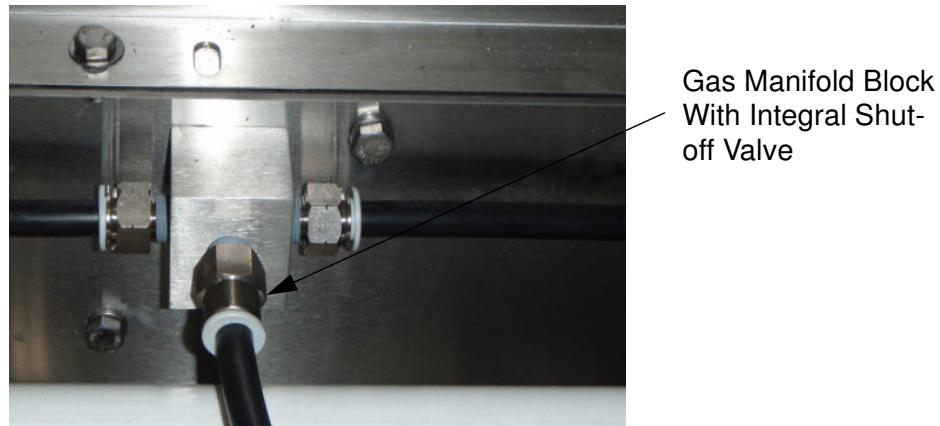


Figure 2-8. Gas Connection



Warning:

DO NOT CONNECT COMPRESSED AIR TO THE MAIN GAS CONNECTION. THIS WILL CONTAMINATE PRODUCT IN THE BAGS.

Machine Communication Cables

The conveyor to machine communication cables must be plugged in for each machine to be able to dump and for the conveyor to be able to push in a box. It is not possible to run a machine if the cable is not hooked up.

Any machine can be connected at any one of the 3 conveyor load/ discharge areas.

Machine Frame Bracket

After each machine is in place along the conveyor, fix them in position by attaching the machine frame bracket to the conveyor stand. There are two brackets per machine to lock the sealing heads in position. Put each rear leg of the machine through the notch. Tighten the U-brackets to the conveyor rail and tighten the top leveler nut.

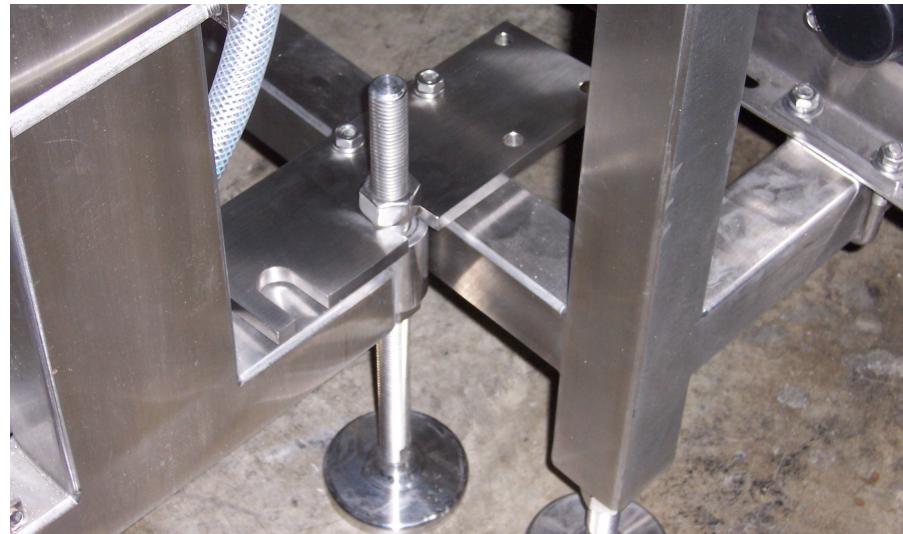


Figure 2-9. Machine Frame bracket

SECTION: 3

OPERATION

MACHINE OPERATION

Machine Cycle

Below are step by step instructions to cycle the A200 machine once. The instructions are made with the assumption that all the timers and switches have been set. The timers and switches will have to be set before operating the A200 for the first time. Understanding how the machine operates first will help in selecting the proper settings for your machine.

1. Use the touchscreen to enter “RUN” mode.
2. Load the bag

Vacuum Manifold: Position bag on manifold making sure that the bag is smooth and free of wrinkles.

Bag Stretchers: With the bag stretchers in the down position, bring the bag around stretchers. Make sure that the snorkels will extend into bag and not outside of it. Press the left bag stretcher (stretcher expands, pulling bag tight).

3. Snorkels extend downward, entering bag. The snorkels can be extended before placing the bag on the bag stretchers by pressing the green “POWER ON/START” button.

Note: If the bag stretcher expands without the bag in place, or the snorkels miss the bag the machine can be reset by pressing the green “POWER ON/RESET” button. This will retract the snorkels and return the bag stretchers to their original position.

4. Press both “CYCLE START” optical touch switches (OTS) simultaneously.

5. Manifold clamps shut.

6. *Bag stretcher models:* Bag stretchers return to “up” position.

7. Snorkels draw vacuum.

Vacuum Time: The vacuum is drawn for a preset time that can be adjusted through the operator interface.

Vacuum Switch: The vacuum is drawn to an adjustable setpoint on the vacuum switch.

8. Once required vacuum level is reached, vacuum stops.

9. Snorkels dispense gas for preset time as set using the touchscreen. Snorkels return to “up” position.

10. Heat seal bar extends for preset time set on the operator interface.

11. Heat seal bar releases.

12. Manifold opens releasing bag.

13. **Cycle is now complete.**

A200

SEQUENCE OF OPERATION

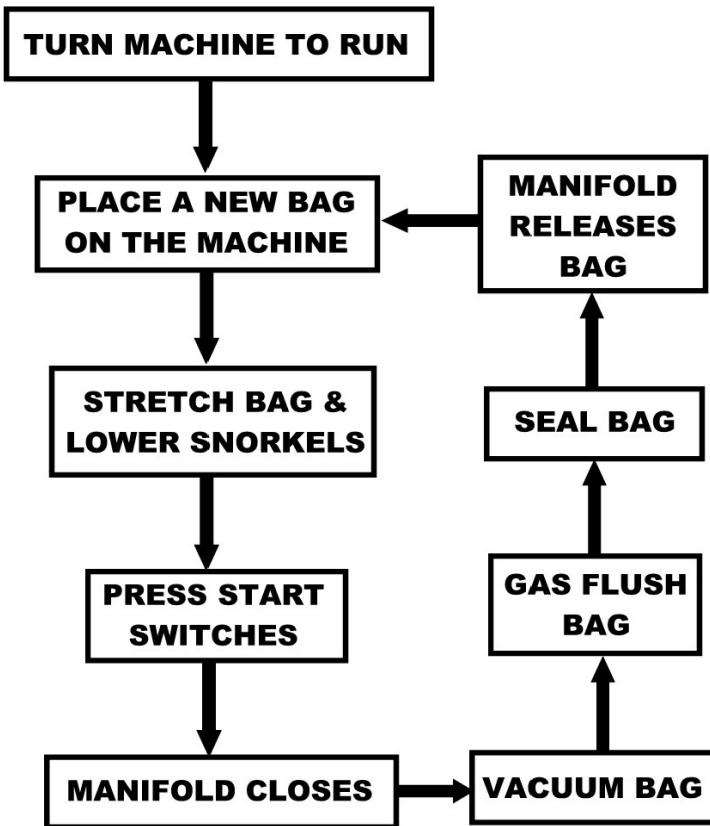


Figure 3-1. Sequence of operation flowchart

OPERATOR CONTROLS

Controls Overview

Figure 3-2 shows the controls located on the front panel of the machine.

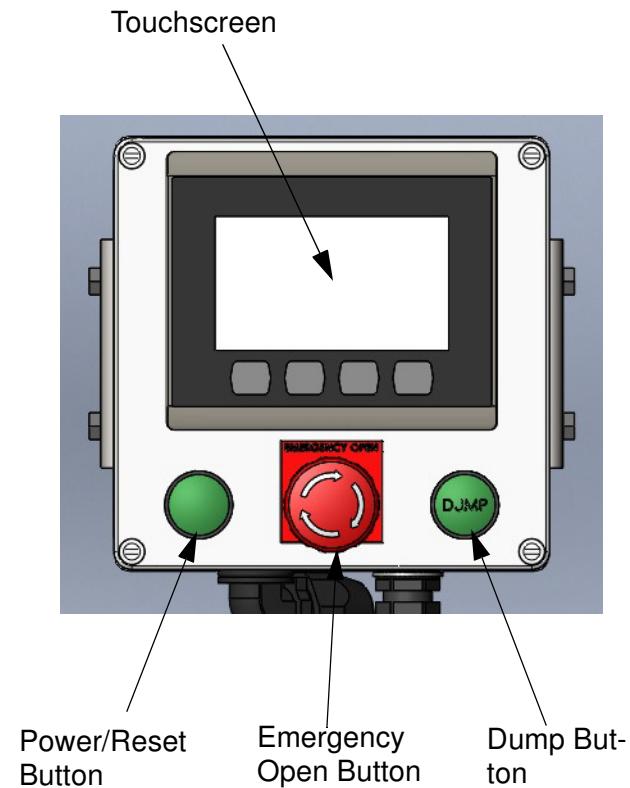


Figure 3-2. Operator Control Panel

The operator control panel is the single access point for all the functions of the A200. Selecting the mode and pack setting, adjusting the seal bar temperature and adjusting the vacuum level are all done from this location. By using the touchscreen the operator can change vacuum, gas and seal timers. During initial setup certain machine settings are configured using the touchscreen. The touchscreen also informs the operator at which step of the cycle the machine is and if there are any faults to report.

Familiarize yourself with the location of the operator controls, each controller and switch are covered in full detail throughout this manual.

OPERATION PRECAUTIONS

Safe Operating Practices

It is important to know and understand the safety precautions before operating the A200 packaging machine. Improper and unsafe operating habits will cause injury to the operator.

- **One operator at a time.** The A200 is equipped with anti-tie down two hand start buttons. This assures that the operators hands are clear of the manifolds while they close. Bag loading devices are used to hold the bag in place while the operator starts the machine cycle.
- **Do not lean on or near areas of the machine that move.** Loose clothing or parts of your body may become pinched in the machine. The machine is equipped with a jaws closed sensor to open the manifold in the event it closes on someone's hand. As long as the previous precaution is followed this should not happen.
- **Do not operate with loose or damaged parts.** This will only cause harm to the operator and/or additional damage to the machine. Repair or replace faulty parts before operating the machine.
- **Use the machine in the manner for which it was designed.** Operate the machine as directed in this manual or as instructed by a CVP representative. Again, improper use of this machine will result in injury or cause additional damage to the machine.

MACHINE PERFORMANCE

The A200 Fresh Vac® machine will perform satisfactorily providing that proper safety and maintenance procedures are followed.

What to Expect

The average cycle time is approximately 8-12 seconds (for a single cycle), depending on specific product and condition of machine. Cycle times will be higher on machines running double and triple cycles or large bins.

Shelf life of any given product should increase. However, the length of time will vary depending upon certain aspects of product processing.

Some of these aspects are:

- the **freshness** of the product,
- the **sanitation level** of the processing facility
- the **temperature** of the product
- the **oxygen level** inside package,
- the **quality** of the bag and
- the **quality** of the bag seal.

Maintaining Performance

When a satisfactory level of performance is achieved take note of the operating procedure. Maintaining that procedure consistently along with routine maintenance of the machine will insure satisfactory performance of the machine and increased shelf life of your product.

Increasing Performance

If you need to increase the performance of your machine, contact your CVP Representative. There may be an option available or a different configuration to the machine that will increase the performance of the machine.

SECTION: 4

PACK/MODE SETTING

MAIN MESSAGE SCREEN

General Information

The operator interface is located on the front panel. The screen on the interface prompts the operator through each step of the vacuum, gas and sealing cycle. The following messages will appear:

1. MACHINE READY
2. PRESS STRETCHER BAR (LEFT)
3. PRESS START BUTTONS
4. VACUUM 1, GAS 1
5. BAG SEAL HEAT
6. LOWER SHELF

The operator interface communicates with the PLC via a serial cable running from the side of the interface to the serial port on the PLC. The cable has a 9 pin DIN female connector on the interface end and an 8 pin mini DIN male 90 deg. angled connector on the PLC end. For communication to take place, the mode switch on the PLC must be in the REMOTE or RUN position and the RUN indicator must be lit. When the PLC mode switch is in REMOTE or RUN position, program presets and timers may be changed via the interface.

When the mode switch is in the RUN position, the PLC program is protected from being changed remotely.

Display Areas

The boxed display area shows operator messages and prompts. Each Pack sequence prompts the operator through each step. For example, at the start of a new Pack sequence, the "MACHINE READY" message will appear until a box is pushed onto the shelf. Then the operator will be prompted to "PRESS STRETCHER BAR" followed by "PRESS START BUTTONS", etc.

In the center of the screen on the right (blue box) is the actual vacuum level read at the snorkels in "inHg" units. On the Status screen the units can be changed to "metric" to read out in mBar.

In the center of the screen in the yellow box is the currently selected Pack number to run. There are 12 programmable pack settings.

The lower display line shows the menus that can be jumped into by pressing that menu button or their function keys below.

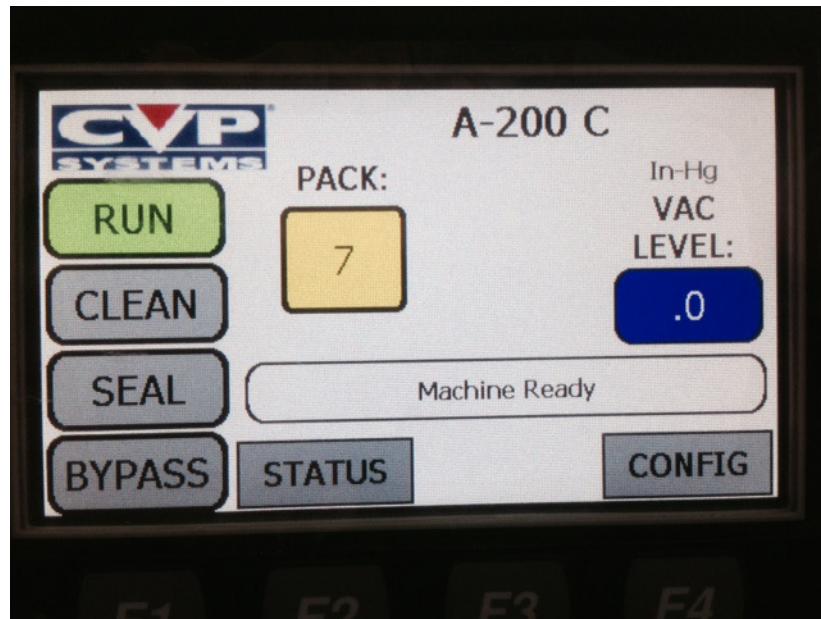


Figure 2-4. Main Message Screen in RUN mode

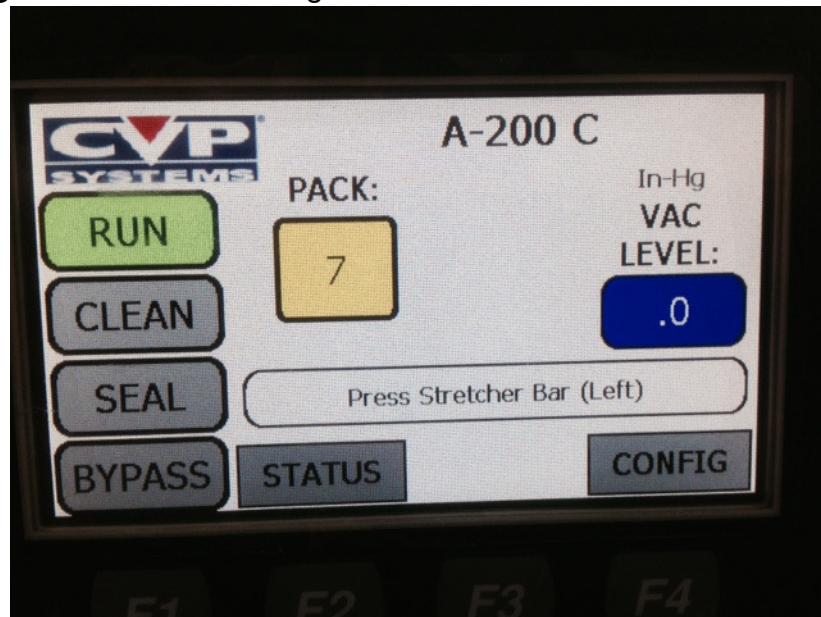


Figure 2-5. Message Screen after Box Loaded

Left Sidebar Keys Press the RUN key to enter RUN mode.

Press the CLEAN key and the display jumps to the CLEAN menu.

Press the SEAL key to enter SEAL ONLY mode.

Press the BYPASS key to enter BYPASS mode.

Pack Selector

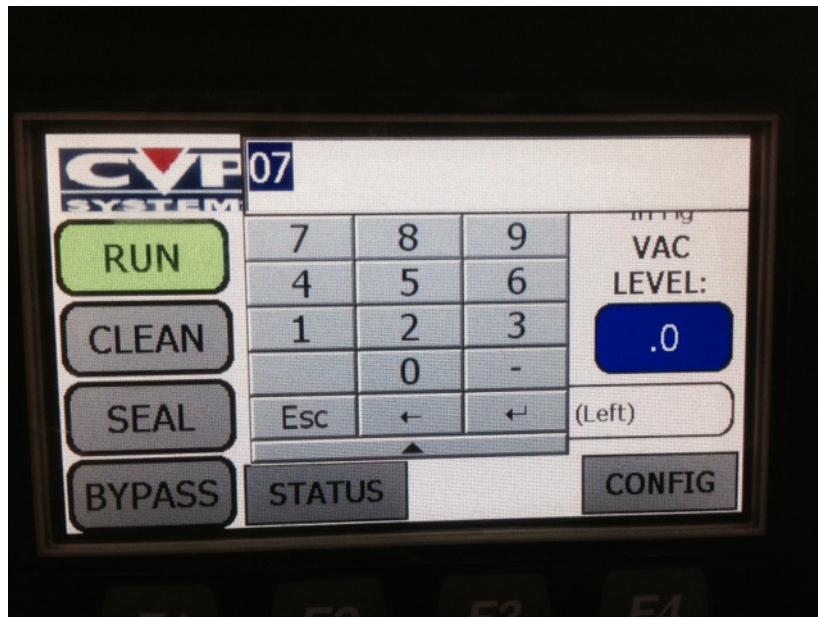


Figure 2-6. Pack Select to 7

Press the yellow PACK key to bring up a popup keypad to change the pack number. Enter 1-12 and press the ENTER key on the lower right.

Clean Mode

Press the CLEAN key to enter the CLEAN MENU. Snorkels will drop. Disconnect the hose to the Vacuum generator at the clear sediment bowl. Install the hose adapter at the sediment bowl and hook up hot water there. Position a barrel below the snorkels to catch water. Open the water valve.

Swiping both Start buttons will start a pulsing action (3 seconds ON/ 3 seconds OFF) cleaning with the water for the rest of the cycle. The pulse action will last until the timer counts down to zero.

Note: Water will continue to flush at the end of the Clean Time. Pulse action will stop. Water supply must be manually shut off at this time.

Disconnect water and empty the sediment bowl. Press the left stretcher paddle to blow out residual water from the snorkels and hose leading to the bowl. Replace the bowl taking care that the o-ring is in place

Press the RUN key when done cleaning to return to the main message screen.

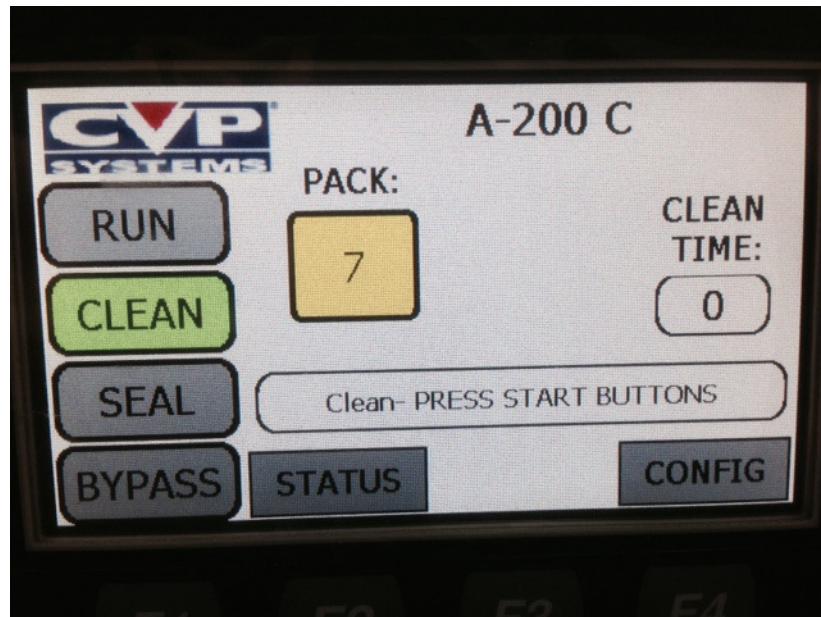


Figure 2-7. Clean Mode Screen

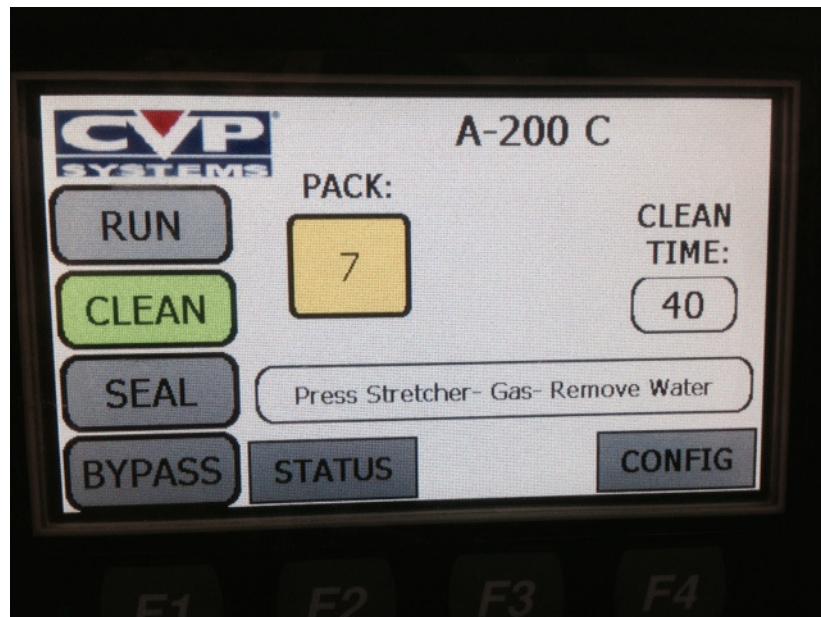


Figure 2-8. Clean Mode End of Cycle

Bypass Mode

When BYPASS is selected, the machine is in BYPASS mode. Select BYPASS mode to automatically dump all loaded boxes to the lower conveyor as soon as they are seen on the shelf and the exit is clear.

Only use BYPASS mode if ALL incoming packages need to be bypassed. If only select boxes need to be bypassed, use the DUMP button on the front panel.

Seal Only Mode

Press the SEAL key to enter SEAL ONLY mode. All parameters of the pack program you are in will be remembered but the vacuum and gassing steps will be skipped. Snorkel will be retracted.

Use this mode for testing seals on bags or for packing items not requiring modified atmosphere. This mode is also useful to put a double seal on a finished bag. Press the RUN key to return to regular RUN mode for your pack setting.

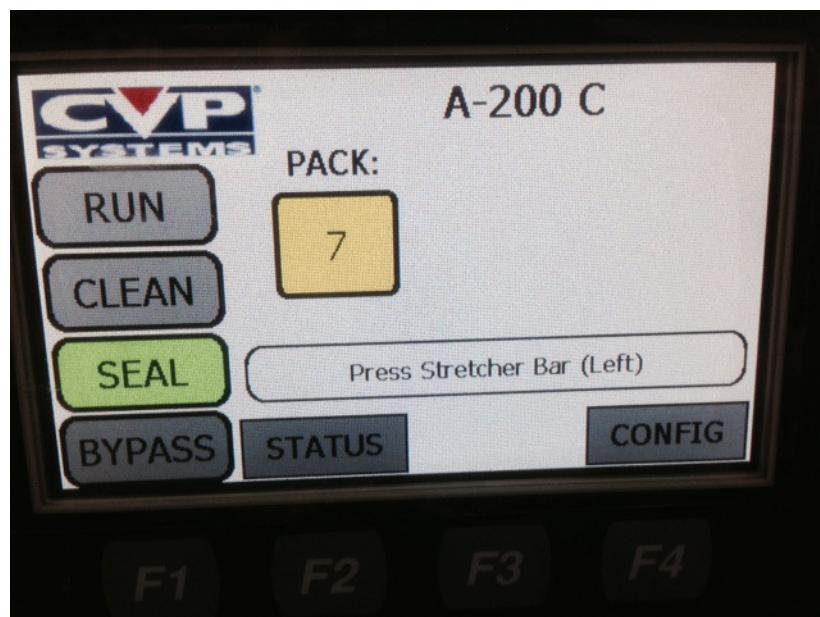


Figure 2-9. Seal Only Mode

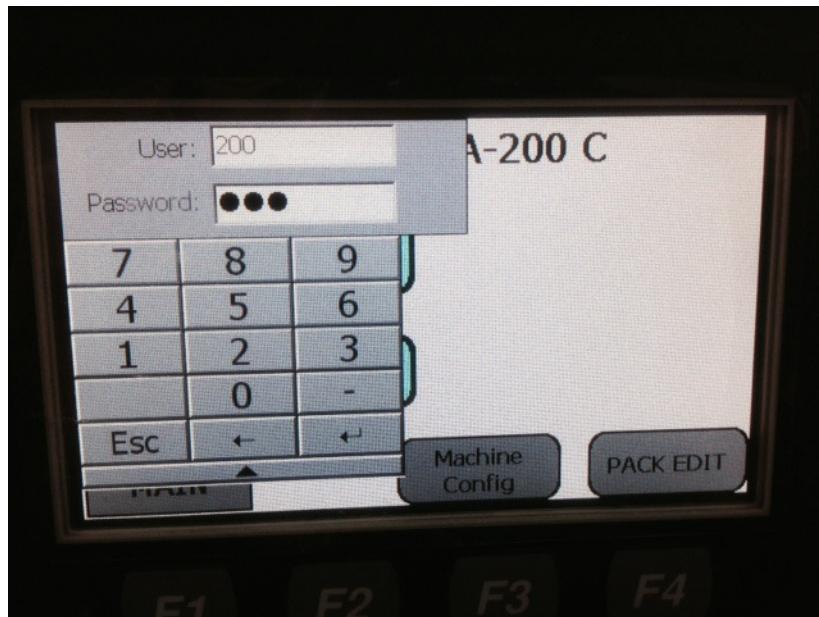
PACK EDIT Mode

Figure 2-10. Enter Password Popup Screen

Enter the PACK EDIT menu by pressing the CONFIG key in the main menu (lower right). Now press the PACK EDIT key in the lower right of the CONFIG menu.

The PASSWORD popup menu appears. The User and Password are “200”. The cursor should be in the User box. Enter “200” then touch the box next to Password. Enter “200” again. Press the ENTER key at the lower right to enter both and advance to the PACK EDIT menu. If the wrong password is entered, access will be denied.

There are MANY presets for each Pack setting. The top preset item is STRETCHER ENABLE. There are 4 presets per page. Press the PREV and NEXT keys to move through the pages of the PACK EDIT menu.

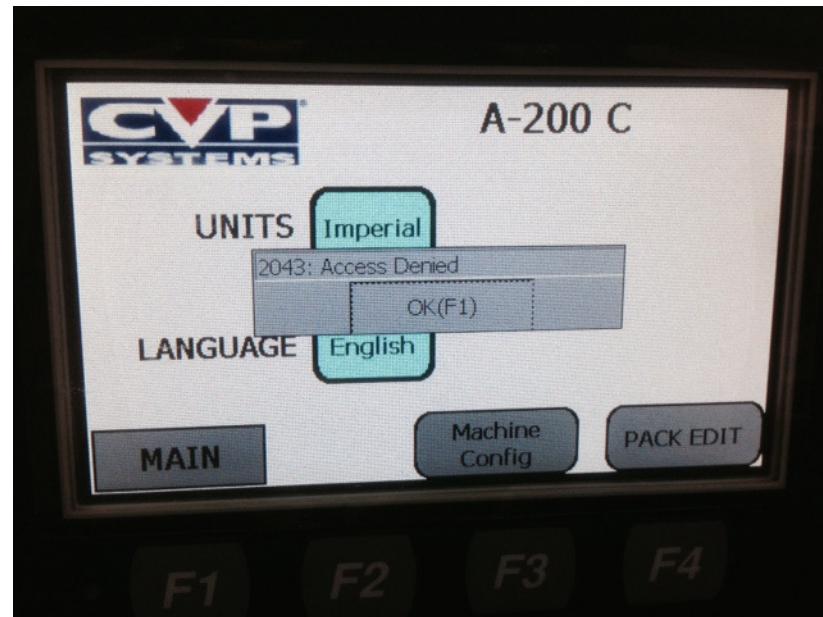


Figure 2-11. Wrong User name or Password

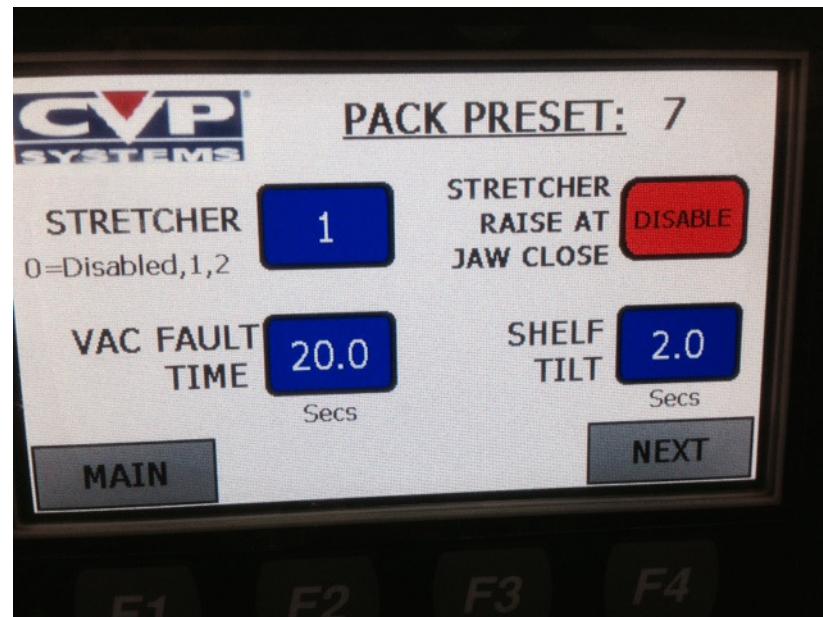


Figure 2-12. Pack Edit menu (Pack 7, page 1)



Figure 2-13. Pack Edit menu (Pack 7, page 2)



Figure 2-14. Pack Edit menu (Pack 7, page 5)

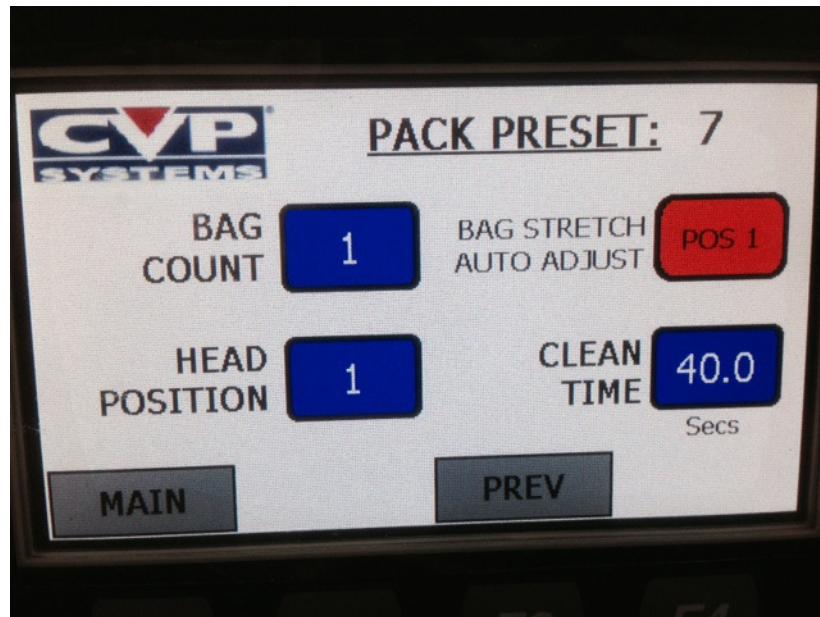


Figure 2-15. Pack Edit menu (Pack 7, page 6)

The top line shows the Pack # that we are adjusting Presets for. Each box, up to 4 per page shows the current value of the preset.

To change preset values using the numeric keypad, touch the value you want to change on the touchscreen. The popup keypad will appear. Type the new value in and press <-- ENTER. You will see the new value appear immediately.

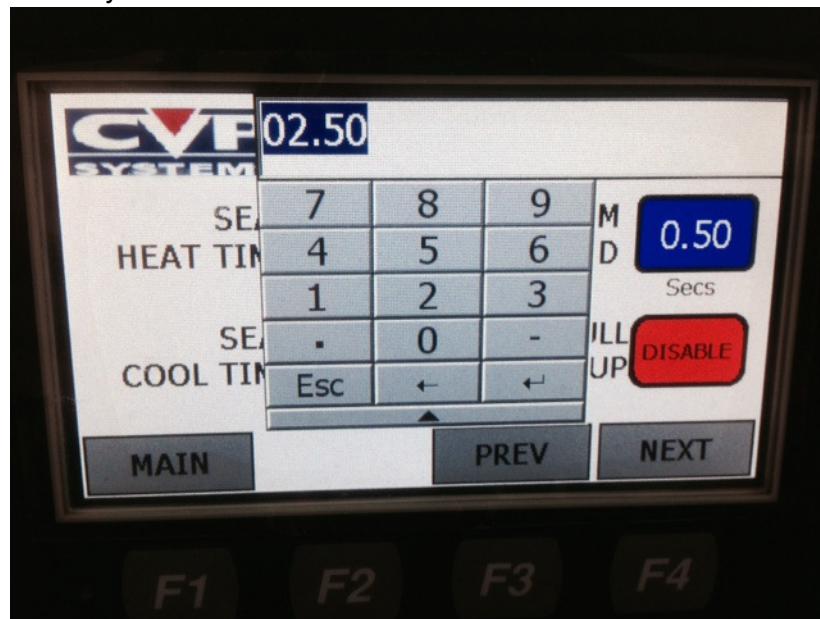


Figure 2-16. Numeric Keypad popup screen

Preset Functions Preset functions are described below in their order on the menu:

TOP OF MENU

1. **STRETCHER MODE SET:** When set to 0, stretchers are disabled. When set to 1, stretchers drop and operate for a single bag by depressing the left bag stretcher. When set to 2, stretchers drop and operate for two bags. Snorkels drop separately when depressing the corresponding left/right stretcher. Stretchers should be enabled to pull a bag tight before the seal cycle. Stretchers can be disabled on smaller bags that lie flat without stretching. If your machine is not equipped with double stretchers, you cannot set to 2. Factory setting: 1 = single bag enabled
2. **VAC FAULT TIME:** Vacuum Fault Time is how long the machine may draw a vacuum through the snorkel in a Vacuum Switch Pack mode to try to reach the Vacuum Level Setting. If this time is exceeded, the machine cycle aborts with a fault message. This is done to alert the operator of a problem such as a tear in the bag. NOTE: On very large bags, the timer value may need to be increased to allow the machine to finish drawing a vacuum. (0-99 sec. adjustment range)
3. **STRETCHER RAISE AT JAW CLOSE:** When the Stretcher RAISE enable bit is set to 1, stretchers immediately retract when the jaw is proven closed. When set to 0, stretchers retract just before the seal cycle starts. Set to 1 to reduce vacuum leakage around the stretchers on high vacuum, light load applications. Set to 1 for normal load applications. Factory setting: 0 = normal stretcher operation
4. **SHELF TILT:** This is the time the drop shelf will remain in the down position before resetting to the up or load position upon completion of a cycle. If the machine was not supplied with a drop shelf or you wish to disable the drop shelf, set this to zero. (0-10.0 sec. adjustment range). Factory Setting: 2.0 sec.
5. **VAC-TIME #1:** Sets the first vacuum cycle extend time (0-99.99 sec. adjustment range)
6. **VAC-LEVEL #1:** Sets the first vacuum cycle level target (5-29.9 in.Hg adjustment range)
7. **GAS-TIME #1:** Sets the first gas cycle time (0-99.99 sec. adjustment range)
8. **PAUSE-TIME #1:** Sets the pause time after the first cycle (0-99.99 sec. adjustment range)
9. **VAC-TIME #2:** Sets the second vacuum cycle extend time (0-99.99 sec. adjustment range)
10. **VAC-LEVEL #2:** Sets the second vacuum cycle level target (5-29.9 in.Hg adjustment range)
11. **GAS-LEVEL #2:** Sets the second gas cycle time (0-99.99 sec. adjustment range)
12. **PAUSE-TIME #2:** Sets the pause time after the second cycle (0-99.99 sec. adjustment range)

13. **VAC-TIME #3:** Sets the third vacuum cycle extend time (0-99.99 sec. adjustment range)
14. **VAC-LEVEL #3:** Sets the third vacuum cycle level target (5-29.9 in.Hg adjustment range)
15. **GAS-TIME #3:** Sets the third gas cycle time (0-99.99 sec. adjustment range)
16. **PAUSE-TIME #3:** Sets the pause time after the third cycle (0-99.99 sec. adjustment range)
17. **SEAL TIME:** This is the heat time for the seal cycle. It is the time the heat seal bar is pressed to the bag to make a seal. (0-99.99 sec. adjustment range)
18. **COOL TIME:** This is the time that the heat seal bar is removed from the bag before the jaws open and the bag drops. (0-99.99 sec. adjustment range)
19. **VACUUM EXTEND TIME:** This extend time is added to the Vacuum #1, 2 and 3 extend times so in effect it is a minimum vacuum extend time. Delay is to ignore the initial vacuum spike when the valve opens to the vacuum pump. Minimum setting of 0.5 seconds is recommended. (0-99.99 sec. adjustment range)
20. **BAG COUNT:** This sets the bag count per box. Normally it is 1 but in cases where there are multiple bags in the box that need to be sealed, set to that number and after each bag is sealed, the stretchers will drop again to seal the next bag. After the last bag is sealed the shelf will discharge. Factory setting: 1. (1-9 adjustment range)
21. **HEAD POSITION:** When set for 0, the head will remain in the highest position after a box is loaded. When 1, head will drop one position after a box is loaded. When 2, head will drop 2 positions after a box is loaded. Factory setting: 1 position. Head can also be manually adjusted lower after the box is loaded before the bag stretchers are actuated. Swipe both START buttons to lower by one position.
22. **BAG STRETCHER AUTO ADJUST:** USED ONLY WHEN A MACHINE IS BUILT WITH AUTO ADJUST. When enabled, AUXILIARY STRETCHER is in the EXPANDED position for this pack. When disabled, AUXILIARY STRETCHER is in the RETRACTED position for this pack. Factory setting: 0 = disabled
23. **CLEAN TIME:** When in CLEAN mode, this is the time that the vacuum valve cycles ON and OFF to pulse water through the snorkels. (0-99.99 sec. adjustment range)

BOTTOM OF MENU

Hint: Zeroes may be entered for vacuum, gassing or pause timers to skip a step in any sequence. If values are entered for vacuum level and time, vacuum level will first reach the target and then continue vacuuming for the extend time setting. Zero entered for vacuum level and a value entered for vacuum time in the same cycle is

the way to vacuum only by time. Zero entered for vacuum time and a value entered for vacuum level in the same cycle is the way to vacuum only by switch.

Current Pack Setting

Often the question comes up, "What is the Vac - Gas sequence for this Pack?" Check the Pack number (1-12) on the Main menu top line. To check what vacuum - gas sequence is currently programmed for this pack, press the STATUS key (F2). The STATUS screen appears.

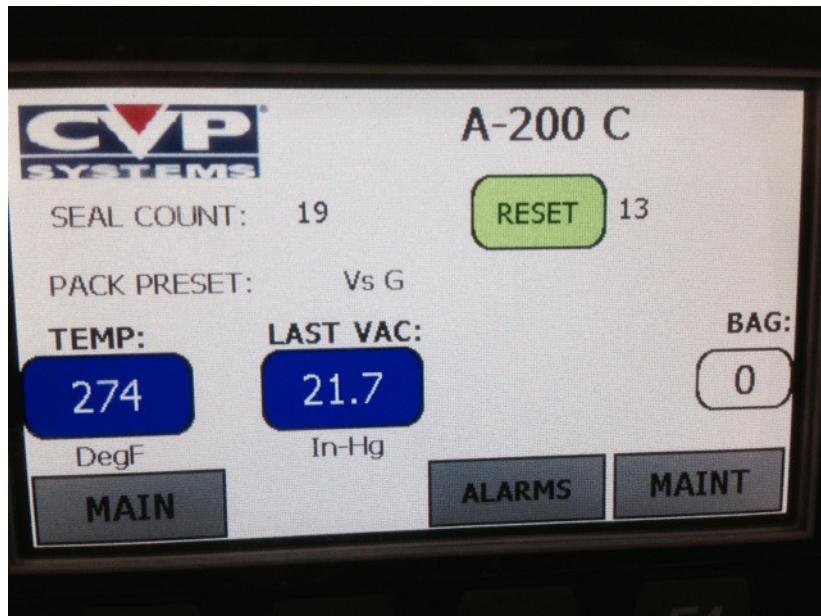


Figure 2-17. Current Pack Setting screen

Check the PACK PRESET line: Suppose it shows only "Vt". This indicates only one vacuum sequence by time. This would have a value in the first preset (Vacuum Time #1) and the next 11 presets = 0.

The next simplest pack is one vacuum sequence only by switch. This would have a 0 in the first preset, a value in the second preset (Vacuum level #1) and the next 10 presets = 0. The middle line of the Current Pack Setting screen would show only "Vs".

In the figure above, pack 7 is set up for a Vacuum gas cycle where the vacuum sequences finishes when it reaches the switch level.

If there are values in all Vac -Gas -Pause presets, the sequence will be Vac - Gas - Pause - Vac - Gas - Pause - Vac - Gas - Pause and each vacuum step will have a level target and extend time. If the Vacuum Pullup preset is set to 1, vacuum will also be on as the snorkels pull up. The CURRENT PACK SETTING screen would then show "Vs Vt G P Vs Vt G P Vs Vt G P Vu". "P" indicates PAUSE. "G" indicates GAS. "Vu" indicates VACUUM on snorkel coming UP.

Seal Count	One non-resettable counter increments every time the heat seal bar actuates. It is on the top line of the STATUS screen. At 99999999, it wraps around to zero again. One resettable counter increments every time the seal bar actuates. Press RESET button on the SEAL COUNT line to zero out this counter. Press MAIN (F1) to return to the main menu.
Bag Count	When sealing multiple bags per box, this counter will show the number of bags yet to be sealed. When equal to zero (0), the shelf will discharge.
Status Screen	Also on the STATUS screen is the LAST VACUUM (vacuum level achieved on the last bag) and the current SEAL BAR TEMPERATURE. There are buttons at the bottom of the STATUS screen to jump to the ALARM HISTORY screen and the MAINTENANCE screen where you can check PLC inputs and outputs.
Factory Settings	As shipped from CVP, pack 1 is set for a single vacuum by time (3s). Pack 2 is set for a single vacuum by time (5s). Pack 3 is set for a single vacuum by switch. Pack 4 is set for a single vacuum by switch with vacuum on snorkel pullup. Pack 5 is set for vacuum by time (3s) and gas by time (0.5s). Pack 6 is set for vacuum by time (5s) and gas by time (1.0s). Pack 7 is set for vacuum by switch (17 inchesHg) and gas by time (0.5s). Pack 8 is set for vacuum by switch (20 inchesHg) and gas by time (1.0s). Pack 9 is set to vacuum by time, gas, pause, vacuum by time again, gas again. Pack 10 is set for vacuum by switch, gas, pause, vacuum by switch again, gas again. Pack 11 is set to vacuum by time, gas, pause, repeat in cycle 2, vacuum by time again, gas again. Pack 12 is set for vacuum by switch, gas, pause, repeat in cycle 2, vacuum by switch again, gas again. The table below summarizes the factory settings and has space to write your adjusted settings.

Table 1: CVP Factory Settings for Pack 1 = Vac-Time

Parameter	CVP Pack 1	
Stretcher Preset	1 (enabled)	
Vacuum Fault Timer	20.0 sec.	
Stretcher Retract Mode	0	
Shelf tilt time	0	
Vacuum Time #1	3.0 sec.	
Vacuum Level #1	0	
Gas Time #1	0	

Table 1: CVP Factory Settings for Pack 1 = Vac-Time

Parameter	CVP Pack 1
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 2: CVP Factory Settings for Pack 2 = Vac-Time

Parameter	CVP Pack 2
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.
Stretcher Retract Mode	0
Shelf tilt time	0
Vacuum Time #1	5.0 sec.
Vacuum Level #1	0

Table 2: CVP Factory Settings for Pack 2 = Vac-Time

Parameter	CVP Pack 2
Gas Time #1	0
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 3: CVP Factory Settings for Pack 3 = Vac-Switch

Parameter	CVP Pack 3
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.
Stretcher Retract Mode	0
Shelf tilt time	0
Vacuum Time #1	0

Table 3: CVP Factory Settings for Pack 3 = Vac-Switch

Parameter	CVP Pack 3
Vacuum Level #1	17.0 inHg
Gas Time #1	0
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 4: CVP Factory Settings for Pack 4 = Vac-Switch

Parameter	CVP Pack 4
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.
Stretcher Retract Mode	0
Shelf tilt time	0

Table 4: CVP Factory Settings for Pack 4 = Vac-Switch

Parameter	CVP Pack 4
Vacuum Time #1	0
Vacuum Level #1	20.0 inHg
Gas Time #1	0
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	1 (enabled)
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 5: CVP Factory Settings for Pack 5 = Vac-Gas-Time

Parameter	CVP Pack 5
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.
Stretcher Retract Mode	0

Table 5: CVP Factory Settings for Pack 5 = Vac-Gas-Time

Parameter	CVP Pack 5
Shelf tilt time	0
Vacuum Time #1	3.0 sec.
Vacuum Level #1	0
Gas Time #1	0.5 sec.
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 6: CVP Factory Settings for Pack 6 = Vac-Gas-Time

Parameter	CVP Pack 6
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.

Table 6: CVP Factory Settings for Pack 6 = Vac-Gas-Time

Parameter	CVP Pack 6
Stretcher Retract Mode	0
Shelf tilt time	0
Vacuum Time #1	5.0 sec.
Vacuum Level #1	0
Gas Time #1	1.0 sec.
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Head Position	0
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 7: CVP Factory Settings for Pack 7 = Vac-Gas-Switch

Parameter	CVP Pack 7
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.

Table 7: CVP Factory Settings for Pack 7 = Vac-Gas-Switch

Parameter	CVP Pack 7
Stretcher Retract Mode	0
Shelf tilt time	0
Vacuum Time #1	0
Vacuum Level #1	17 inHg
Gas Time #1	0.5 sec.
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 8: CVP Factory Settings for Pack 8 = Vac-Gas-Switch

Parameter	CVP Pack 8
Stretcher Preset	1 (enabled)

Table 8: CVP Factory Settings for Pack 8 = Vac-Gas-Switch

Parameter	CVP Pack 8
Vacuum Fault Timer	20.0 sec.
Stretcher Retract Mode	0
Shelf tilt time	0
Vacuum Time #1	0
Vacuum Level #1	20 inHg
Gas Time #1	1.0 sec.
Pause Time #1	0
Vacuum Time #2	0
Vacuum Level #2	0
Gas Time #2	0
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 9: CVP Factory Settings for Pack 9 = VGVG-Time

Parameter	CVP Pack 9	
Stretcher Preset	1 (enabled)	
Vacuum Fault Timer	20.0 sec.	
Stretcher Retract Mode	0	
Shelf tilt time	0	
Vacuum Time #1	3.0 sec.	
Vacuum Level #1	0	
Gas Time #1	0.5 sec.	
Pause Time #1	1.0 sec.	
Vacuum Time #2	3.0 sec.	
Vacuum Level #2	0	
Gas Time #2	0.5 sec.	
Pause Time #2	0	
Vacuum Time #3	0	
Vacuum Level #3	0	
Gas Time #3	0	
Pause Time #3	0	
Seal Time	3.0 sec.	
Cool Time	0	
Vacuum Extend Time	0.5 sec.	
Vac during Snorkel Pullup	0	
Bag Count	1	
Head Position	1	
Bag Stretcher Auto Adjust	0	
Clean Time	40.0 sec.	

Table 10: CVP Factory Settings for Pack 10 = VGVG-Switch

Parameter	CVP Pack 10
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.
Stretcher Retract Mode	0
Shelf tilt time	0
Vacuum Time #1	0
Vacuum Level #1	17 inHg
Gas Time #1	0.5 sec.
Pause Time #1	1.0 sec.
Vacuum Time #2	0
Vacuum Level #2	17 inHg
Gas Time #2	0.5 sec.
Pause Time #2	0
Vacuum Time #3	0
Vacuum Level #3	0
Gas Time #3	0
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

Table 11: CVP Factory Settings for Pack 11 = VGVGVG-Time

Parameter	CVP Vac-Gas Switch	
Stretcher Preset	1 (enabled)	
Vacuum Fault Timer	20.0 sec.	
Stretcher Retract Mode	0	
Shelf tilt time	0	
Vacuum Time #1	3.0 sec.	
Vacuum Level #1	0	
Gas Time #1	0.5 sec.	
Pause Time #1	1.0 sec.	
Vacuum Time #2	3.0 sec.	
Vacuum Level #2	0	
Gas Time #2	0.5 sec.	
Pause Time #2	1.0 sec.	
Vacuum Time #3	3.0 sec.	
Vacuum Level #3	0	
Gas Time #3	0.5 sec.	
Pause Time #3	0	
Seal Time	3.0 sec.	
Cool Time	0	
Vacuum Extend Time	0.5 sec.	
Vac during Snorkel Pullup	0	
Bag Count	1	
Head Position	1	
Bag Stretcher Auto Adjust	0	
Clean Time	40.0 sec.	

Table 12: CVP Factory Settings for Pack 12 = VGVGVG-Switch

Parameter	CVP Vac-Gas Switch
Stretcher Preset	1 (enabled)
Vacuum Fault Timer	20.0 sec.
Stretcher Retract Mode	0
Shelf tilt time	0
Vacuum Time #1	0
Vacuum Level #1	17 inHg
Gas Time #1	0.5 sec.
Pause Time #1	1.0 sec.
Vacuum Time #2	0
Vacuum Level #2	17 inHg
Gas Time #2	0.5 sec.
Pause Time #2	1.0 sec.
Vacuum Time #3	0
Vacuum Level #3	17 inHg
Gas Time #3	0.5 sec.
Pause Time #3	0
Seal Time	3.0 sec.
Cool Time	0
Vacuum Extend Time	0.5 sec.
Vac during Snorkel Pullup	0
Bag Count	1
Head Position	1
Bag Stretcher Auto Adjust	0
Clean Time	40.0 sec.

CONFIG screen Pressing the CONFIG key (F4) from the main menu brings the user to the CONFIG screen. Here you can select IMPERIAL or METRIC units for the

display. Imperial displays temperature in DegF and vacuum level in units of inHg. Metric displays temperature in DegC and vacuum level in units of mBar.

You can also select ENGLISH or SPANISH language messaging.

There are also buttons on the bottom to jump to password protected menus. The machine configuration menu need only ever be accessed if you are adding a machine feature such as gas sampling, O2 logging, 2 or auto adjust bag stretchers, Safety Edge, gas alarm, etc.

The PACK EDIT menu button is the gateway to change pack settings from those set up at the factory. A popup menu will appear when pressed and you must enter "200" for the username and password.



Figure 2-18. CONFIG screen



Figure 2-19. Metric Units selected

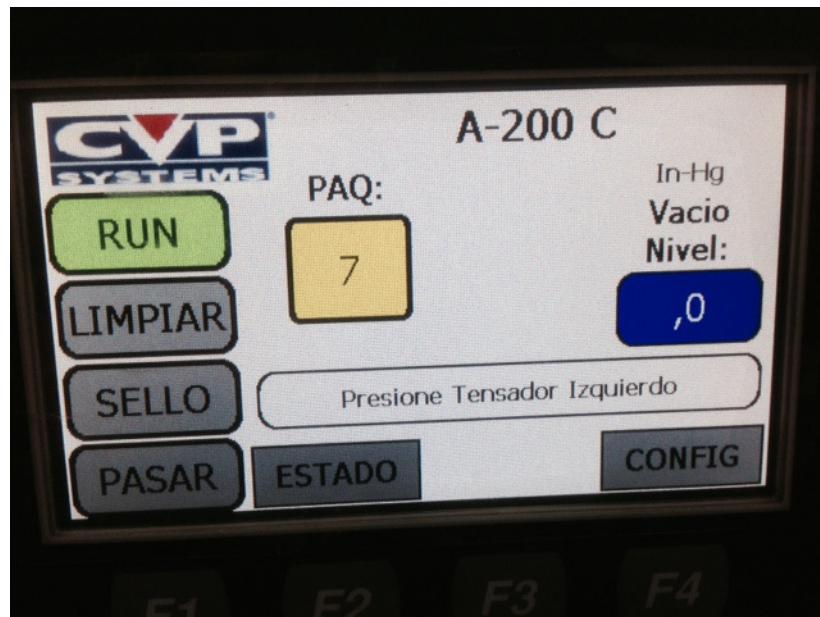


Figure 2-20. Spanish messaging selected

Alarms

Alarms that occur during operation of the A200 vacuum packaging machine must be acknowledged. When alarms occur, an alarm popup message appears on the interface top line. The background color of the alarm text is in RED to alert the operator.

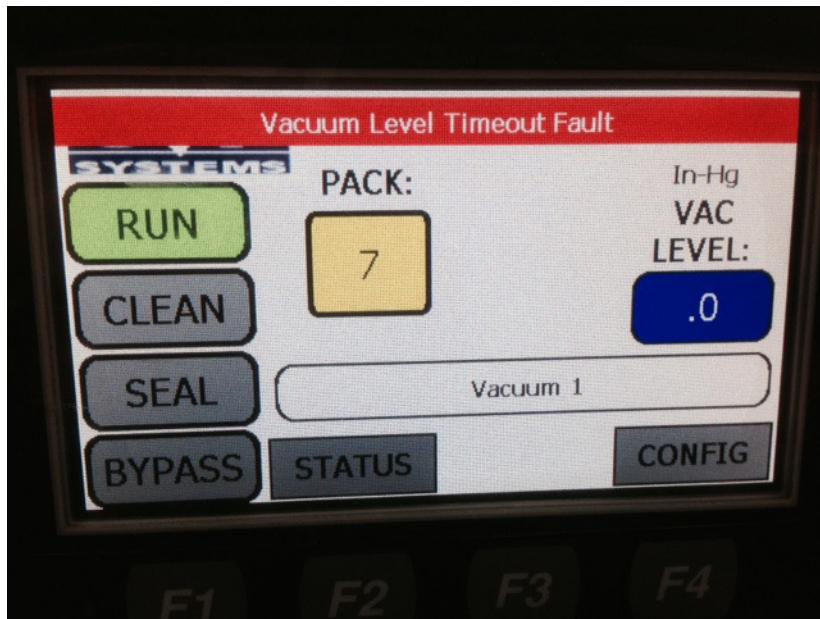


Figure 2-21. Alarm condition - Vacuum Fault

The above figure shows a typical alarm popup screen. When the fault condition is corrected, press the START/ RESET button to acknowledge the alarm and return to the main menu. In this case, vacuum level could not reach the target level programmed in the pack by the vacuum fault time. Any one of seven alarm messages may appear:

1. Vacuum Fault: Occurs if the actual vacuum time exceeds the vacuum fault time.
2. Snorkel Fault: Occurs if the program expects the snorkel to be in the retracted position and the Snorkel retracted PLC input is not ON.
3. Jaw Close Fault: The program commanded the jaw to close and the Jaw Close input was not received within one second.
4. Low Gas Fault: In Gas Pack settings, the fault occurs when the Gas Pressure PLC input is not received. Jumper if not used.
5. Temperature Fault: The temperature has remained below the controller setpoint for one minute and the analog temperature reading has not gone up. Power to the heater is removed until reset.
6. Vacuum Sensor Fault: Occurs when the 0-5VDC signal is not received from the vacuum sensor.
7. Jaw Open Fault: The Jaw Closed Cylinder switch is ON when the program is commanding the Jaw to be open.
8. Discharge Blocked Fault: The shelf remains in the lower position and the discharge photoeye is blocked indicating a jam. Remove the jam and press "RESET" to correct the fault.

9. Shelf Raise Fault: The tilt shelf should be in the up position but the cylinder reed switch is not activated . A jam may have occurred, remove the jam and press “RESET” to correct the fault.

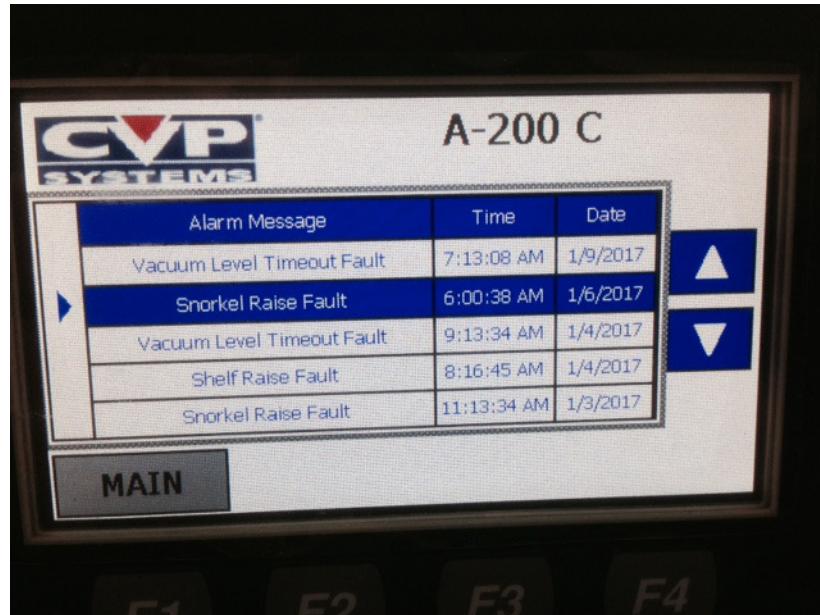


Figure 2-22. Alarm History

Alarm History

Access the Alarm History menu shown above from the Status Screen. Alarms that occur on the A-200 are time and date stamped. 50 alarms are stored and can be scrolled through using the screen buttons. After 51 alarms, the oldest alarms are purged from screen storage.

Maintenance Screen

Access the Maintenance screens shown below from the Status Screen by pressing the MAINT key. First the PLC inputs screen appears showing all current inputs that are energized in GREEN and those off in RED. Press NEXT and the PLC outputs screen appears showing all current outputs that are energized in GREEN and those off in RED.

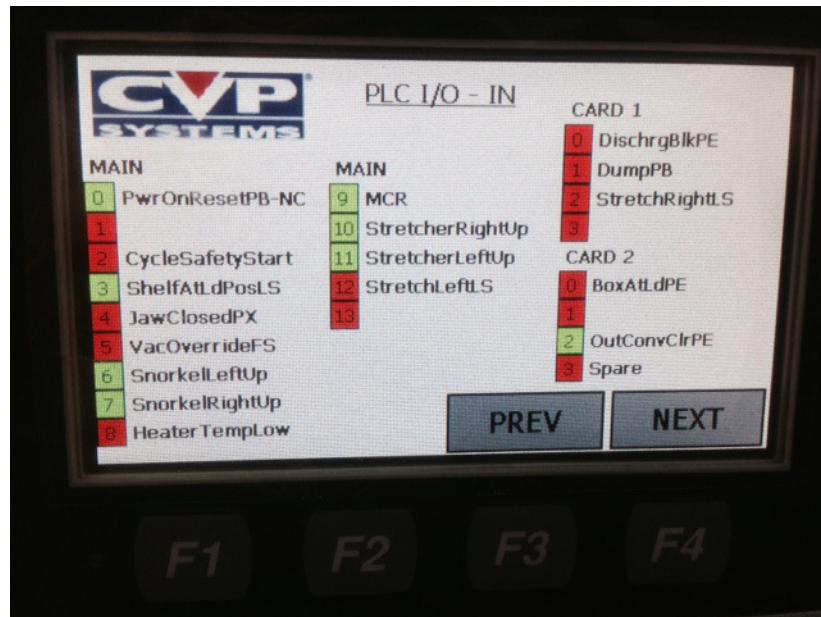


Figure 2-23. Maintenance screen - PLC Inputs

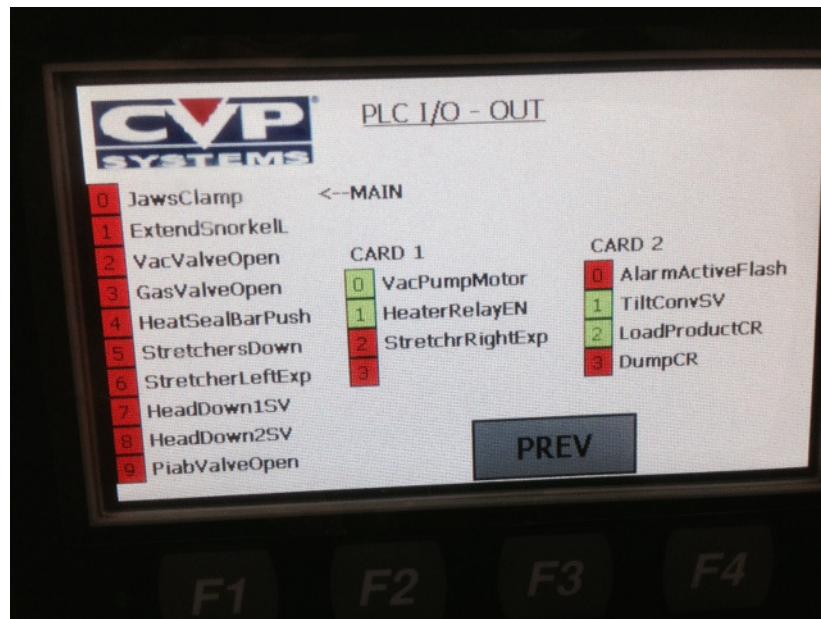


Figure 2-24. Maintenance screen - PLC Outputs

Other Controls Power/Reset Button

Pressing and holding down the Power/Reset button resets the machine to the point of placing the bag in the manifold or on the bag stretchers. It is

also required to press the Reset button to acknowledge alarm conditions. If not using bag stretchers, tapping the Reset button drops the snorkels.

Emergency Open: When the emergency open button is pressed, the machine ceases operation, the jaws open and the drop shelf lowers. The machine can not be turned on until the emergency open button is reset. Pull the button out to reset. Shelf will come back up when green power/reset button is pressed.

Operator Interface

The LCD screen and it's associated buttons allow the operator to change the preset timers within the pack settings as well as the seal timers. During operation the screen provides the operator with prompts at each stage of the operating cycle, as well as troubleshooting and programming information discussed in the troubleshooting section of this manual. The buttons are provided for programing and troubleshooting proposes and are not needed to run the machine.

Start Button

The Opto-touch start switches are located on both sides of the control panel. After placing the bag either on the bag stretchers or in the manifold, touch the start switches to seal the bag. *Both Start Buttons must be pressed simultaneously in order for the A200 jaws to close and seal the bag.*

Dump Button

Press DUMP button on the front panel to manually dump the loaded box to the lower conveyor as soon as the exit is clear.

Use BYPASS mode if ALL incoming packages need to be bypassed. If only select boxes need to be bypassed, use the DUMP button.

Cycle Start Optical Touch Switch (OTS)

The Cycle Start OTS are located on both sides of the control panel. After placing the bag either on the bag stretchers or in the manifold, activate both Cycle Start OTSs to initiate the cycle. *Both Start Buttons must be pressed simultaneously in order for the A200 jaws to close and seal the bag.*

SECTION: 5

VACUUM PUMPS

GENERAL INFORMATION

Pump Description	Selecting the correct pump for your application is determined by the level of vacuum needed, speed of the vacuum flow, type of MAP gases used, and environment in which the pump is to be used. There are two types of vacuum pumps available on the A200 Multiline XT. The rotary vane style pump uses an electric motor that runs a pump to generate a vacuum. These pumps require oil to aid in the vacuum process, however the pumping speed and vacuum level are higher on this type of pump. The venturi pump uses compressed air to generate a vacuum. Oil is not used in this pump, decreasing maintenance requirements. For every second of pump operation, 1/2 cubic foot (14.2L) of air is consumed. The larger the volume of air to evacuate, the more air is used.
Pumps Used	The A200 Multiline XT is available with two vacuum pump options. <ol style="list-style-type: none">1. The standard venturi pump is suitable for most applications. This pump works well in applications with incidental moisture and moderate vacuum levels. This pump is also recommended for high oxygen applications. The pump is located on the sealing head stand, below the drop table.2. The High Capacity electric pump is recommended where deeper vacuum levels and/or faster vacuum times are required. If your system is equipped with this type of pump, it will be mounted on a separate platform.
Pump Maintenance	The venturi pump has no moving parts and is nearly maintenance-free. This pump only requires a periodic, thorough cleaning. The electric pump requires periodic oil and filter changes. See Section 10 for more maintenance details.
Filters	The vacuum system is equipped with filters to protect the pumps from debris. The standard filter has a clear acrylic bowl allowing the operator to see the contents and empty when needed. A red button on the top of the filter relieves the vacuum in the sediment bowl when pressed.

Important: There is an O-ring inside the acrylic bowl for a seal. Without this O-ring the machine will not achieve the vacuum levels as specified.

VENTURI VACUUM PUMP OPERATION

Start up

The venturi vacuum pump requires no specific start up procedure. However check for debris and water in the sediment bowl and the filter regulator unit before running the vacuum pump.

Operation

During operation of the A200 Multiline XT, the vacuum pump only runs during the vacuum cycle. When the vacuum cycle begins, the vacuum valve opens to make a clear passage from the snorkels to the vacuum pump. At the same time, an electric solenoid valve opens, feeding compressed air to the venturi pump. This generates the vacuum. The vacuum level that is displayed on the user interface is taken directly from the vacuum pump.

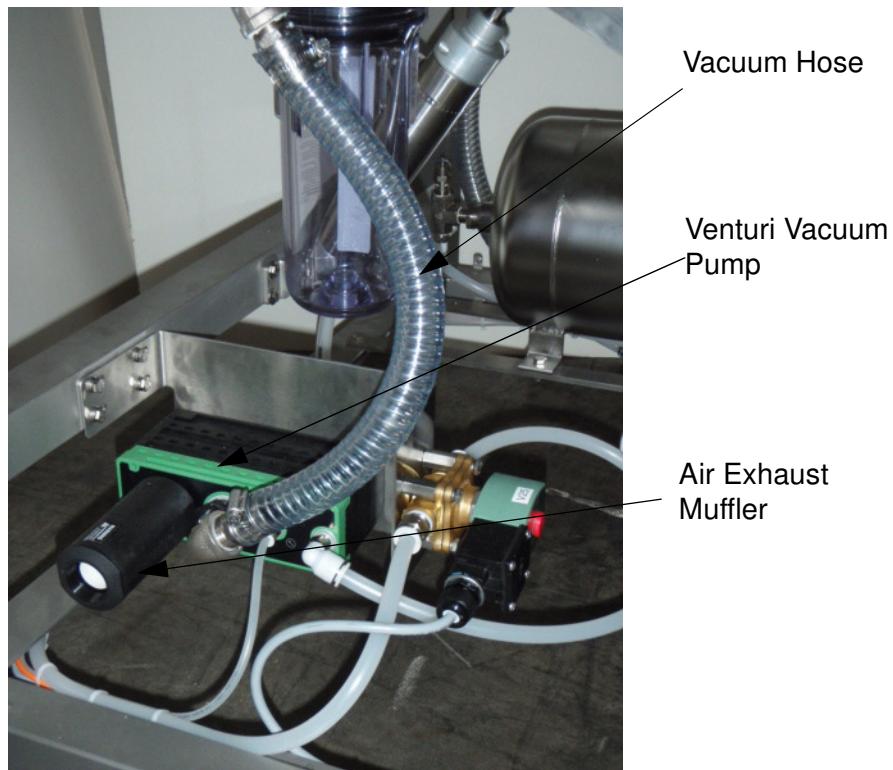


Figure 5-1. Venturi Vacuum Pump

Note: In cold rooms where water is present in the air supply, icing may occur in the pump. Use clean, dry air when using this pump in cold areas.



Warning:

**USE COMPRESSED AIR ONLY WITH THE VENTURI VACUUM PUMP!
ASPHYXIATION HAZARD EXISTS IF OTHER GASSES ARE
EXHAUSTED INTO THE MACHINE AREA.**

VACUUM VALVE

General Information

The vacuum valve closes off the vacuum and gas chamber from the vacuum pump and sediment bowls. The valve is an air operated valve requiring a minimum pressure of 60 PSI (4.0 bar).

SECTION: 6

GAS SYSTEM

GAS FLUSH SYSTEM

Important: Do not connect compressed air to the accumulator tank:
Compressed air is not a modified atmosphere gas. Product contamination will occur.



Warning:

APPLICATIONS USING OXYGEN REQUIRES SPECIAL “OXYGEN CLEAN” COMPONENTS. CONSULT YOUR CVP REPRESENTATIVE FOR FURTHER DETAILS.

General Information

The gas system utilizes an accumulator tank, gas sensor and gas valve. Gas is supplied to each machine from the conveyor manifold and controlled by timers in the PLC program. These timers can be adjusted through the operator interface. See Section 4 “Mode and Pack Settings” for additional information on adjusting the timers. The main gas connection is at a bulk-head on the conveyor by the main electrical panel.

Determining Gas Time

For each pound of product, a certain amount of gas, in cubic inches, is required to backflush into the bag. After determining the type of cycle the machine will run, cycle an empty bag and check the final gas amount in the bag. Adjust the timers accordingly. If more gas is needed, increase the gas timers. If less is needed, decrease the timers.

To check the amount of gas, follow the instructions below:

1. Place the bag on a flat surface and place another flat object on top of the bag, i.e. a sheet of card board, parallel to the lower flat surface. This will sandwich the bag.
2. Measure the length and width of the bag as well as the distance between the two flat objects.
3. Multiply these dimensions to determine the volume in the bag.
4. Compare this amount to the amount required.

Consult a CVP Systems representative for the amount of gas per pound required for your application.

Accumulator Tank

The accumulator tank has a 2-1/2 gallon (9.5 L) capacity and provides for a quicker flow of gas into the bag. Gas supply lines feeding several machines or supply lines travelling long distances have inconsistent gas flows. The gas supply for the machine travels from the Multiline conveyor's bulk sys-

tem to the accumulator tank where there is a check valve and a pressure relief valve. It is located below the discharge shelf of each machine.

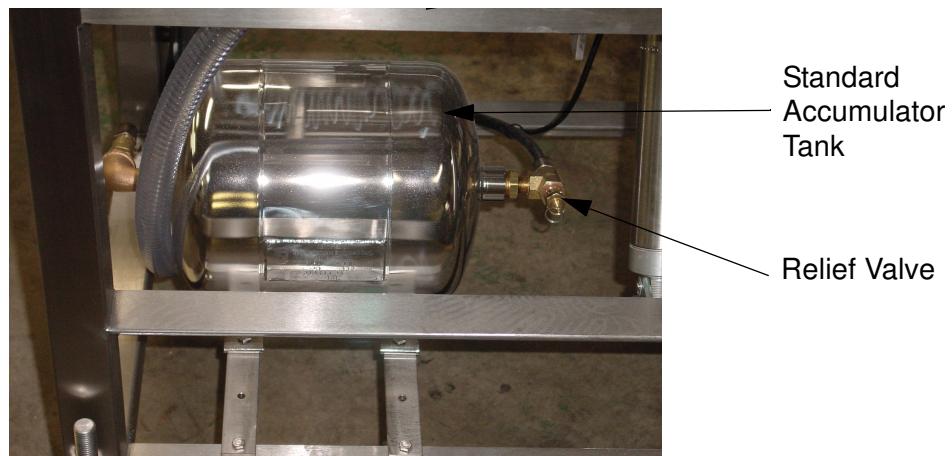


Figure 6-1. Accumulator Tank

**Gas Supply From
Multiline
Conveyor**

When using a Multiline conveyor with the A200 Multiline XT sealing head machine, a gas manifold is mounted to the lower conveyor. The tube fittings on the manifold blocks that connect the gas supply line to the accumulator tank feature an integrated shut-off valve.

To service the gas system, remove the gas supply tube at the conveyor and bleed the gas from the tank by pulling the ring on the relief.

Gas Sensor

The gas sensor is located in the bottom of the conveyor enclosure. The gas supply manifold runs along the conveyor to supply each machine and the gas sensor. The sensor lets the conveyor program know whether gas is being supplied or not. If there is no gas, the conveyor panel displays a gas fault and prevents boxes from pushing onto the machines from the conveyor.

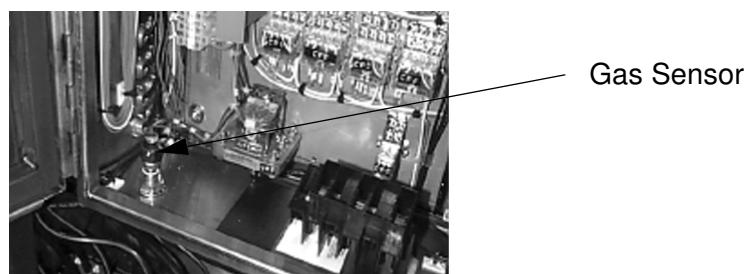


Figure 6-2. Gas Sensor Location

Gas Valve

The gas valve is an air actuated valve located above the snorkels, next to the vacuum valve. This valve can be manually actuated by pressing the yellow manual override button on the V9 valve on the pneumatic valve bank.

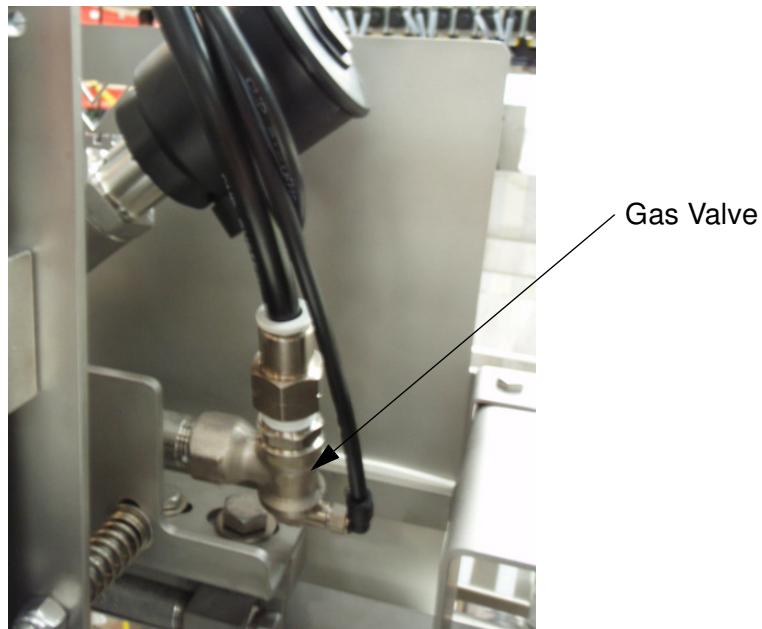


Figure 6-3. Gas Valve

SECTION: 7

SEAL SYSTEM

HEAT SEAL ADJUSTMENTS

Heat Sealing Plastic Film is a function of:

1. Pressure
2. Dwell
3. Temperature
4. Flatness of Film

Pressure

The air pressure is controlled by the main regulator. The pressure should be set at 80 PSI (5.4 bar). As the machine is cycled, the pressure should not drop by more than 5 PSI (0.3 bar). Should the gauge show a greater pressure drop than this, check your air supply.

Dwell

The heat seal dwell is controlled by the SEAL TIME preset in the operator interface. See Section 4 for more information on adjusting the timer. It is important to adjust this time to at least 2.50 seconds for most films as this allows for heat penetration through wrinkles and contamination. It is more desirable to increase the dwell time before increasing the temperature set-point on the controller to get the desired seal integrity.

Temperature

Temperature of the heat seal bar is controlled by the temperature controller. Temperature should be set between 250 and 300° F (121 and 149° C) depending on the film. See the Temperature Controller instructions in this section for more information on adjusting the setpoint temperature.

Flatness of Film

It is important to place the bag on the manifold as wrinkle free as possible to minimize leaks. The more wrinkles, the more potential for leaks. Use bag stretchers whenever possible. Check that the box and bag do not move after positioning the bag on the manifold. Be sure the load conveyor is level.

Setpoint Adjustment

To adjust temperature setpoint, press the **2** key (4th key on bottom). Now tap the **△** or **▽** keys until the desired setpoint is reached. Press **2** again to return to the operation display.

By adjusting the setpoint up or down, seal quality can change dramatically. We recommend that any adjustments be made in 5° F increments. After altering the temperature setpoint (green value on display), let the temperature process value (red value on display) stabilize before attempting to seal bags and test seals. The SP ^ output LED on the temperature controller is on whenever power is supplied to the heating element. The LED flickers as temperature approaches setpoint.

Note: Initially set temperature at 270° F for testing. Satisfactory seals usually occur between 250° F and 300° F (121 and 149° C).

6100 TEMP CONTROL SETUP AND ADJUSTING

Operation Display

- Upper Display: Actual Temperature (red)
- Lower Display: Setpoint Temperature (green)
- Lower Display: “OPEN” indicates thermocouple break
- Lower Display: “[HH]” indicates input sensor fault (overrange)
- Lower Display: “[LL]” indicates input sensor fault (underrange)

Note: When actual temperature is 5 deg. F or more below setpoint, the low temperature alarm is on. For input sensor fault, check that the thermocouple is type K (red =+, yellow = -). Red to terminal 1, yellow to terminal 2.



Figure 7-1. 6100+ TEMP. CONTROLLER

As factory-configured by CVP, the red ^ LED to the right of the lower display will light when the controller calls for heat. The ALM LED in the lower display will light when the actual heater temperature (upper display) is lower than the setpoint by 5 deg. F or more.



Figure 7-2. 6100+ SETPOINT ADJUSTED TO 270 DEG. F

Program Menu Entry

From the operation screen, hold the key and press the key to enter the operator menu. From the operator menu, press the key to return to the operation screen, or from the operator menu, press the or key to scroll through 9 other menus before wrapping back around to the operator menu.



Figure 7-3. 6100+ Operator Menu



Figure 7-4. 6100+ Configuration Menu

**Configuration
Menu Unlock
Code**

Several of the program menus require an “Unlock Code” to be entered before access is given to view/ change the parameters. The Configuration Menu unlock code is “20”. So with the Configuration Menu entry screen showing, press the key to select entry and enter “20” for the unlock code “ULoc”.



Figure 7-5. 6100+ Configuration Menu Unlock Code

Configuration Menu Parameter Access

Pressing the **¶** key after the Unlock code 20 is entered will get you into the Configuration mode parameter list. With an unconfigured controller, Configuration menu parameters must be set before all other menus. Each parameter is in green on the lower display. The current setting is in red on the upper display. Press the **¶** key to scroll through the list. You can only scroll from top to bottom through the list. Pressing **¶** again at the end of the list wraps around to the first display parameter.

Press the **▽** or **△** keys to change parameter settings. Hold the **¶** key and press **△** to return to the program menu.

Table 13: Configuration Mode Parameters

Parameter	lower display	Description	CVP setting
Input type	InPt	type K thermocouple, deg. F	kF
Scale Range Upper Limit	ruL	hi limit 400 deg. F	400
Scale Range Lower Limit	rLL	low limit 32 deg. F	32
Control Type	CtyP	primary only	SnGL
Control Action	Ctrl	reverse acting	rEv
Alarm 1 type	ALA1	NA	nonE
Alarm 2 type	ALA2	deviation alarm	dE
Deviation alarm 2	dAL2	low temp. 5 deg. F below SP	-5
alarm 2 hysteresis	AHY2	1 deg. F	1
Loop alarm	LAE	disabled	diSA
Alarm inhibit	Inhi	no alarms inhibited	nonE
Output 1 usage	USE1	primary power	Pri
Output 2 usage	USE2	alarm2 - direct acting	A2_d
Output 3 usage	USE3	recorder process value	rEtP
Linear output 3 range	typ3	0-5 volts DC	0_5
Linear output 3 scale max	ro3H	420 deg. F = 5 VDC	420
Linear output 3 scale min	ro3L	0 deg. F = 0 VDC	0
Display Strategy	diSP	adjustable PV & SP	1
Configuration Lock code	CLoc	lock code	20



Figure 7-6. 6100+ Configuration Menu first parameter (type K thermocouple input)

Setup Menu Unlock Code

Several of the program menus require an “Unlock Code” to be entered before access is given to view/ change the parameters. The Setup Menu unlock code is “10”. So with the Setup Menu entry screen showing, press the **Esc** key to select entry and enter “10” for the unlock code “ULoc”.



Figure 7-7. 6100+ Setup Menu

Setup Menu Parameter Access

Pressing the **Esc** key after the Unlock code 10 is entered will get you into the Setup mode parameter list. Each parameter is in green on the lower display. The current setting is in red on the upper display. Press the **Esc** key to

scroll through the list. You can only scroll from top to bottom through the list. Pressing **OK** again at the end of the list returns to the operation display.

Press the **▼** or **▲** keys to change parameter settings. Hold the **▼** key and press **▲** to return to the program menu.

Table 14: Setup Mode Parameters

Parameter	lower display	Description	CVP setting
Input Filter Time Constant	Filt	2.0 seconds	2.0
Offset	OFFS	none	0
Power Level	PPjj	read only	NA
Primary Proportional Band	Pb_P	Band (deg. F)	8.0
Automatic Reset	ArSt	Integral time (s)	5.00
Rate	rAtE	Derivative time (s)	1.15
Manual Reset	biAS	25%	25
Setpoint Upper Limit	SPuL	400 deg. F	400
Setpoint Lower Limit	SPLL	32 deg. F	32
Power Limit	OPuL	100%	100
Output 1 Cycle time	Ct1	0.5 seconds	0.5
Deviation alarm 2	dAL2	low temp. 5 deg. F below SP	-5
alarm 2 hysteresis	AHY2	1 deg. F	1
Autopretune	APt	disabled	diSA
Manual Control	PoEn	disabled	diSA
Setpoint Ramping	SPr	disabled	diSA
ramp value	rP	NA	OFF
setpoint value	SP	270 deg. F or as required	270
Setup menu lock code	SLoc	lock code	10



Figure 7-8. 6100+ Setup Menu Unlock Code

Table 15: Program Menus Select

Program Menu	upper display	Description	Unlock code
Operator	Optr	select to return to Oper. screen	none
Setup	SEtP	Setup and PID parameters	10
Configuration	ConF	Configuration parameters	20
Product Information	info	All read only	none
Autotuning	Atun	Autotune start	0
Other Program Menus	From the operation screen, hold the Esc key and press the Δ key to enter the operator menu. From the operator menu, press the Esc key to return to the operation screen, or from the operator menu, press the Δ or ▽ key to scroll through 9 other menus before wrapping back around to the operator menu.		
Autotuning	<p>Due to the different characteristics of heater elements, the temperature controller may “overshoot” the temperature setpoint. If the temperature repeatedly overshoots the setpoint and affects the quality of the seal an “Autotune” may be necessary.</p> <p>Autotune ‘teaches’ the controller the main characteristics of the process and ‘learns’ by cycling the output on and off. The results are measured and are automatically programmed in the controller memory.</p>		

Pretuning starts with the heater element cold, tuning occurs during warm-up, preventing overshoot.

Autotune Instructions

With the heater element cold, power up the machine. From the operation screen, hold the **ESC** key and press the **△** key to enter the operator menu. From the operator menu, press the **△** or **▽** key to scroll to the Autotune menu.

From the display “Atun” press the **ESC** key. With “Ptun” shown in the lower display, tap the **△** key to turn autotune ON.

Note: Autotune will not engage if actual temperature is within 5% of the input range span or 20 deg. F or less from the setpoint. CVP recommends tuning at SP = 270 deg. F

The tune program will now start. As long as the “Ptun” parameter is set to ON, autotune is still running. When the tune program is complete, new PID values are automatically entered in the Setup menu. The process temperature will rise to the setpoint and control should be stable. “Ptun” will reset to OFF after a successful autotune.



Figure 7-9. 6100+ Autotune DISABLED or DONE

Cycle Time

The CVP Systems heater control device is a solid state relay and a 0.5 second cycle time is pre-configured. Cycle time (Ct1) preset in the Setup menu is set to 0.5 in the factory settings list.

A cycle time of 0.5 means that the minimum time the solid state relays can cycle on, off, then back to on is 0.5 seconds. When connected properly, the RELAY ON LED on each solid state relay will light whenever the SP ^ output LED of the controller is on.

Factory Settings

The controller has two modes, program mode and operating mode. When in program mode the controller can be programmed with settings and functions to suit the application. When in operating mode the controller uses the settings and functions entered in the program mode to control the application and also displays the process variable and setpoint temperatures. The 6100+ temperature controller is set up for the main setpoint output (SP1) to be a solid state relay driver. The SP1 output is 10 VDC, actuating the solid state heater relays whenever the controller is calling for heat.

Menu parameters outside the Configuration and Setup menus should never need to be changed.

Note: All controllers shipped from CVP Systems, Inc. will have the factory settings listed in tables 1 & 2 pre-configured. No setup is required. CVP part # is 7707-2892.

A complete manual can be downloaded off the Web at www.west-cs.com for the type 6100+ (59300-4) temperature/ Process Controller.

Changes to Factory Settings

Factory settings allow the operator to change the temperature setpoint. To lock the setpoint, change the diSP setting in the Configuration menu from 1 to 6. Use the key to increase the parameter from 1 to 6. With the 6 flashing, press the key to accept the change. Now all setpoint changes must be made in the Configuration menu via the SP parameter.

Factory settings also show temperature units in deg. F. To show deg. C, change your inPt setting in the Configuration menu from kF to kC. Press the key once to change kF to kC. With kC flashing, press the key to accept the change. New scale limits must also be entered in the Config. menu. Change the rUL setting to 204 and the rLL setting to 0. A new low temperature alarm deviation must also be entered in the Config. menu. Change the dAL2 setting to -3. New retransmit limits must also be entered. Change the ro3H setting to 215 and the ro3L setting to -18.

As factory-configured by CVP, the SP ^ to the right of the lower display will light when the controller calls for heat. The red ALM LED in the lower display will light when the actual heater temperature (upper display) is more than five (5) °F from reaching the setpoint.

HEAT SEAL TESTING

Seal quality is a function of time, pressure and the bar temperature. The seal time parameter located on the operator interface controls the length of time the seal bar applies pressure to the bag. This parameter can be different for pack 1, 2, 3 and 4.

With the sealing manifold at the setpoint temperature, load an empty bag on the machine and start a cycle in SEAL mode. After the cycle is complete, inspect the seal. If the seal is weak, increase the dwell time. If the seal appears to be burning through or distorting the film, but the seal is bonded, decrease the time. Repeat this procedure until the optimum setting is achieved. Satisfactory seals usually occur at 2.5 to 3.5 seconds seal time. If this cannot be achieved, you may increase the temperature setpoint and repeat the test.

Start the controller setting at 250° F and slowly raise the setpoint in 5 degree increments as you examine the seals. When seals start to bubble or burn through, back off the temperature, allowing time for cool down before testing another seal.

After your machine has completed its cycle, check the quality of the heat seal. It is essential that you allow the seal to cool completely before testing it.

BEGIN BY INSPECTING THE SEAL VISUALLY. Does the seal appear to be uniform? Does it have a texture similar to that of the Teflon Tape? Does the seal appear to be "hot enough" (sealed well enough to bond both sides of bag securely)? Look for signs of cold spots (sections where seal is visibly inferior in comparison to majority of seal). Look for "hot spots" (sections where seal is visibly burned in comparison to majority of seal). If isolated hot spots or burns are visible in the bag, inspect the seal bar for damage to the teflon tape.

GIVE SEAL A "TUG TEST". Pull on both sides of bag, starting at one end and working your way to the other, with a moderate amount of force, trying to separate seal. Is the seal strong and uniform from end to end?

Look for weak areas, where the bag seal separates, due to lack of heat. Look for fold overs and wrinkles. Look for weak areas where the bag tears at the seal caused by too much heat.

TEST SEAL AT BOTH ENDS IN CORNERS. Use a dull pointed tool, like a pen or pencil to probe at the seal. Does the tool break through the side, or edges of the bag before it penetrates the corners of the seal?

MOST OF YOUR SEALING PROBLEMS CAN BE CORRECTED BY ADJUSTING TEMPERATURE AND/OR HEAT SEAL DWELL TIME.

For more information on heat seal problems, causes and corrections, see the TROUBLESHOOTING section of this manual.

HEAT BAR COMPONENTS

Heater Element

A tubular resistance type heating element inside of the seal bar is continuously cycled to maintain a constant seal bar temperature. The power is connected to the elements with quick disconnects. The disconnects are water tight to prevent water from entering and shorting out the element. Always disconnect the main power supply to the machine before disconnecting the heater connections. Also note that elements are stamped with the voltage matching the voltage listed on the serial tag of your machine. This stamp is located on one end of the element tube between the bend and the power cable.

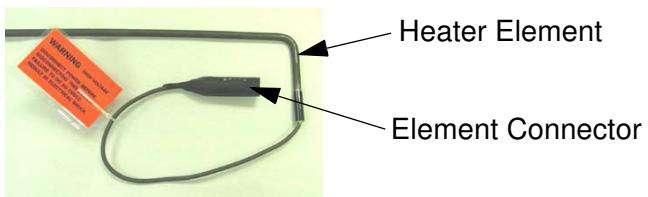


Figure 7-10. Heater Element



Figure 7-11. Seal Bar Thermocouple Connection and Rod Bearing

Thermocouple

The thermocouple senses the heat seal bar temperature and sends a signal back to the temperature controller. The connection is accessible through a cutout just off-center of the rear manifold. A bayonet cap is wound on a spring at the sensing end of the thermocouple. The cap should be wound back on the spring at least 2" (50.8mm) so when the cap is screwed into the adapter connection on the bar, the thermocouple makes positive contact with metal.



Figure 7-12. Thermocouple Removed from Seal Bar

Without the thermocouple positive connection in place, the controller cannot sense the actual bar temperature. The controller will heat the bar constantly and to extreme temperatures. This will warp the heat seal bar causing uneven sealing of bags and requiring bar replacement.

The thermocouple wire is type K. Yellow is considered positive and red is negative. The controller is configured to accept the type K thermocouple signal.

Teflon Tape

One layer of Teflon tape is required on the heat seal bar to prevent film from sticking. Tape is usually black in color and should not have any visible damaged areas. Damaged tape will adversely affect the sealing performance of the A200.

Important: More than one layer of teflon tape will affect the quality of the seal.

Some bars are plasma coated with teflon at the factory and do not require taping. If the coating on these bars becomes damaged, the bar needs to be recoated or taped over the plasma coating. Plasma coated bars can be sent back to CVP Systems for recoating.

**Pancake
Cylinders and
Pushers**

The heat seal bar floats in the lower manifold between an upper and lower sponge rubber that grips the film. When the heat seal bar extends, it pushes out farther than these sponge rubbers and sandwiches the film between the hot bar and the backup rubber in the upper manifold, forming a seal.

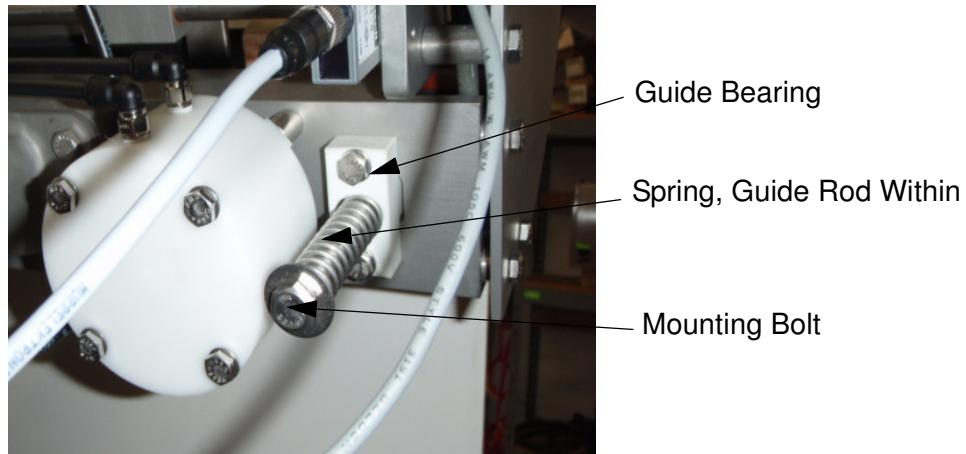


Figure 7-13. Seal Bar Guide Rod

The guide rods, bolts and springs that hold the heat seal bar are accessible from the backside of the lower manifold. The bushings that go through the manifold openings act as bearings for the guide rods and must be in place so the bar stays centered in the manifold opening. The springs keep the bar in the retracted position until the pancake cylinders push out on the back of the bar, extending it and compressing the springs.

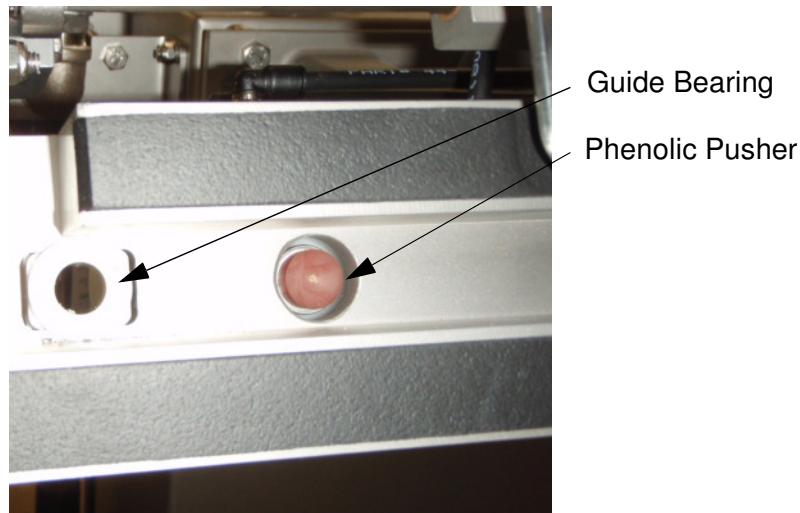


Figure 7-14. Pancake Cylinder Pusher (Heat Bar removed)

The pancake cylinders are actuated only for the heat seal dwell time. Valve 5 in the pneumatic valve bank actuates the cylinders. Phenolic pushers are inserted on the pancake cylinder rod ends that push against the heat seal bar. There should be a 1/8" (3.2 mm) gap between the back of the heat seal bar and the inside face of the rear manifold. Replace worn pushers when this gap is less than 3/32" (2.4 mm).

Severely worn pushers will cause the heat bar to transfer heat to the manifold and the bar will be cooler in that area.

SECTION: 8

BAG STRETCHERS

General Information

Bag stretchers are used to hold the bag in the manifold while the operator starts the cycle. A straight and wrinkle free seal is produced due to the manner in which the bag is held.

The bag stretcher holds one bag at a time during a cycle. Two stretcher bars, or fingers, are used with one to each side of the snorkels. The left hand stretcher expands the distance between the stretcher fingers holding the bag in place. Both bag stretcher fingers are adjustable to accommodate various bag widths.

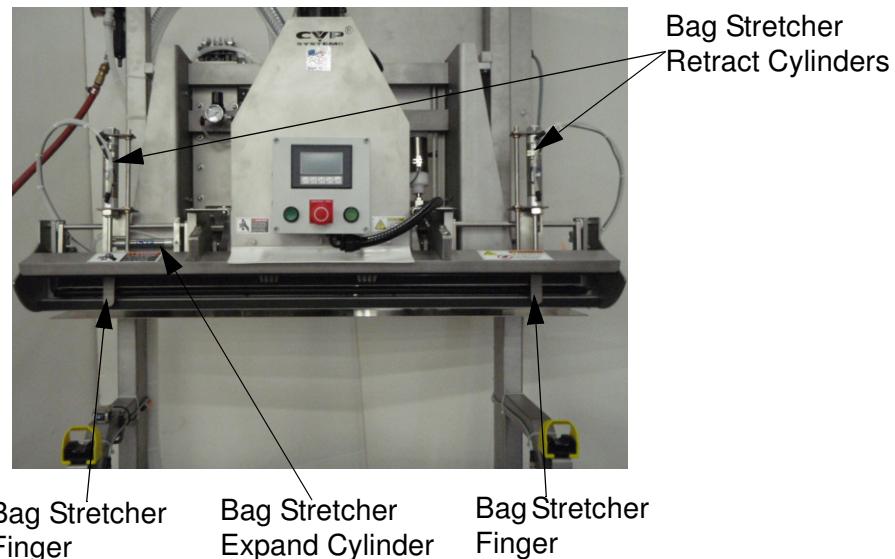


Figure 8-1. Standard Bag Stretchers

Adjusting For Bag Width

The width of the bag stretchers are easily adjusted. The stretcher mechanisms are mounted to two rods that allow linear movement when the stretchers expand. To expand and hold the bag, a cylinder mounted to a fixed block extends, sliding the left hand bag stretcher mechanism. The right hand bag stretcher mechanism is adjustable, but is locked in a fixed position during operation. The following explains how to adjust the bag stretchers to different bag sizes.

1. On the left hand mechanism loosen the two (2) pinch bolts on the fixed block that the expanding cylinder is attached to. This will require a 7/16" wrench.



Figure 8-2. Adjusting the Left Hand Bag Stretcher

2. On the right hand mechanism, using a 9/64" hex key, loosen set collar on the slide block.

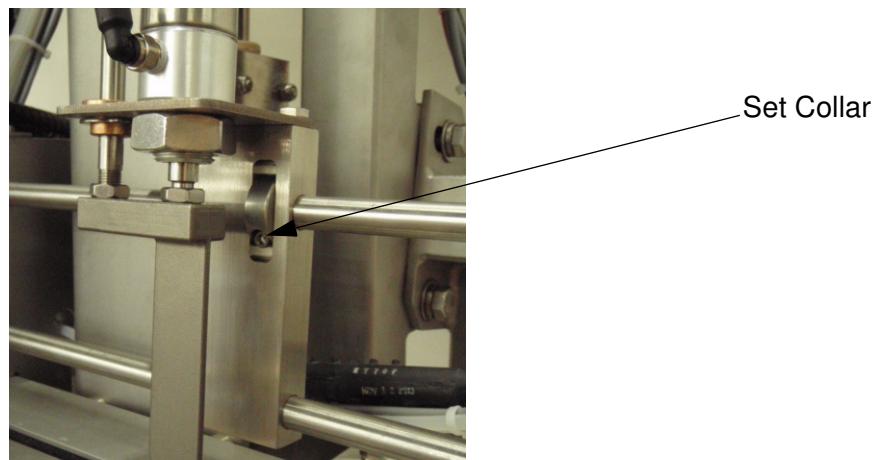


Figure 8-3. Right Hand Bag Stretcher

3. Press the left hand stretcher finger to expand the stretcher.

4. Hold the bag up to the stretchers and slide the stretchers to hold the bag. With the bag being held by the stretcher fingers, center the bag to the manifold. Remove the bag and expand the fingers 1/2" (12.7 mm) wider than the bag opening. This will accommodate tolerances in the bag width.
5. Tighten the four hex screws to lock the stretcher mechanisms in place.
6. Reset the machine and test the bag stretchers.

Adjusting Vlier Pin

The bag stretchers are held off the manifold rubber by spring loaded vlier pins. There are two pins total on a machine with bag stretchers. The pins are located at each end of the manifold. In time, this pin will need to be replaced.

To remove the worn vlier pin, loosen the jam nut with a 1/2" wrench and back the vlier pin out of the block. Thread a new pin into the block until the bag stretcher bars are approximately 1/2" (12.7 mm), or a fingers width, above the manifold. Once adjusted, tighten the jam nut on the vlier pin to hold in position. Test the bag stretchers for proper activation of the stretchers.

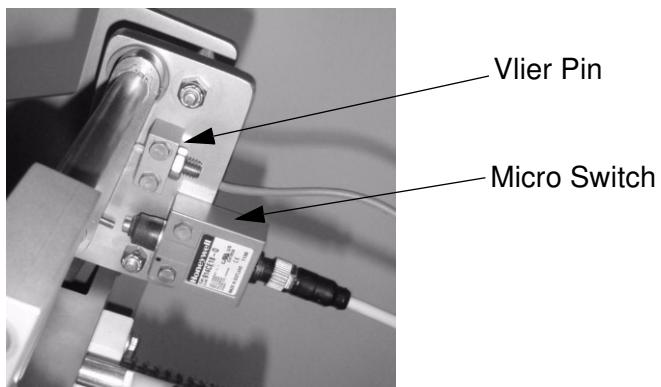


Figure 8-4. Vlier Pin and Micro Switch

Adjusting the Micro Switch

The micro switch is mounted next to the vlier pin on the left hand pivot bar. A screw mounted in the swing arm above the micro switch actuates the switch to expand the bag stretchers.

To adjust the screw, loosen the jam nut with a 7/16" wrench. The screw should be easily turned by hand, but if not, a straight blade screwdriver can be used. The screw should be adjusted to actuate the micro switch as the stretcher bars touch the rubber on the manifold. Any higher will cause the stretchers to expand prematurely. Retighten the jam nut to lock the screw in place.

**Adjusting
Cylinder
PositionSwitches**

The cylinder position switches are located on the end of the bag stretcher retract cylinders and are activated when the bag stretcher bars are retracted. A red LED illuminates when the switches are activated. A third cylinder position switch is located on the snorkel cylinder and is activated when the snorkels are retracted. With all three cylinder position switches activated, the machine knows that the manifold area is clear and the seal bar can be activated.

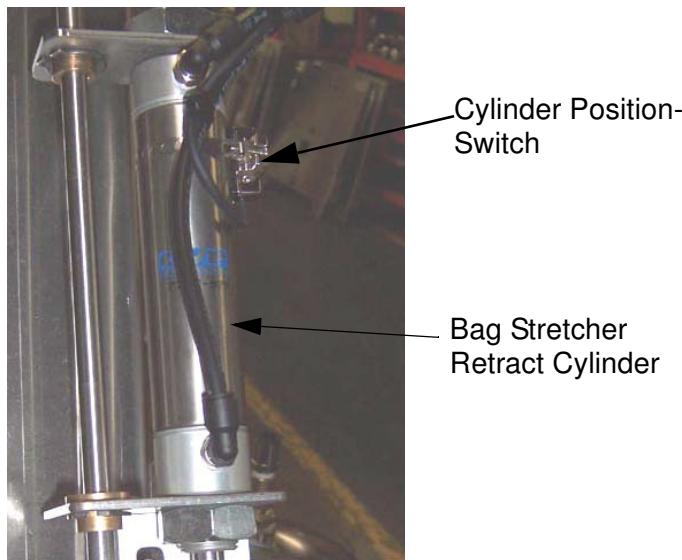


Figure 8-5. Bag Stretcher Reed Switch

The bag stretcher cylinder position switches are wired in series, requiring both to be activated and the LED to illuminate.

To adjust the cylinder position switches, retract the bag stretchers. Loosen the band around the cylinder using a small straight blade screwdriver. Slide the cylinder position switches evenly from the top end of the cylinder down until both LED's illuminate. Tighten the band around the cylinder to hold switches in position.

**Bag Stretcher
Operation**

The following is a step by step sequence of operation for bag stretchers.

1. The manifold head may lower automatically after it senses a box on the load shelf. Line 3 of the display will show "H1" if the current pack is set so the head will not adjust after a box is loaded. It will show "H2" if the current pack is set so the head drops one position after a box is loaded. It will show "H3" if the current pack is set so the head drops two positions after a box is loaded. The manifold head can also be manually lowered one or two positions by swiping either optical touch button. This makes it easier to slip the bag around the bag stretchers.
2. As an option, pressing START will manually drop the snorkels. The operator lifts the bag up and slides the bag around the snorkels.

3. The operator lifts the bag up and slides the bag around the stretcher bars.
4. The operator, while holding the bag, presses down on the left stretcher bar actuating a micro switch mounted to the bag stretcher assembly. This will cause the left bag stretcher bar to slide to the left expanding the distance between stretcher fingers holding the bag tight. The snorkels will drop automatically into the bag at this point if not already down.
5. The operator activates the machine cycle by swiping the optical touch buttons.
6. The manifold closes and the machine starts the vacuum/gas cycles.
7. At the end of the vacuum/gas cycle the snorkels retract from the manifold. The bag is then sealed.
8. The manifold opens allowing the bag to be taken away from the machine ending the cycle.

BAG CLAMPS

General Information

Similar to bag stretchers, bag clamps also serve to hold the bag in the manifold while the operator starts the machine cycle. However, instead of stretching the bag, bag clamps pinch the bag to the rear manifold.

The bag clamps hold one bag at a time during a cycle. Two clamp fingers are used, with one to each side of the snorkels. When activated, air cylinders attached to the clamp fingers retract and hold the bag against the rear sponge rubber. Both bag clamp fingers are adjustable to accommodate various bag widths.

Adjusting For Bag Width

The clamp fingers should be adjusted so that they are positioned 3"-4" from either end of the bag. The left clamp finger in particular should be adjusted so that the operator can depress the finger while simultaneously holding the bag.

To adjust the position of the clamp fingers, loosen the two pinch bolts with a 7/16" wrench. Slide the clamp fingers to the desired position and tighten the pinch bolts.

Adjusting The Clamp Cylinder Switch

The position switch on the left hand air cylinder controls the point at which the bag clamps activate. To adjust the position of the switch, loosen the screw on the mounting band and slide the sensor forward or backward on the cylinder to the desired position. DO NOT over-tighten the mounting screw or damage to the position switch will result.

The position switch features an LED that lights when the switch is made. This is useful for making adjustments to the activation point of the bag clamps or troubleshooting problems.

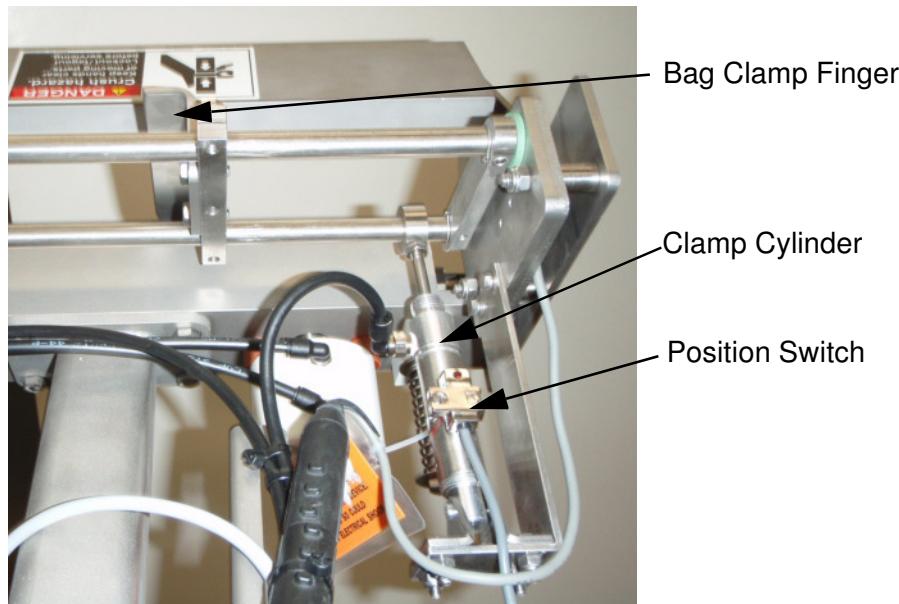


Figure 8-6. Bag Clamp Cylinder

Bag Clamp Operation

The following is a step by step sequence of operation for bag clamps.

1. As an option, pressing START will manually drop the snorkels. The operator lifts the bag up and slides the bag around the snorkels.
2. The operator positions the ends of the bag behind the clamp fingers.
3. While holding the bag taught, the operator presses the left clamp finger to activate both bag clamps. The snorkels will drop automatically into the bag at this point if not already down.
4. The operator activates the machine cycle by swiping the optical touch buttons.
5. The manifold closes and the machine starts the vacuum/gas cycles.
6. At the end of the vacuum/gas cycle the snorkels retract from the manifold. The bag is then sealed.
7. The manifold opens allowing the bag to be taken away from the machine ending the cycle.

SECTION: 9

CLEANING

CLEANING INFORMATION

The A-200 product line is equipped with a CIP (Clean in Place) system to assist in the sanitation process.

Selection of appropriate and effective cleaning solutions will depend on individual plant needs, sanitation procedures and industry regulatory requirements and are the customer's responsibility.

All cleaners should be checked for their corrosive properties which can have a potential negative impact on the following materials which are used in our product line:

- 303/304/316 Stainless Steel
- Viton
- Teflon
- Polypropylene
- SAN
- PVC

Clean-In-Place Vacuum System

The A200 XT is designed so that hot water can be flushed through the vacuum system.

Important: The machine should be covered if the area around the A200 Multiline is foamed as part of your cleaning procedures.

Water Connection

Connect a hot water source to the garden hose connector below the drop shelf.

Note: Connect a standard facility hot water supply (typically 40-50 PSI). Do not connect a high pressure water source.

CLEANING INSTRUCTIONS

1. Place a barrel or other container beneath the snorkels.
2. Move the position of the cam-lock fitting from the sediment/filter bowl, to the hot water connection (See Figure 9-3 and Figure 9-4).



Figure 9-7. Normal "Run" Configuration



Figure 9-8. Backflush Configuration

3. Press the “CLEAN” button on the touchscreen.

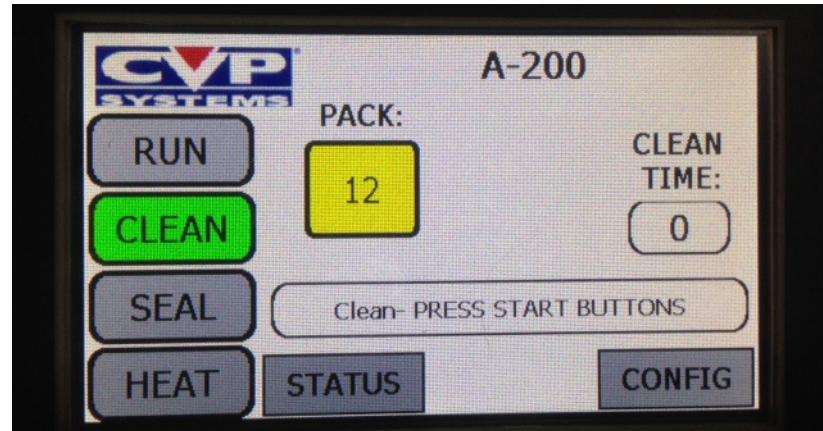


Figure 9-9. Clean Mode Display

4. Open the hot water supply valve.
5. Activating both opticla touch switches simultaniously will start a pulsing action (vacuum valve on 3 seconds - off 3 seconds) until the end of clean time. This pulsing action helps dislodge debris that may have built up in the system. On bag stretcher machines, water will go on 3 seconds then off 3 seconds through the snorkels. On vacuum manifold machines, water flow will shift from the snorkels to the manifold holes and back every 6 seconds through the cycle.



Warning:

HOT WATER EMITTED FROM THE SNORKELS AND/OR MANIFOLD HOLES MAY BE DANGEROUS TO PERSONNEL IN THE AREA. IT IS BEST TO PERFORM A CLEAN CYCLE WITH NO ONE AROUND THE MACHINE.

6. At the end of the clean cycle, the pulsing action will stop. Water flow through the snorkels will continue until it is manually shut off. .
7. Shut off the hot water supply valve.

8. Press the left bag stretcher bar to dispense gas through the hoses and snorkels to flush the remaining water from the system.

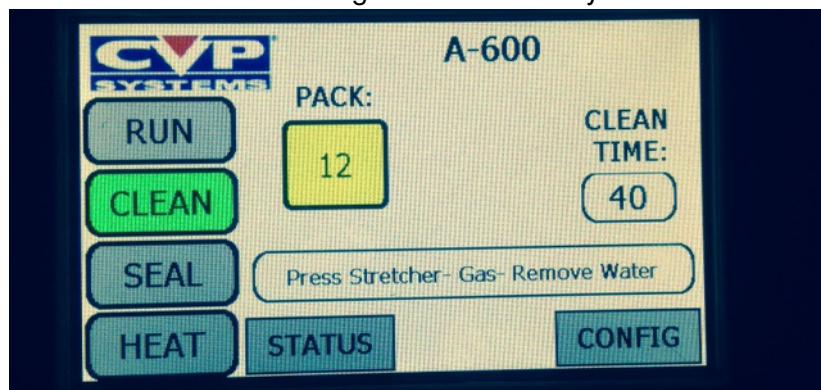


Figure 9-10. End of Clean Cycle Display

9. Return the cam-lock fitting to it's normal position, connected to the sediment/filter bowls (See Figure 9-1).
10. Unscrew the clear Sediment/filter Bowl(s), empty any water, then put back in place.

Note: When remounting the clear Primary Sediment Bowl(s), make sure that the O-ring is in place before tightening.

11. Press the "RUN" button on the touchscreen. This turns on the vacuum pump and pulls any remaining water in the system back to the Primary Sediment Bowl.
12. Cycle the machine once. Gas will blow any remaining water out of the snorkels.
13. Press E-stop and empty any water which may have accumulated from Primary Sediment Bowl.

Important: Make it standard practice to empty all filter and sediment bowls of water before starting the machine.

SECTION: 10

MAINTENANCE

A200 MULTILINE XT MAINTENANCE SCHEDULE

Items To Check On A Daily Basis

ITEM	COMPLETED
SEAL QUALITY	
AIR PRESSURE	
SEDIMENT BOWL CONDITION	
OVERALL CONDITION OF MACHINE	
MANIFOLD SPONGE RUBBER CONDITION	
FILTER-REGULATOR CONDITION	
VACUUM HOSE CONDITION	
GAS PRESSURE	
TEFLON TAPE CONDITION	
OXYGEN LEVEL OF PACKAGED PRODUCT	

Maintenance To Perform On A Daily Basis

FUNCTION	COMPLETED
CLEAN & BACKFLUSH VACUUM SYSTEM	

Figure 10-1. Daily Routine

Maintenance To Perform Twice A Year Or As Needed

ITEM	ACTIONS	DATE
HIGH CAPACITY VACUUM PUMP	CHANGE OIL, DEMISTER FILTER, AND OIL FILTER	
SNORKELS	CLEAN INTERNALLY WITH CLEANER & HIGH PRESSURE WATER, USE COMPRESSED AIR TO DRY	
SNORKEL QUICK EXHAUSTS	REBUILD	
HEAT SEAL BAR	REPLACE TEFLON TAPE	
THERMOCOUPLE	CHECK CONNECTION	
LIGHT BULBS	REPLACE	
HEAT SEAL BAR CYLINDERS	REPLACE	
VALVE BANK EXHAUST	REPLACE	
SILICONE BACK-UP RUBBER	REPLACE	
MANIFOLD SPONGE RUBBERS	REPLACE	

Figure 10-2. Maintenance to Perform Twice a Year or as Needed

REGULAR MAINTENANCE

Regular maintenance is the key to product longevity with the A200 Multiline XT or any other machine. When a preventive maintenance schedule is followed, the operating efficiency of the machine is maintained and breakdowns are reduced. This section of the manual will take you through an extensive routine check of the unit. This is the same type of inspection used by CVP Service personnel to evaluate the condition of older equipment.

Items which need regular attention and/or service are brought to your attention below.

Visual Inspection

1. Check overall appearance of the machine. Look for things which obviously need attention, such as broken or missing parts, worn out parts, etc.
2. Observe the machine while it is running.
3. Determine if the machine is operating satisfactorily. Get input from the operators and area supervisors. They can readily inform you of any recent malfunctions.
4. Cycle the machine.

Air Supply Regulator/ Lubricator

Check air pressure:

- Air supply regulator: 80 PSI (5.4 bar)
- Snorkel Regulator: 7-15 PSI (0.5 to 1.0 bar)
- Stretcher Regulator: 15-25 PSI (1.0 to 1.7 bar)
- Check lubricator oil level daily (if equipped)

All of the pneumatic components of the A200 Multiline XT are factory lubricated and sealed for life. Lubricating oil is not required. However, if air lubrication is used it must be continued, as the factory lubrication will be removed and premature failure of these components may result.

Note: Do not use mineral oil or lubricants containing mineral oil. Mineral oil is chemically incompatible with the air cylinder seals, and its use will result in premature cylinder failure.

Oil can be added to the lubricator prior to pressurization or while under pressure through the fill port. Remove the fill plug and fill with CVP Vacuoil or 10W oil through the fill port. The rate of oil delivery is controlled by turning the adjusting screw CCW for more or CW for less oil delivered. CVP sets the oil rate at one drop of oil every 17-20 cycles of the heat seal cylinders (V5). V5 valve is manually actuated by pressing the yellow manual override button while there is no other air consumption.

Remove air pressure from the system whenever removing the oil bowl to check contents. This can be accomplished by either removing the air supply line or by turning regulator pressure down to zero. Periodically inspect the bowl to detect damage. Replace if cracked or deteriorated. When bowl becomes dirty, wipe only with a clean dry cloth.

Gas Supply

Check gas pressure:

- Recommended pressure is 60 to 80 PSI (4.0 to 5.4 bar).

Important: Inspect supply line for kinks, leaks, or any other physical damage which may adversely affect gas flow.

Sediment Bowl

Check sediment bowl: Water or other foreign particles must be emptied from the bowl. Make sure to replace the black O-ring after emptying. Vacuum loss will occur if the O-ring is missing or installed improperly.

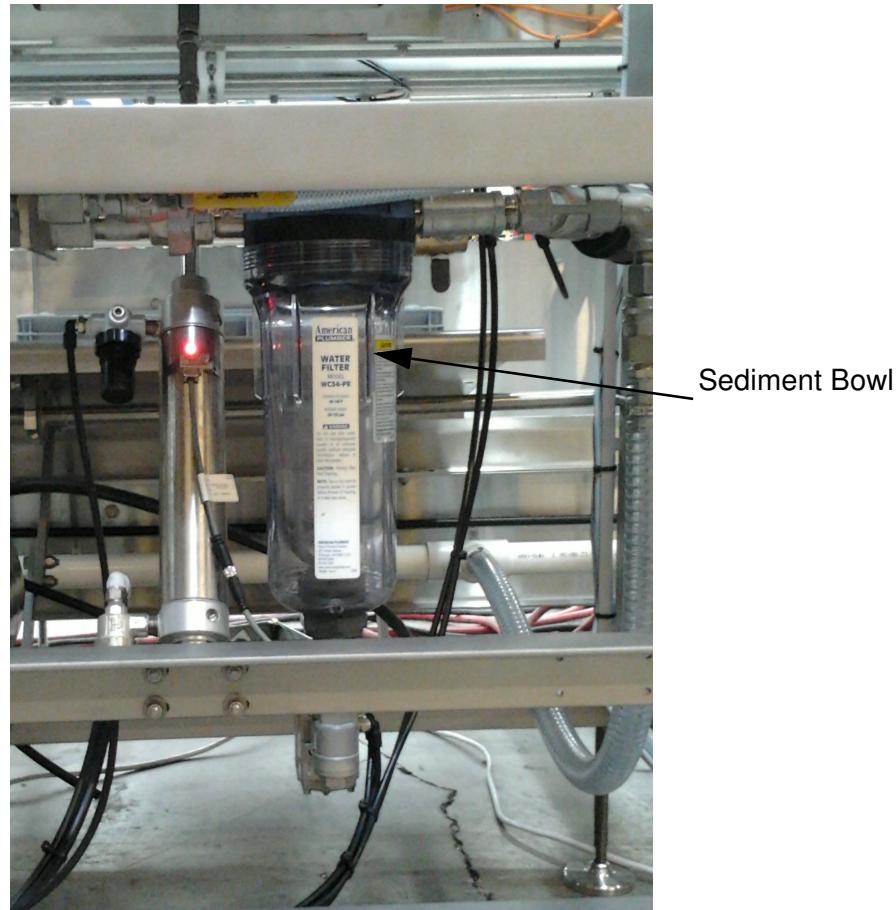


Figure 10-3. Sediment Bowl

SEAL BAR AND MANIFOLD MAINTENANCE

Heat Seal Bar

Check straightness of heat seal bar by observing this bar in the rear manifold. Bar must be straight for best results. Warped heat seal bars will create an uneven seal resulting in poor seal quality.

1. To correct a warped bar, the bar must be removed. Turn power off before disconnecting the rubber plugs that supply electrical power to the bar. Remove the mounting bolts and springs holding the bar that are accessed from the backside of the rear manifold. Do not lose the white or green colored bushings as these act as bearings for the guide rods. Remove thermocouple and ground wire as well.
2. Place the heat seal bar on a flat rigid surface and check for high areas. With moderate force, push the high points into the flat surface to straighten.
3. Remount into the rear manifold.

Important: If this procedure does not correct the problem, replace the heat seal bar or return it to CVP Systems Inc. for repair.

Teflon Tape

Check teflon tape on heat seal bar (black in color): Tape should not have any visible damaged areas. If it does, replace with high quality teflon tape which is available from CVP Systems, Inc. Replace any teflon tape that has poor adhesion. Remove old adhesive with solvent and dry completely. Wipe the bar off with alcohol before applying new tape. Apply tape evenly and in line to avoid wrinkles.

Important: Damaged teflon tape will adversely affect the sealing performance of the A200 Multiline XT.



Teflon Tape

Figure 10-4. Teflon Tape on the Heat Seal Bar

Thermocouple

Check the thermocouple connection: The thermocouple is accessible through the cutout of the rear manifold. It is a very critical part of the temperature control system. If the thermocouple is broken or has a bad connection, the temperature controller cannot sense the actual heat seal bar temperature. Without the thermocouple in place, the heat seal bar will heat to temperatures out of specification and possibly warp the heat seal bar.

Note: On thermocouple wires, white or yellow is considered positive and red negative.

Changing the thermocouple

Changing the thermocouple is accomplished by loosening the terminal screws which hold the two thermocouple wires in place inside the user interface enclosure. Remove cord connector from electrical enclosure, loosen the knurled lock collar and slip old thermocouple wire out. Reverse this order to install a new one. It is recommended that some type of "anti-seize" compound be applied to the thermocouple adapter before locking down.

Important: When replacing the thermocouple, it will be necessary to adjust the bayonet nut on the spring to ensure that the thermocouple tip makes firm contact with the heat seal bar. CVP recommends the cap be wound down on the spring at least 2" (50.8mm).



Figure 10-5. Thermocouple

**Warning:**

IF THE THERMOCOUPLE IS NOT ATTACHED TO THE HEAT SEAL BAR THE HEATER ELEMENT WILL HEAT TO EXCESSIVELY HIGH

**TEMPERATURES. SERIOUS INJURY AND/OR EQUIPMENT DAMAGE
MAY RESULT.**

Ground Wire

The ground wire should be attached to the chassis after completing the installation of the thermocouple.

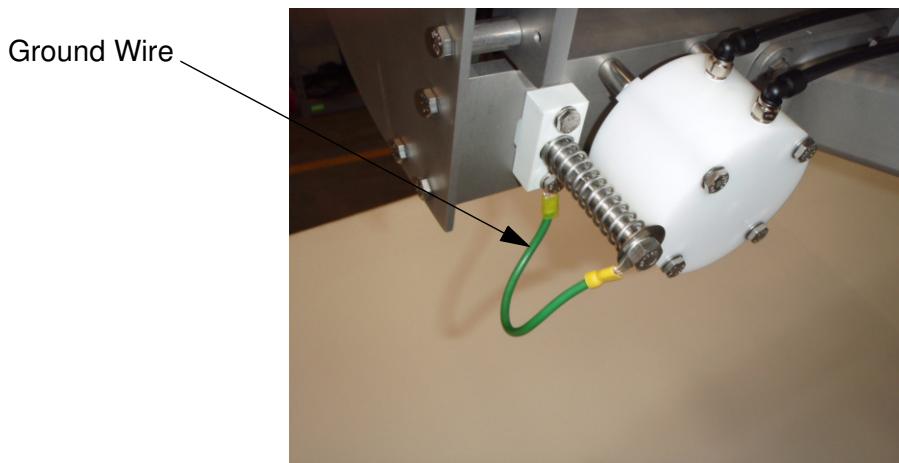


Figure 10-6. Ground Wire

**Warning:**

**RE-ATTACH THE GROUND WIRE TO GUIDE ROD TO AVOID
ELECTRICAL SHOCK.**

Seal Bar Back Up Rubber

The seal bar back up rubber, located in the upper manifold, will need to be replaced if the rubber becomes damaged or the surface is uneven. In time the silicon rubber will become too hard to form around the profile of the seal bar causing the seal to look faded along the edge of the seal on the bag.

To replace, perform the following:

1. Remove the six (6) 1/4-20 screws in the upper manifold holding the back up bar in position.
2. Using a razor knife remove the silicone rubber from the bar.
3. Clean residue from the bar using adhesive remover. When all the adhesive is removed, clean the bar a final time with a clean rag and isopropyl alcohol.
4. Wipe the rubber clean with a clean rag and alcohol.

5. Apply an even layer of RTV. CVP recommends "GE" brand RTV 157. This adhesive is available at most industrial supply companies.
6. Lay the silicone rubber on the back up bar and align the edges of the bar and rubber.
7. Turn the bar over and clamp to a straight surface, with the rubber facing down. RTV 157 sets in one hour and will cure in 24 hours.
8. Mount the bar back in the manifold.

Hint: An alternative clamping method is to mount the back up bar in the manifold, close the manifold, and extend the seal bar by pressing and locking the manual override button on the heat seal bar valve (V5). This will clamp the rubber in place.

Manifold Sponge Rubber



Figure 10-7. Sponge Rubber

The black sponge rubber on the front and rear manifolds hold the bag tight during each cycle and prevent loss of vacuum during snorkel pullout. When these sponge rubbers become damaged, worn or dry-rotted, they should be replaced. Worn sponge rubber will cause poor vacuum performance due to leaks.

To change sponge rubber, pull off old rubber, clean and dry mounting surface, and stick new sponge rubber in place. Degrease the manifold groove with solvent to remove residues and old adhesive before applying new rubber.

SNORKEL MAINTENANCE

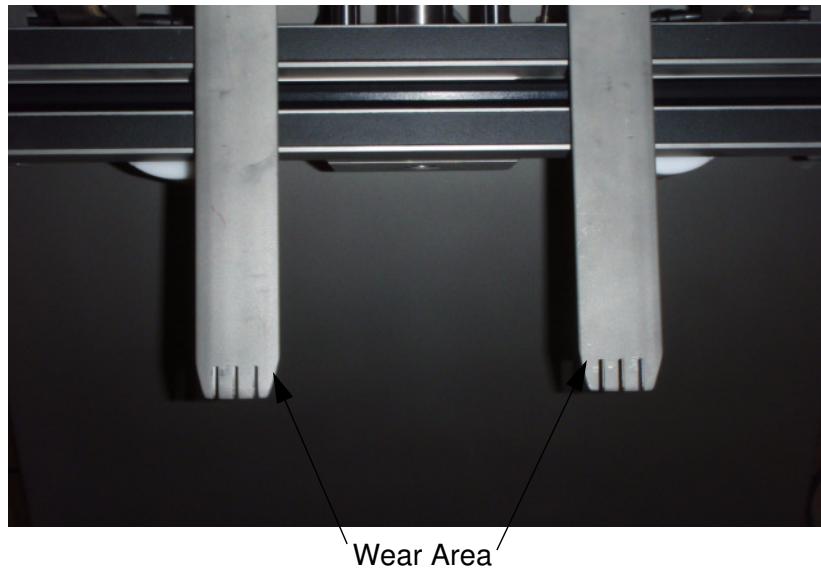


Figure 10-8. Snorkel Wear Area

Snorkel Wear

1. Keep the exterior of the snorkels clean for best heat sealing results. Do not use soap or any other cleaners which will leave a residue behind.
2. Inspect snorkels for wear or sharp edges around the tips. Replace worn and/or damaged snorkels. It is recommended that you keep a spare set of snorkels on hand at all times.

Important: If the finish of the snorkels becomes polished, it may cause the bags to stick to the snorkels (especially if moisture is present). The snorkels can be bead blasted or replaced as needed.

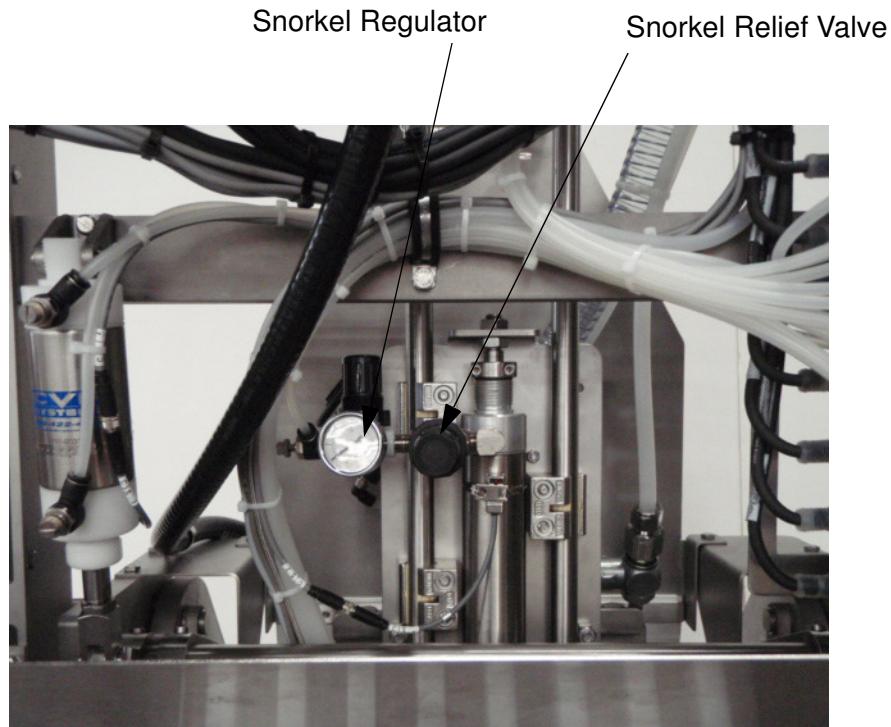


Figure 10-9. Snorkel Regulator

Snorkel Regulator

The snorkel regulator should be set between 7 to 15 PSI (0.5 to 1.0 bar). Adjust so the force of the extending snorkels does not damage product in the bag.

1. To adjust, unlock knob, then turn clockwise to increase pressure, counterclockwise to lower it.
2. Adjust while snorkels are extended.
3. Cycle the machine and observe the speed at which the snorkels retract. If the snorkel retracts too slow or not at all, the air pressure may be set too high. Readjust and cycle again.

Snorkel Relief Valve

Adjust for least resistance during snorkel retraction.

To adjust, unlock knob, then turn clockwise to increase pressure, counterclockwise to decrease resistance. When turning knob counterclockwise expect to hear air hissing from relief port. Turn knob just slightly clockwise until hissing stops. This is the point of least resistance. Adjust after the Snorkel Regulator has been set.

Snorkel Space Position

The snorkel assembly features a spring-loaded pivot. When the manifold is open and the snorkels are extended, there should be approximately 1/2"

space between the snorkels and the sponge rubber to facilitate easier bag loading.

If snorkel adjustment is necessary:

1. Lower the snorkels by pressing the override button on the snorkel down valve (commonly V1).
2. Loosen or tighten the locknuts on the snorkel centering spring to achieve the desired spacing. Adjust both springs to evenly distribute the spring force to both sides.

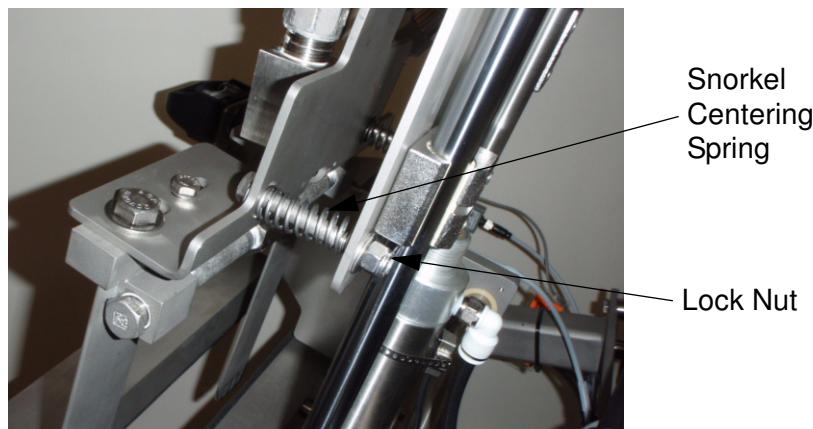


Figure 10-10. Snorkel Centering Spring

Snorkel Guide Shafts and Bearings

The linear shaft and bearings that guide the snorkels up and down movement should be inspected periodically for excessive play and replaced when necessary.

The plastic linear bearings are designed to be used in wet or dry environments without lubrication. However, if lubrication is required, use only the following types of lubricant:

- Waylube Oil
- Lightweight oil
- Petroleum-based grease
- 3-in-1 oils

Note: The following lubricants are chemically incompatible with the linear bearings and their use will result in premature bearing failure:

- PTFE Sprays
- WD-40
- Flourocarbons
- Silicon oils, grease, or spray

MANIFOLD MAINTENANCE

Adjusting Manifold Clamp Speed

The pivot clamp cylinders use flow controls on the back of the upper frame to control the speed of each cylinder. This helps the clamps close simultaneously. While reading the instructions that follow, refer to the figure below for locations of control devices.

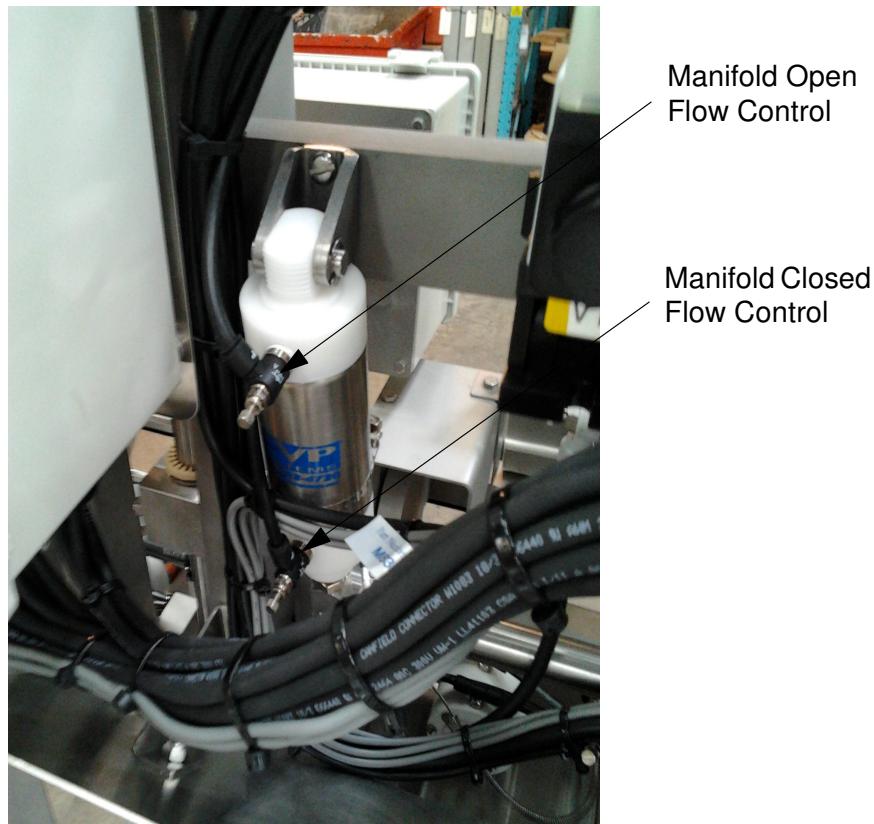


Figure 10-11. Adjust Clamping Speed

Perform the following steps to adjust the manifold clamp speed.

1. To adjust clamping speed, loosen locknuts on the flow controls.
2. Opening the center flow control will increase the speed of the opening of the clamp (turn knurled wheel clockwise). Turning it counterclockwise will decrease the speed of the opening of the clamp.
3. Opening the left flow control will increase the speed of the closing of the clamp (turn knurled wheel clockwise). Turning it counterclockwise will decrease the speed of the closing of the clamp.

BAG STRETCHERS

Bag Stretcher Regulator

Unlock knob, then turn clockwise to increase pressure, counterclockwise to lower it. Set at 15 to 25 PSI (1.0 to 1.7 bar) when left bag stretcher is extended.

Important: When pressure is set too high, heat seals will appear to be stretched and wrinkled. When pressure is too low, bags will not stay secured to stretcher bars.

Bag Stretcher Flow Controls

The bag stretcher flow control is adjusted at full counterclockwise position for greatest speed.

LS6, Bag Stretcher Expand

Adjusted to activate LS6, microswitch, as the left bag stretcher bar makes contact with black sponge rubber when pressed. This will expand the stretcher to hold the bag on the bag stretcher fingers.

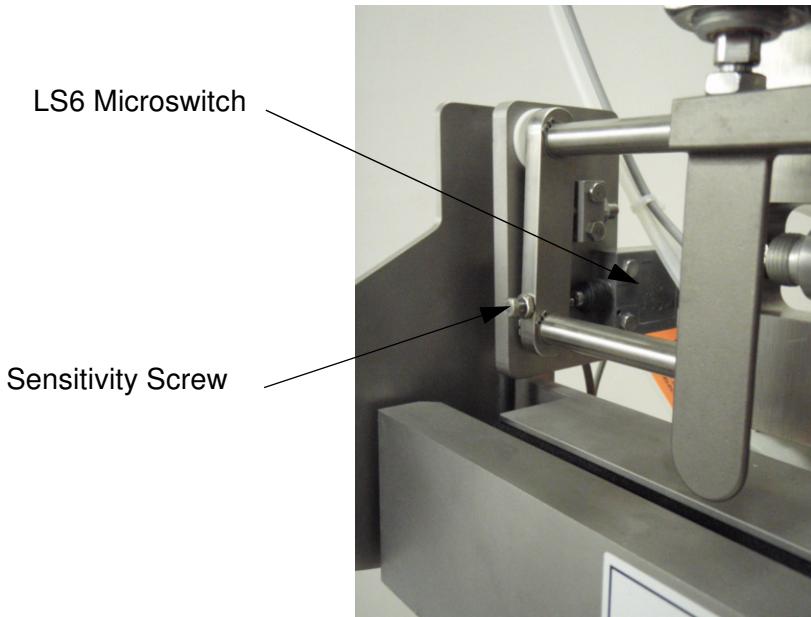


Figure 10-12. LS6 Microswitch

To adjust, loosen locknut on sensitivity screw. Turn screw clockwise to increase sensitivity, or counterclockwise to decrease sensitivity. Tighten locknut once adjustment is complete.

VACUUM SWITCH

VS2, Snorkel Vacuum Switch

The VS2 digital vacuum switch is used to measure the vacuum level inside the bag. It is mounted inside the main electrical enclosure. There is an auxiliary display on the user interface. The vacuum switch indicates the amount of vacuum being drawn in inches of mercury (inches Hg). When the operator display changes color from green to orange, the vacuum setpoint has been reached. The switch sends a 1-5 VDC signal to the PLC analog card proportional to the vacuum level.

Adjusting the Vacuum Switch Setpoint

To change the vacuum switch set point, press the PRE key on the operator interface and adjust the Vacuum Level presets. There is a separate setpoint for Packs 1 & 2 and for Pack 3 only.

Vacuum level is adjustable from 5 to 29.9 inches Hg . For more information on operator interface adjustments, see Appendix A.

Zero the Vacuum Switch

In measurement mode and with the vacuum pump off, press the "A" key for 2 seconds or more to adjust the zero point of the switch.

Factory Settings

Also from measurement mode, holding the SET key for 5 seconds will display factory preset values (operation mode). These settings determine display and control properties for the vacuum switch. Tap the SET key to scroll through the five parameters. They should be set as follows:

- 1. INCH**
- 2. F-3**
- 3. NO**
- 4. 2.5**
- 5. 2-C**

Press the SET key again and return to the operating display (measurement mode).

Use the UP or DOWN keys to change preset values to match the above. Tapping the set key after the last preset returns to measurement mode.

PART NAMES AND FUNCTIONS

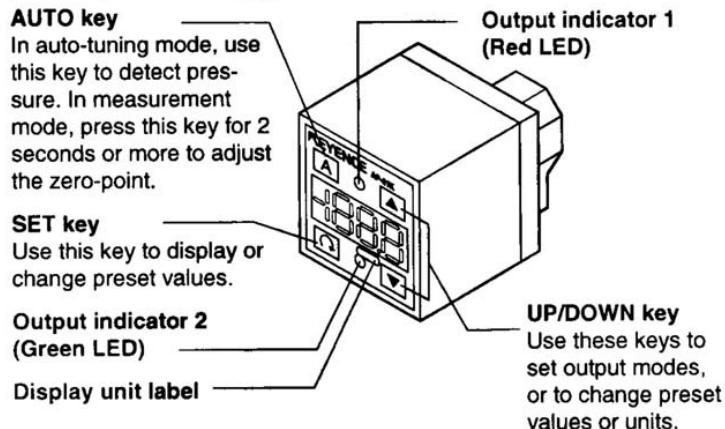


Figure 10-13. Vacuum Switch Part Names and Functions

Adjusting LS1/PRX1 Adjust so that switch is actuated when front manifold clamps into position.

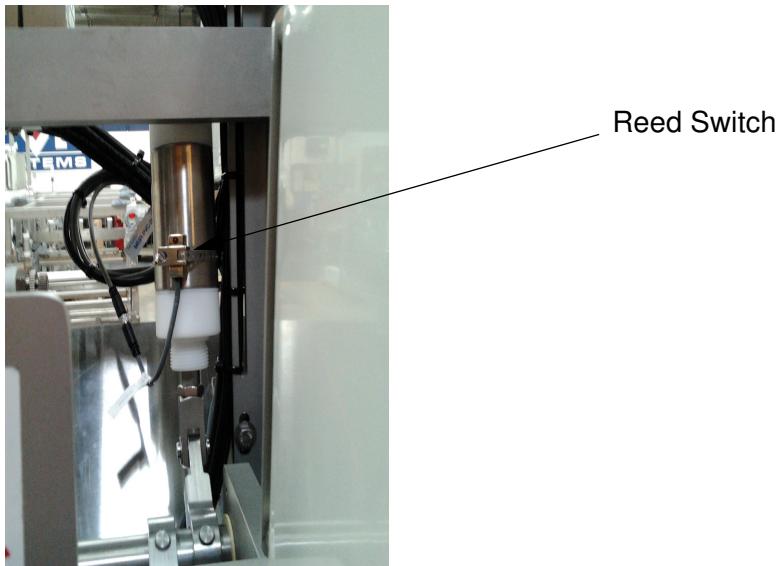


Figure 10-14. Proximity Switch

Adjust the position of the reed switch so that the red indicator light is on when the manifold is fully closed and locked. Misadjustment of the switch will result in a “JAWS CLOSED FAULT” on the user interface display.

ADJUSTABLE HEAD

Adjust Speed of Head	Adjust the machine head for comfortable up and down speed of upper mainframe. To adjust, loosen locknuts on adjusting screws, located on V11 and V12 solenoid valves. Turn adjusting screws clockwise to decrease speed. Turn counterclockwise to increase speed. Do not allow head to "slam" into down position.
Linear Shaft and Bearings	The linear shaft and bearings that guide the head's up and down movement should be inspected periodically for excessive play and replaced when necessary. The plastic linear bearings are designed to be used in wet or dry environments without lubrication. However, if lubrication is required, use only the following types of lubricant: <ul style="list-style-type: none">• Waylube Oil• Lightweight oil• Petroleum-based grease• 3-in-1 oils

Note: The following lubricants are chemically incompatible with the linear bearings and their use will result in premature bearing failure:

- PTFE Sprays
- WD-40
- FlourocARBONS
- Silicon oils, grease, or spray

SECTION: 11

TROUBLESHOOTING

COMMON PROBLEMS

Not creating enough vacuum in the bag:

Increase the vacuum level:

- Vacuum switch

On the operator interface increase the vacuum level setpoint. You must be in the pack you want to change the setting for then press CONFIG, PACK EDIT.

- Vacuum Timer

On the operator interface increase the vacuum time setpoint. You must be in the pack you want to change the setting for then press CONFIG, PACK EDIT. For more information on the touchscreen interface please refer to section 4.

Check the foam rubber.

- The foam rubber that clamps the bag in position for each cycle may begin to form a memory over time. Examine the four pieces of rubber, two on the front manifold and two on the rear manifold for deformations. If both pieces of foam rubber do not seal tightly against each other, air may leak into the bag limiting the level of vacuum that may be reached.

Pump Problems.

- For air operated pumps check the air supply to the pump regulator. It is located to the left side of the machine. This regulator has no lubricator. Make sure that the pump holds a constant air pressure during operation. If pressure drops more than a 5-psi during each cycle, the supply line needs to be larger. The optimal working pressure is 87-psi and at that pressure air usage will be 30-scfm whenever drawing vacuum.
- For electric high capacity vane pumps, first visually inspect the pump. Note the color of the vacuum oil in the sight glass. Does it need to be changed? Check the pump exhaust for smoke coming out. If there is, the demister may need to be changed or there may be too much oil in the pump. For more in-depth analysis of the vane vacuum pump refer to the Vacuum System section of the manual.

Vacuum lines.

- Examine the main vacuum hoses connected to the snorkels for any holes or cracks in the line. Check the hose clamps on the ends of the hose line connected to the hose barbs. Check that the hose clamps are tight to eliminate any leaks.
- Check the tubing connected to the vacuum switch. Over time the tubing may have unseated itself allowing a small vacuum leak. There are two locations to check. First check the rear of the vacuum switch in the operator interface panel. Next check at its connection to the main vacuum

line. This tubing is connected to the vacuum plumbing through a round brass valve most commonly connected to the gas valve assembly. (see A-200 lower frame assembly for more details)

- Inspect snorkel for debris inside or damage.

Sediment Bowl.

- Check o-ring is in place in the groove on top of the clear bowl. If not in place, there will be a vacuum leak. Also check all filters for any debris.
- If there is an auto dump valve on the bowl, check it is not stuck open or tubed backwards. The actuator should close the valve during the vacuum cycle.

Problems with inconsistent gas levels

Supply Line.

- Verify there is a consistent supply of gas. If there are multiple machines with the same supply confirm that the lines can supply them simultaneously. A gas accumulator tank may be necessary.

Gas Valve.

- Check the gas valve on the machine to make sure that it is operating consistently, meaning that it is seated and opening properly. This can be done by checking the machine schematic and overriding the valve to see if it is reacting consistently time after time.
- There is a spring-loaded check valve at the outlet of the gas valve that may be clogged.
- An electric solenoid valve (V9) opens the gas supply to the vacuum block. Output O:2/4 actuates V9 whenever the program calls for gas. If the O:2/4 output light illuminates and the fuse is good, check solenoid valve operation. Verify 120 VAC at fuse 13.

Bag Placement.

- Control the placement of the bag to insure consistent volumes in each bag. If the bag is not placed in the same position every time there will be a different volume of bag to fill, and thus a different amount of gas in each bag causing inconsistency between packs.

Vacuum Valve.

- Check that vacuum valve is fully closed during the gas cycle.

Problems with seals:

Check heat timer.

- Adjust seal timer in the preset menu of the interface. See the Heat Sealing section of this manual.

Check bar temperature.

- Adjust setpoint temperature on the CAL 9400 temperature controller. See the Heat Sealing section of this manual.

Check seal bar.

- Teflon taped bar
Check teflon tape covering bar for bare spots or wrinkles. If tape is not smooth and consistent across the bar, replace the tape.
- Plasma coated bar
Examine the leading edge of the seal bar for nicks, scratches or other wear marks which may cause poor seals. If your bar has these problems, replace the bar.
- Check heater power plug-in connections.
- Check that the thermocouple sensor is making good contact with the manifold. Verify that the thermocouple is a type K and that the CAL 9400 is configured for a K thermocouple input. If the thermocouple fails or is not connected, the CAL 9400 controller display will flash “inPt: Fail”.

Check manifold rubbers.

- Inspect foam rubbers (black) and silicone backup rubber (red). They should be pliable and show no signs of damage.

Check Pancake cylinders.

- Confirm that all pancake cylinders are extending properly. If not, bar pressure will be uneven.

OPERATOR INTERFACE FAULT DISPLAY

Snorkel or Stretcher fault:

Description: During each machine cycle, the snorkels and bag stretchers (if equipped) must be retracted before the seal bar activates so that they are not crushed by the seal bar. If the snorkel/bag stretcher cylinder sensors do not detect the snorkels/bag stretchers in the up position, the machine will stop and display a “SNORKEL FAULT” or “STRETCHER FAULT”. Similarly, if the program commands the snorkels or stretchers to extend and still receives the signal that they are retracted, the fault message will appear.

Response: Check to see that the snorkels and bag stretchers are in fact fully retracted and in the up position. If not, one of the actuating cylinders may have been damaged.

If the snorkel and bag stretchers are in the fully retracted position and a snorkel/stretcher fault is displayed, loosen the mounting strap for the cylinder position switch and slide them up or down the cylinders until they light. The magnet that actuates the cylinder sensor is near the top when it is in the retracted position.

Note: The two snorkel cylinder position switches are wired to inputs I:6 and I:7. Both inputs should light up when snorkels are UP. Similarly, the bag stretcher sensors are wired to inputs I:10 and I:11. Both inputs should light up when stretchers are UP.

If the cylinder position switches still do not light then a switch may have failed.

Vacuum fault:

Description: When the machine is running in “Vacuum Switch” mode it will keep the pump running until the vacuum switch reaches a preset value. If this value is not achieved the machine will stop and display a “VACUUM FAULT”

Response: Check to see if there is a hole in the bag, or if one of the snorkels is outside the bag (sometimes the snorkel will be under, not inside the bag).

Determine whether or not the vacuum level is set to a reasonable level. Normal values for a machine that has been in the field for some time are as follows: Piab, 20-22”Hg, SV-40 23-25”Hg. If the value is too high, set it to a lower value or run in vacuum time mode. If the set vacuum level is appropriate to your machine configuration, troubleshoot as a vacuum level problem.

Jaw closed fault: **Description:** After the start buttons have been activated the jaw is given one second to close. If it has not closed completely after this time it will open and the machine will display a “JAW CLOSED FAULT”. The jaw will open and the machine will have to be restarted.

Response: Open the pivot clamp cylinder flow controls located on the rear of the upper frame slightly. This will allow the jaw to close more quickly.

Manually close the manifold by using the yellow manual override button on V1. Check the input light 4-main on the PLC to verify the proximity switch has been made. If it does not light, check to see if the proximity switch located on the center pivot has come out of adjustment. To check, loosen the proximity trip bar mounting screws and move until it is “seen” by the switch. The red indicator light will be on when it senses the trip bar.

If you are not able to get the proximity switch to make by the above steps the switch is defective and should be replaced.

Low Gas Pressure Fault

Description: If gas pressure drops below 20 psig, the operator interface will display a “LO GAS FAULT”. The machines will still run through a cycle with this message displayed.

Response: Check gas connection and your gas supply. When there is sufficient gas pressure, alarm light will go OFF.

Safety Edge Fault (Optional)

Description: Whenever the safety edge pad is pressed hard, the safety circuit is broken and input I:1 will go off. If input I:1 goes off when the jaw is commanded to close, the jaws will immediately open and the cycle will abort. The operator interface will display “SAFETY EDGE FLT”. This prevents a hard object such as a finger from getting clamped in the jaw. Usually, the safety edge is provided only on machines with a 70 inch or 100 inch manifold.

Response: If there is no pressure on the safety edge pad, the safety edge relay and I:1 should be energized. Check that the 12VDC relay is lit. There is a 250 ohm resistor that must be in series with the coil for the safety circuit to function. If the pad is shorted, the relay will never light and the safety edge will need to be replaced. If the relay drops out as soon as the manifold closes, the pad may need to be adjusted back slightly. Adjust so that a 1/2 inch thick bar clamped any where along the length of the manifold trips the relay.

TEMP. CONTROLLER ERROR MESSAGES

- Thermocouple fault:** Display flashes “**inPt FAiL**” indicating that the thermocouple is burnt out, unconnected or polarity reversed. Check wiring and connection.
- Memory fault** Display flashes “**dAtA FAiL**” indicating a non-volatile memory error. power down the unit briefly. Replace unit if problem persists.
- Auto tune fault** When an auto tune is initiated, the display immediately flashes “**tunE FAiL**”. This indicates that no setpoint has been entered. Enter a temperature setpoint.

VACUUM SWITCH ERROR CODES

- Zero Point fault** Display shows “**E**” indicating that a zero point adjustment was executed at a vacuum level +5% of full scale. Only perform a zero point adjustment at atmospheric pressure. Hold the A key for 2 seconds to zero the display with no pressure or vacuum applied to the switch.
- Over current fault** Display shows “**Ec**” indicating there was an over current condition on output 1 or output 2. Power down the unit. Most likely there is short to ground on the white or black vacuum switch wires.
- Range Fault** Display shows “**FFF**” indicating that the applied pressure or vacuum was outside of the display range. The display range is 0 to -29.9 inchHg. Most likely there is a positive pressure being applied to the switch. This could be caused by the gas valve sticking open or a malfunctioning Humphrey valve. If the error occurs during vacuum, most likely the transducer in the switch has come out of calibration.

TROUBLESHOOTING THE PLC

I/O Status Lights The I/O status lights on the PLC, I/O cards and valve bank are important tools used in troubleshooting the A200 PLC machine. There are 14 inputs and 10 outputs on the main PLC. Input terminals are on top and output terminals are on the bottom. The main status lights for inputs 0-13 are to the left of the main input terminal block. The main status lights for outputs 0-9 are to the left of the main output terminal block. The main input and output blocks are removable with the 2 screws on the outside.

There is a combo card in top slot 1 and 2 that also has 4 inputs and 4 outputs each. Each card has its own status lights in the upper left corner. There is an analog input card in slot 3 for 0-10VDC signals. All top mount cards can be removed by depressing the tab on top and pulling straight out.



Figure 11-1. Status Lights on the PLC

The interface communicates with the PLC via a serial cable running from the comm. port on the PLC to the comm. port on the side of the interface. The cable has an 8-pin mini-DIN connector on the PLC end and a 9 pin female DSUB connector on the interface end. For communication to take place, the POWER and RUN indicators on the PLC must be lit.

The PLC requires a 24 VDC power source. Check for DC power at the +DC24 and -DC24 terminals (left most terminals on the lower main terminal) if the POWER status indicator is not lit. If you wish to check the status

of an input or output, determine which input or output is used. Check the electrical schematic included with your machine. Make a note of the input or output you wish to check.

Other Status Indicators

1. MS (Module Status) - Should be on (solid) GREEN when module cards are operational.
2. NS (Network Status) - Should be on (solid) or flashing GREEN when transmitting through the ethernet port. This should be the case when a network cable is connected to the PLC for programming.
3. POWER - Should be solid GREEN when input power to the PLC is ON.
4. RUN - If OFF, user program not being executed. Flashing GREEN indicates program transfer in progress. Solid GREEN indicates user program is executing.
5. FAULT - When RED a fault condition exists that requires power cycle.
6. FORCE - Should always be off. Lights AMBER when forces are active.
7. COMM - Should be on (solid) or flashing when transmitting through the RS232 port. This should be the case when the interface cable is connected to the touchscreen.

The lower left corner of the PLC has a MODE SWITCH. It must be in the REMOTE or RUN position for normal operation. For programming, the switch must be in REMOTE. Switch to RUN to disable program changes over the network.

Terminal Configuration



Figure 11-2. Terminal Config File Manager screen

Normally, the terminal is executing the program as loaded by CVP. A terminal in configuration mode is shown above. This is the screen you would want to be in if a new screen program were to be loaded from a thumb drive. Where it says SOURCE in the upper left, select USB. If there is an appropriate *.cha file on the thumb drive it will appear. Select it and press COPY. It will ask if you want to unload the current application. YES. Then switch the source back to Internal and the new program should appear. Select SET AS STARTUP so it appears on the bottom of the screen. Hit RUN to run the new application.

Or hitting the MAIN button on the right will jump to the main menu where you can adjust date/ time, calibrate the screen and more

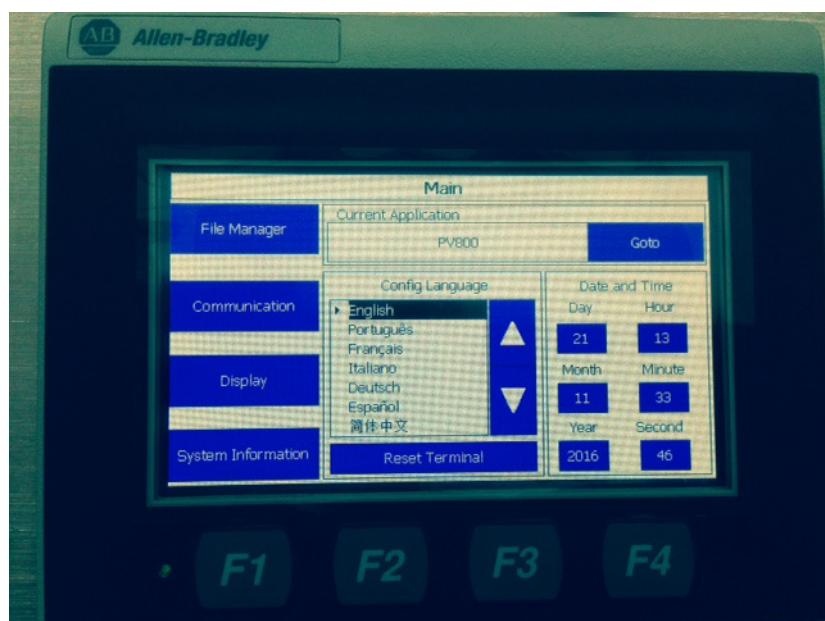


Figure 11-3. Main Config screen

When done, jump back to the FILE MANAGER SCREEN and select RUN.

Troubleshooting Using the I/O Status Lights

The exact point in the machine's sequence of operations where a problem is occurring can be pinpointed by monitoring the status lights.

- Determine where in the sequence of operation the machine is failing to function. For example, "the heat seal is not coming on"; or "the jaw should open at this point, but it doesn't".
- Consult the electrical schematic and note which output controls the action that is at issue. For example, O-1 extends the snorkels; or O-0 controls the jaw.

- Check to see if the input is in the proper state. For example, do I-6 and I-7 come on when the snorkels are up? Does I-4 come on when the jaw closes?
- If the output is correct, then check the output's fuse (if fused), solenoid, valve, and relay (if any). The goal is to examine each component between the PLC and the activating component, and discover which is not functioning.
- If the output is not being activated then most likely the machine is waiting for an input. Determine from the schematic which inputs must be made before the required output will trigger.

TROUBLESHOOTING SPECIFIC PROBLEMS

- Jaw Won't Close.**
- Check the light inside each start button to see if it lights when the button is activated.
 - Check input I-2 to see if it lights when the start buttons are activated.
 - When the operator interface display reads “PRESS START BUTTONS”, check output O-0. It should light along with relay JR when the start buttons are swiped simultaneously. If the jaw closes but doesn’t latch, suspect JR.
 - Check fuse FU1, replace if needed.
 - If your machine has a 2 hand safety relay, it should activate when both start buttons are pressed. IN1 and IN2 lights on the relay should both light green when the swipes are made. If not, it may be defective. Check all wiring including jumper between Y1 and Y2 terminals.
 - Verify valve V1 operates manually by pressing the manual override. If no operation, troubleshoot as a pneumatic problem.
 - Verify that solenoid V1 operates electrically by applying 24 VDC directly to fuse FU1. If no operation, replace solenoid.
 - Replace valve V1.
- The Machine is Not Working At All.**
- Confirm that the machine has power.
 - Check the MCR relay for power. If there is no power, check fuse FU101.
 - Verify that the emergency stop button is pulled out.
 - Check the operator interface for error messages. If there is an error message, troubleshoot as shown in the error messages section.
 - Verify that the “POWER” and “RUN” lights on the PLC are lit. If not, check fuse FU2. Confirm that there is DC power to the PLC.
 - If the “POWER” indicator light is lit but the “RUN” light is not, see if cycling power will bring it back into RUN mode. Cycle the MODE switch from program back to RUN. If the PLC is powered and the “POWER” or “RUN” lights are unlit then the PLC may need to be replaced.
 - Confirm there is 24 VDC power between terminals 2 and 3 in the main panel and at the interface terminal connector in the front panel. If not, check fuse FU101.
- The Machine Does Not Seal**
- If the heat bar extends and the machine pauses in the seal stage for an appropriate amount of time, troubleshoot as a seal quality problem. Try adjusting heat seal settings in the operator interface.

- If the heat seal settings are OK, check the SP1 power output light on the temperature controller. When it lights, the SSR relay indicator lights should also light. Check heater element and both heater power fuses. Always check heater element with main power disconnected.

CVP Part #	Nominal Size (in.)	Volts	Watts	Approx. Ohms
A-C-7707-141-B	48	440	1800	108
B-C-7707-141-B	48	220	1800	27
C-C-7707-141-B	57	440	2160	90
D-C-7707-141-B	57	220	2160	22
E-C-7707-141-B	70	220	2800	17
F-C-7707-141-B	70	440	2800	69
G-C-7707-141-B	100	220	3900	12
H-C-7707-141-B	100	440	3900	50
I-C-7707-141-B	48	120	1800	8
J-C-7707-141-B	57	120	1800	8

Figure 11-4. Heater Element Part Numbers and Information

- If the seal bar does not extend, check output O-4. If the output does not activate, the problem is not a seal problem. It might be a stretchers or snorkel up fault. Heat bar will not push until all snorkels and stretchers are in the UP position.
- Examine fuse FU5, Solenoid V5 and valve V5, in that order.

ASSISTANCE

When calling, for technical assistance or service, have the model (A200) and serial number available for our customer service representative. This will allow us to more accurately assist you with your machine.

The serial number tag for the A200 is located inside the main electrical enclosure door on the print pocket.

Contacting CVP Systems can be accomplished in three different ways; by phone, fax or e-mail. Please include model and serial numbers in all correspondents to CVP Systems.

Phone: 800-422-4270 (In the US, Canada, & Mexico)

630-852-1190 (All others)

Fax: 630-852-1386

- E-Mail:spareparts@cvpsystems.com

SECTION: 12

ASSEMBLIES

MACHINE ASSEMBLIES

Customer Service

This section contains subassemblies for the A200 C Multiline XT. By using the subassembly drawings you will be able to find the part(s) needed to repair the A200 C Multiline XT. If you can not find the part(s) needed, contact CVP customer service for assistance. When calling for parts or service, have the model and serial numbers available for our customer service representative to more accurately assist you:

The serial number for the A200 C Multiline XT sealing head is located inside the main electrical enclosure. (See Figure 12-1)

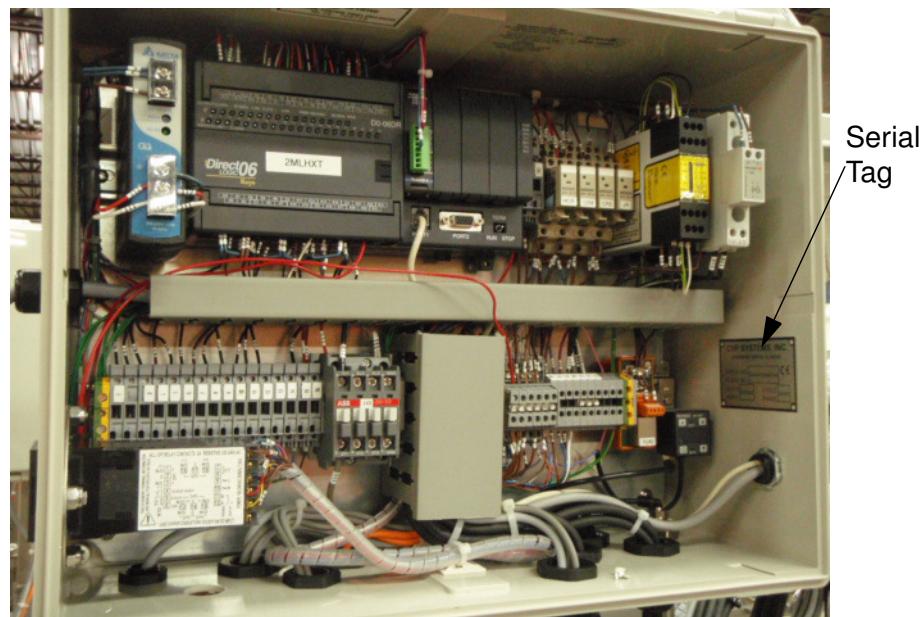


Figure 12-1. Serial Tag Location

Ordering Parts

Ordering parts from CVP Systems can be done by phone, fax or e-mail. Please include model and serial numbers in all correspondents to CVP Systems.

Phone: 800-422-4720 (In the US, Canada, & Mexico)
630-852-1190 (All others)
Fax: 630-874-0229
E-Mail: spareparts@cvpsystems.com

STAND ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	1110-0126-1	SWITCH.OPTO TOUCH.W/COVER.SAFETY
2	100	44-W	TUBING, POLY-FLO, 1/4"
3	100	66-W	TUBING, POLY-FLO, 3/8"
4	2	7707-1741	CABLE, 5-PIN, 10M
5	4	7707-1925	ASSEMBLY DROP LEG
6	25	88-W	TUBE, POLYFLO, 1/2" OD
7	2	9743-1045	CABLE, PHOTOEYE, 10M
8	2	9743-1281	PHOTOEYE, DIFFUSE
9	2	B-7707-1811	MULTILINE PHOTO EYE BRACKET
10	2	B-9743-1133	BRACKET
11	1	B-9743-1418L	SHELF SUPPORT, LEFT
12	1	B-9743-1418R	SHELF SUPPORT, RIGHT
13	2	C-8013-1249	MOUNT BAR, ACCUM TANK
14	2	C-9743-1417	SIDE PANEL, A-200 ML HEAD
15	1	D-9743-1147	WELDMENT, A200 MULTILINE STAND FRAME
16	8	FW10-A	WASHER, FLAT
17	4	FW3/8-C	WASHER, FLAT
18	4	HH1/4-20X7/8	SCREW, HEX HEAD
19	8	HH10-32X3/4	SCREW, HEX HEAD
20	2	HH3/8-16X2-3/4	SCREW, HEX HEAD
21	2	HH3/8-16X4-1/2	SCREW, HEX HEAD
22	4	HH3/8-16X5/8	SCREW, HEX HEAD
23	4	HH5/16-18X1-1/4	SCREW, HEX HEAD
24	4	HHM4X.7X16	SCREW, HEX HEAD METRIC
25	4	LN1/4-20	NUT, LOCK
26	2	LN3/8-16	NUT, LOCK
27	2	LN3/8-16LP	NUT, LOCK, LOW PROFILE
28	4	LN5/16-18	NUT, LOCK
29	8	LW10	WASHER, LOCK
30	4	LW3/8	WASHER, LOCK
31	4	LW8	WASHER, LOCK

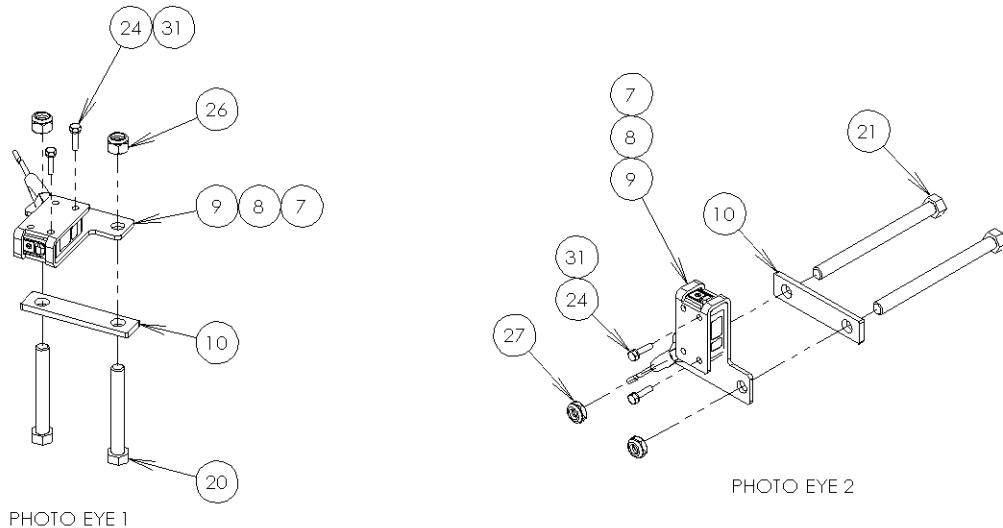
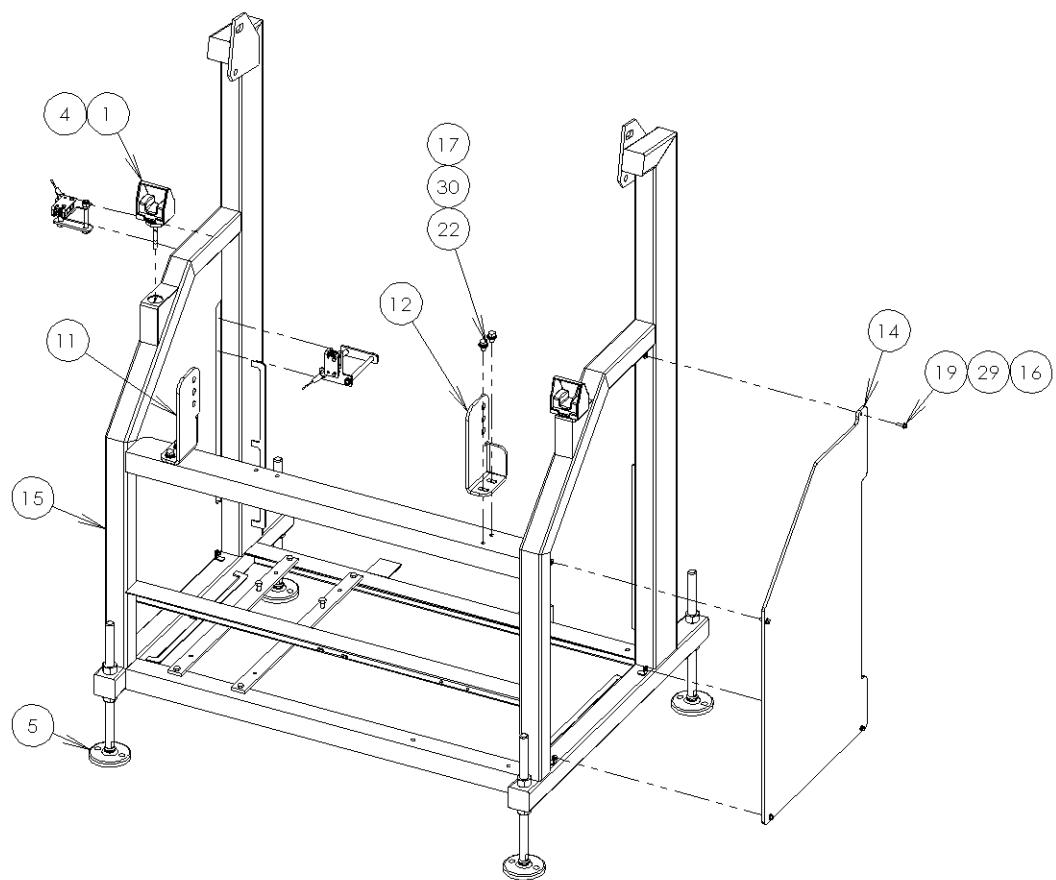
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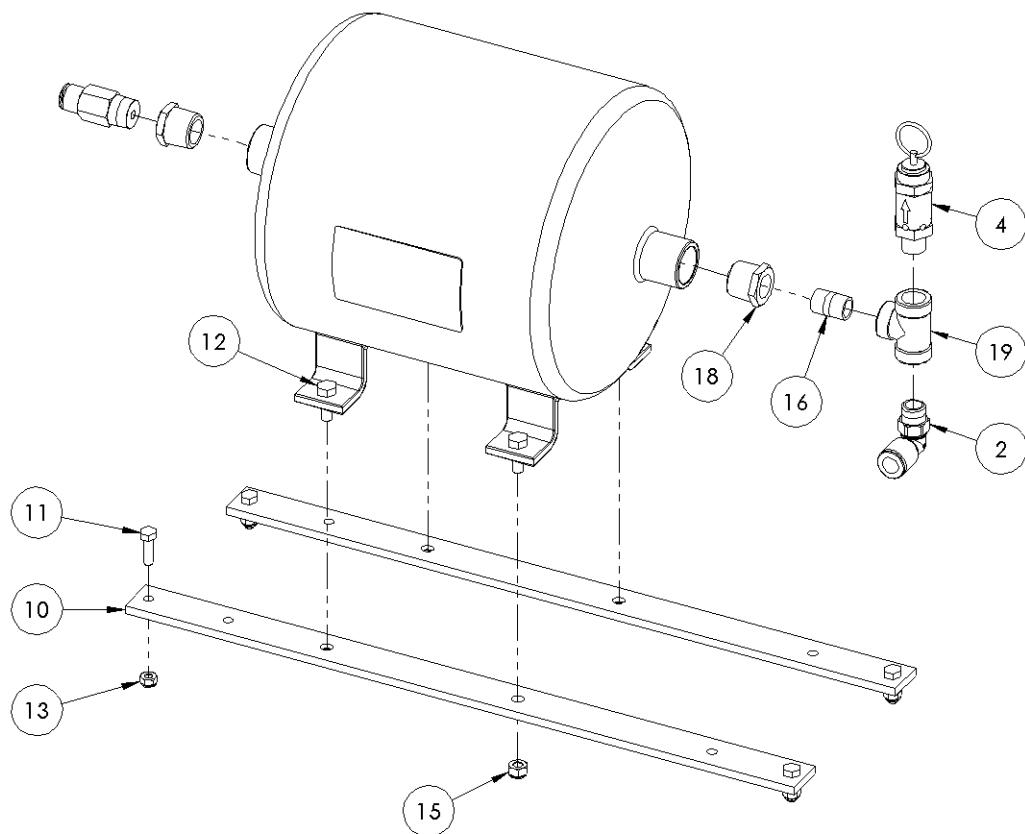
PHOTO EYE 1

PHOTO EYE 2



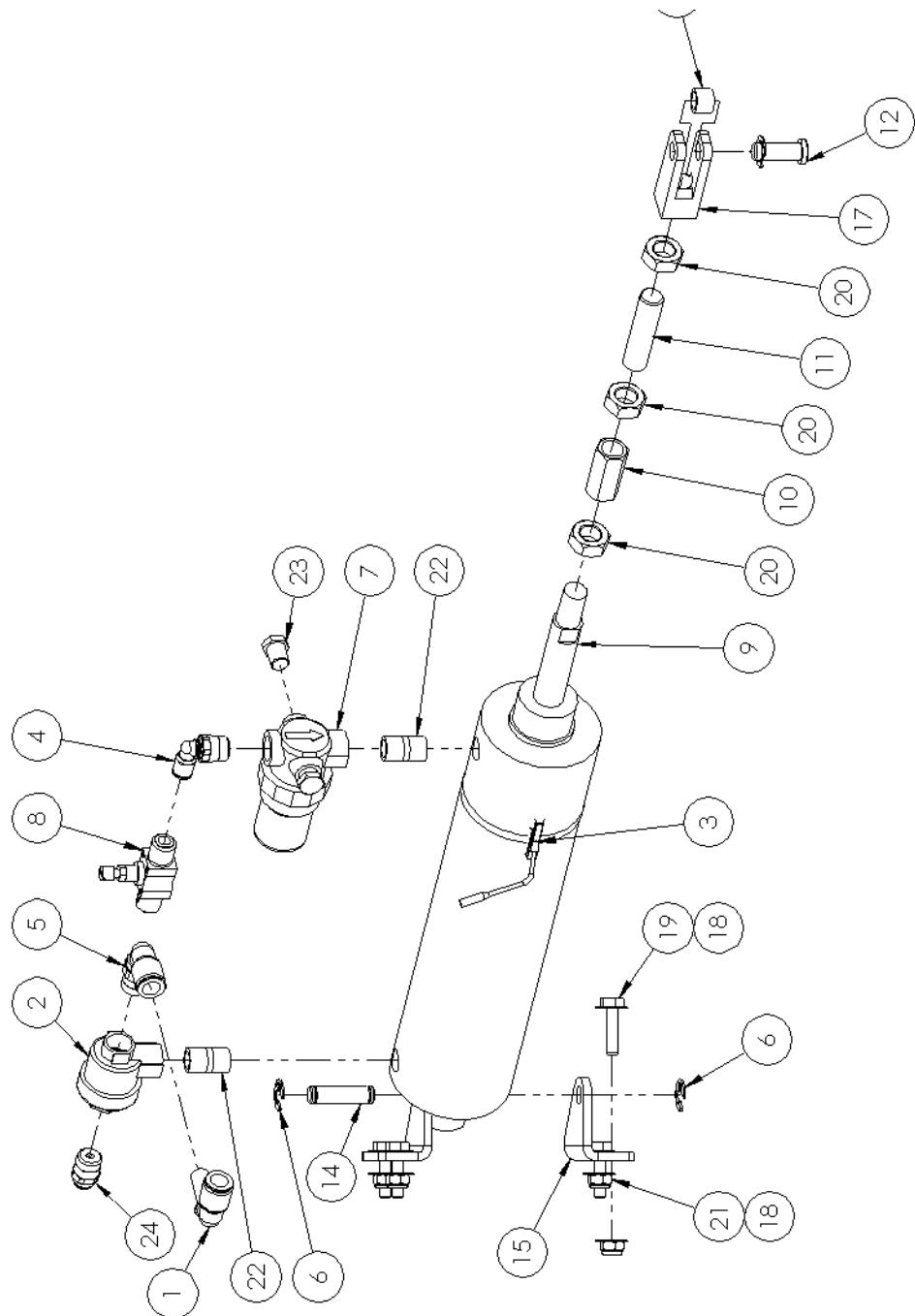
ACCUMULATOR TANK ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
2	1	269P-08-06	FITTING.TBG.ELB, 1/2OD X 3/8NPT
4	1	7707-2515	SAFETY RELIEF VALVE
5	1	7707-2903	CHECK VALVE 1/2NPTX1/2TUBE
6	5	88-W	TUBE, POLYFLO, 1/2" OD
9	1	C-7707-306	ACCUMULATOR TANK
10	2	C-8013-1249	MOUNT BAR, ACCUM TANK
11	4	HH1/4-20X7/8	SCREW, HEX HEAD
12	4	HH5/16-18X7/8	SCREW, HEX HEAD
13	4	LN1/4-20	NUT, LOCK
15	4	LN5/16-18	NUT, LOCK
16	1	SN3/8NPT	NIPPLE, 3/8" NPT X 1"
17	1	SSB3/4NPTX1/2	HEX BUSHING, 3/4"NPT X 1/2" NPT
18	1	SSB3/4NPTX3/8	HEX BUSHING, 3/4"NPT X 3/8" NPT
19	1	SST3/8NPT	TEE, 3/8" NPT

ASSEMBLY NUMBER: C-7707-607-6

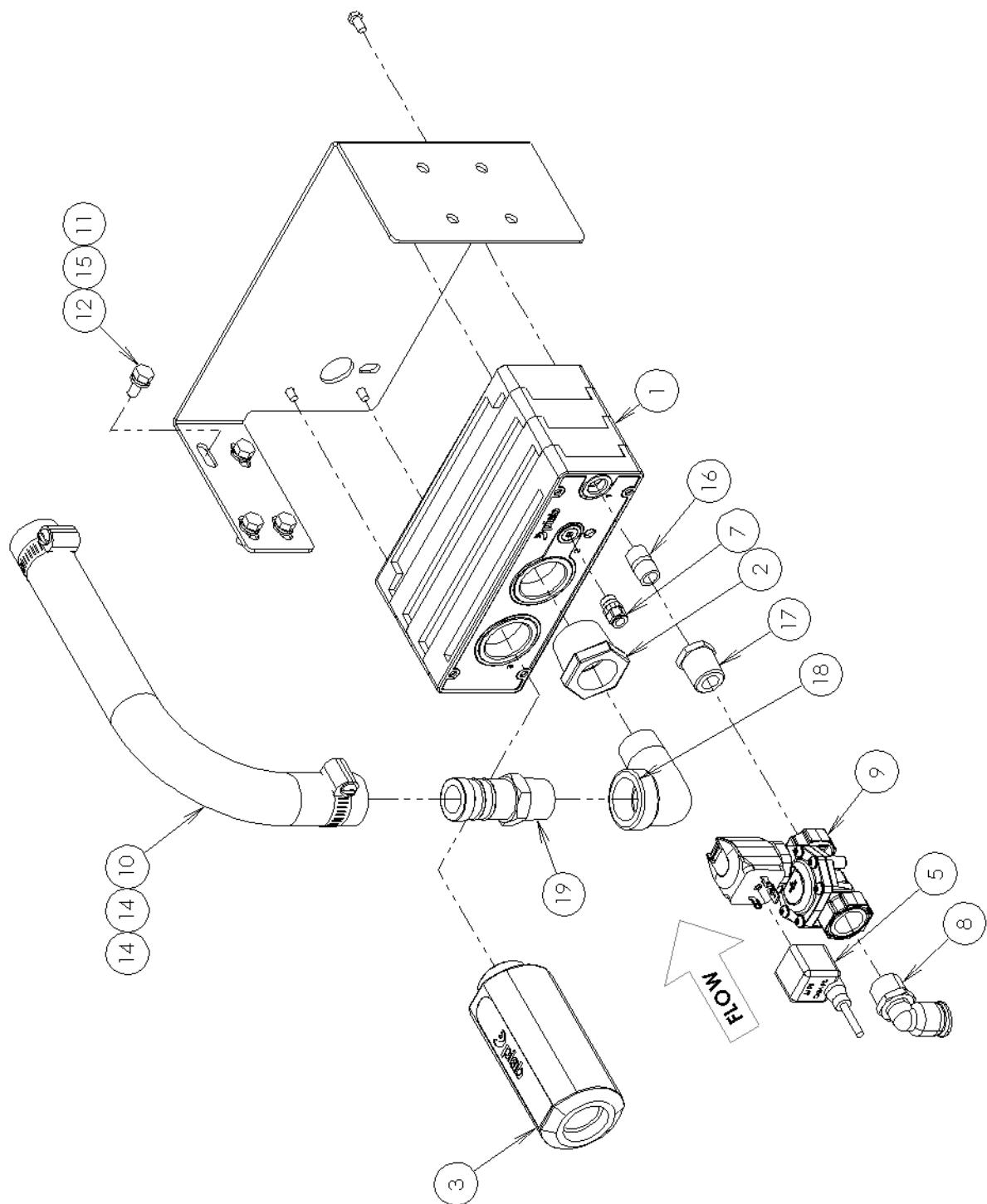
TILT CYLINDER ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0243-0571	FITTING, TBG, ELB, PUSH-IN, 3/8OD
2	1	0243-420	VALVE, QUICK EXHAUST
3	1	0550-1321	CYLINDER POSITION SWITCH
4	1	269P-04-04	FITTING.TBG.ELB.1/4OD X 1/4NPT
5	1	269P-06-04	FITTING.TBG.ELB.3/8OD X 1/4NPT
6	2	5133-37H	RETAINING CLIP, 3/8"
7	1	7707-118	REGULATOR, 1/4NPT 45PSI MAX.
8	1	7770-56-00	FLOW CONTROL, 1/4"
9	1	9743-1258	CYLINDER, 2" BORE, ANODIZED ENDS
10	1	9743-1306	NUT, COUPLING, 1/2"-20 UNF
11	1	9743-1307	STUD, THREADED, 1/2"-20 UNF x 2" LG
12	1	9743-1516	CLEVIS PIN W/ RET RING
13	1	AA507-11	BEARING, SLEEVE
14	1	B-7707-1152	PIN CLEVIS
15	1	B-9743-1433L	PIVOT, LEFT
16	1	B-9743-1433R	PIVOT, RIGHT
17	1	B-9743-1434	ROD END
18	8	FW1/4-A	WASHER, FLAT
19	4	HH1/4-20X1	SCREW, HEX HEAD
20	3	JN1/2-20	NUT, JAM
21	4	LN1/4-20	NUT, LOCK
22	2	SN1/4NPT	NIPPLE, 1/4" NPT X 7/8"
23	2	SP1/8NPT	HEX PLUG, 1/8" NPT
24	1	268P-04-04	FITTING.TBG.1/4NPT.1/4OD

ASSEMBLY NUMBER: C-9743-1134-1

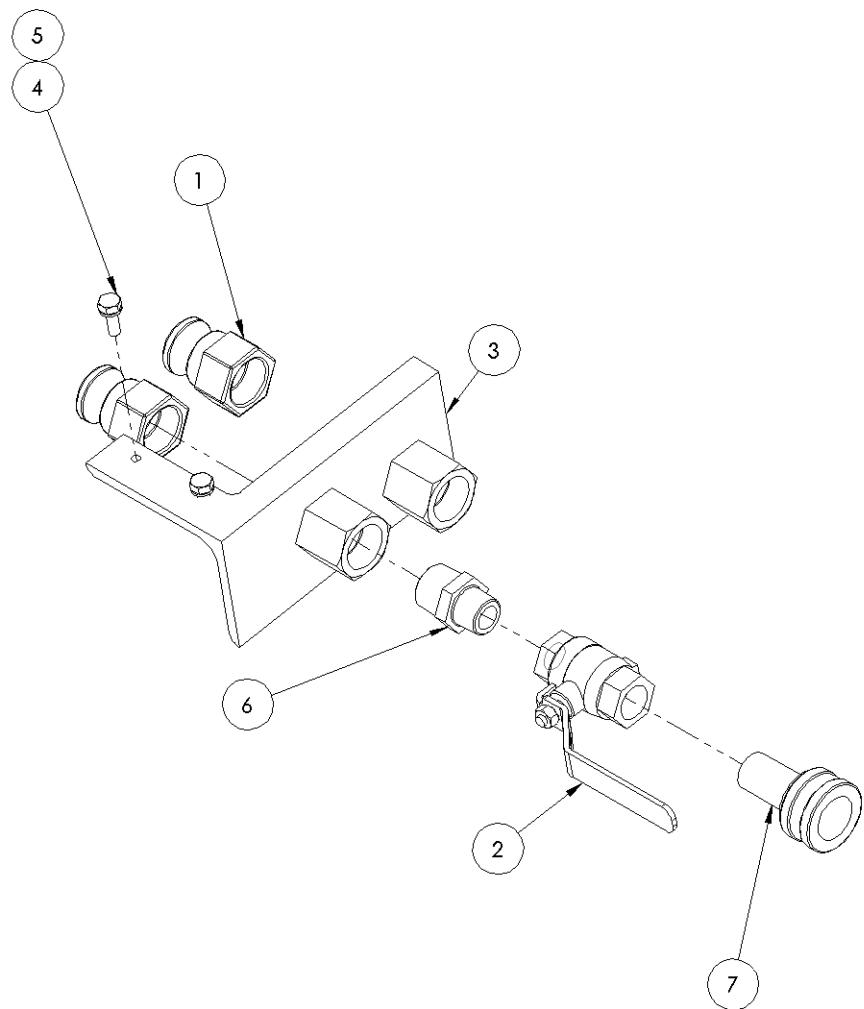
VACUUM PUMP ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	1110-0077	VAC PUMP, PI CLASSIC
2	1	1110-0079	BUSHING.HEX.SS.1.25NPT X 0.75NPT
3	1	1110-0139	PI MUFFLER
4	1	1110-0202	FITTING, TGB, RED, 1/2OD X 3/8OD
5	1	1110-0276	ISO DIN CONNECTOR, 24VDC, 15FT
6	1	264P-08	FITTING, TBG, TEE, 1/2OD
7	1	268P-04-02	FITTING.TBG.STR.1/4OD.1/8NPT
8	1	269P-08-08	FITTING.ELB.1/2 NPT TO 1/2 OD
9	1	7707-3149	VALVE, 2-WAY, 24VDC
10	2	9537-1432	HOSE, HIGH FLOW
11	4	FW1/4-B	WASHER, FLAT
12	4	HH1/4-20X5/8	SCREW, HEX HEAD
13	3	HH10-32X3/8	SCREW, HEX HEAD
14	2	HSS-16	HOSE CLAMP, SS, 11/16" - 1 1/4"
15	4	LW1/4	WASHER, LOCK
16	1	SN1/4NPT	NIPPLE, 1/4" NPT X 7/8"
17	1	SSB1/2NPTX1/4	HEX BUSHING, 1/2"NPT X 1/4" NPT
18	1	SSE3/4NPT	90 DEG ST ELBOW, 3/4" NPT
19	1	SSH1X3/4NPT	HOSE BARB, 1" OD X 3/4" NPT
20	1	C-9743-1285	BRACKET, MOUNTING, PIAB PUMP

ASSEMBLY NUMBER: C-9743-1497

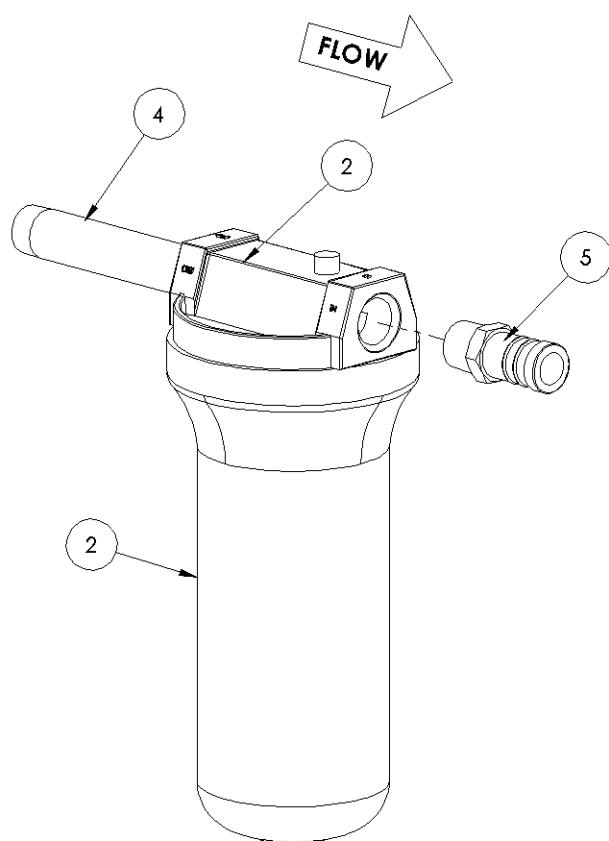
BULKHEAD ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	1110-0090	MALE ADAPTER, 3/4 NPT
2	1	9743-1517	BALL VALVE, 1/2"NPT SS, REST FLOW
3	1	C-9743-1290	WELDMENT, BULKHEAD
4	2	HH1/4-20X3/4	SCREW, HEX HEAD
5	2	LW1/4	WASHER, LOCK
6	1	NPBRN3/8NPTX1/4NPT	REDUCING NIPPLE
7	1	NPBSHC3/4X3/8NPT	CONNECTOR HOSE

ASSEMBLY NUMBER: C-9743-1294

SEDIMENT BOWL ASSEMBLY

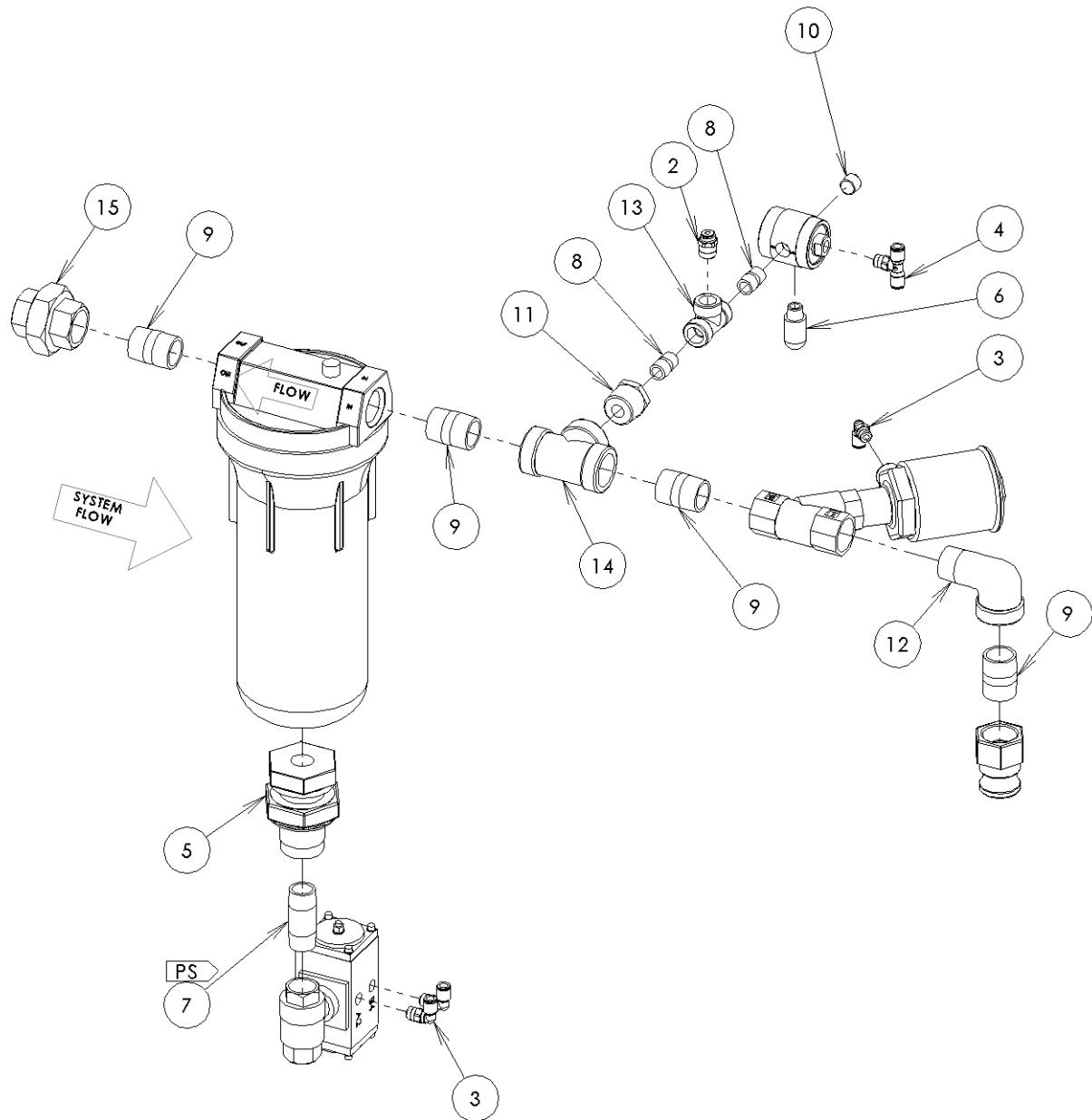
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	151120	O-RING, SEDIMENT BOWL
2	1	7707-156	SEDIMENT BOWL
4	1	SN3/4NPTX6	NIPPLE, 3/4" NPT X 6"
5	1	SSH1X3/4NPT	HOSE BARB, 1" OD X 3/4" NPT

ASSEMBLY NUMBER: D-9743-1293-2

SEDIMENT BOWL ASSEMBLY, AUTO DUMP

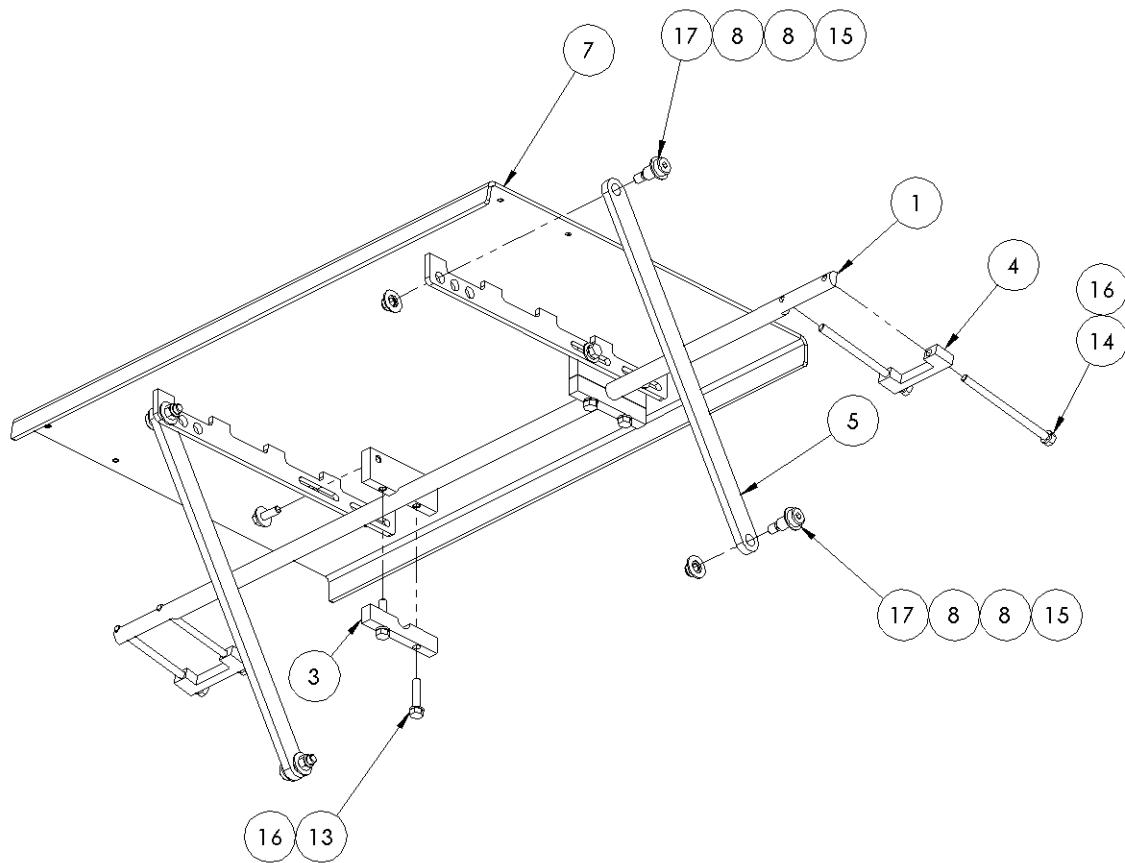
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	264P-04	FITTING.TBG.TEE.1/4OD
2	1	268P-03-04	FITTING.TBG.STR.5/32OD X 1/4NPT
3	3	269P-04-02	FITTING, TBG, ELBOW, 1/4 OD X 1/4 NPT
4	1	272P-04-02	FITTING.TBG.TEE.1/4OD X 1/8NPT
5	1	7707-902	BULKHEAD, 1/2" NPT
6	1	9537-1258	MUFFLER.POLY.0.25NPT
7	1	SN1/2NPTX2	NIPPLE, 1/2" NPT X 2"
8	2	SN1/4NPT	NIPPLE, 1/4" NPT X 7/8"
9	4	SN3/4NPT	NIPPLE, 3/4" NPT X 1-3/8"
10	1	SRP1/4NPT	HEX PLUG, 1/4" NPT, RECESSED
11	1	SSB3/4NPTX1/4	HEX BUSHING, 3/4"NPT X 1/4" NPT
12	1	SSE3/4NPT	90 DEG ST ELBOW, 3/4" NPT
13	1	SST1/4NPT	TEE, 1/4" NPT
14	1	SST3/4NPT	TEE, 3/4" NPT
15	1	SSU3/4NPT	UNION, 3/4" NPT
16	1	B-7504-545	SEDIMENT BOWL W/ DRAIN
17	1	7707-2208	BALL VALVE, PNEUMATIC
18	1	7707-496	VALVE, 2-WAY, NC (PRESSURE)
19	1	7707-2372	VALVE.PISTON.SS.0.75NPT.50MM.NC
20	1	1110-0090	MALE ADAPTER, 3/4 NPT

ASSEMBLY NUMBER: C-9743-1500



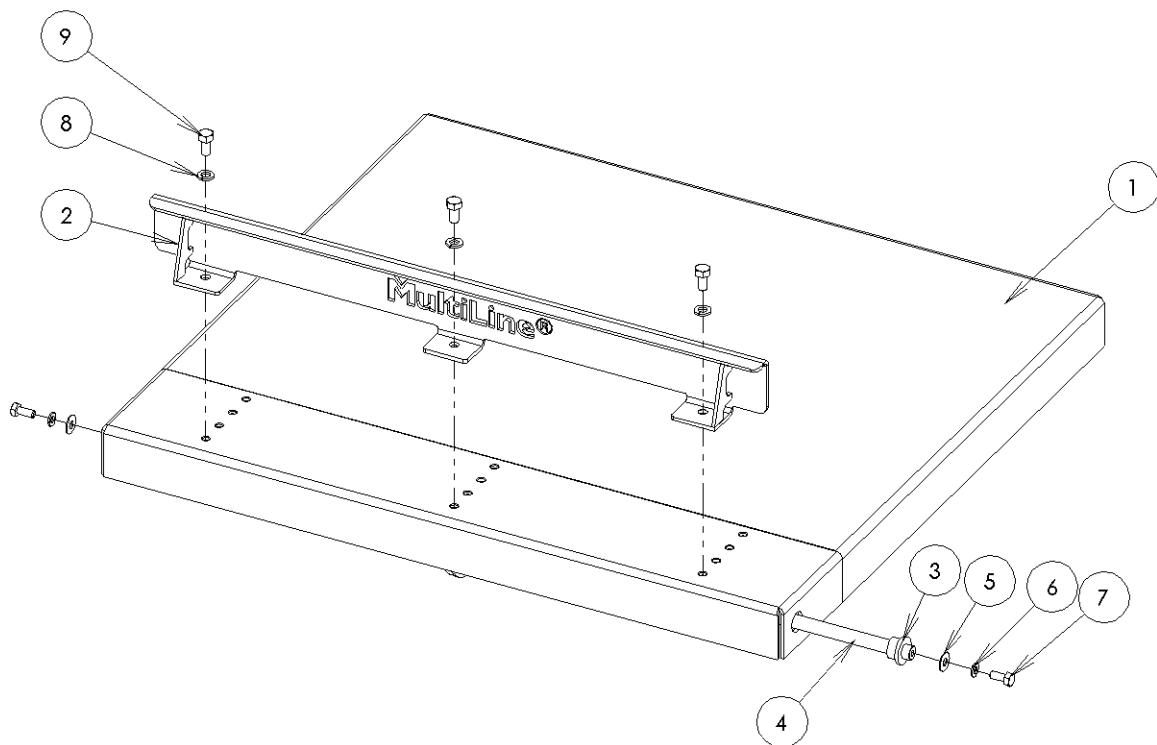
TRANSFER SLIDE ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-9743-1181	MOUNTING SHAFT, EXIT SLIDE
2	2	B-9743-1491	SLIDE PLATE MOUNT
3	2	B-9743-1492	SUPPORT BAR MOUNT
4	2	B-9743-1495	EXIT SLIDE, FRAME MOUNTING BLOCK
5	2	B-9743-1515	SUPPORT, EXIT SLIDE
7	1	D-9743-1489	ML EXIT SLIDE
8	8	FW1/2-B	WASHER, FLAT
10	4	FW5/16-B	WASHER, FLAT
12	4	HH5/16-18X1	SCREW, HEX HEAD
13	4	HH5/16-18X1-1/2	SCREW, HEX HEAD
14	4	HH5/16-18X5	SCREW, HEX HEAD
15	4	LN3/8-16	NUT, LOCK
16	12	LW5/16	WASHER, LOCK
17	4	SB1/2X3/4	BOLT, SHOULDER

ASSEMBLY NUMBER: D-9743-1490

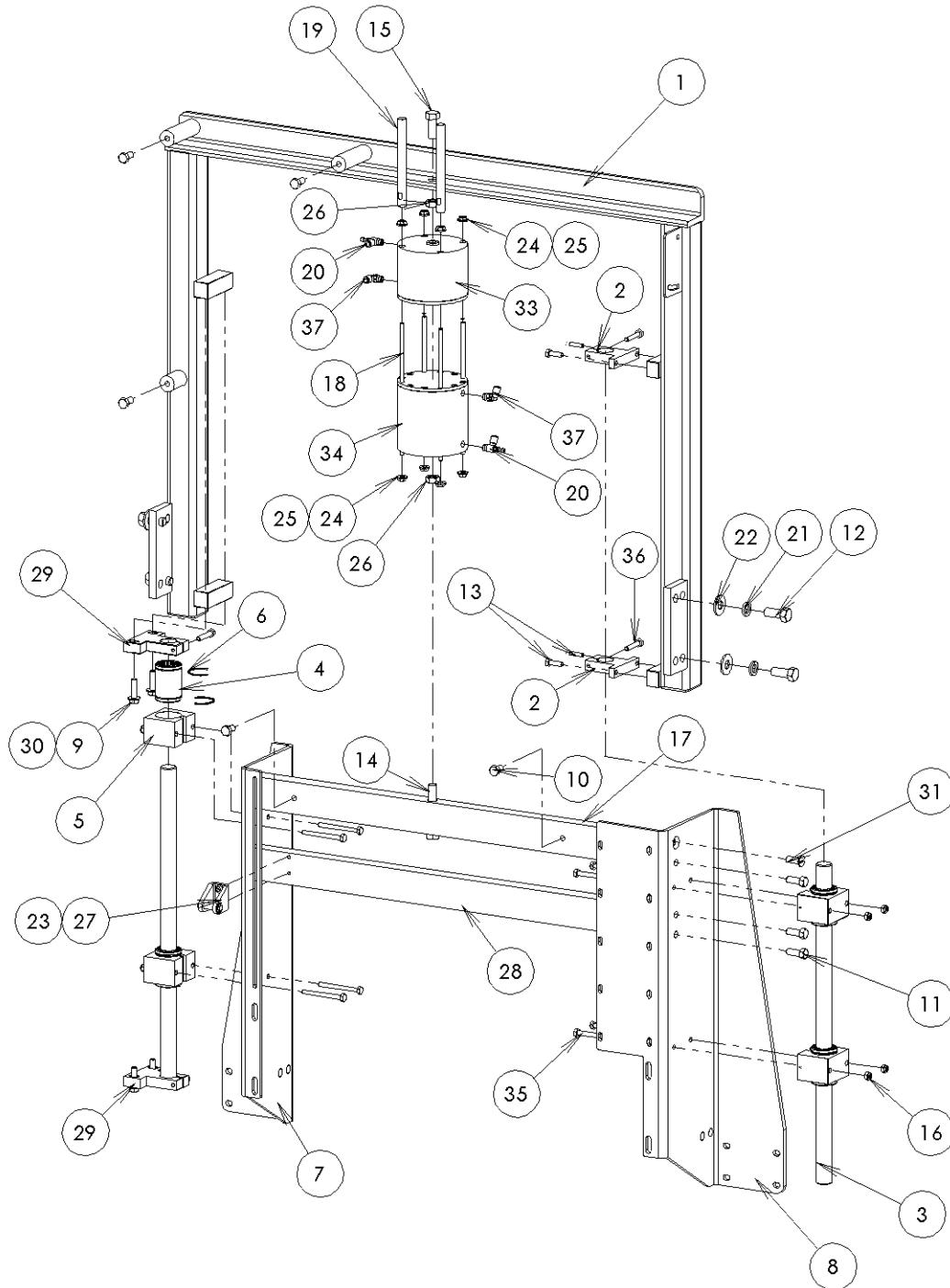
DROP TABLE ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-9743-1507	WELDMENT, DROP TABLE, RIGIDIZED
2	1	C-9743-1487	WELDMENT TABLE STOP
3	2	B-7707-2514	BEARING, FLANGED SLEEVE
4	1	B-9743-1430	PIVOTING ROD
5	2	FW1/4-A	FLAT WASHER
6	2	LW1/4	WASHER, LOCK
7	2	HH1/4-20X5/8	SCREW, HEX HEAD
8	3	LW5/16	WASHER, LOCK
9	3	HH5/16-18X5/8	SCREW, HEX HEAD

ASSEMBLY NUMBER: D-9743-1508

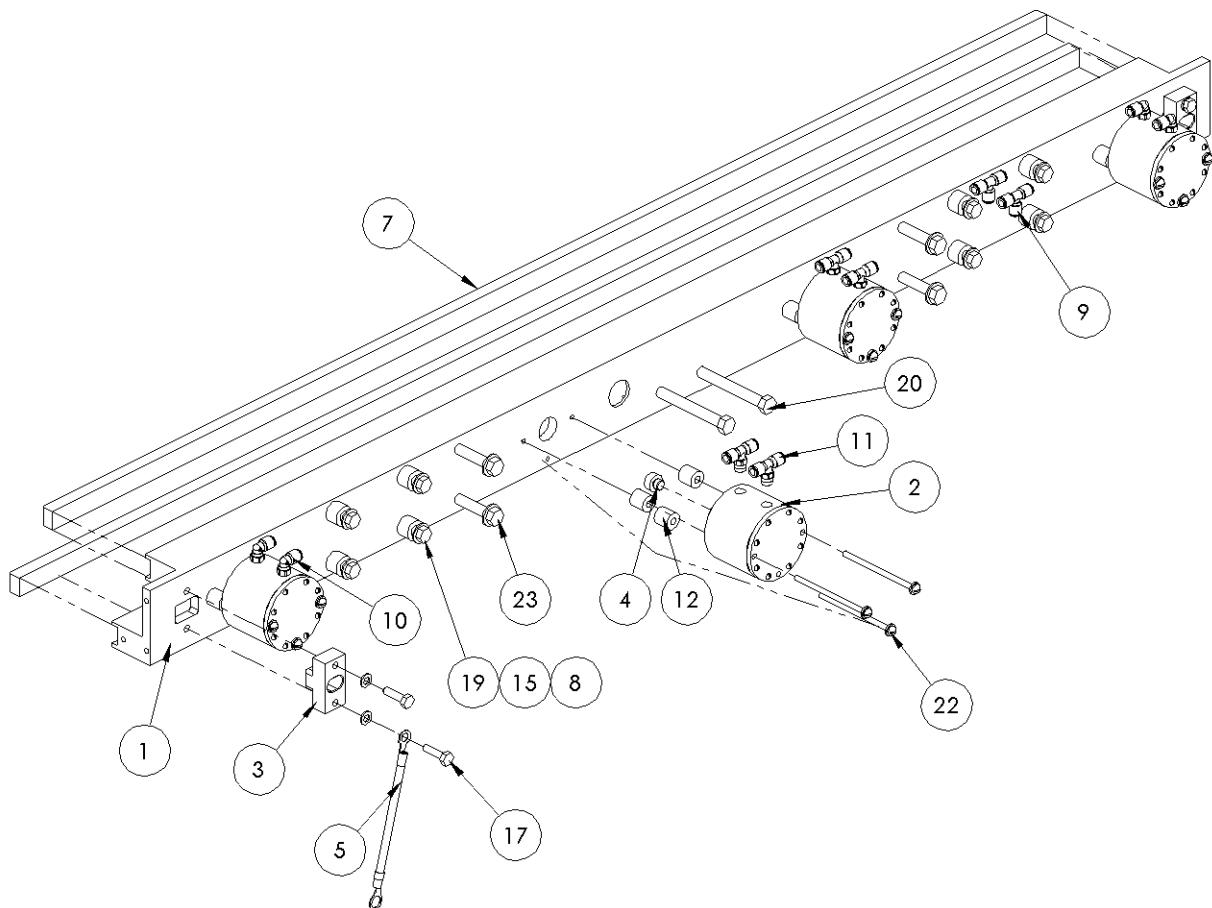
ADJUSTABLE HEAD ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	D-1110-0129	WELDMENT, ADJ. HEAD
2	2	B-7707-2685	SHAFT SUPPORT, 1"
3	2	B-1110-0135	LINEAR SHAFT, 1" DIA X 20" LG
4	4	1110-0134	LINEAR BEARING
5	4	B-0210-0571	BLOCK, LINEAR BEARING
6	8	0210-0573	EXT. RETAINING RING 1 9/16" OD.
7	1	C-1110-0130	BRKT, MANIFOLD SUPRT, RIGHT
8	1	C-1110-0131	BRKT, MANIFOLD SUPRT, RIGHT
9	4	HH5/16-18X1-1/4	SCREW, HEX HEAD
10	2	HH3/8-16X5/8	SCREW, HEX HEAD
11	6	HH3/8-16X1	SCREW, HEX HEAD
12	4	HH1/2-13X1-1/4	SCREW, HEX HEAD
13	4	HH1/4-20X7/8	SCREW, HEX HEAD
14	1	HH1/2-20X3	SCREW, HEX HEAD
15	1	HH1/2-20X1-1/4	SCREW, HEX HEAD
16	8	LN1/4-20	NUT, LOCK
17	1	B-1110-0133	CROSS BAR, ADJ. HEAD, UPPER
18	4	B-7707-464-2	ROD, THREADED, 8-1/4
19	2	B-7707-2586	ROD, NON-ROTATE
20	2	9537-1184	FLOW CONTROL
21	4	LW1/2	WASHER, LOCK
22	4	FW1/2-B	WASHER, FLAT
23	2	PH1/4-20X5/8	SCREW, PAN HEAD
24	8	FW1/4-A	WASHER, FLAT
25	8	JN1/4-20	NUT, JAM
26	2	JN1/2-20	NUT, JAM
27	1	D-55205-SS	BRACKET.PIVOT.SS.2.0 BORE CYL
28	1	B-1110-0148	CROSS BAR, ADJ. HEAD, LOWER
29	2	B-1110-0152	SHAFT SUPPORT, 1"
30	4	0210-1130	WASHER 5/16 ID X 3/4 OD X 1/16 THK.
31	2	FH3/8-16X1	SCREW, FLAT HEAD MACHINE
32	3	HH3/8-16X3/4	SCREW, HEX HEAD
33	1	7707-1626	CYLINDER, AIR, 3" X 2"
34	1	7707-2050	CYLINDER, AIR, 3" X 3"
35	8	HH1/4-20X2-3/4	SCREW, HEX HEAD
36	4	HH1/4-20X1-1/2	SCREW, HEX HEAD
37	2	269P-04-02	FITTING, TBG, ELBOW, 1/4 OD X 1/4 NPT

ASSEMBLY NUMBER: D-1110-0132

REAR MANIFOLD ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-1110-0252	REAR MANIFOLD
2	4	B-8013-54	PANCAKE CYLINDER
3	2	B-7707-2186	BLOCK, BEARING, HEAT SEAL ROD
4	4	B-7707-925	PUSHER INSERT, 1/4"
5	1	B-7707-715	ASS'Y, GROUND WIRE, HEAT SEAL BAR
6	1	B-7707-187	RUBBER, SPONGE, 1/2"x3/4"x57"
7	1	B-7707-187	RUBBER, SPONGE, 1/2"x3/4"x57"
8	8	0243-0667	SPACER
9	2	264P-04	FITTING.TBG.TEE.1/4OD
10	4	269P-04-02	FITTING, TBG, ELBOW, 1/4 OD X 1/4 NPT
11	4	272P-04-02	FITTING.TBG.TEE.1/4OD X 1/8NPT
12	12	1110-0069	SPACER, 5/8" OD X 5/8" L
13	12	FW10-A	WASHER, FLAT
14	4	FW1/4-B	WASHER, FLAT
15	8	FW5/16-A	WASHER, FLAT
16	4	FW3/8-C	WASHER, FLAT
17	4	HH1/4-20X1	SCREW, HEX HEAD
19	8	HH5/16-18X1-1/4	SCREW, HEX HEAD
20	2	HH3/8-16X3-3/4	SCREW, HEX HEAD
21	12	LW10	WASHER, LOCK
22	12	RH10-32X3-1/2	SCREW, ROUND HEAD
23	4	HH3/8-16X2-1/4	SCREW, HEX HEAD

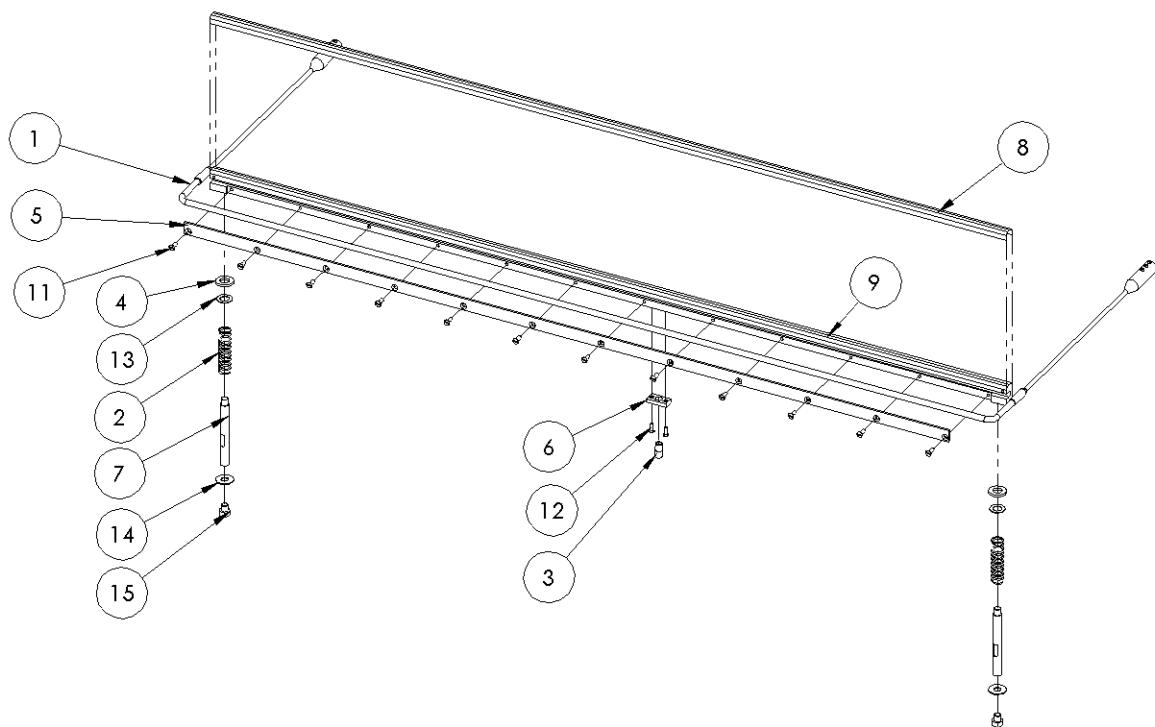
ASSEMBLY NUMBER: C-1110-0232-1

HEAT SEAL BAR ASSEMBLY

ITEM NO.	-0/QTY.	-1/QTY.	PART NUMBER	DESCRIPTION
1	1	-	1110-0243	HEATER ELEMENT, 120V
2	2	2	7707-132	SPRING
3	1	1	7707-139	ADAPTER, THERMOCOUPLE
4	2	2	B-1110-0084	SPACER, HEAT SEAL RETRACT
5	1	1	B-1110-0238	RETAINER PLATE, 52"
6	1	1	B-7707-281	PLATE, THERMOCOUPLE MTG
7	2	2	B-7707-282	ROD, HEAT SEAL BAR
8	1	1	BLK 5451-3M-1-1_2	TEFLON TAPE W/BACKING BLACK
9	1	1	C-1110-0253	SEAL BAR.52" MAN
10	-	1	C-7707-1890-L	HEATER ELEMENT, 52" 220V
11	12	12	FH10-32X1/2	SCREW, SLOTTED FLAT HEAD
12	2	2	FH8-32X1/2	SCREW, SLOTTED FLAT HEAD
13	2	2	FW1/2-A	WASHER, FLAT
14	2	2	FW3/8-A	WASHER, FLAT
15	2	2	HH3/8-16X3/8	SCREW, HEX HEAD

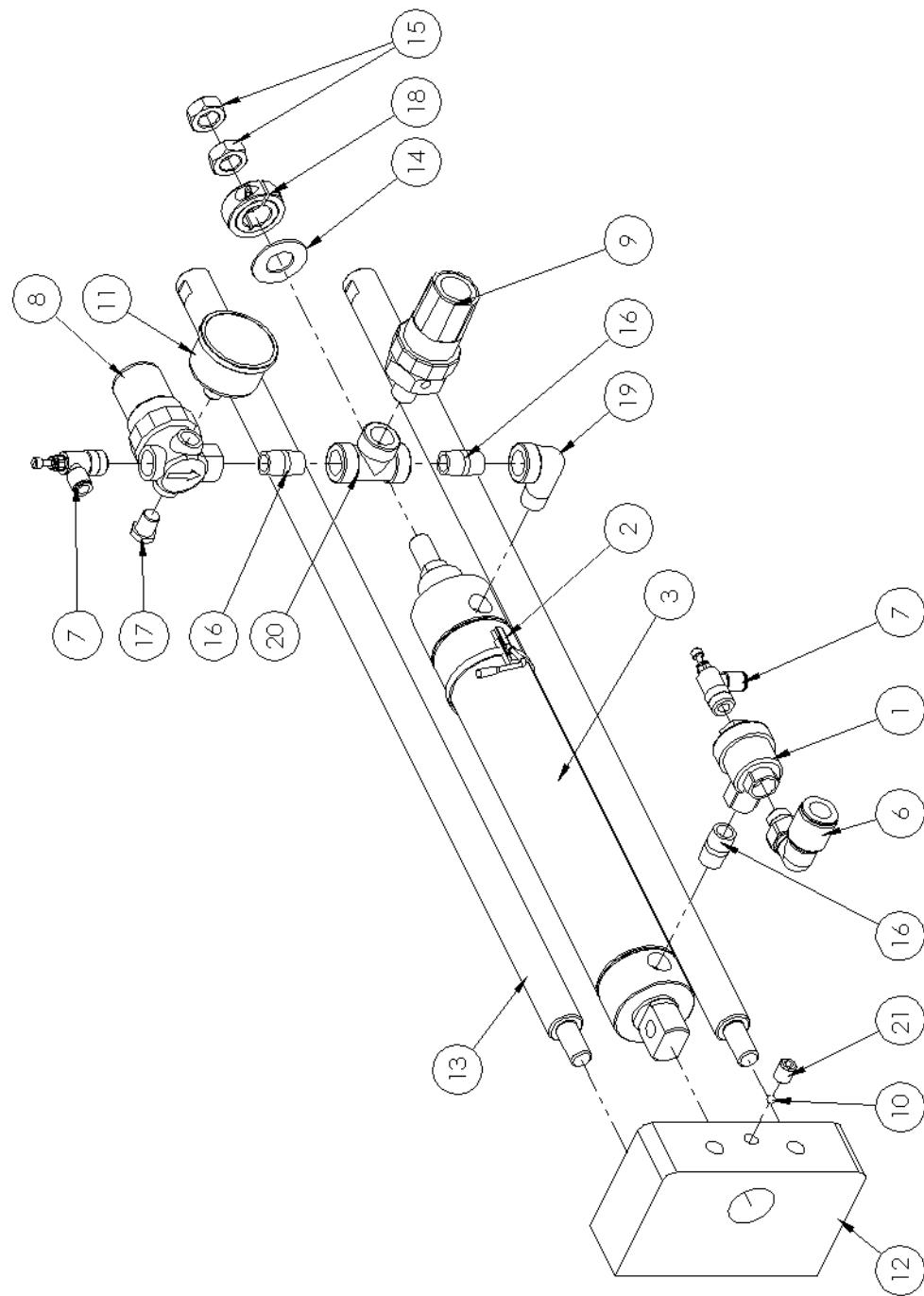
OPTIONS:

- 0: 120VAC
- 1: 220VAC

ASSEMBLY NUMBER: C-1110-0236

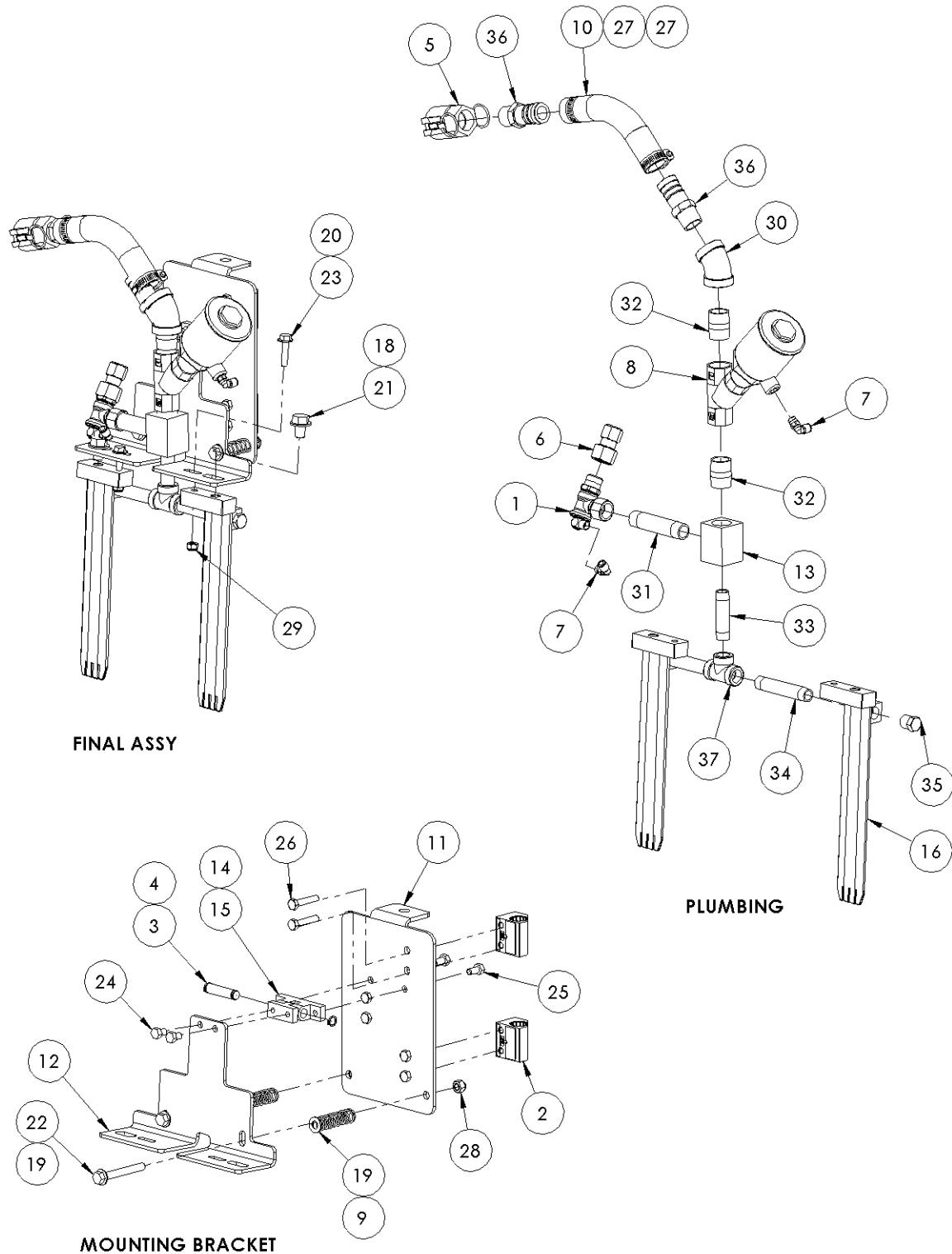
SNORKEL GUIDE ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0243-420	VALVE, QUICK EXHAUST
2	1	0550-1321	CYLINDER POSITION SWITCH
3	1	1110-0256	CYLINDER, AIR
6	1	3109-62-14	ELBOW, 1/2 OD X 1/4 NPT
7	2	7665-56-14	FLOW CONTROL, 1/4 NPT TO 1/4 TUBE
8	1	7707-118	REGULATOR, 1/4NPT 45PSI MAX.
9	1	7707-252	VALVE, RELIEF 1/4 NPT
10	1	7707-2765	NYLON BALL, 3/16"
11	1	7707-489	PRESSURE GAUGE
12	1	B-1110-0004	CYL MTG BLOCK, SNORKEL
13	2	B-1110-0013	LINEAR SHAFT
14	1	B-1110-0257	RUBBER GASKET, 5/8 X 1-1/4 X 1/16
15	2	JN1/2-20	NUT, JAM
16	3	SN1/4NPT	NIPPLE, 1/4" NPT X 7/8"
17	1	SP1/8NPT	HEX PLUG, 1/8" NPT
18	1	SSC625	5/8" SHAFT COLLAR
19	1	SSE1/4NPT	90 DEG ST ELBOW, 1/4" NPT
20	1	SST1/4NPT	TEE, 1/4" NPT
21	1	ST3/8-16X1/2	SCREW, SET, CUP POINT

ASSEMBLY NUMBER: C-1110-0041-1

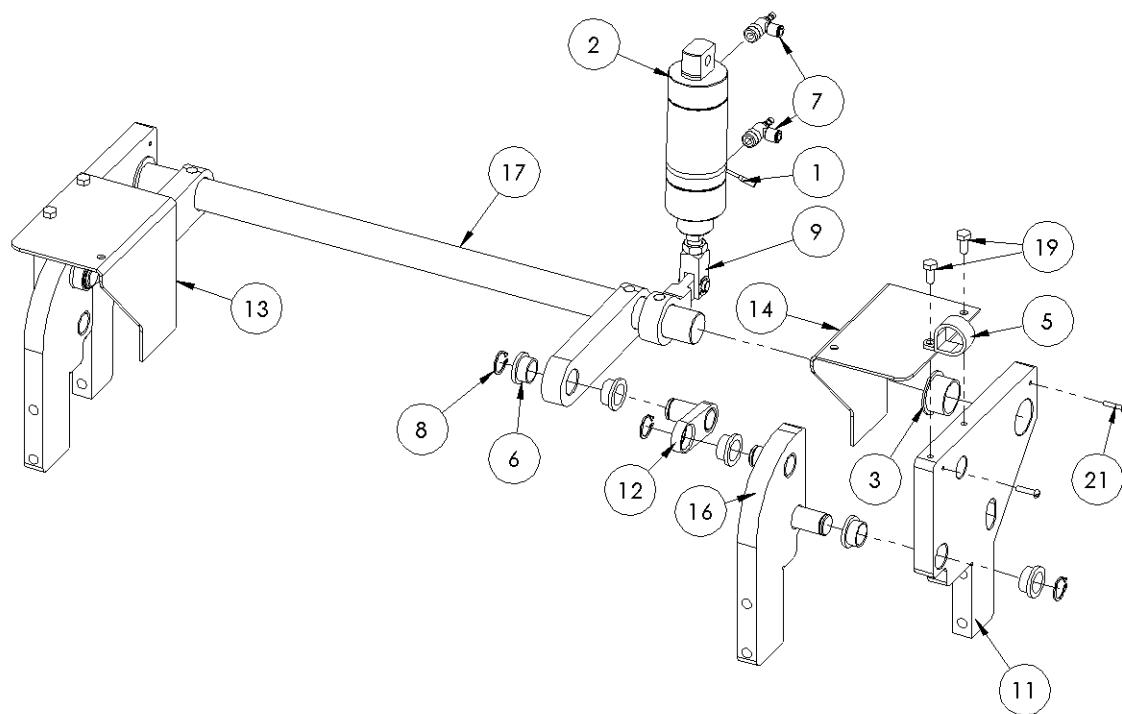
SNORKEL ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0210-2257	LOCKOUT VALVE
2	3	1110-0027	LINEAR BEARING, 20MM
3	1	1110-0030	PIN, 12MM
4	2	1110-0031	RETAINING RING, 11MM
5	1	1110-0089	FEMALE COUPLER, 3/4 NPT
6	1	1110-0156	COMPRESSION FITTING, 1/2OD X 1/2NPT
7	2	269P-04-02	FITTING, TBG, ELBOW, 1/4 OD X 1/4 NPT
8	1	7707-2372	VALVE.PISTON.SS.0.75NPT.50MM.NC
9	2	8013-103	SPRING
10	12	9537-1432	HOSE, HIGH FLOW
11	1	B-1110-0011	SNORKEL MTG PLATE, REAR
12	1	B-1110-0012	SNORKEL MTG PLATE, FRONT
13	1	B-1110-0016	JUNCTION BLOCK
14	1	B-1110-0169	SNORKEL PIVOT, FRONT
15	1	B-1110-0170	SNORKEL PIVOT, REAR
16	1	C-7707-1037	SNORKEL.A200
17	1	C-7707-1037-1	SNORKEL.A200
18	2	FW1/2-B	WASHER, FLAT
19	4	FW3/8-C	WASHER, FLAT
20	2	FW5/16-A	WASHER, FLAT
21	2	HH1/2-20X3/4	SCREW, HEX HEAD
22	2	HH3/8-16X3	SCREW, HEX HEAD
23	2	HH5/16-18X1-3/8	SCREW, HEX HEAD
24	2	HH5/16-18X1/2	SCREW, HEX HEAD
25	2	HH5/16-18X5/8	SCREW, HEX HEAD
26	6	HHM8X1.25X40	SCREW, HEX METRIC
27	2	HSS-16	HOSE CLAMP, SS, 11/16" - 1 1/4"
28	2	LN3/8-16	NUT, LOCK
29	2	LN5/16-18	NUT, LOCK
30	1	SE3/4NPTX45DEG	45 DEG ELBOW, 3/4" NPT
31	1	SN1/2NPTX3-1/2	NIPPLE, 1/2" NPT X 3-1/2"
32	2	SN3/4NPT	NIPPLE, 3/4" NPT X 1-3/8"
33	1	SN3/8NPTX2-1/2	NIPPLE, 3/8" NPT X 2-1/2"
34	2	SN3/8NPTX3-1/2	NIPPLE, 3/8" NPT X 3-1/2"
35	2	SP3/8NPT	HEX PLUG, 3/8" NPT
36	2	SSH1X3/4NPT	HOSE BARB, 1" OD X 3/4" NPT
37	1	SST3/8NPT	TEE, 3/8" NPT

ASSEMBLY NUMBER: C-1110-0042-1

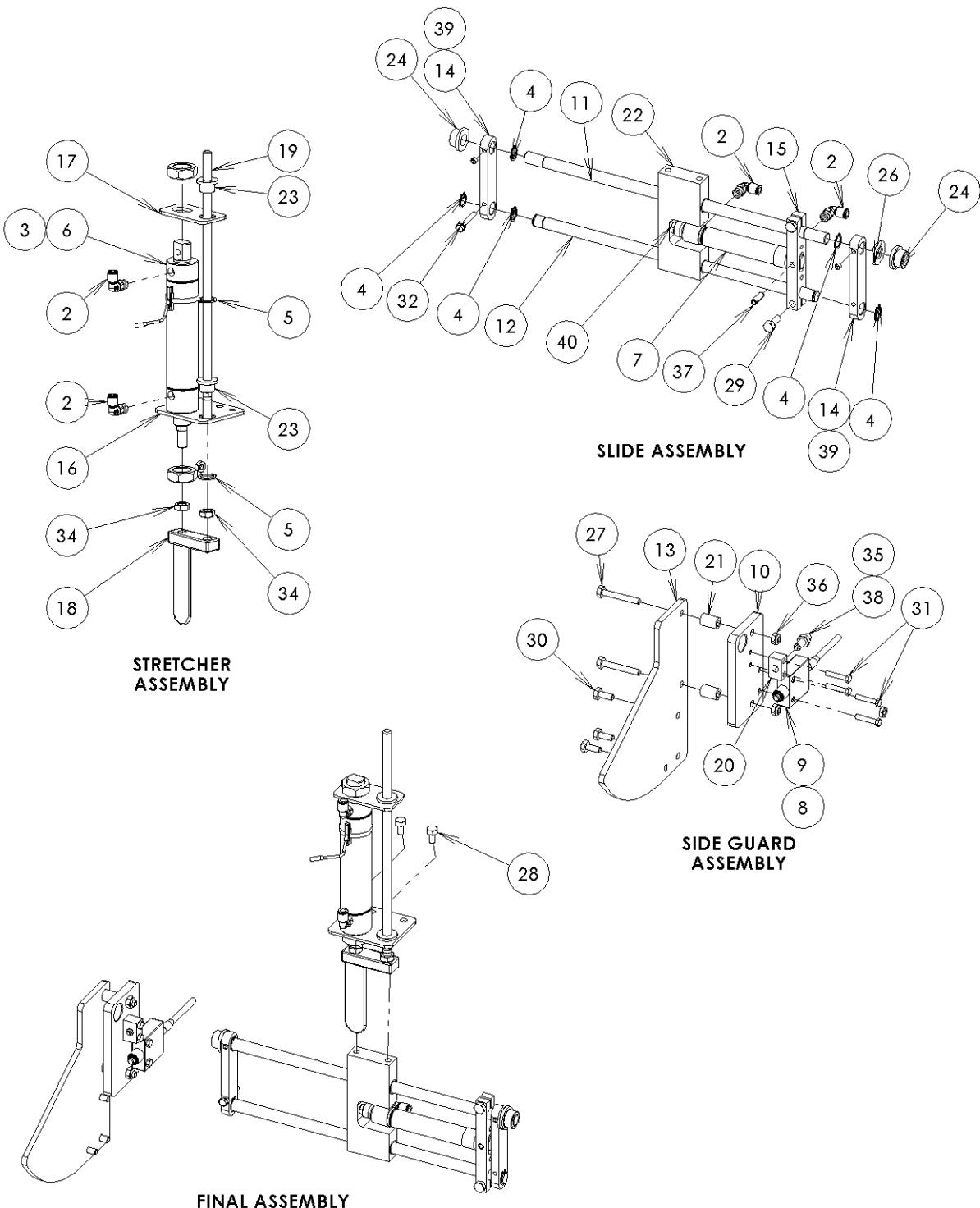
JAW CLAMP ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0550-1321	CYLINDER POSITION SWITCH
2	1	1110-0033	CYLINDER, 2" BORE X 1.5" STROKE
3	2	1110-0034	BEARING, 1.125 BORE
5	1	3225T28	3/4" OD STRAP
6	10	703-01009-016	BEARING, FLANGE 3/4 X 7/8 X 1/2
7	2	7665-56-14	FLOW CONTROL, 1/4 NPT TO 1/4 TUBE
8	6	7707-161	RETAINING RING
9	1	8013-1788	CLEVIS.CYL.2.00BORE.SS
11	2	B-1110-0006	PIVOT, REAR
12	2	B-1110-0008	ASS'Y, PIVOT LINK
13	1	B-1110-0144	PIVOT GUARD, LEFT, ML
14	1	B-1110-0145	PIVOT GUARD, RIGHT, ML
15	1	C-1110-0007L	PIVOT, FRONT LEFT
16	1	C-1110-0007R	PIVOT, FRONT RIGHT
17	1	C-1110-0128	ASS'Y, PIVOT SHAFT
19	4	HH5/16-18X3/4	SCREW, HEX HEAD
21	4	RH8-32X3/4	SCREW, ROUND HEAD

ASSEMBLY NUMBER: C-1110-0043-1

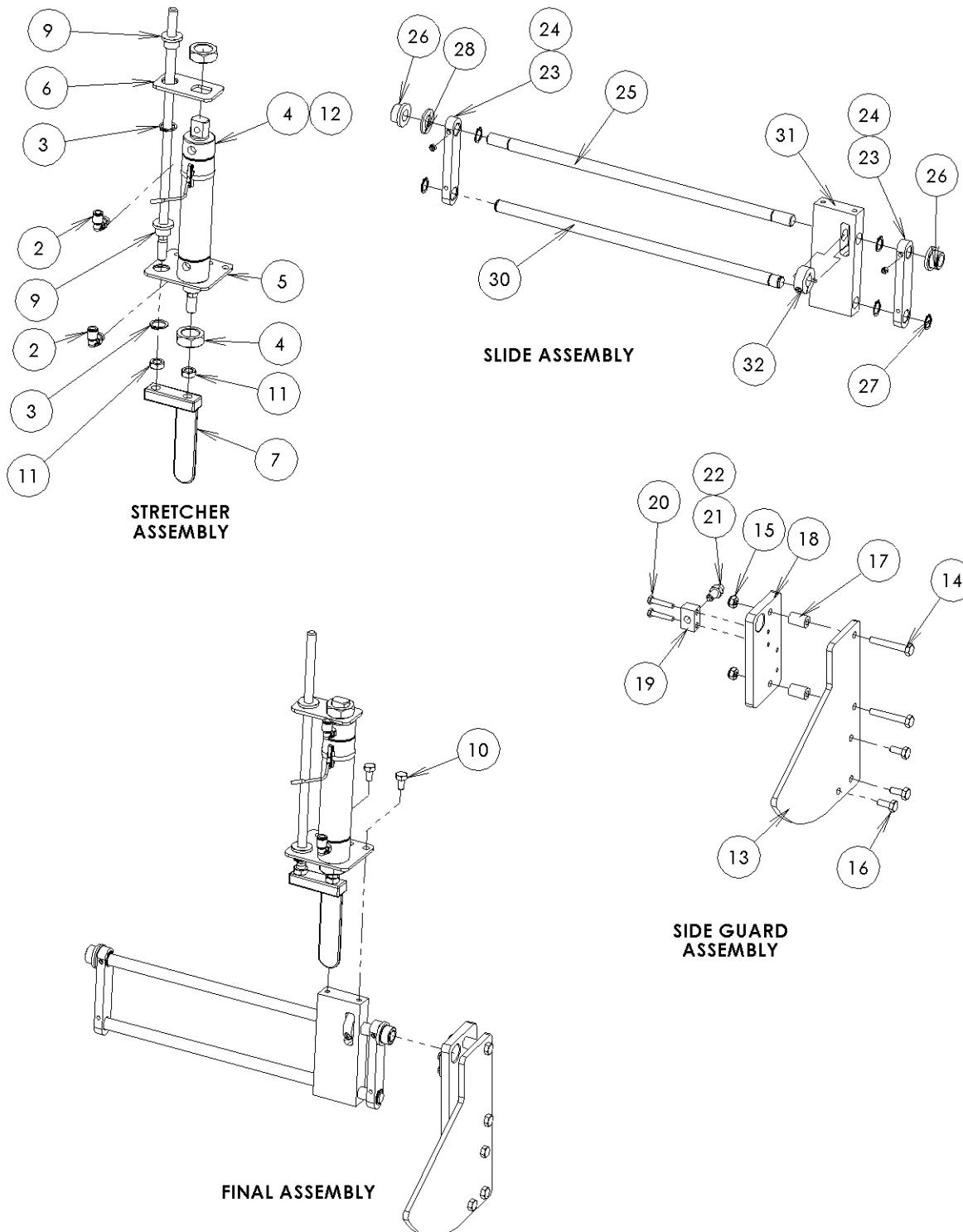
BAG STRETCHER ASSEMBLY, LEFT

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	264P-04	FITTING.TBG.TEE.1/4OD
2	4	269P-04-02	FITTING.TBG.ELB.1/4OD X 1/8NPT
3	1	0550-1321	CYLINDER POSITION SWITCH
4	5	5100-50H	CLIP, RETAINER
5	2	5555-62H	RING, RETAINING
6	1	7707-979	CYLINDER, AIR
7	1	7707-1651	CYLINDER, AIR
8	1	7707-1741	CABLE, 5-PIN, 10M
9	1	7707-2692	LIMIT SWITCH, NO CABLE
10	1	B-1110-0018	BAG STRETCHER MOUNT, INBOARD
11	1	B-1110-0242	SHAFT, GUIDE TOP
12	1	B-1110-0241	SHAFT, GUIDE BOTTOM
13	1	B-1110-0066	BAG STRETCHER MOUNT, OUTBOARD
14	2	B-7707-953	ARM, PIVOT
15	1	B-7707-955	BAR, ADJUST
16	1	B-7707-956	BRACKET, CYLINDER
17	1	B-7707-957	PLATE, GUIDE
18	1	B-7707-958	BAR, STRETCHER
19	1	B-7707-964	ROD, GUIDE
20	1	B-7707-965	SPACER, VLİER PIN BLOCK
21	2	B-7707-975	SPACER, 1/4"ID X 1/2"OD X 3/4"
22	1	B-7707-2226	ASS'Y, SLIDE BLOCK, BAG STRETCHER
23	2	FB610-4	BEARING, FLANGE
24	2	FP812-4	BEARING, FLANGED
25	1	FW1/2-A	WASHER, FLAT
26	1	FW1/2-B	WASHER, FLAT
27	2	HH1/4-20X1-3/4	SCREW, HEX HEAD
28	2	HH1/4-20X1/2	SCREW, HEX HEAD
29	2	HH1/4-20X3/4	SCREW, HEX HEAD
30	3	HH1/4-20X5/8	SCREW, HEX HEAD
31	4	HH10-32X1	SCREW, HEX HEAD
32	1	HH10-32X1-1/4	SCREW, HEX HEAD
33	1	HN10-32	NUT, HEX
34	2	JN3/8-24	NUT, JAM
35	1	JN5/16-18	NUT, JAM
36	2	LN1/4-20	NUT, LOCK
37	1	RP1/4X3/4	PIN, ROLL
38	1	SSS-D56	PIN, VLİER
39	2	ST1/4-20X3/16	SCREW, SET, CUP POINT
40	1	JN1/4-28	NUT, JAM

ASSEMBLY NUMBER: C-1110-0239

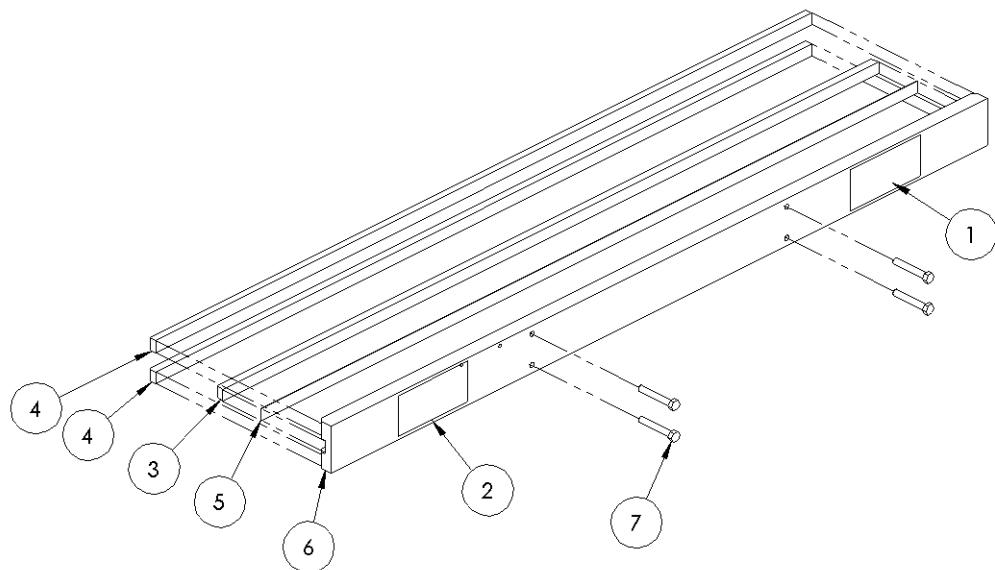
BAG STRETCHER ASSEMBLY, RIGHT

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	264P-04	FITTING.TBG.TEE.1/4OD
2	2	269P-04-02	FITTING.TBG.ELB.1/4OD X 1/8NPT
3	2	5555-62H	RING, RETAINING
4	1	7707-979	CYLINDER, AIR
5	1	B-7707-956	BRACKET, CYLINDER
6	1	B-7707-957	PLATE, GUIDE
7	1	B-7707-958	BAR, STRETCHER
8	1	B-7707-964	ROD, GUIDE
9	2	FB610-4	BEARING, FLANGE
10	2	HH1/4-20X1/2	SCREW, HEX HEAD
11	2	JN3/8-24	NUT, JAM
12	1	0550-1321	CYLINDER POSITION SWITCH
13	1	B-1110-0066	BAG STRETCHER MOUNT, OUTBOARD
14	2	HH1/4-20X1-3/4	SCREW, HEX HEAD
15	2	LN1/4-20	NUT, LOCK
16	3	HH1/4-20X5/8	SCREW, HEX HEAD
17	2	B-7707-975	SPACER, 1/4"ID X 1/2"OD X 3/4"
18	1	B-1110-0018	BAG STRETCHER MOUNT, INBOARD
19	1	B-7707-965	SPACER, VPLIER PIN BLOCK
20	2	HH10-32X1	SCREW, HEX HEAD
21	1	SSS-D56	PIN, VPLIER
22	1	JN5/16-18	NUT, JAM
23	2	B-7707-953	ARM, PIVOT
24	2	ST1/4-20X3/16	SCREW, SET, CUP POINT
25	1	B-1110-0242	SHAFT, GUIDE TOP
26	2	FP812-4	BEARING, FLANGED
27	5	5100-50H	CLIP, RETAINER
28	1	FW1/2-B	WASHER, FLAT
29	1	FW1/2-A	WASHER, FLAT
30	1	B-1110-0241	SHAFT, GUIDE BOTTOM
31	1	B-7707-2225	BLOCK, FIXED, BAG STRETCHER
32	1	B-7707-963	CLAMP, COLLAR

ASSEMBLY NUMBER: C-1110-0240

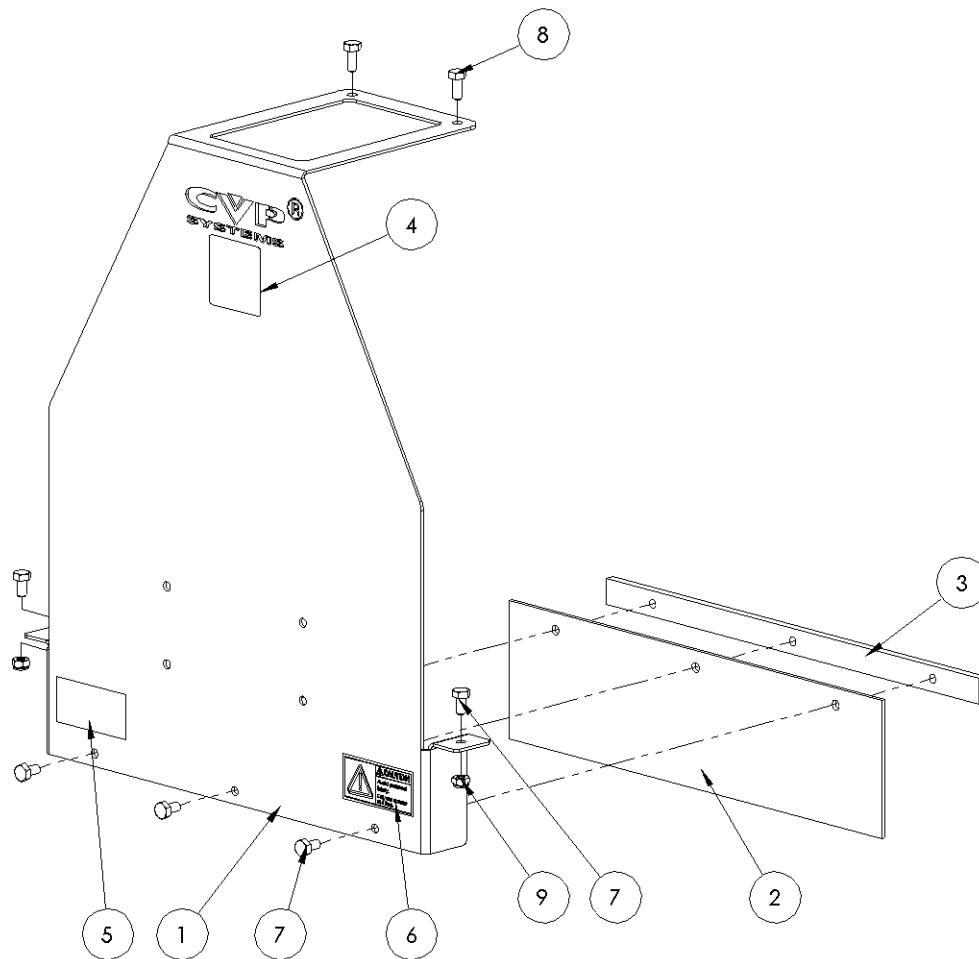
FRONT MANIFOLD ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	7707-2359	LABEL, DANGER HOT - AVOID BURNS
2	1	7707-2360	LABEL, DANGER - MANIFOLD
3	1	B-7707-182	SILICONE RUBBER, ORANGE
4	2	B-7707-187	RUBBER, SPONGE, 1/2"x3/4"x57"
5	1	B-7707-3170-5	ASSY, DOUBLE-SIDED TAPE, 5'
6	1	C-1110-0235	FRONT MANIFOLD, 52"
7	4	HH3/8-16X2-1/2	SCREW, HEX HEAD

ASSEMBLY NUMBER: C-1110-0234

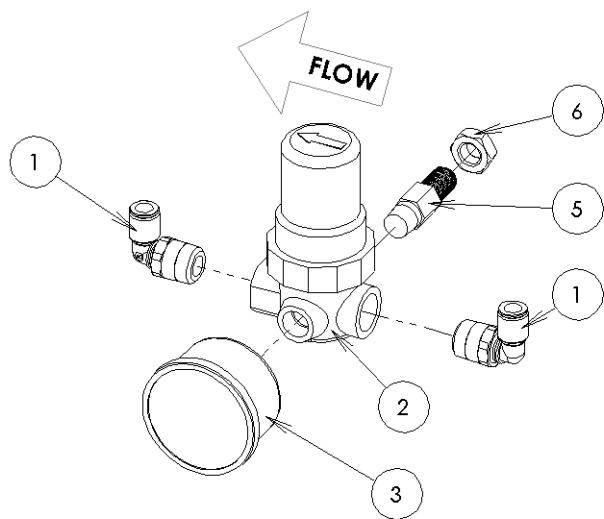
SNORKEL GUARD ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-1110-0218	GUARD, SNORKEL
2	1	B-1110-0095	FLAP, SNORKEL GUARD
3	1	B-1110-0094	RETAINER, SNORKEL GUARD
4	1	1110-0078	LABEL, MADE IN USA
5	1	8013-2107	WARNING LABEL, CRUSH HAZARD
6	1	8013-2106	LABEL, CAUTION - ONE OPERATOR
7	5	HH1/4-20X1/2	SCREW, HEX HEAD
8	2	HH1/4-20X5/8	SCREW, HEX HEAD
9	2	LN1/4-20	NUT, LOCK

ASSEMBLY NUMBER: B-1110-0220

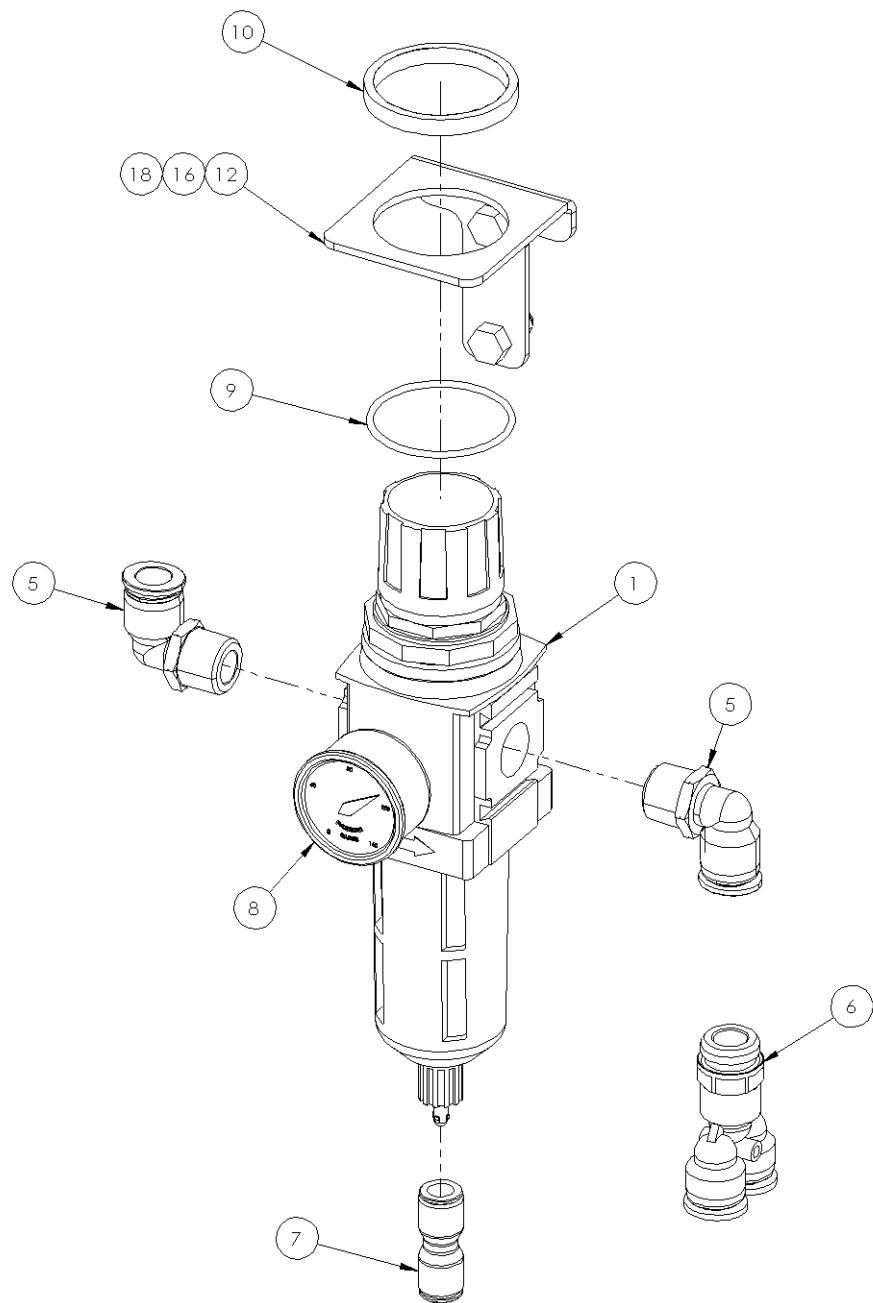
REGULATOR ASSEMBLY, BAG STRETCHER

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	269P-04-04	FITTING,TBG,ELB.1/4OD X 1/4NPT
2	1	7707-118	REGULATOR, 1/4NPT 45PSI MAX.
3	1	7707-489	PRESSURE GAUGE
4	2	7770-56-00	FLOW CONTROL, 1/4"
5	1	B-8013-2060	FRL MTG. STUD
6	1	JN3/8-16	NUT,JAM

ASSEMBLY NUMBER: B-1110-0143

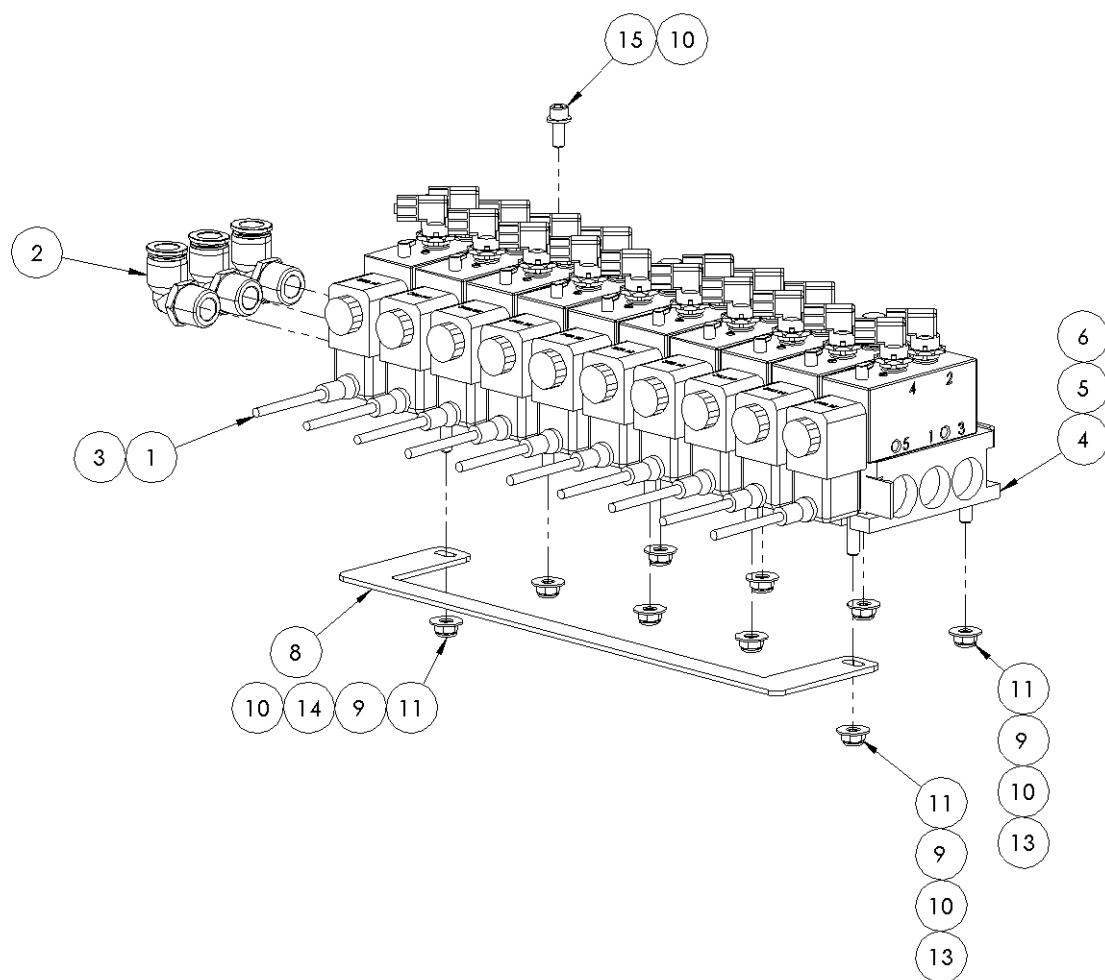
FILTER/REGULATOR ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0651-1529	FILTER, REG, 1/2NPT, W/AUTO DRAIN
5	2	269P-08-08	FITTING.ELB.1/2 NPT TO 1/2 OD
6	1	273P-08-08	FITTING.TBG.WYE.1/2OD
7	1	3106-60-00	FITTING, UNION, 3/8"
8	1	7501-162	GAUGE.PRESSURE.0.25NPT
9	1	7707-3108	O-RING, #134
10	1	7707-3136	PANEL NUT, FILTER/REG
12	1	B-7707-3077	REG MTG BRKT
16	2	HH5/16-18X3/4	SCREW, HEX HEAD
18	2	LN5/16-18	NUT, LOCK
22	1	SRP1/4NPT	HEX PLUG, 1/4" NPT, RECESSED

ASSEMBLY NUMBER: B-1110-0047-1

VALVE BANK ASSEMBLY

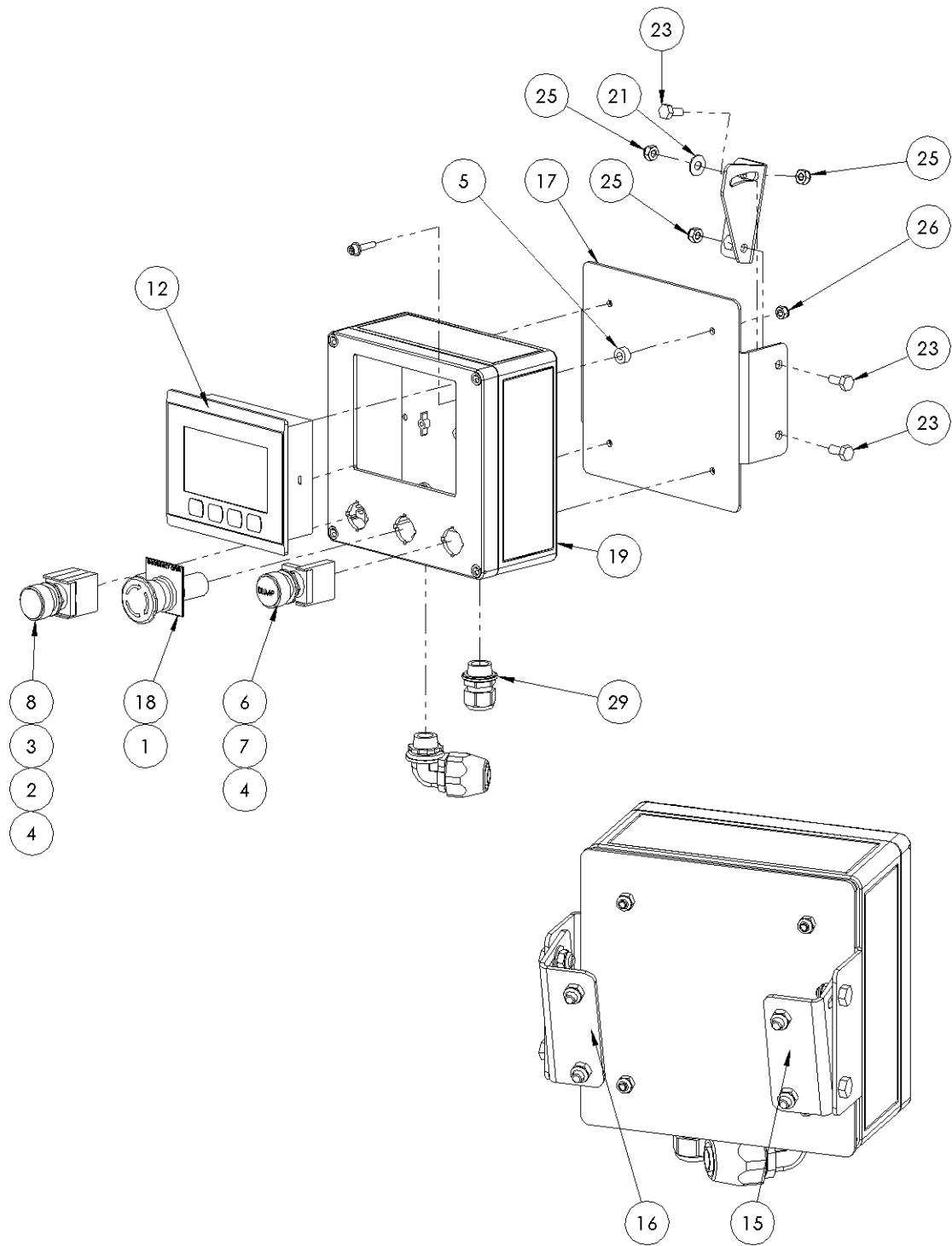
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	10	1110-0227	ISO DIN CONNECTOR, 24VDC, 6FT
2	3	269P-08-08	FITTING.ELB.1/2 NPT TO 1/2 OD
3	10	7707-3248	SOLENOID VALVE COIL, 24 VDC
4	1	7707-3257	6-VALVE BANK
5	4	7707-3260	SOLENOID VALVE W/ COIL CAP
6	4	9130-401	STATION SEGMENT
7	2	9130-886	VALVE BANK CAP
8	1	B-1110-0213	WIRE TIE BAR
9	9	FW1/4-A	WASHER, FLAT
10	10	FW1/4-B	WASHER, FLAT
11	9	LN1/4-20	NUT, LOCK
12	18	P68949	VALVE ADAPT ELB, 1/4" TUBE
13	8	SH1/4-20X1	SCREW, SOCKET HEAD
14	1	SH1/4-20X1-1/8	SCREW, SOCKET HEAD
15	1	SH1/4-20X5/8	SCREW, SOCKET HEAD

ASSEMBLY NUMBER: C-1110-0212

USER INTERFACE ASSEMBLY

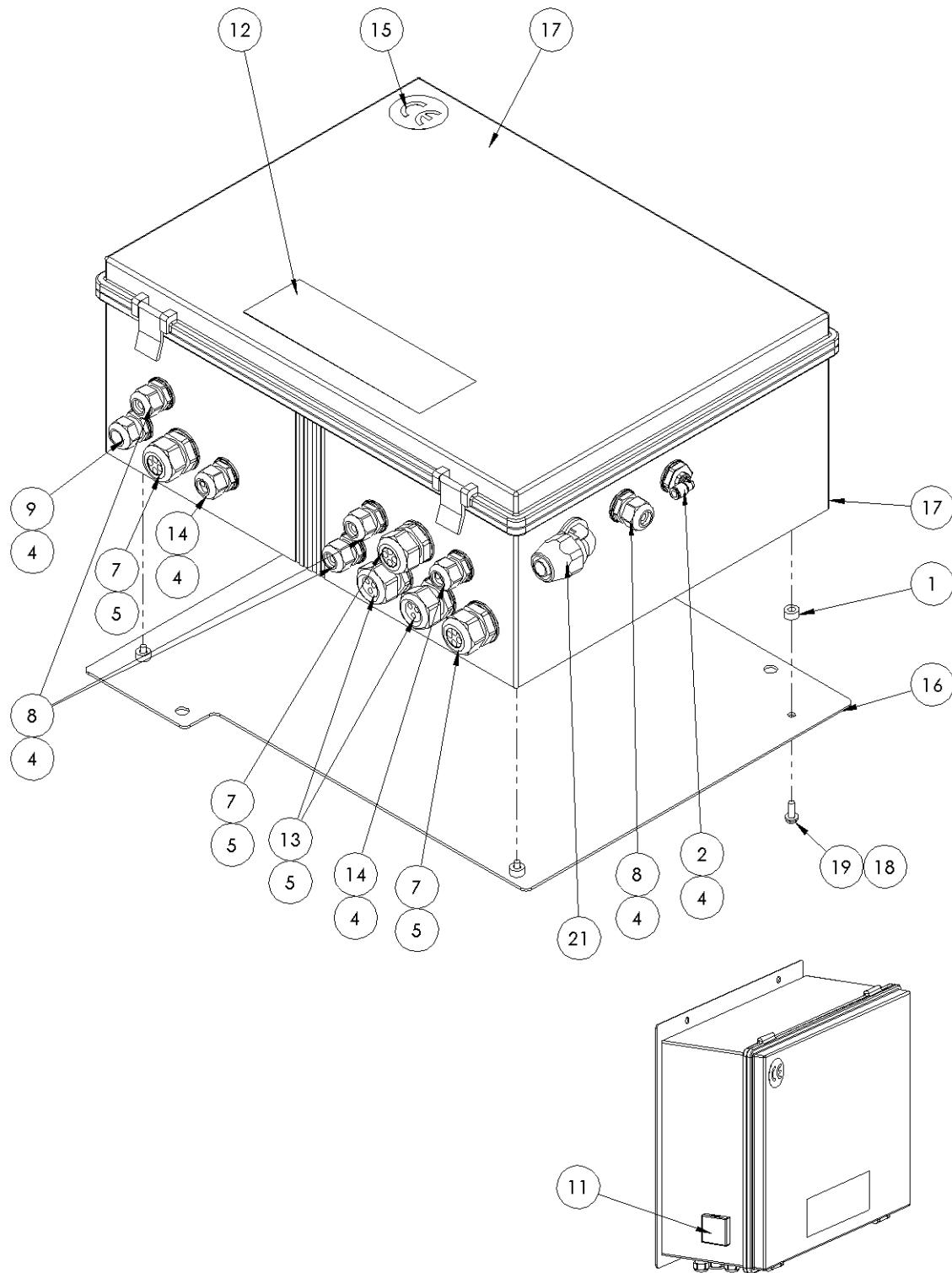
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0550-1154	EMERGENCY STOP
2	1	0651-1516-1	24V LIGHT UNIT
3	1	0651-1519-1	NC CONTACT
4	2	0651-1520-1	NO CONTACT
5	4	1110-0086	SPACER, 1/4 ID X 1/2 OD X 1/4L
6	1	1110-0215	PUSH BUTTON, BUTTONLESS
7	1	1110-0216	BUTTON, ETCHED, DUMP
8	1	1110-0217	PUSHBUTTON, ETCHED, START
9	1	5262	1/2" SEAL RING
10	1	7707-1634	1/2" CORD GRIP, 1 HOLE
11	1	7707-3008	CABLE INTERFACE AB, 5M
12	1	7707-3189-P	HMI TERMINAL, PV800 HMI, 4.3"
13	1	9743-1197	FEMALE FIELD SPLICE
14	1	9743-1198	MALE FIELD SPLICE
15	1	B-1110-0141	MTG BRKT A, USER INTERFACE
16	1	B-1110-0195	MTG BRKT, USER INTERFACE, RH
17	1	B-1110-0214	MTG PLATE, HMI
18	1	B-9537-1101	LEGEND PLATE, EMERGENCY OPEN
19	1	B-9743-1539	HMI ENCLOSURE, ML XT, PV800
20	1	D-1110-0269	ELEC SCHEMATIC, ML XT, AB850
21	2	FW1/4-A	WASHER, FLAT
22	4	FW10-A	WASHER, FLAT
23	8	HH1/4-20X5/8	SCREW, HEX HEAD
24	15	JZ12C20-AWG	CABLE
25	8	LN1/4-20	NUT, LOCK
26	4	LN10-32	NUT, LOCK
27	4	LT-11	SEALTITE, 1/2"
28	4	SH10-32X7/8	SCREW, SOCKET HEAD
29	1	ST9050	1/2" SEALTITE CON, 90DEG
30	3	WBL18-AWG	WIRE, 18AWG, BLUE
31	3	WBR18-AWG	WIRE, 18AWG, BROWN

ASSEMBLY NUMBER: C-9743-1538



MAIN ELECTRICAL ENCLOSURE ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	4	1110-0086	SPACER, 1/4 ID X 1/2 OD X 1/4L
2	1	269P-04-04	FITTING.TBG.ELB.1/4OD X 1/4NPT
3	1	4/14/3109	FITTING, TBG, ELBOW, 5/32OD X 1/4NPT
4	7	5262	1/2" SEAL RING
5	5	5263	3/4" SEAL RING
6	1	7707-1190	THERMOCOUPLE, TYPE K, 85" LG
7	3	7707-1633	3/4" CORD GRIP, 4 HOLE
8	3	7707-1634	1/2" CORD GRIP, 1 HOLE
9	1	7707-1705	CORD GRIP, 1/2"
10	2	7707-2135	CONNECTOR, FEMALE, 3M
11	1	7707-2892-1	TEMP CONTROLLER, 24VDC
12	1	7707-532	LABEL, DANGER HIGH VOLTGE
13	2	9537-1193	3/4" CORD GRIP, 3 HOLE
14	2	9537-1194	1/2" CORD GRIP, 2 HOLE
15	1	B-7707-1901	LABEL, CE
16	1	B-9743-1511	ENCLOSURE MTG PLATE
17	1	D-1110-0277	ENCLOSURE, ML XT
18	4	FW10-A	WASHER, FLAT
19	4	HH10-32X5/8	SCREW, HEX HEAD
20	1	NPBBH 1/4 NPT-15/16 LG	NPB BULKHEAD ADAPT 1/4 NPT
21	1	ST9050	1/2" SEALTITE CON, 90DEG
22	4	WBL18-AWG	WIRE, 18AWG, BLUE
23	6	WBR18-AWG	WIRE, 18AWG, BROWN
24	2	WG18-AWG	WIRE, 18AWG, GREEN
25	4	WR18-AWG	WIRE, 18AWG, RED

ASSEMBLY NUMBER: C-1110-0211

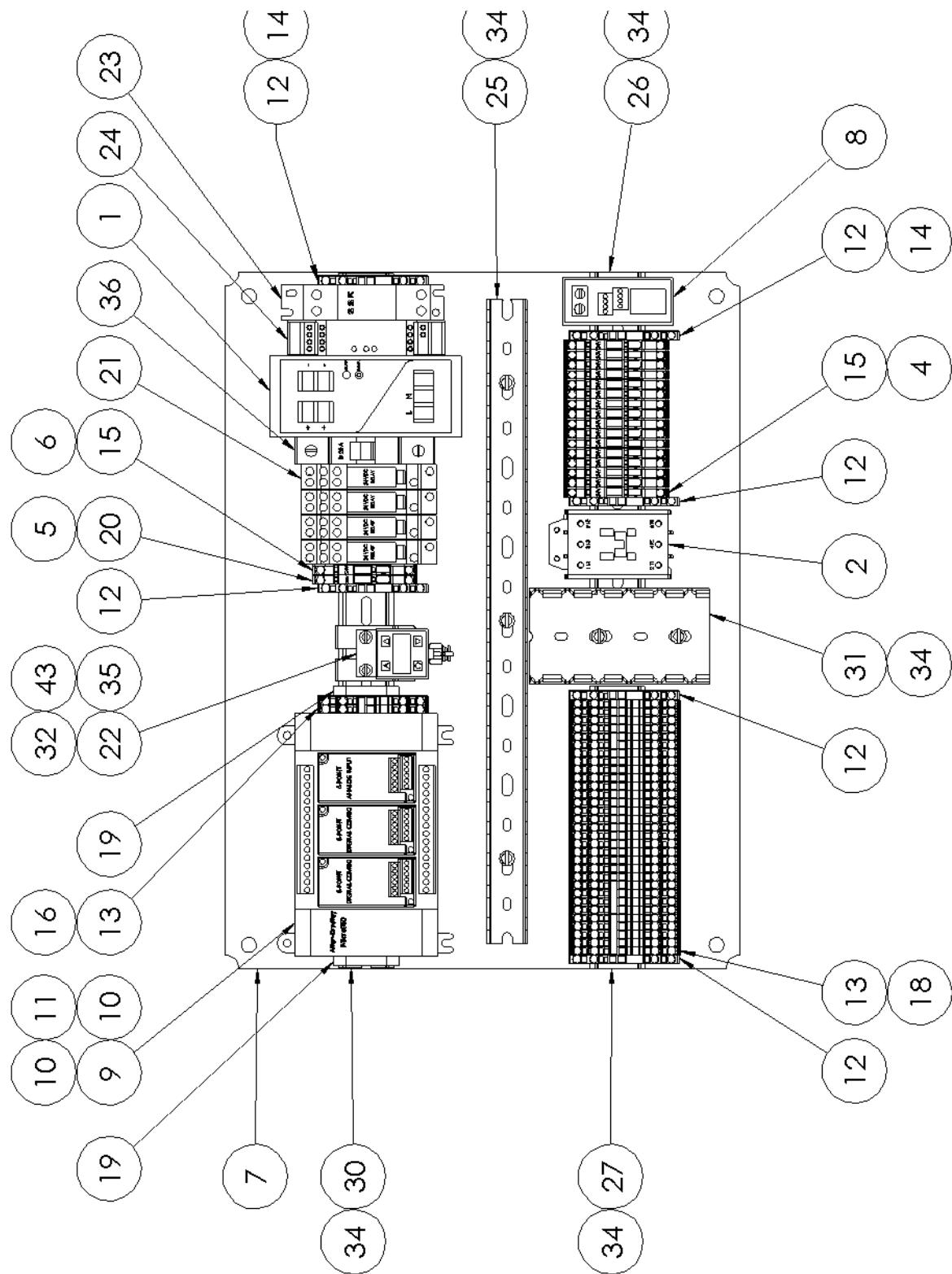
ELECTRICAL PANEL ASSEMBLY

ITEM NO.	-0/QTY.	-1/QTY.	PART NUMBER	DESCRIPTION
1	1	1	0550-1208	POWER SUPPLY, 120W
2	1	1	0550-1209	CONTACTOR 24 VDC
3	-	1	0651-1237	10A 2 POLE CB
4	16	16	217.315	FUSE.5 X 20MM.0.315A
5	1	1	2173.15	FUSE.5 X 20MM.3.15A
6	1	1	218004	FUSE.5 X 20MM.4.00A
7	1	1	7707-2932	ELEC PANEL
8	1	1	7707-3075	TERM BLOCK, 8 POLE TO RJ45
9	1	1	7707-3190-P	PLC, ALLEN-BRADLEY MICRO850
10	2	2	7707-3191	8-PT DIGITAL COMBO CARD
11	1	1	7707-3192	4-PT ANALOG INPUT CARD
12	6	6	7707-3224	4-PT GROUND TERM BLOCK
13	33	33	7707-3225	4-PT CLAMPING TERM BLOCK
14	4	4	7707-3227	END PLATE, TERM BLOCK
15	17	17	7707-3228	FUSE TERM BLOCK W/ LED, 24V
16	2	2	7707-3232-2	JUMPER BAR, 2-POLE
17	1	1	7707-3232-4	JUMPER BAR, 4-POLE
18	1	1	7707-3232-5	JUMPER BAR, 5-POLE
19	2	2	7707-3233	END STOP
20	1	1	7707-3265	FUSE TERM BLOCK W/ LED, 230V
21	4	4	9537-1023	RELAY OMRON, 24VDC
22	1	1	9537-1217-1	SWITCH.VACUUM.DIGITAL.0-29Hg.PNP
23	1	1	9537-1323	SOLID STATE RELAY
24	1	1	9537-1426	RELAY, 2 HAND SAFETY
25	1	1	B-0210-2469	WIREWAY, 1" W, 16" LG, 0" CUT
26	1	1	B-1110-0222	DIN RAIL, 8", 1/2" CUT
27	1	1	B-1110-0224	DIN RAIL, 7", 1/2" CUT
28	1	-	B-1110-0254	ASSY, PLUG AND REC, 120V, 1P+N+G, 20A
29	-	1	B-1110-0254-1	ASSY, PLUG AND REC, 220V, 2P+G, 20A
30	1	1	B-1110-0274	DIN RAIL, 17 1/4", 0" CUT
31	1	1	B-9537-1445	WIREWAY, 2 1/4" W, 4 1/2" LG, 3/4" CUT
32	2	2	FM4	DIN CLIP
33	7	7	MLW14AWG	WIRE, 14AWG, BLACK, TYPE M
34	13	13	PH10-32X5/16	SCREW, PAN HEAD
35	2	2	PHM4X0.7X8MM	PAN HEAD SCREW METRIC SLOTTED
36	1	-	S271-K20	20A 1 POLE CB
37	5	5	WBL18-AWG	WIRE, 18AWG, BLUE
38	15	15	WBR18-AWG	WIRE, 18AWG, BROWN
39	4	4	WG18-AWG	WIRE, 18AWG, GREEN
40	3	3	WP18-AWG	WIRE, 18AWG, PURPLE
41	10	10	WR18-AWG	WIRE, 18AWG, RED
42	5	5	WW18-AWG	WIRE, 18AWG, WHITE
43	1	1	268P-02-02	FITTING, TBG, STR, 5/32"OD X 1/8"NPT

OPTIONS-

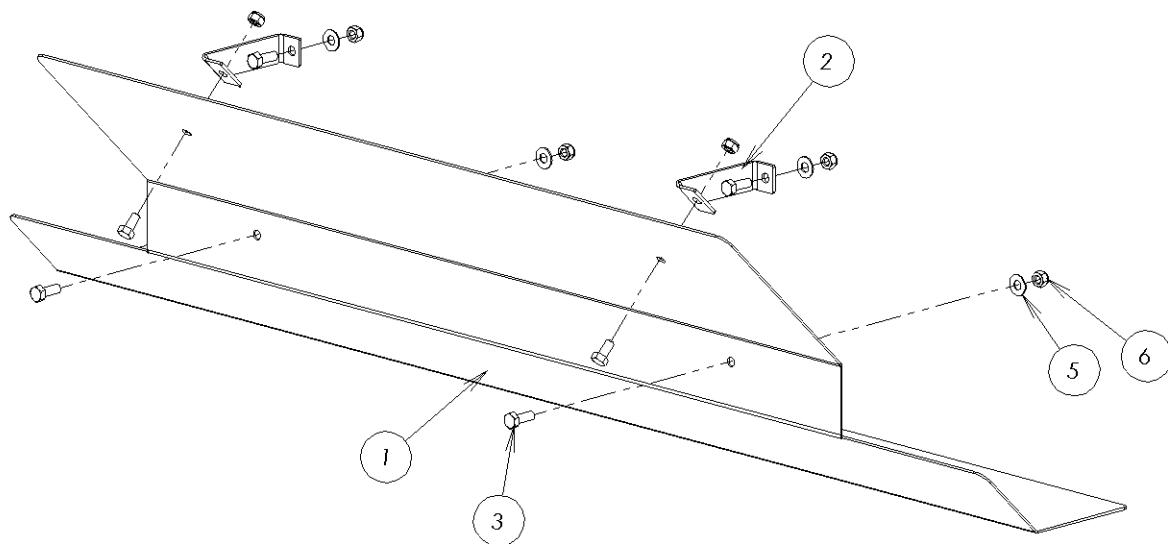
-1: 220 VAC

-2: 220 V

ASSEMBLY NUMBER: D-1110-0268

DRIP PAN ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-1110-0136	DRIP PAN
2	2	B-1110-0147	MTG. BRKT, DRIP PAN
3	4	HH5/16-18X7/8	SCREW, HEX HEAD
4	2	HH5/16-18X5/8	SCREW, HEX HEAD
5	4	FW5/16-A	WASHER, FLAT
6	6	LN5/16-18	NUT, LOCK

ASSEMBLY NUMBER: B-1110-0137



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