

Vibratory Gross Weigh Scale

Model VG



Operation and Maintenance Manual



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Machine Serial Number: _____

Sales Order Number: _____

Important Information

Conventions

Safety Alert Symbols

The  symbol indicates that important personal safety information follows. Carefully read this text for the warnings information it contains. The signal word next to each safety alert symbol is defined as:



WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION



Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury, or damage to the equipment. This single word may also be used to identify unsafe practices.



LOCKOUT

This symbol will be used anytime that a procedure requires an electrical lockout.

Static Sensitive Symbols for Equipment Handling Instructions

The  and  symbols indicate important handling guidelines for proper handling of electronic equipment modules and sensitive components for the prevention of potential damage that could be caused by ESD (electrostatic discharge) during routine maintenance, handling and transportation.



ESD NOTICE

To protect against ESD damage to electronic equipment, follow the Standard ESD Prevention Procedures. Failure to use protective measures could result in permanent equipment damage, either immediate or latent, when handling modules.



ESD NOTICE

To protect against ESD damage to electronic equipment containing components, follow the Standard ESD Prevention Procedures. Failure to use recommended protective measures could result in permanent equipment damage, either immediate or latent, when handling components.

Standard Electro-Static Discharge (ESD) Prevention Procedures

The VG Series Electronic Small Packer utilizes many electronic components that are susceptible to damage from Electro-Static Discharge. Anytime electronic components are serviced, the following precautions should be followed:

1. Wear a commercial grounding wrist strap.
2. Remove power from the machine.
3. Leave all static sensitive components in their protective packaging until it is time to install the component
4. Always hold static sensitive components by their metal mounting tabs, and/or by their edges

Important/Notable Information

While all of the information in this manual is important, there are some pieces of information where special attention needs to be paid to avoid equipment damage, or specific information needs to be emphasized. This information will be handled as follows:

***Important:** Indicates an operating procedure, practice, or condition that, if not strictly followed, may cause equipment damage.*

***Note:** Indicates additional information or emphasizes a topic related to the subject being discussed.*

Personal Safety Instructions

Only qualified personnel should work on or around this equipment. To ensure the highest degree of personal safety, all who use this equipment are required to become thoroughly familiar with all safety instructions contained in this document. Successful and safe operation of this equipment depends upon proper handling, operation, maintenance, and application of associated equipment. Refer to Appendix A of this manual for all safety instructions. Safety instructions are also provided where they apply within the body of this manual.



WARNING

No information in this manual supersedes or replaces your employer's operating rules. If there is a difference in instructions between this manual and the employer's operating rules, follow the most restrictive instruction.

Deliberate misuse or abuse of electronic components may cause personal injury or death.

Warranty Information

Seller warrants that the Products will operate substantially in conformance with Seller's published specifications, when subjected to normal, proper and intended usage by properly trained personnel, for a period of one (1) year from the date of shipment to Buyer (the "Warranty Period"). Seller agrees during the Warranty Period, provided it is promptly notified in writing upon the discovery of any defect and further provided that all costs of returning the defective Products to Seller are pre-paid by Buyer, to repair or replace, at Seller's option, defective Products so as to cause the same to operate in substantial conformance with said specifications. Replacement parts may be new or refurbished, at the election of Seller. All replaced parts shall become the property of Seller. Replacement Parts will be billed at list price, unless they are approved as warranty replacement item(s) by the service technician and the technical services manager.

Lamps, fuses, bulbs and other expendable items are expressly excluded from the warranty. Seller's sole liability with respect to equipment, materials, parts or software furnished to Seller by third party suppliers shall be limited to the assignment by Seller to Buyer of any such third party supplier's warranty, to the extent the same is assignable. In no event shall Seller have any obligation to make repairs, replacements or corrections required, in whole or in part, as the result of (i) normal wear and tear, (ii) accident, disaster or event of force majeure, (iii) misuse, fault or negligence of or by Buyer, (iv) use of the Products in a manner for which they were not designed, (v) causes external to the Products such as, but not limited to, power failure or electrical power surges, (vi) improper storage of the Products or (vii) use of the Products in combination with equipment or software not supplied by Seller. If Seller determines that Products for which Buyer has requested warranty services are not covered by the warranty hereunder, Buyer shall pay or reimburse Seller for all costs of investigating and responding to such request at Seller's then prevailing time and materials rates. If Seller provides repair services or replacement parts that are not covered by the warranty, the Buyer shall pay Seller therefore at Seller's then prevailing time and materials rates. ANY INSTALLATION, MAINTENANCE, REPAIR, SERVICE, RELOCATION OR ALTERATION TO OR OF, OR OTHER TAMPERING WITH, THE PRODUCTS PERFORMED BY ANY PERSON OR ENTITY OTHER THAN SELLER WITHOUT SELLER'S PRIOR WRITTEN APPROVAL, OR ANY USE OF REPLACEMENT PARTS NOT SUPPLIED BY SELLER, SHALL IMMEDIATELY VOID AND CANCEL ALL WARRANTIES WITH RESPECT TO THE AFFECTED PRODUCTS.

Field Service

Magnum Systems can provide field service for start-up assistance, training, maintenance, and replacement/spare parts for new and existing equipment. Contact Magnum Systems, at (888) 882-9567, for any questions related to field service.

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VG Series

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Chapter 1

Product Description

1.1 General Description

This chapter provides a high-level product description of the VG Series.

1.2 Introduction

The Magnum Systems VG Series is an electronic vibratory gross weigh scale that is capable of filling up to 10 bags per minute. The VG Series is designed to fill packages ranging in weight from 15 to 125 lbs. (7 to 55 kg.).

The VG Series comes standard with a painted finish, but can be ordered with 304 stainless steel product contact parts.

1.3 Manual Scope

This manual will provide information on installation, operation, preventive maintenance, troubleshooting, and repair of the VG Series.

The appendices include safety information, spare parts list, and mechanical drawings.

1.4 Electrical Requirements

The VG Series is designed to operate on 115 VAC at 50 or 60 Hz. The power receptacles should be placed within 6 feet of the VG Series.

1.5 Pneumatic Requirements

The VG Series uses approximately 1 CFM (28 liters) @ 80-100 PSI (.55-.69 MPa) of compressed air. The VG Series also has a secondary regulator that is used to regulate the air pressure for the inflatable neck seal. The secondary regulator should be set to 3 to 7 PSI (.02-.05 MPa). Magnum Systems recommends that the air supply line be equipped with a refrigerated air dryer, or at the very least a water separator.

1.5.1 Pneumatic Lubrication Requirements

The lubricator portion of the FRL should be filled with 10 weight non-detergent oil. The lubricator should be set to provide 1 drop of oil per 20 fill cycles.

Important: While setting the lubrication rate too low may cause component wear/damage, setting the lubrication rate too high may also cause damage, or at the very least, affect production efficiency. Too much oil may cause pneumatic components to gum up and negatively affect their ability to operate.

1.6 Major Systems and Components

When working with the VG Series, it is important to understand the major systems and components of the unit.

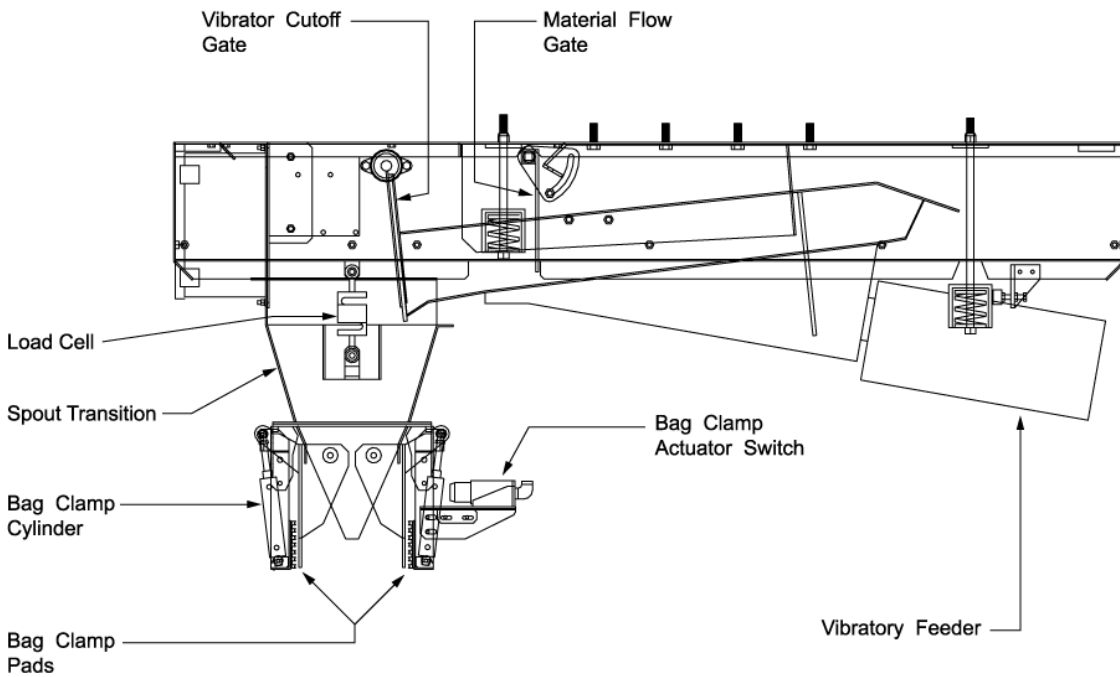


Figure 1-1. VG Series – Right Side View

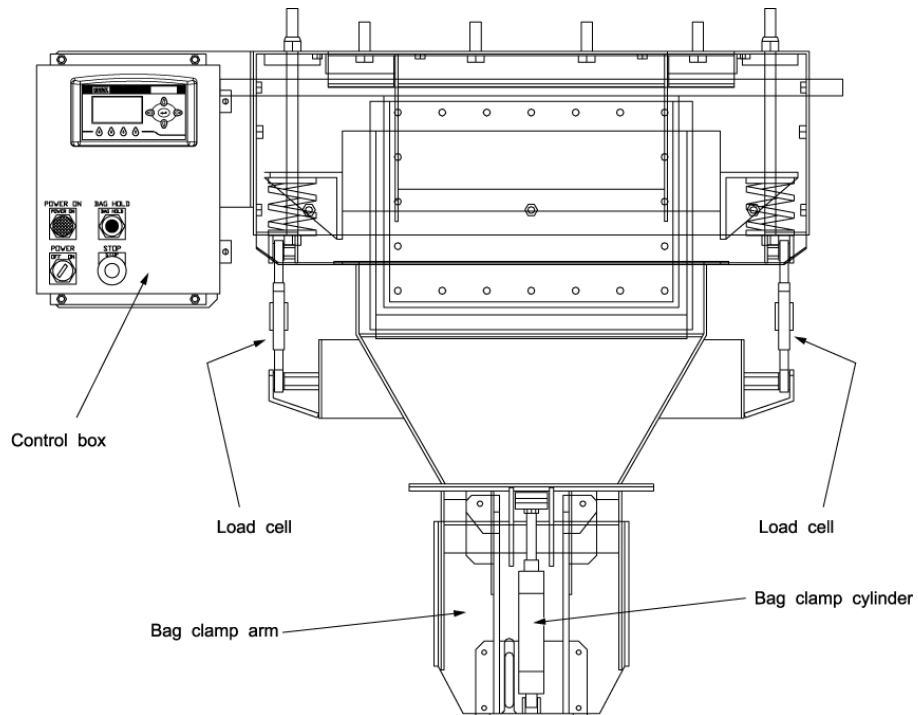


Figure 1-2. VG Series – Front View

1.6.1 Cabinet

The cabinet serves as the backbone for the VG Series. It serves as the mounting point for the other items that make up the VG Series.

1.6.2 Spout Transition

The spout transition is the transition between the vibratory feeder and the spout. The spout transition has angled sides to control the materials as they fall from the feeder pan toward the spout.

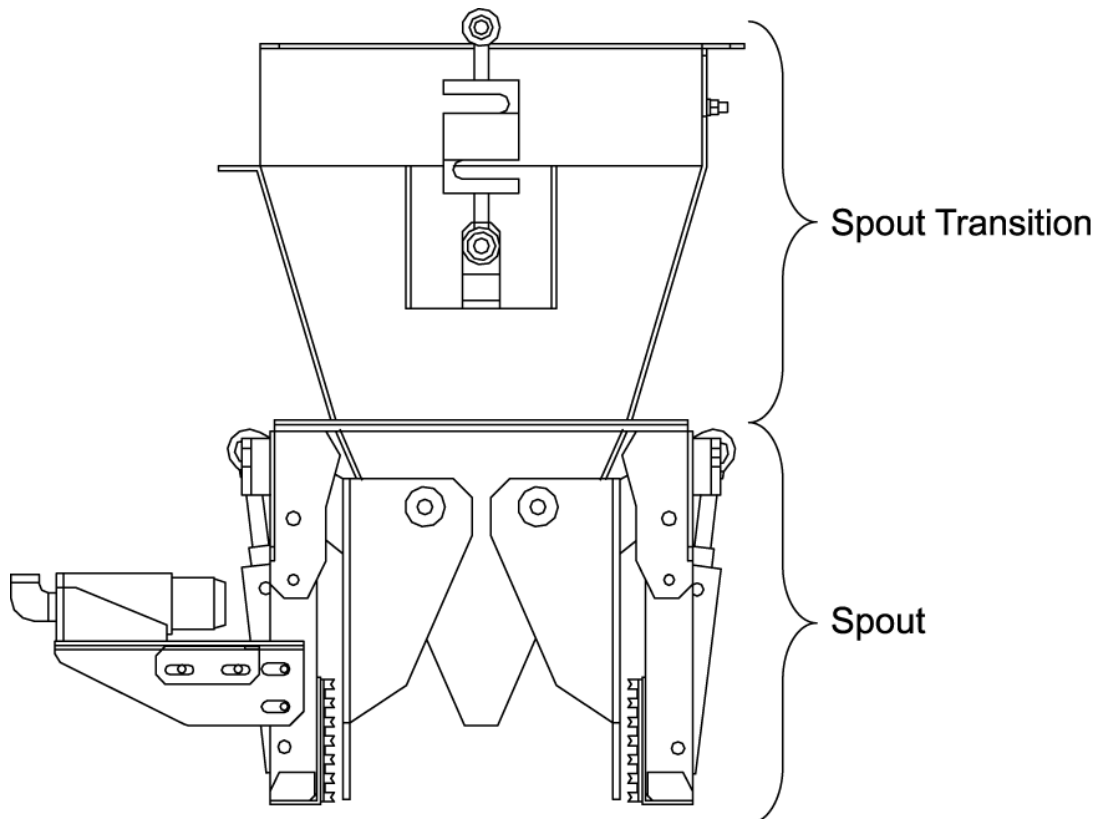


Figure 1-3. Spout Transition and Spout

1.6.3 Spout

The spout serves two purposes. It serves as the mounting point for the bag clamps, and it is used to control the materials as they fall and direct them into the packaging container. The spout comes equipped in three different basic configurations.

- Standard – Used on most VG Series units, this spout is equipped with v-type bag clamps.
- Elongated – Also uses v-type bag clamps, but is larger in size to allow oversized materials to be packaged without bridging in the spout.
- Inflatable – A round metal spout that is equipped with an inflatable bladder bag clamp system.

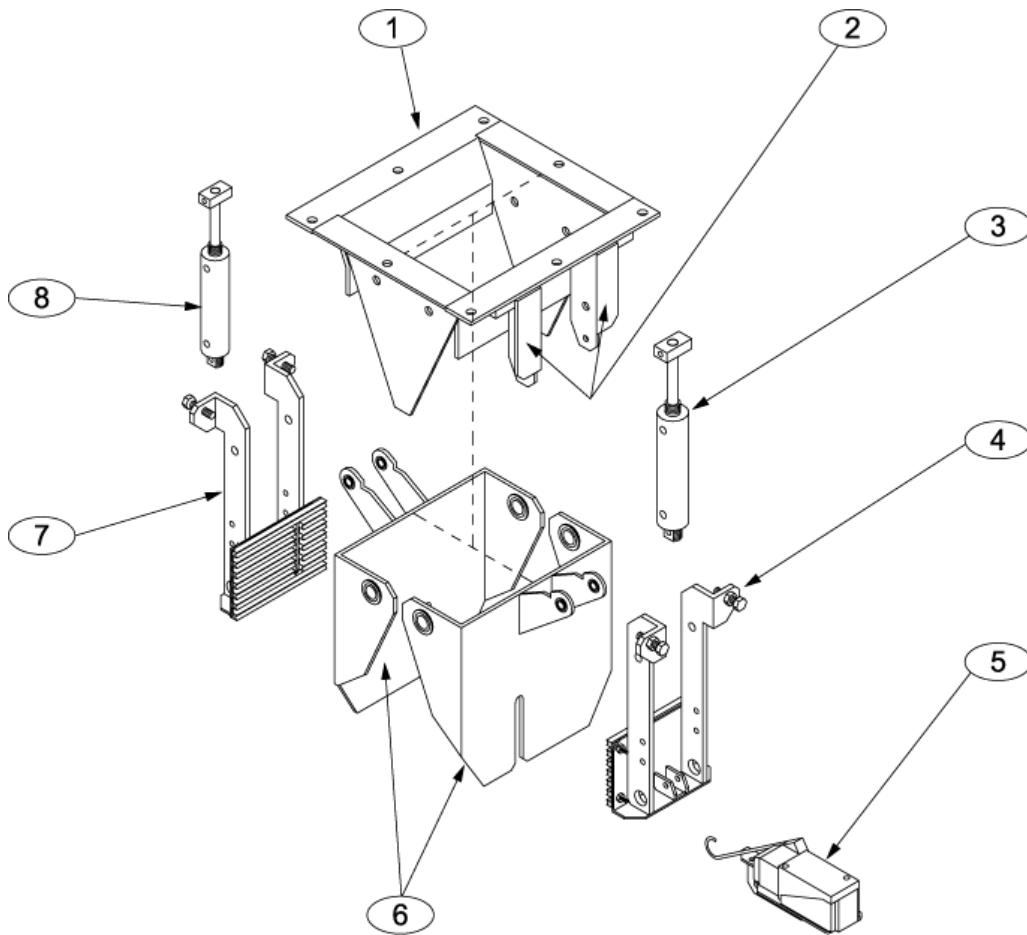
1.6.4 Bag Clamps

A bag clamp system is used to hold the bag in place while it is being filled. There are two types of bag clamp systems used on the VG Series:

- V-type
- Inflatable

1.6.4.1 V-Type Bag Clamps

The VG Series comes standard with a V-type bag clamp setup. This means that there are two bag clamp arms. One is installed on either side of the spout. Each bag clamp arm is equipped with a rubber bag clamp pad on the surface that will make contact with the bag. Each bag clamp arm is attached to a pneumatic cylinder.

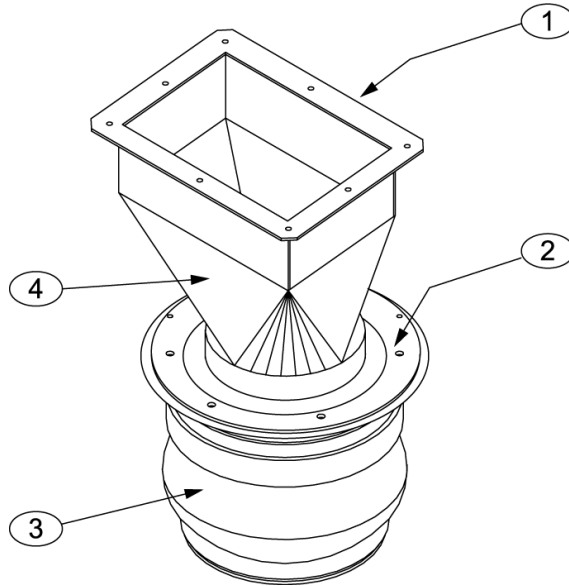


Item #	Description	Item #	Description
1	Spout	5	Bag Clamp Actuator Switch
2	Bag Clamp Pad Arm Mounts	6	Bag Clamp Arms
3	Bag Clamp Cylinder	7	Bag Clamp Pad Arm
4	Bag Clamp Pad Arm	8	Bag Clamp Cylinder

Figure 1-4. Spout with V-type Bag Clamps

1.6.4.2 Inflatable Bag Clamp

The optional inflatable bladder bag clamp uses an inflatable rubber bladder to hold the bag in place during the fill cycle. The operator will place the bag on the spout. Once the bag clamp actuator switch is tripped, compressed air will fill the bladder causing it to expand. The bladder will press outward on the inside of the bag, holding it in place. The air supply line for the inflatable bladder is equipped with a pressure regulator. The regulator should be set so that air pressure in the bladder will not exceed 7 psi (.048 MPa). A blow out switch is used to prevent over inflating the inflatable bladder.



Item #	Description	Item #	Description
1	Transition Mounting Flange	3	Inflatable Bladder
2	Spout Mounting Flange	4	Transition

Figure 1-5. Spout with Inflatable Bladder Bag Clamp

1.6.5 Bag Clamp Actuator Switch

Located on the spout assembly is the bag clamp actuator switch. It is a rotary type switch. A wire bale is attached to the shaft. As the operator's hand comes into contact and lifts the bale, the shaft on the switch rotates, causing the switch to change status and will apply the bag clamps to start the fill cycle.

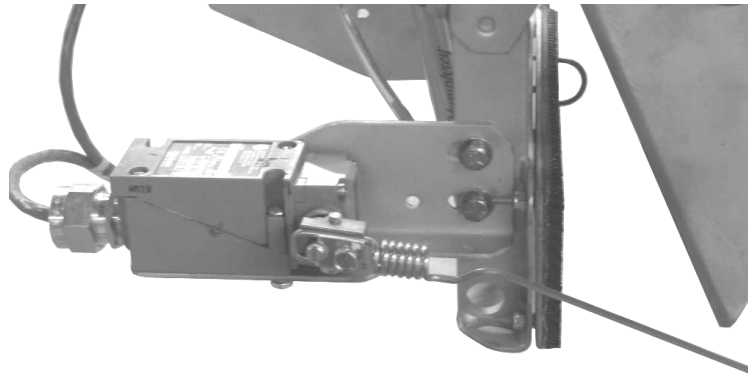


Figure 1-6. Bag Clamp Actuator Switch (V-type Bag Clamp Shown)

1.6.6 Bag In Place Switch

To prevent the fill cycle from starting without a bag being in position to receive the product, the VG Series utilizes a bag in place switch. If the bag clamps apply, and the bag in place switch does not indicate that a bag is in place, a two-second timer will initiate. After the timer has run, the bag clamps will release. This is done to prevent dispensing product when a bag is not properly positioned on the spout.

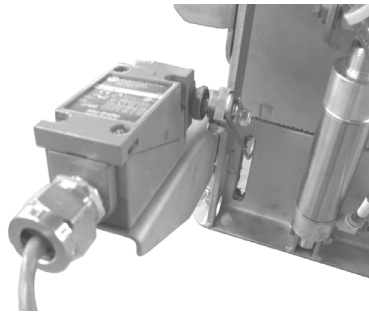


Figure 1-7. Bag In Place Switch

1.6.7 Vibratory Pan Feeder

The VG Series comes standard with a vibratory pan feeder. The vibrator pan feeder uses vibration to move the material from the surge hopper to the spout. On units equipped with a T4000 control panel, the T4000 controls the speed/frequency of the vibrator pan feeder. On units with the T3000 control panel, the PLC and the vibrator control module control the speed/frequency of the vibrator pan feeder.

Important: The factory set angle of the vibrator tray is 6° downward.

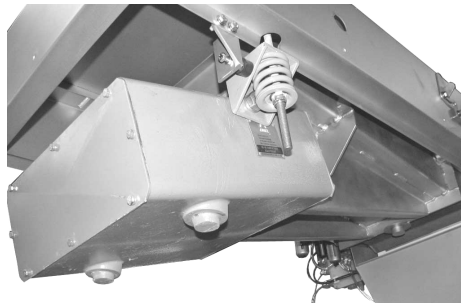


Figure 1-8. Vibratory Feeder Motor

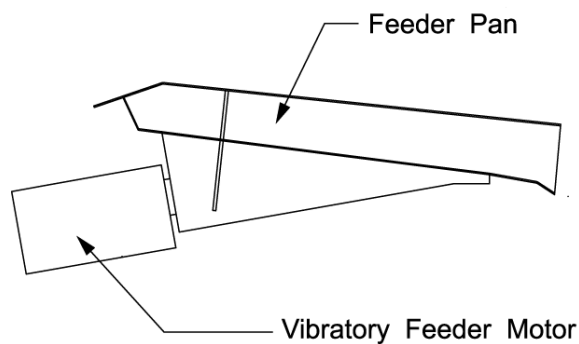


Figure 1-9. Side View of Vibratory Feeder

1.6.8 Load Cells

The spout transition/spout assembly hangs from two load cells that are mounted inside the main cabinet. The load cells are used to sense the weight of the material in the bag. As material is loaded into the bag, the voltage output from each load cell increases. The output from the load cells is supplied to the controller. On VG Series units equipped with T4000 controls, the processor on the Hardy summing board balances the two inputs and uses its internal logic to determine the weight of the product in the bag. It then transmits this single weight to the T4000. On VG Series units equipped with T3000 controls, the controller balances the two inputs and uses its internal logic to determine the weight of the product in the bag.



Figure 1-10. Load Cell (1 of 2 shown)



CAUTION

A sudden jerk or shock, such as being struck by a tool or hitting the spout etc., can cause load cell damage. The load cell is NOT covered by the Magnum Systems warranty.

1.6.9 MAC Valves

The VG Series uses a series of MAC valves to control the flow of air to the different pneumatic components. The MAC valves are pneumatic valves that are controlled by electric solenoids. When power is applied to the solenoid, it causes the valve to change states. The MAC valves are used to control the cutoff gate and bag clamps.

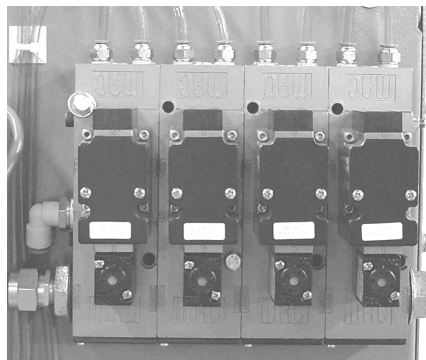


Figure 1-11. MAC Valves

1.6.10 Cutoff Gate

A cutoff gate has been installed on the VG Series. It is used to prevent additional product from falling from the feeder pan once the fill cycle has finished. The cutoff gate is attached to a pneumatic cylinder and a return spring. When the fill cycle ends, the return spring assists in closing the cutoff gate and keeping it closed. A MAC valve is used to direct compressed air to the cylinder to open or close the cutoff gate. The MAC valve is controlled via the PLC.

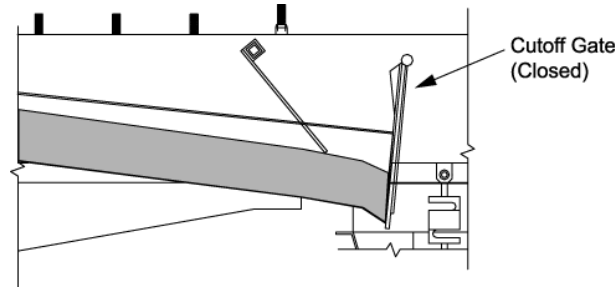


Figure 1-12. Cutoff Gate (Closed)

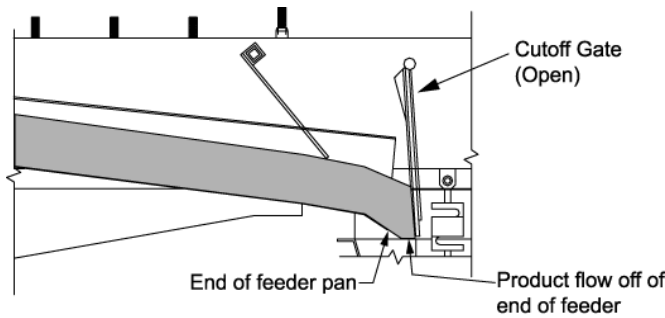


Figure 1-13. Cutoff Gate (Open)

1.6.11 Flow Gate

The VG Series is equipped with a flow gate that is positioned at the approximate mid point of the feeder pan. The flow gate spans the width of the feeder pan and pivots on a shaft in the top of the VG Series cabinet. The operator will adjust the flow gate via a mechanical adjustment on the side of the cabinet. The adjuster is equipped with a lock bolt that prevents movement during normal operation.

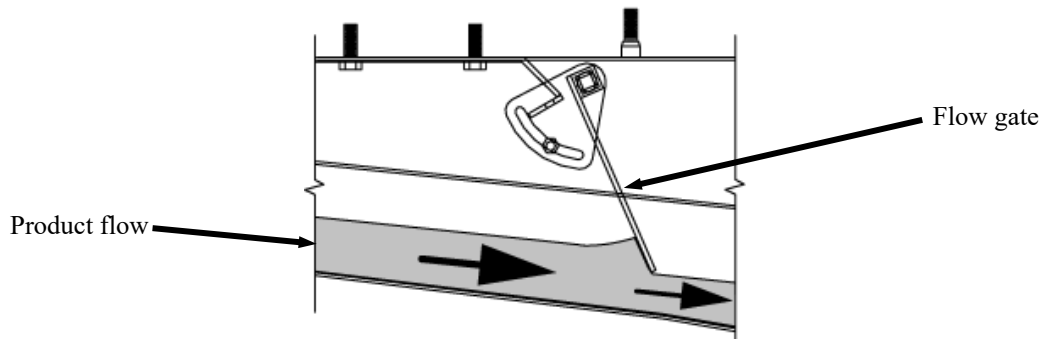


Figure 1-14. Flow Gate

The flow gate is used to adjust the depth of product being fed off of the feeder pan. This adjustment has an effect on the flow rate of the product.

1.6.12 Machine Controls

The VG Series can be equipped with two types of control systems.

- T4000
- T3000

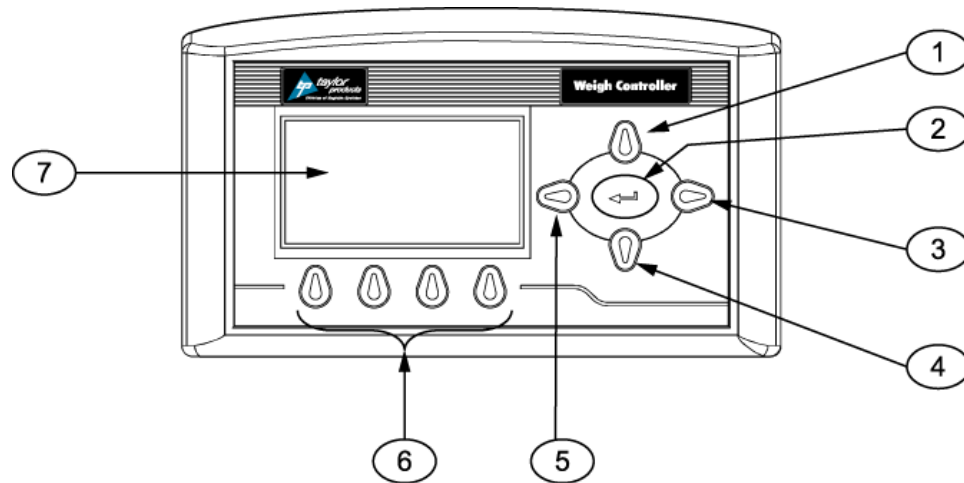
The standard control system is a Magnum Systems/Hardy Instruments T4000 control panel. The T4000 combines a weigh meter and control panel in one. An optional control system utilizes a Magnum Systems/Hardy Instruments T3000 control panel. The T3000 combines the weigh meter and control keys in one unit.

Regardless of the type of control panel that is used, there will be several additional control switches and indicators that will be also be used to control the VG Series.

1.6.12.1 T4000 Control Panel

The T4000 series weigh controller is the standard weigh controller used on the VG Series packaging machine. The T4000 uses different levels of voltage to monitor and control the weighments. The T4000 units are available in either a single set point model or a dual set point model. A single set point unit uses one fill rate. A dual set point unit will use two fill rates, a fast fill rate that is referred to as the bulk rate, and a slower fill rate that is referred to as the dribble rate. The controller is comprised of the following components:

- LCD panel
- Key pad
- Cable
- Electrical enclosure



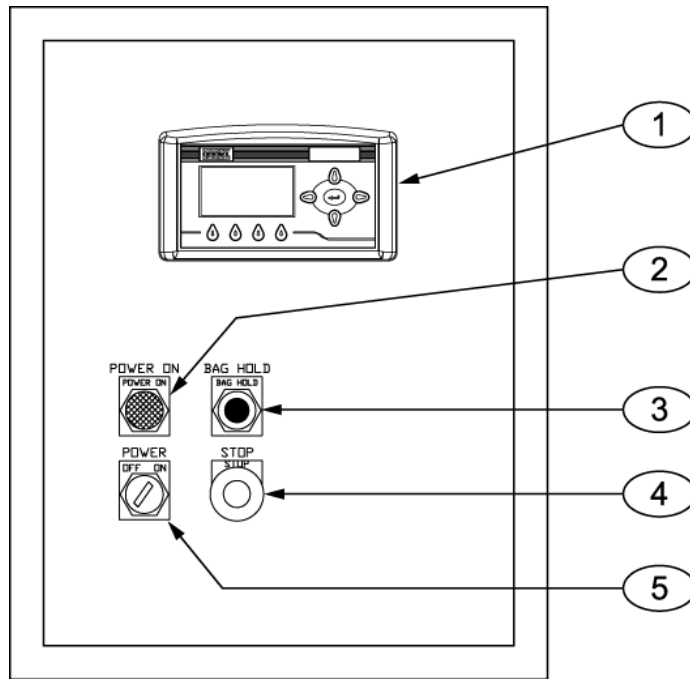
Item #	Description	Item #	Description
1	Control panel	5	Down arrow key
2	Up arrow key	6	Left arrow key
3	Enter key	7	Function keys
4	Right arrow key	8	LCD screen

Figure 1-15. T4000 Faceplate Layout

1.6.12.2 Control Box With T4000 Control Panel

In its standard configuration, the VG Series is equipped with a single control box mounted on the machine that contains the T4000 control panel and some additional control switches and indicators. There is an option where the machine can be ordered with an optional pedestal mounted control panel. The operator controls consist of the following items:

- **T4000 Control Panel** – The T4000 is the primary operator interface to the VG Series. This control panel is used to make operational adjustments to the machines program based on the specific product being packaged.
- **POWER switch** – Located in the lower left hand corner of the control box, the POWER switch is used to control power to all electrical components.
- **POWER indicator** – Located above the POWER switch. This indicator will illuminate to show that power is turned on.
- **BAG HOLD** – Located to the right of the POWER ON indicator. Pressing and holding the button in will force the bag clamps to hold the bag after the fill cycle has completed. This is done so the operator can check the final bag weight.
- **STOP button/indicator** – Located to the right of the POWER switch. The STOP button/indicator will immediately stop the fill cycle when it is pushed in. When pushed in, this button will illuminate red to indicate that the button is pushed and that machine function has been interrupted. The machine will not resume normal function until the button has been pulled back out.



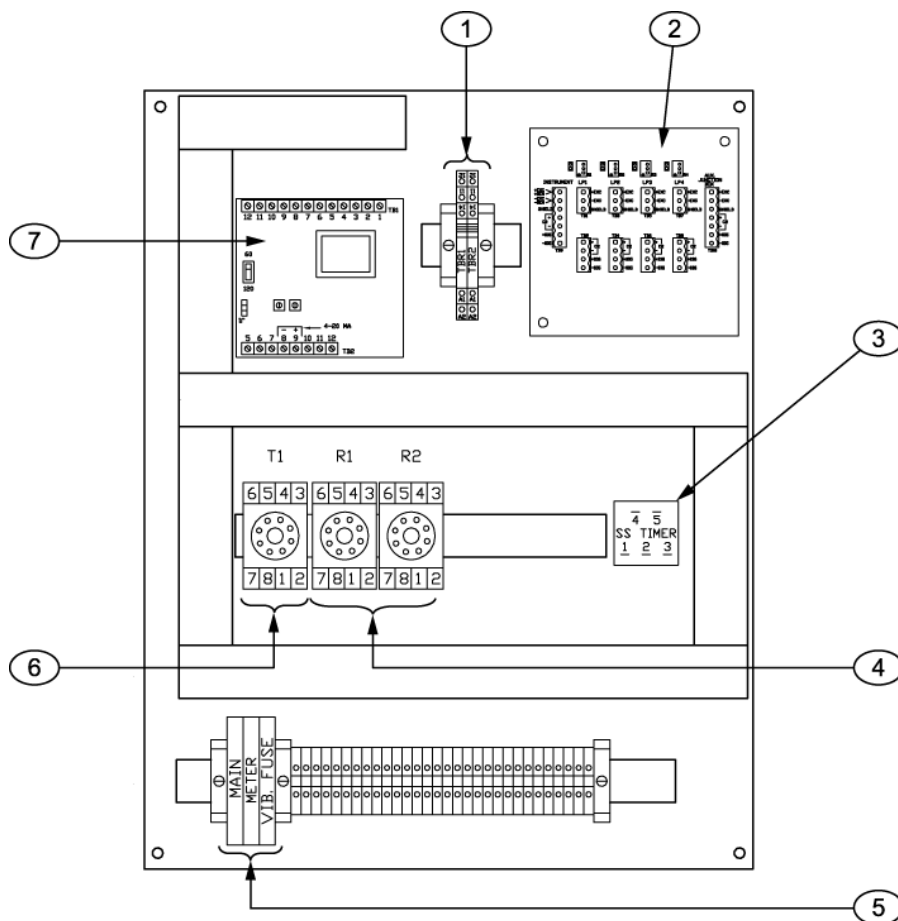
Item #	Description	Item #	Description
1	T4000 control panel	4	STOP button/indicator
2	POWER ON indicator	5	POWER switch
3	BAG HOLD button		

Figure 1-16. Control Panel With T4000 Controls

1.6.12.3 Control Box With T4000 Control Panel, Electronic Control Components

Inside the control box are the components that actually perform the control functions for the machine. These components include the following components:

- **Hardy summing board** – The interface between the load cells and the weigh meter. The processor on the PC board converts the incoming load cell analog signal and sends an output to the weigh meter to display the weight. The PC board is also where calibration procedures will be carried out.
- **Vibrator control module** – This device interfaces with the T4000 and controls the vibrator.
- **Relay bases** – The mounting point for control relays.
- **Fuse holders, fuses, and terminals** – Used to protect the electronic components from over current conditions.



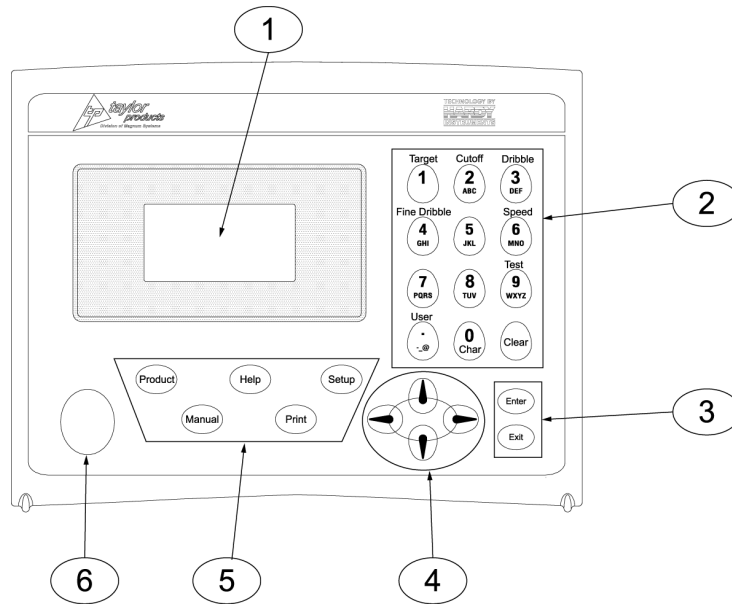
Item #	Description	Item #	Description
1	Terminal relays	5	AC fuses
2	Hardy summing board	6	Relay base
3	Terminal relay	7	Vibrator control module
4	Relay bases		

Figure 1-17. Control Box with T4000, Internal Electronic Control Components

General Description

1.6.12.4 T3000 Control Panel

The VG Series is available with an optional Taylor T3000 control set. The T3000 has the ability for total monitoring and instrument control. This control set allows the operator to monitor and control the VG Series. The T3000 units are available in either a single set point model or a dual set point model. A single set point unit uses one fill rate. A dual set point unit uses two fill rates. A fast rate, called the bulk rate (Fast A), is used from the start of the fill cycle, until the package is approximately 90% full. Once the package has hit the dribble point, the machine will top the bag off at a slower rate, called the dribble rate (Slow A).



Item #	Description	Item #	Description
1	LCD screen	4	Directional arrow keys
2	Alpha-numeric keypad	5	Function keys
3	Enter and Exit keys	6	Infrared port (not used)

Figure 1-18. T3000 Control Panel Faceplate Layout

The T3000 has an operating range of -10°C to 50°C (14°F to 122°F). As temperatures approach the lower end of the operating range, the display will start to look "slow". This is the display that is slowing down. The internal electronics are still operating at their default rates.

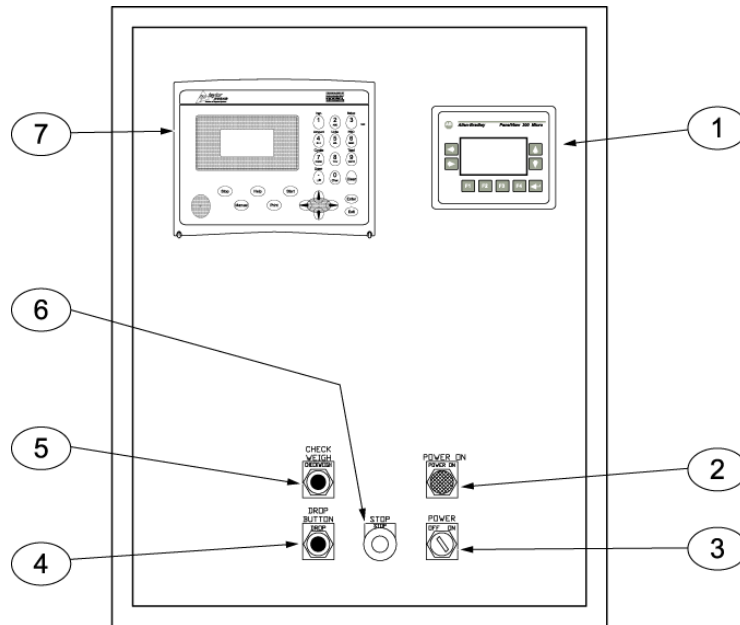
The operator controls consist of the following items:

- T3000 control panel
- KICK/HOLD button
- Power switch
- POWER ON indicator

1.6.12.5 Control Box With T3000 Control Panel

The controls that the operator will use to start, stop, and adjust machine functions are located on the front side of the control box. The operator controls consist of the following items:

- **T3000 control panel** – The T3000 is the primary operator interface to the VG Series. This control panel is used to make operational adjustments to the machine program based on the specific product being packaged.
- **PV300 control panel** – The PV300 control panel is mounted just to the right of the T3000. The PV300 is used to set vibrator feed rates and certain timer functions.
- **POWER ON indicator** – When the POWER switch is turned to the ON position, if the machine is connected to its power source, this indicator will illuminate green.
- **POWER switch** – Used to turn the power to the machine on and off, is located on the lower right corner of the control box and has two positions, OFF and ON.
- **STOP button/indicator** – The STOP button/indicator will immediately stop the fill cycle when it is pushed in. When pushed in, this button will illuminate red to indicate that the button is pushed and that machine function has been interrupted. The machine will not resume normal function until the button has been pulled back out.
- **MANUAL DROP button** – This is an optional feature. When equipped, pressing this button will allow the operator to manually release the bag clamps and drop the bag.
- **CHECKWEIGH button** – Pressing the CHECKWEIGH button will result in the current bag weight being displayed on the weigh meter.



Item #	Description	Item #	Description
1	PV300 control panel	5	Checkweigh
2	POWER indicator	6	STOP button/indicator
3	POWER switch	7	T3000 control panel
4	DROP button		

Figure 1-19. T3000 Control Panel

1.6.12.6 Control Box With T3000 Control Panel, Electronic Control Components

Inside the control box are the components that actually perform the control functions for the machine. These components include the following components:

- **T3000 interface board** – Used to as an analog to digital converter. It converts the analog signal from the load cells into a digital signal that the T3000 can use.
- **Power supply** – This power supply converts the incoming 115 VAC power to 24 VDC power that can be used by the Allen-Bradley PV300 control panel.
- **PLC** – allows the operator to precisely control system devices. The primary function of the PLC is timer control.
- **Relay boards** – The mounting point for control relays.
- **Fuse holders, fuses, and terminals** – Used to protect the electronic components from over current conditions.

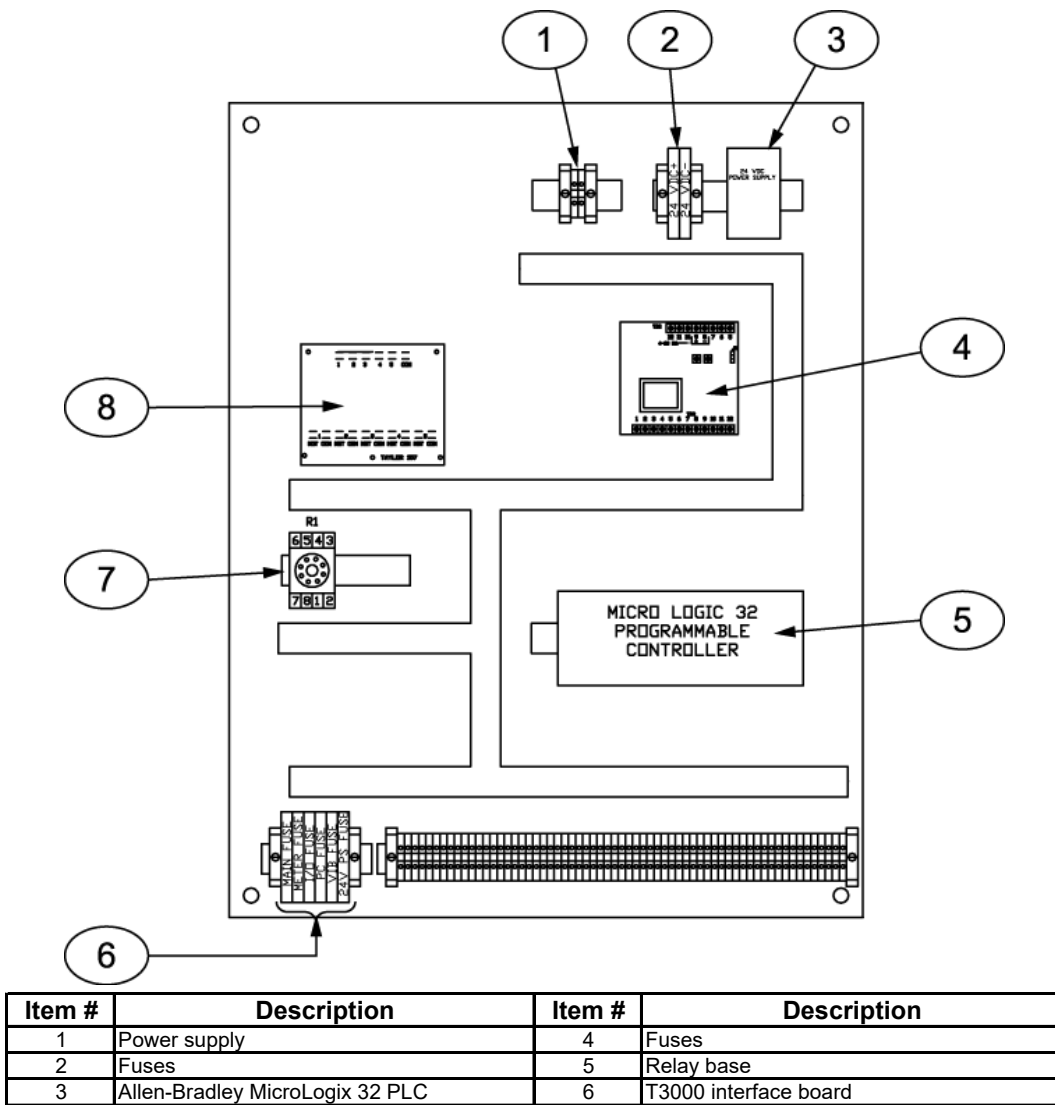


Figure 1-20. Optional T3000 Electronic Control Components

Chapter 2

Receiving Equipment

2.1 General Description

The VG Series and all of its components are thoroughly inspected before shipment. Upon receipt of the equipment, it is important that the machine be carefully inspected for shipping damage. In the event that damage is found, contact the shipping company and follow their process for reporting shipping damage.

2.2 Uncrating the Equipment

The VG Series is shipped in a shell crate to protect it during shipment. Follow the procedure below to unpack the equipment and prepare it for installation.

1. Before removing VG Series from the shipping pallet, inspect VG Series for visible damage. Inspect for damaged or missing parts. If there is damage, notify the shipper immediately. If the unit is not damaged, proceed to the next step.
2. Remove the shell crate. Use care when unpacking the VG Series to avoid damage to any hinged parts and external control knobs.



Figure 2-1. Typical Shell Crate

3. Carefully cut the plastic shrink-wrap that is wrapped around the VG Series away and remove it.
4. Remove lag bolts from mainframe at pallet.
5. Grasp unit by the base frame to handle.
6. Remove all crating and discard.

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Chapter 3

Setup/Installation

3.1 General Description

Only persons who have been properly trained and hold the appropriate qualifications should attempt to install, operate, or maintain this equipment.



WARNING

Before installing, adjusting, or servicing any electrical component, be sure to become familiar with the electrical schematics for the machine.



WARNING

Before installing, adjusting, or servicing any pneumatic component, be sure to become familiar with the pneumatic schematics for the machine.

3.2 Mechanical Setup

Use the following procedures to assemble the VG Series and prepare it for operation.

3.2.1 Determining The Height Of The VG Series Feeder System

When determining the height of the VG Series feeder system, the spout should be positioned at a comfortable working height. Care must be taken to include allowances for any conveyor systems, the height of the longest bags that the unit will fill, and any other factors that may affect working conditions.

$$\begin{array}{l} \text{Longest} \\ \text{Package} \\ \text{Length} \end{array} + \begin{array}{l} \text{Conveyor} \\ \text{Height} \end{array} + 2 \text{ inches} = \text{Fill Height}$$

Figure 3-1. Calculating the Fill Height of the VG Series

3.2.2 Determining Supply Hopper Size

The hopper that will be feeding the VG Series should be a minimum of 30 cubic feet. The sides of the hopper should be at a sufficient angle to allow the product to flow into the top of the feeder and not have a column that is greater than 18”.

3.2.3 Mounting the VG Series

When mounting the VG Series, it should be suspended from a sturdy product hopper, or from framework that will support it without movement or vibration. The hopper flange should have a 12” X 12” opening. The mounting holes should be 5/8”. There should be 12 mounting holes spaced on 5” centers. Additional supports should be installed on the 4 corner holes. These holes are threaded 5/8”-11, on 21 1/2” X 62” centers. The VG Series requires an area that is approximately 10’ x 10’ in size. Complete any nearby construction before installing the VG Series.

Important: *The factory set angle of the vibrator tray is 6° downward.*

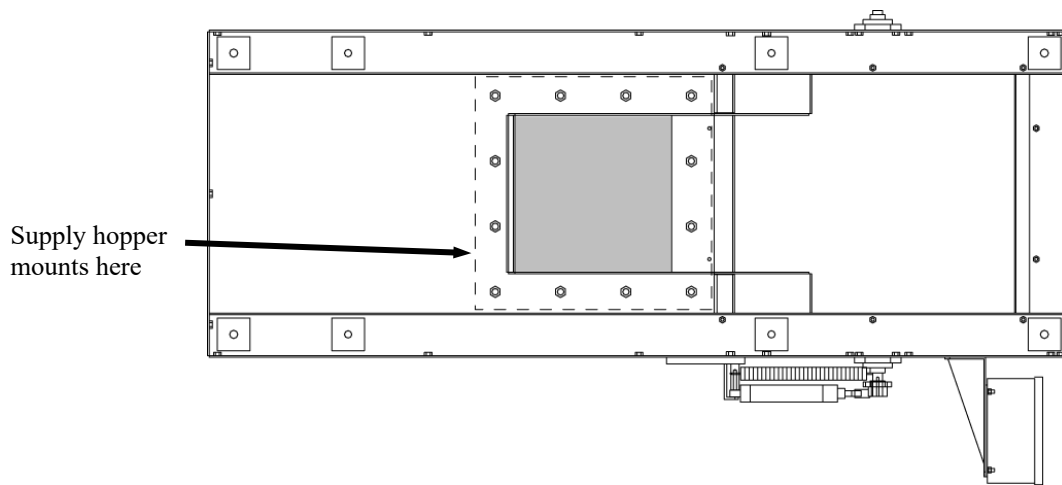


Figure 3-2. Supply Hopper Mounting Surface – Top View of VG Series

1. The VG Series should be suspended from a sturdy product hopper or framework, that is capable of supporting it without allowing it to move, or allowing vibration to interfere with its operation. The VG Series has four mounting bolts, one for each corner of the machine.

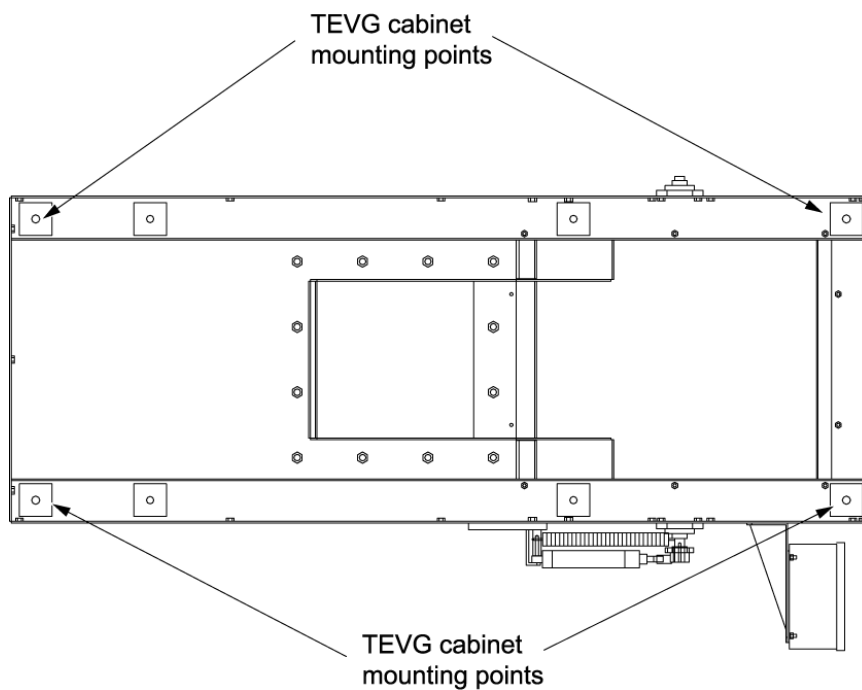


Figure 3-3. VG Series Cabinet Mounting Points

2. Lift the VG Series into position. Install and tighten the mounting hardware (bolts, washers, and nuts).
3. Loosen the four shipping nuts fully.

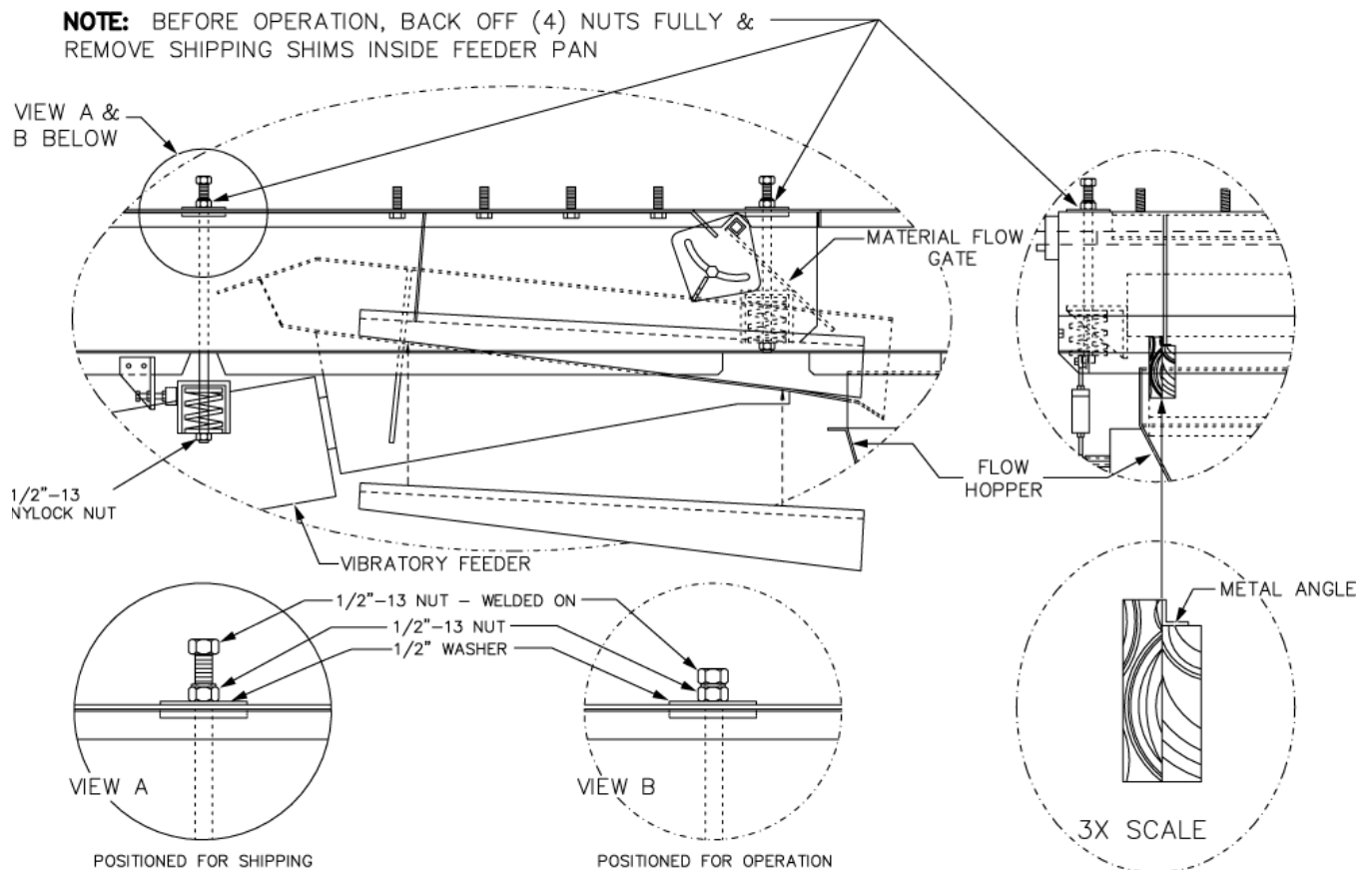


Figure 3-4. Shipping Nuts/Shims

4. Remove the shipping shims inside the feeder pan.
5. Connect the plant air supply line to the FRL. Refer to 3.4 Making Pneumatic Connections.
6. Connect the main electrical connections to plant supplied power receptacles. Refer to 3.3 Making Electrical Connections.
7. Install the spout. Refer to 7.3.1 Spout Replacement.

3.3 Making Electrical Connections

Before connecting the VG Series to the electrical supply, it is vital that the unit be properly grounded. The recommended method is to plug the power cord into an earth grounded receptacle.

The VG Series is designed to operate on 115 VAC at 50 or 60 Hz. The VG Series is equipped with two power cords. One is connected to the control panel for the vibratory feeder, while the other is connected to the control panel that contains the weigh meter. The power receptacles should be placed within 6 feet of the VG Series.

Important: Refer to the electrical diagrams for the specific machine being worked on for proper line and breaker sizing.

3.4 Making Pneumatic Connections

The VG Series uses approximately 1 CFM (28 liters) @ 80-100 PSI (.55-.69 MPa) of compressed air. Magnum Systems recommends that the air supply line be equipped with a refrigerated air dryer, or at the very least a water separator.

3.4.1 Lubrication Requirements

The pneumatic cylinders require lubrication to ensure their proper operation and to extend their useful life. The lubricator should be filled with 10 weight, non-detergent oil.

The oil flow control knob, located on top of the lubricator, should be set so that the lubricator is delivering 1 drop of oil for every 30 bags that are filled.

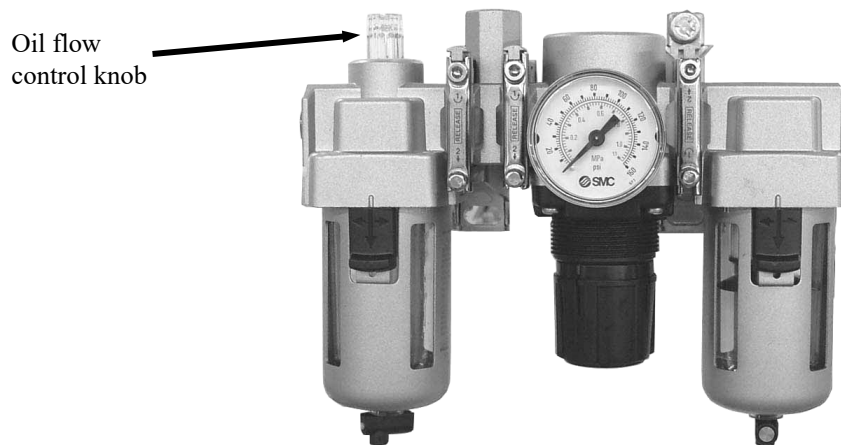


Figure 3-5. Lubricator – Oil Flow Control

Use caution when setting the flow control on top of the lubricator. While too little oil can cause operational problems, so can too much oil. If the oil control is set too high, it may result in gummed up solenoid valves and cylinders.

3.5 Making Network Connections

VG Series units that are equipped with the optional T3000 control panel have the ability for total monitoring and instrument control via the built in communication connectivity of the T3000. The T3000 has the following network capabilities:

- DeviceNet
- HardyLink Ethernet
- IR Port
- RS-232 Simplex Serial Port
- Remote I/O (RIO) (optional)
- ControlNet (optional)
- Profibus I/O (optional)
- Modbus over TCP/IP (optional)
- OLE Process Control (OPC) (optional)

3.6 Establishing Security Settings

On all VG Series packaging machines, the manager has the ability to control who does and who does not have the ability to change system and calibration settings. The process for setting security varies, based on the type of controller used.

3.6.1 Establishing T4000 Security Settings

The Security parameters allow management to place security on the instrument and any menu or sub-menu requiring a password before enabling any changes. The Change Security parameter enables all persons to see the security status for a given menu, and selected persons to change that security status for any menu.

1. From the Standby screen, press the function key that is below the word MENUS.

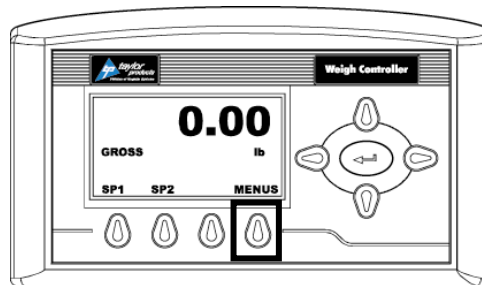


Figure 3-6. Press the Function Key Under MENUS

2. From the Configuration menu press the down arrow until the cursor is in front of Security.

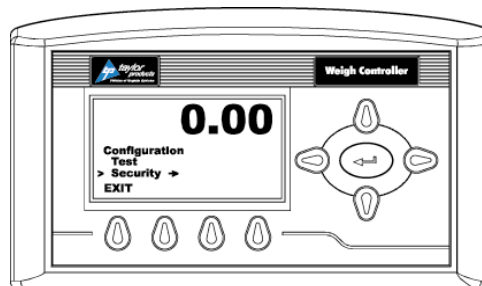


Figure 3-7. Placing The Cursor In Front Of Security

3. Press the Enter key. The Security menu appears.
4. Set the Password Parameter. The Set Password parameter enables the operator to create a password for entry to secure menus and sub-menus. If the password is 0 there is no security. If the password is anything other than 0 the security is enabled.

Note: It is recommended that the passwords be created before setting security on the various menus.

5. Press the down arrow button until the cursor is in front of Set Password.

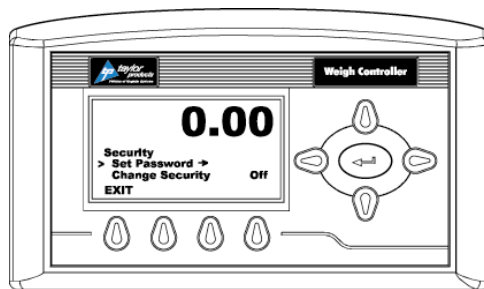


Figure 3-8. Placing The Cursor In Front Of Set Password

6. If the password is being set for the first time or if the factory defaults have been reset in the Test menu, enter the default password “2205”. If the password is being reset, and the existing password is known, enter that number. Press the Enter button. The Verify Password display appears.
7. Press the enter button. If the password is correct a brief message “Entry Accepted” appears and the Set Password display with the current password appears.

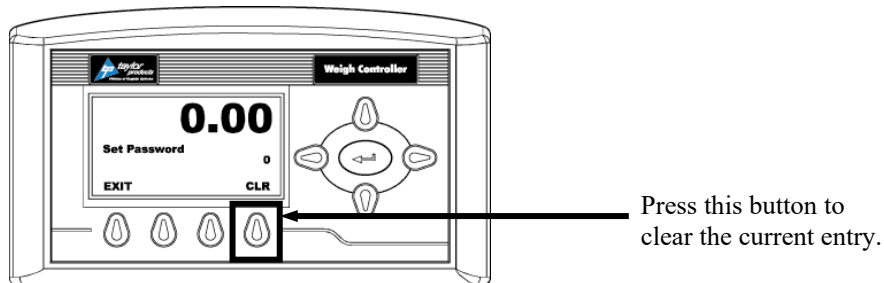


Figure 3-9. Set Password Menu

8. Press the function button located directly below the CLR item on the display to clear the entry. Use the left or right arrow buttons to move the cursor left and right. Use the up or down arrow buttons to enter the password number. To delete a single entry, press the left arrow button. In the example below, “123” was entered.

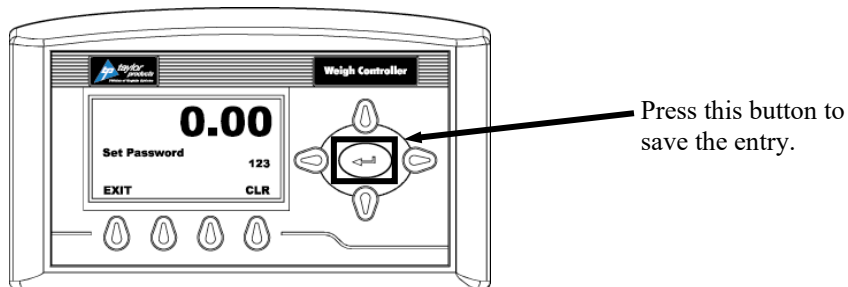


Figure 3-10. Password Set To 123

9. Press the right or left arrow buttons to toggle Change Security On. The Verify Password display appears.

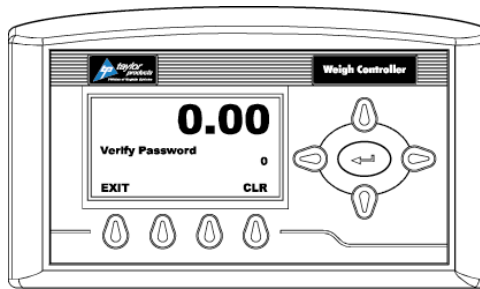


Figure 3-11. Verify Password

- Use the left or right arrow buttons to move the cursor left and right. Use the up or down arrow buttons to enter the password number.

Important: When entering the password, the last digit is entered first, then the next digit to the left and so on. For example, if the password is set to 123, then 3 is entered first, then the 2, and the 1 is entered last.

- Press the Enter button. The Change Security status changes to On. In this instance we turned Change Security ON because we want to change the security of a sub-menu.
- Now that the Change Security On feature has been turned on, press the function key below the word EXIT on the display to return to the Configuration menu.
- Use the up or down arrow buttons to go to the desired sub-menu to be secured. In the example below, the Decimal Point sub-menu has been selected. Notice that the display now includes a SECUR menu item above the function keys.

Note: Steps 8-12 will need to be repeated to lock and unlock a parameter.

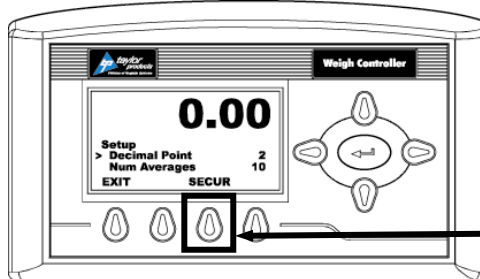


Figure 3-12. SECUR Menu Item Shown Above Function Key

- Press the function key that is positioned below the SECUR item on the display, to view and/or change the security status of this parameter.
- Press the right arrow button to changed to LOCKED thereby securing this sub-menu.

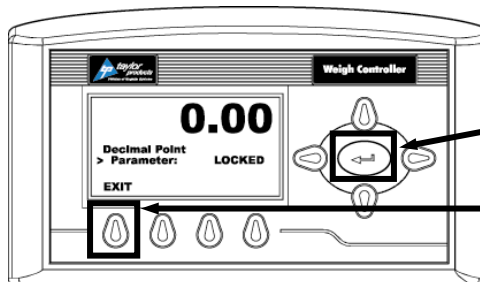


Figure 3-13. Parameter Shown Locked

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16. Press the Enter button to save the entry.
17. Press the function button below EXIT on the screen until the summary display is shown.
Note: To check to see if the security is set on a specific sub-menu, press the EXIT button until the summary display appears. Then re-enter the menus and try to change the secure parameters.
18. Until security has been changed, changing this parameter will require a password (other than 0) to be entered.
19. To turn the Change Security OFF, go back to the Security menu and repeat steps 1-7.

3.6.2 Establishing T3000 Security Settings

On VG Series machines that are equipped with the optional T3000 control panel, the manager has the ability to control who does and who does not have the ability to change system and calibration settings. There are three levels of system security:

- Low – No password required
- Medium – A password is required to access some, but not all of the top level menus
- High – A password is required to access all top-level menus.

Additionally, the manager also has the ability to assign different levels of security to individual menus. The menus where this applies are:

- Adjust Ingredient
- Setup
- Calibration
- Options
- I/O Mapping

If a menu has a security setting of Medium or High, the users' access will be read-only, unless they enter the correct password.

The typical method for setting security settings on the T3000 is via the control panel. Follow the steps below to set security.

1. Press the User shortcut key. Enter the User ID and high-level password.
2. From the Standby display, press the Setup key. The Configuration Menu will appear.
3. Use the up/down arrows to position the cursor in front of SECURITY. Press the Enter key.
4. The SECURITY MENU will appear. The cursor will be in front of SET SECURITY MENU selection. Press the Enter key.
5. The SET SECURITY MENU will appear. The Top-Level Menus will be listed with the security level set at the default LOW setting.
6. Press the up/down arrow keys to position the cursor in front of the desired menu selection.
7. Press the left/right arrow keys to change the security setting for that menu item.
8. Once the desired security level is displayed, press the Enter key to set the entry.
9. If other menus require an adjustment to its security setting, repeat steps 5 through 7.
10. When all security setting adjustments have been completed, press the Exit key to return to the Standby display.

3.7 Dry Cycle

Once all electrical/pneumatic connections have been made, the operator should dry cycle the machine without product to test the control components. If all components operate properly, the machine is ready to calibrate.

***Note:** The pneumatic cylinders may be tested manually by pressing the test keys on their respective MAC valves.*

1. Press the STOP button in.
2. Turn the power switch on the control panel to the ON position.
3. Make sure that the air pressure on the FRL is set to specification.
4. Pull the STOP button out.
5. Place an empty bag on the spout.
6. The operator needs to trip the bag clamp actuator switch with their hand. The bag clamp will apply and the vibrator cutoff gate will open.

***Important:** Once the bag clamps actuate, if the bag in place switch is not “made”, the bag clamps will release after a 2 second delay. This means that the bag must be properly positioned and that the bag in place switch must be properly adjusted.*

7. Push the STOP button in. The vibrator cutoff gate will close. On machines that do not have a MANUAL DROP button, the bag clamps will release after the bag drop delay timer runs.
8. For machines equipped with a MANUAL DROP button, press the MANUAL DROP button to release the bag from the spout.

3.8 Calibration

Each VG Series is calibrated prior to leaving the factory. However, the unit should be reassessed before first use of the unit. It is recommended that the calibration of the unit should be checked every week. A certified test weight must be used to check the calibration of the VG Series.

3.8.1 Pre-Calibration Mechanical Checks

1. Check to determine if the load cells have been installed properly.
 - a. Refer to the operation and maintenance manual for the machine being worked on for proper installation instructions.
 - b. On some load cells there is an arrow that indicates the direction of the applied load. If the arrow is pointing in the wrong direction, change the position of the load cell so that it is mounted in the direction of the applied load.
2. Check for Binding on the load cell or other parts of the system.



CAUTION

Binding on a scale/vessel or load cell does not allow the load cell free vertical movement and may prevent the instrument from returning to the original zero reference point.

- a. The load cell must be mounted so that 100% of the load (vessel + contents) is applied vertically to the load cell.

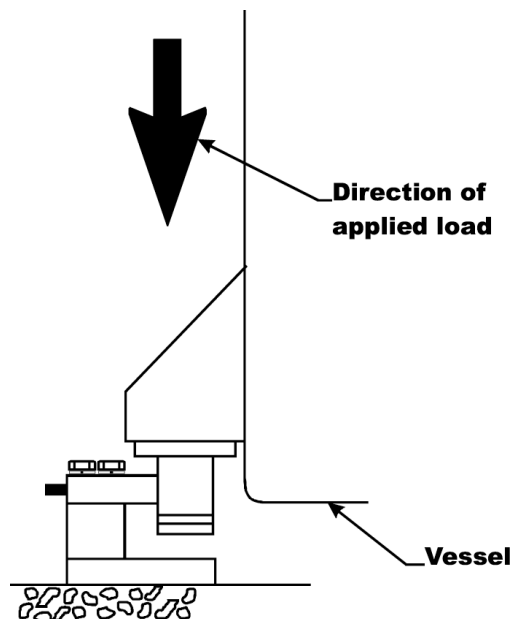


Figure 3-14. Load Passing Through Load Cell

- b. Do a visual check to see that nothing is binding the load cell or other parts of the weighing system. Make sure that nothing is draped over the scale/vessel or the load cell, such as a hose, electrical cord, tubes, or other objects.
3. Check to see that nothing comes in contact with the scale/vessel other than service wires and piping that have been properly mounted with flexible connectors.

4. Check to see that there is power to the control panel.
 - a. If there is power to the controller, the front panel display should be illuminated.
 - b. If the display appears and a weight value is being displayed, the unit is ready for calibration.
5. Allow the instrument to warm up for about 15 minutes before doing the calibration procedures.
6. Put a load (weight) on the scale or vessel. For a full load test, the operator can put 80 – 100% of the expected weight for their process on the scale or vessel.
7. Check to see if the weight reading changes on the display in the proper direction.
 - a. For example, if the display reads 100 lbs and a 20 lb load is placed on the vessel or scale, the display should read 120 or some value over 100.
 - b. If the display reads 80 lbs and a 20 lb load is placed on the vessel or scaled, the reading is going in the wrong direction and indicates some problem with the system.
 - c. If the display is reading improperly or shows no change there is something wrong with the configuration or the load cells.
8. If the display changes in the proper direction, remove the weight and proceed to calibrate the Weigh Controller.

Note: When calibrating the control panel for the first time, go from one sub-menu to the next in sequence.

Note: The settings provide below are just an example. The actual settings used will vary based on the specific application.

3.8.2 Calibrating the T4000 Control Panel

1. Make sure the T4000 has been configured for the intended application. This includes setting the units, decimal point, scale capacity, averages, etc.
2. From the Summary display press the enter key. The Configuration menu appears.
3. Press the down arrow key until the cursor is in front of Calibration.
4. Press the Enter key. The Calibration menu appears.
5. Traditional Calibration is the method of calibration that uses test weights. Magnum Systems recommends that the test weights total 80 – 100% of the desired package weight, and that the weight be distributed uniformly on/in the scale.
6. From the Summary display, press the Enter key. The Configuration menu appears.
7. Press the down arrow key until the cursor is in front of the Calibration line.

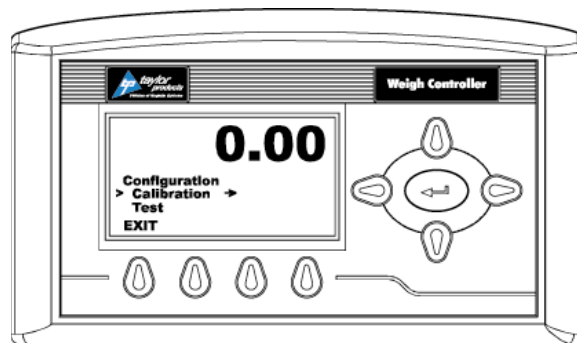


Figure 3-15. Placing the Cursor In Front Of Calibration

Setup/Installation

8. Press the enter key. The Calibration menu appears.
9. Press the down arrow key until the cursor is in front of Trad Cal.

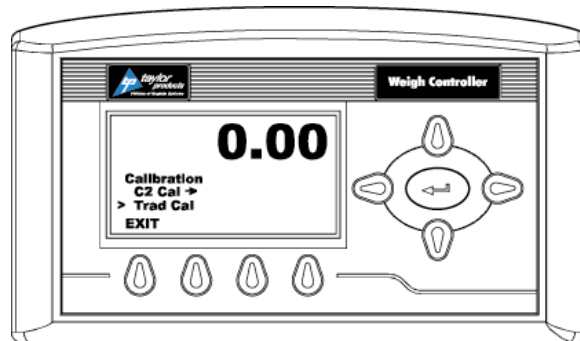


Figure 3-16. Placing The Cursor In Front Of Trad Cal

10. Press the enter key. The Trad Cal menu appears.

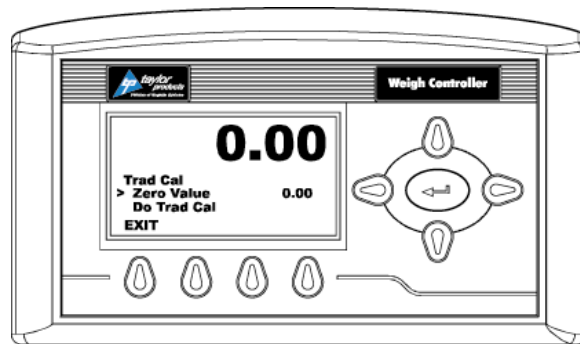


Figure 3-17. Placing The Cursor In Front Of Zero Value

11. Press the Enter key. The Zero Value weight menu appears.
12. Traditional Calibration requires a zero point and the physical placement of test weights on the scale. To set the Zero Value Weight:
 - a. Remove all weight “live load” from the Scale. The Zero Value should be 0.0.



CAUTION The scale MUST be empty.

- b. Wait 12 seconds or more.
13. Use the left and right arrow keys to position the cursor. Use the up or down arrow keys to enter the Zero Value for this instrument.

Note: Most applications will set the Zero Value to 0.00.

14. Press the Enter key to save the entry.
15. Press the down arrow key until the cursor is in front of Do Trad Cal (Zero).

16. Press the Enter key to Do Trad Cal (Zero).
 - a. A “Cal Completed OK” message appears briefly if the calibration was successful.
 - b. If an error message appears, the calibration was not successful. A list of possible error messages is provided with the troubleshooting information in this manual. Refer to 6.4.1 T4000 Alarms, for more information.
17. Press the down arrow key until the cursor is in front of Span Value.
18. Press the enter key. The Span Weight menu appears. The last Span Weight is displayed.

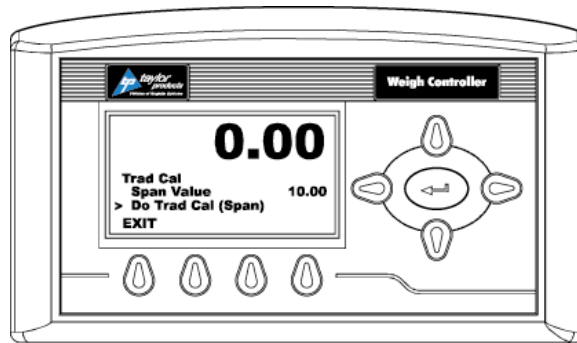


Figure 3-18. Span Value Displayed

19. To set the Span Weight:
 - a. Place a certified test weight on the scale.
 - b. Use the left and right arrows to position the cursor and the up or down arrows to enter the value of the test weight. If a 10 lb. weight is used, enter 10.00.
 - c. Press the Enter key to save the entry.
20. Press the down arrow key until the cursor is in front of Do Trad Cal (Span).
21. Press the Enter key to Do Trad Cal (Span).
 - a. A “Cal Completed OK” message appears briefly if the calibration was successful.
 - b. If an error message appears, the calibration was not successful. A list of possible error messages is provided with the troubleshooting information later in this manual. Refer to 6.4.1 T4000 Alarms, for more information.
22. The scale is now calibrated.

3.8.3 Calibrating the T3000 Control Panel

The Calibration Menu is used to calibrate the weighing system of the T3000. Before beginning the calibration procedure, be sure that the machine is ready to be calibrated. Make sure that the load points have been installed properly. Follow the steps below to make sure the VG Series is ready for calibration:

1. Make sure the load system is free of binding and that nothing is draped over the equipment, such as hoses, electrical cords, tubes, etc.
2. Verify that the load cell is mounted so that 100% of the load always passes vertically through the load cell at the same point.
3. Check all communication and power cables to be sure they are securely fastened to their connectors on the rear of the control panel.
4. Make sure that power is supplied to the controller. The panel display should illuminate.

Important: The operator **MUST** log in with the proper security level to initiate calibration. Once logged in, an access timer will run. If the timer expires (typically about 5 minutes), the operator will be logged out. The operator will have to log in again to regain access.

When the operator selects CALIBRATION from the Configuration Menu, the CALIBRATION screen appears. There is one line on that screen, it is the Cal Type line. The currently selected method of calibration will appear at the far right on the Cal Type line. Use the left/right arrow keys to toggle to until TRAD is displayed on the line. Press the Enter key to access the screen for the TRAD calibration method.

The TRAD calibration screen will provide the following lines for the operator.

- Zero Value – This value should be set to zero.
- Zero Ct – This parameter is controlled by the controller.
- Do Trad. Cal (Zero) – Start the calibration procedure.
- Span Value – The amount of weight being used for calibration.
- Span Ct – This parameter is controlled by the controller.
- Do Trad. Cal (Span) – Start the calibration procedure.

Use this procedure to calibrate a machine with traditional load cells.

1. Turn on the meter.
2. Press the User shortcut key. Enter the User ID and medium or high-level password.
3. Press the Setup key to access the CONFIGURATION MENU.
4. Use the up/down arrow keys to scroll to the CALIBRATION line. Press the Enter key to access CALIBRATION.

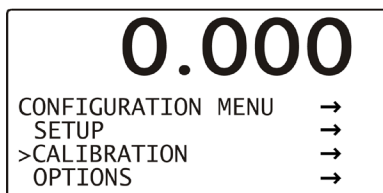


Figure 3-19. Calibration Line

- Use the left/right arrow keys to toggle to the TRAD selection if it is not already displayed. Press the Enter key.

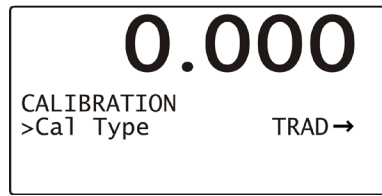


Figure 3-20. Selecting TRAD Calibration

- A Function OK message will flash briefly in place of the Cal Type line, then the TRADITIONAL CAL screen will appear. Check the display to make sure that the Zero Value reads 0.0.

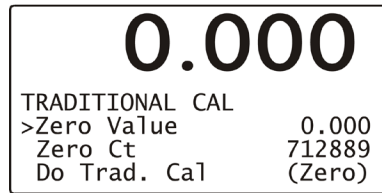


Figure 3-21. Checking Zero Value

- Use the up/down arrow keys to scroll to the Do Trad. Cal (Zero). Press the Enter key. The weight display will display !Calibration in Progress! and will return to its calibration screen.
- Use the up/down arrow keys to scroll to the Span Value selection and use the alphanumeric keypad to enter the weight that will be used for calibration. Press the Enter key.

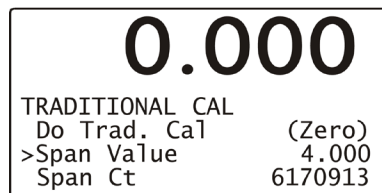


Figure 3-22. Setting Span Value

- Use the up/down arrow keys to scroll down to the Do Trad. Cal (Span). Place the calibration weight on the scale by hanging it on the fill spout directly under the bag clamp cylinder. Press the Enter key. The weight display will display !Calibration in Progress! and will then return to its calibration screen. Press the Exit key three times to return to the main screen.

3.9 Timer Programming

All models of the VG Series utilize timers to allow them to function correctly. These timers are adjustable. The VG Series machines come standard with plugin style block timers. The machines are also available with an optional PLC that performs these functions.

3.9.1 Plugin Style Block Timers

The standard timer used on the VG Series machine is a plugin style block timer. These timers are adjusted using a set of switches. The timer mechanism is located inside the control box.

The timer is equipped with 10 dipswitches. The switches are either ON or OFF. To calculate the amount of delay that is currently set, the operator will need to add the value of all of the switches that are in the ON position. Each switch has a specific amount of delay that it controls. The amount of each delay is different. The top dipswitch controls the shortest amount of delay, and the bottom dipswitch controls the largest amount of delay. The amount of delay that is set can be calculated by adding the value of each switch that is turned on.

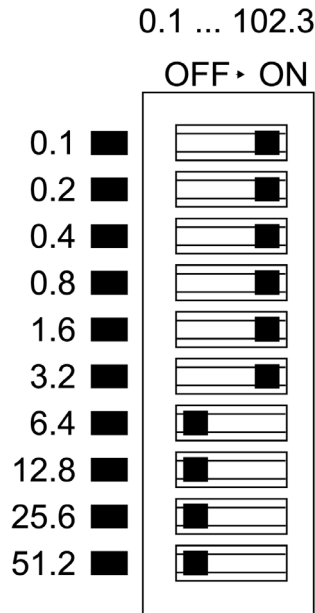


Figure 3-23. Plugin Style Block Timer Switches

In the graphic shown above, the delay is set to 6.3 seconds. If the switch for position 3.2 were switched to the OFF position, the amount of delay would be 3.1 seconds.

3.9.2 PLC Timers

For machines equipped with the Allen-Bradley MicroLogix™ 1000 Programmable Logic Controller (PLC), all timer functions will be performed by the PLC. The PLC is mounted inside the control box and is connected to multiple electrical components. Components that are connected to the Input side of the PLC are components that are being monitored by the PLC. Components that are connected to the Output side of the PLC are components that are being controlled by the PLC.

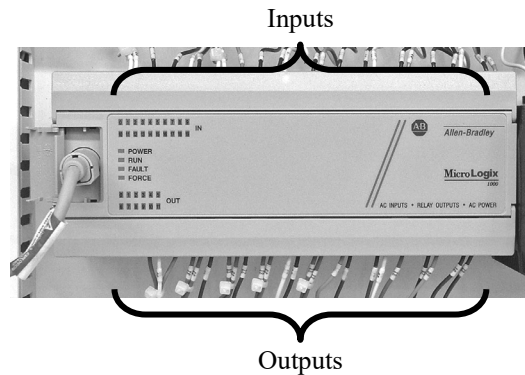


Figure 3-24. Programmable Logic Controller (PLC)

The operator adjusts the timer settings via the Allen-Bradley PV300 control panel that is connected to the PLC. The PV300 is mounted in the control box door, just to the right of the T3000. The PLC is mounted inside the control box. Refer to 4.4.4.1 PV300 Menus for information on timer adjustments.

- **Bag Not On Delay** – The amount of delay after that bag is clamped to when it is released, in the event that the bag in place switch has not been made. The factory default setting is 2 seconds.
- **Drop Delay** – The amount of time that will elapse from when the vibrator stops until the bag clamps drop the filled bag. Set this so that the bag drops just after the last of the product enters the bag.
- **Auto Zero Delay** – The amount of time from when the start switch is made until the fill cycle begins. This delay gives the unit time to stop motion, so an accurate zero can be performed. This setting should be tuned so the AutoZero occurs just as the motion stops. If auto zero is not being used, set it to zero to ensure the fastest fill.

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Chapter 4 Operation

4.1 General Description

This chapter will provide detailed descriptions of the operational controls of the VG Series.

4.2 General Fill Cycle Information

A dual set point unit has two fill rates, bulk rate and dribble rate. Bulk rate is a faster rate that is used to fill the bag quickly, once the bag achieves the SP1 weight, the dribble gate cylinders will be extended to slow the fill rate to dribble. Once the bag achieves the SP2 weight, then the cutoff gate will close and the vibrator will stop. Once the product that is in free fall settles into the bag, the bag weight should match the target weight.

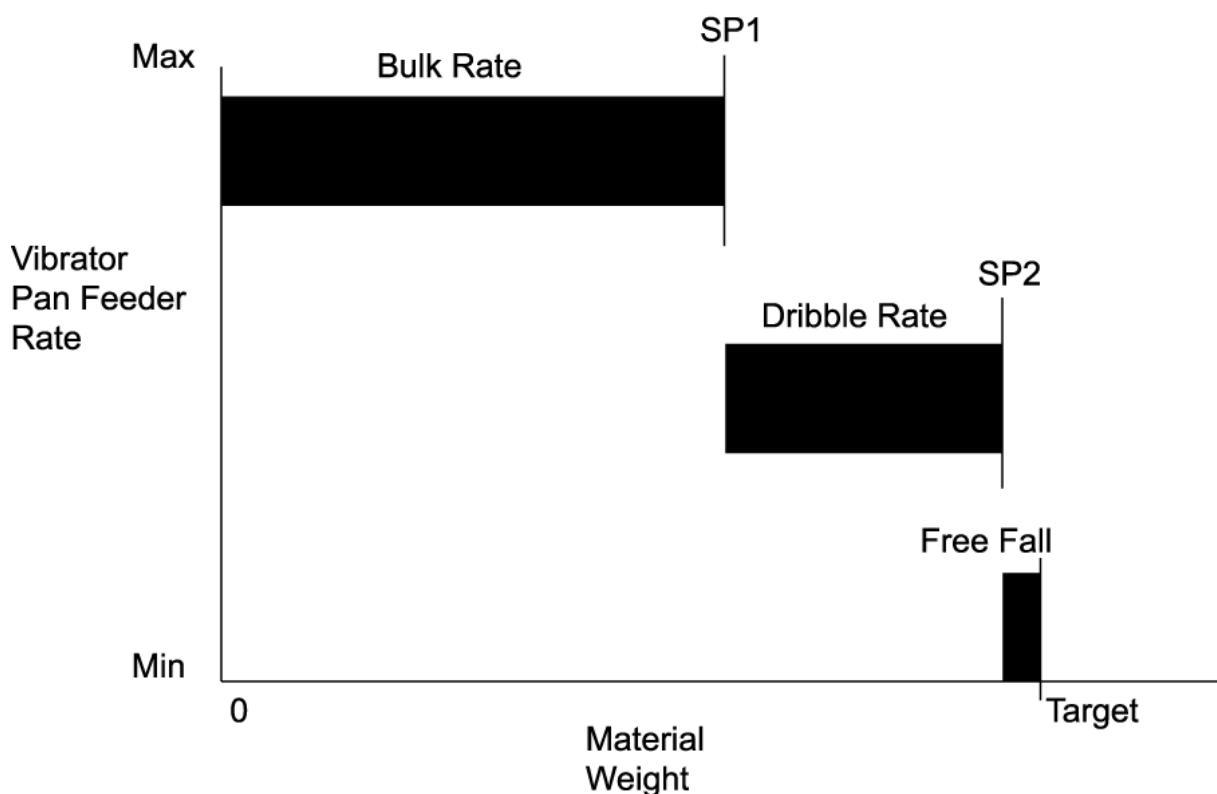


Figure 4-1. Fill Rates

4.2.1 Basic Fill Process

The VG Series will clamp the bag and hold it in place, fill it rapidly, check its weight, and drop the filled bag automatically. The bag clamp jaws are designed to be compatible with most automatic bag hangers to allow for a fully automatic system if desired.

The VG Series machines have a unique feature to prevent the operator releasing a package that is either underweight or overweight. On machines with the T4000 control panel, this feature is the Target Min/Max menu option. When equipped with the T3000 control panel, a unique over/under reject feature is available. This feature is referred to as the Target window. The operator uses the T3000 menu system to manually set the upper and lower limits of the acceptable target window. For example, if the desired bag weight is 50 lbs, and the acceptable tolerance is 0.4 lbs, the operator could set the upper limit at 50.2 lbs, and the lower limit to 49.8 lbs. If the final bag weight is within this range, the machine will release the bag and continue to the next bag.

If the final weight of a bag is outside of this range, the unit will hold the bag until the operator manually releases the bag by pushing the STOP button. This feature is helpful when there is a sudden change in the bulk density of the material or when the feed bin runs out of material. This guarantees that no bag over or under the allowable weight will be shipped.

4.2.2 Typical Fill Cycle for T4000 Machines

The typical fill cycle will vary, based on the configuration of the machine. The fill cycles listed below assume that the machine has been turned ON, the controls have warmed up, and that the machine is already calibrated.

1. Pull the STOP button out.
2. Place a bag on the spout. Ensure that the bag is level and even with the front and rear bag clamp.
3. Actuate the bag clamps. This is done by tripping the bale on the bag clamp actuator switch, or by using the optional foot switch.



CAUTION

Keep hands clear of the clamps. Failure to do so could result in injury.

Important: *Once the bag clamps actuate, if the bag in place switch is not “made”, the bag clamps will release after a 2 second delay. This means that the bag must be properly positioned and that the bag in place switch must be properly adjusted.*

4. If equipped with the auto zero option, after a short delay, the machine will zero the weigh meter.
5. The unit will open the cutoff gate and turn the vibratory feeder on to start the fill cycle at the bulk feed rate (Fast A setting).
6. Once the weight of material in the bag reaches the dribble weight (SP1 setting), the vibrator will switch to the dribble vibrator speed (Slow A setting) to slow the flow of product off of the end of the feeder. The VG Series will continue filling the bag.

7. Once the cutoff weight (SP2 setting) has been reached, the vibrator will stop and the cutoff gate will close.
 - a. The machine will pause for the Wait Timer duration and will then sample the final bag weight. If the weight is not within the acceptable over/under tolerance, manual operator intervention is required.
 - b. The Drop Delay timer runs, allowing the product in free fall to fall into the bag.
8. The Drop Delay timer runs, allowing the product in free fall to fall into the bag.
9. The bag clamps automatically release the bag.
10. Install a new bag on the spout. As soon as the new bag is on the spout and the bag clamp actuator switch has been tripped, the vibrator will automatically begin filling the bag. The cycle will repeat until the surge hopper is empty, or until the fill cycle is manually stopped using the STOP button.

4.2.3 Typical Fill Cycle for T3000 Machines

1. Pull the STOP button out.
2. Place a bag on the spout. Ensure that the bag is level and even with the front and rear bag clamp.
3. Actuate the bag clamps. This is done by tripping the bale on the bag clamp actuator switch, or by using the optional foot switch.



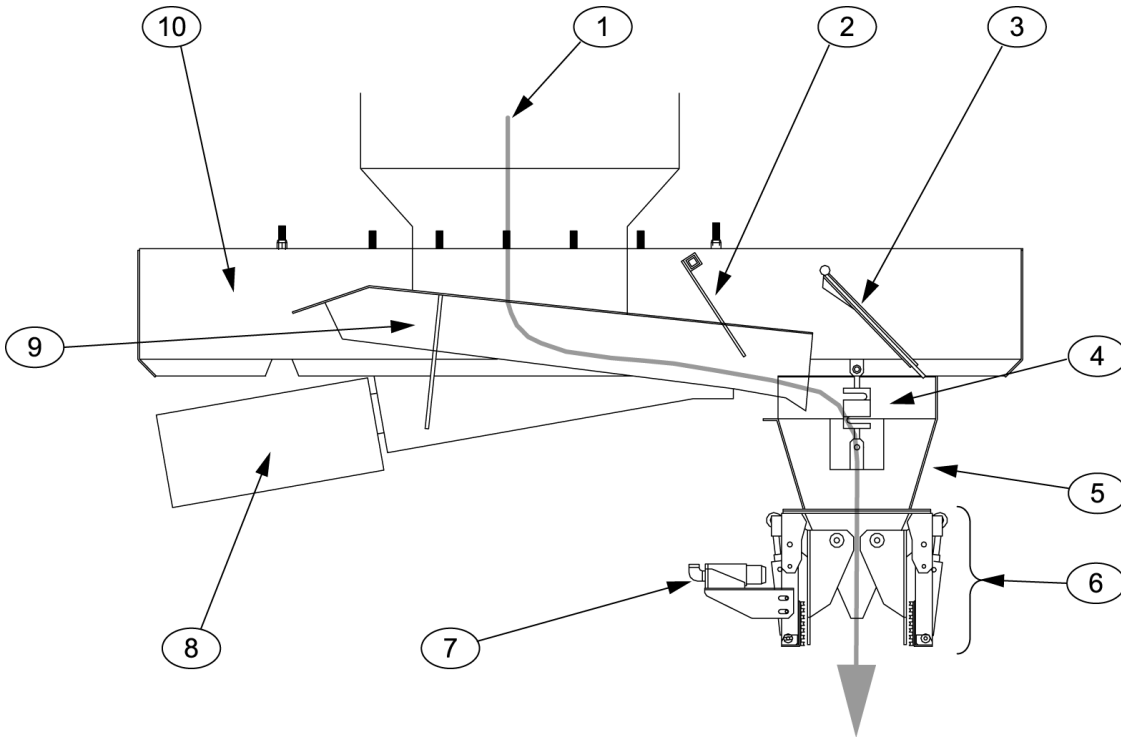
CAUTION

Keep hands clear of the clamps. Failure to do so could result in injury.

4. The machine will pause for the tare delay.
5. The unit will start the fill cycle by opening the cutoff gate and turn the vibratory feeder at the bulk feed rate (Fast A setting).
6. Once the weight of material in the bag reaches the dribble weight (SP1 setting), the vibrator will switch to the dribble vibrator speed (Slow A setting) to slow the flow of product off of the end of the feeder. The VG Series will continue filling the bag.
7. Once the cutoff weight (SP2 setting) has been reached, the vibrator will stop and the cutoff gate will close.
 - a. The machine will pause for the Wait Timer (set in the T3000, not the PV300) duration and will then sample the final bag weight. If the weight is not within the acceptable over/under tolerance, manual operator intervention is required.
 - b. The Drop Delay timer runs, allowing the product in free fall to fall into the bag.
8. After the Wait Timer and Drop Delay timers have run, the bag clamps automatically release the bag.
9. Install a new bag on the spout. As soon as the new bag is on the spout and the bag clamp actuator switch has been tripped, the vibrator will automatically begin filling the bag. The cycle will repeat until the surge hopper is empty, or until the fill cycle is manually stopped using the STOP button.

4.3 Product Flow

Regardless of the type of controls used on the VG Series, the product will flow through each machine in the same way. The product enters the VG Series, via the customer supplied surge hopper, through the top of the VG Series cabinet. Directly under the opening of the hopper (1) is the pan of the vibratory feeder (9). As the feeder vibrates, the product moves down the feeder pan. The flow gate (2) regulates the depth of product in the pan. After this regulation process, the product flows down the feeder and off the end of the feeder pan. The product falls off of the end of the feeder pan, through the product transition (5) and the spout assembly (6) into the bag.



Item #	Description	Item #	Description
1	Product enters VG Series here	6	Spout assembly
2	Flow gate	7	Bag clamp actuator switch
3	Cutoff gate open	8	Vibratory feeder motor
4	Load cell (1 of 2 shown)	9	Vibratory feeder pan
5	Spout transition	10	VG Series cabinet

Figure 4-2. Product Flow Through The VG Series

4.3.1 Using The Flow Gate

The VG Series is equipped with an adjustable flow gate. Both the vibratory control panel and the flow gate control the rate at which the product can flow through the VG Series. The flow gate is a mechanical adjustment.

Setting the flow gate to the full-closed position still allows some product to flow past. If the flow gate is all the way closed, the flow rate will be slow.

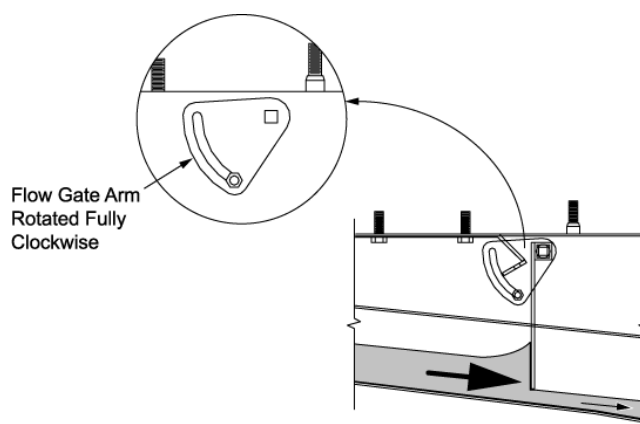


Figure 4-3. Product Flow With Flow Gate In Full-Closed Position

If the flow gate is all the way open, the flow rate will be fast.

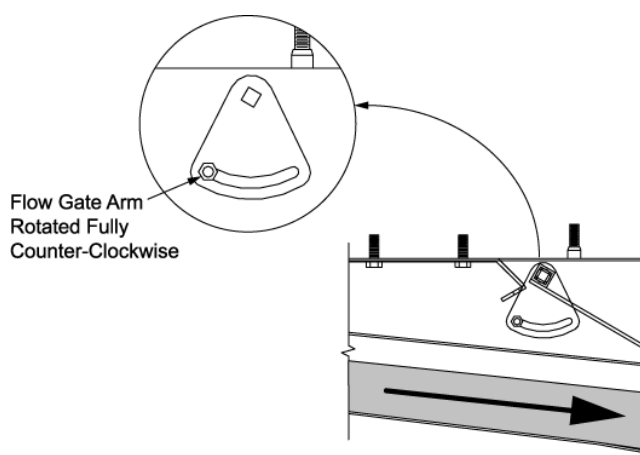


Figure 4-4. Product Flow With Flow Gate In Full-Open Position

The flow gate should be set to produce a regulated, consistent level of product. This setting will be somewhere in between the full-open and full-closed position. The overall bed depth of product will determine the product output speed. The setting of the flow gate, as well as the setting of the vibratory feeder, will vary. The differences will be based on the type of product being packaged and the size of bag that it is being placed into. It is important to regulate the output of product to ensure consistent and accurate bag weights.

4.4 Operational Controls

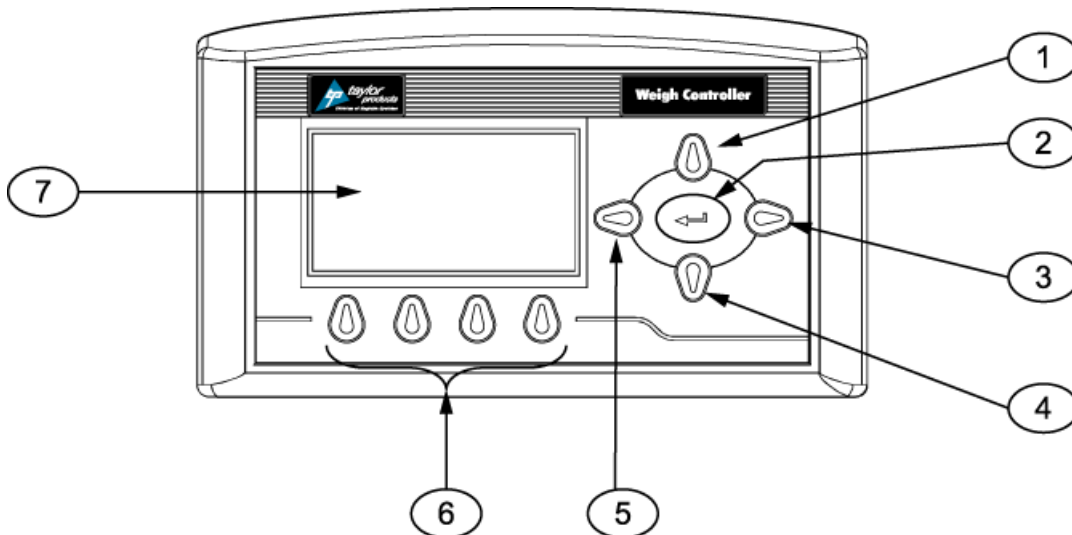
The VG Series is a dual set point machine. Two set points are used to increase operational efficiency. The control box will typically be mounted on the left front corner of the machine. An optional pedestal mount control panel is also available.

The standard VG Series is equipped with a T4000 control panel. Optionally, the VG Series can be ordered with a T3000 control panel. Both control panels are the result of a collaborative effort between Magnum Systems and Hardy Instruments.

4.4.1 VG Series With T4000 Controls

The T4000 series weigh controller is the standard weigh controller used on the VG Series packaging machine. The T4000 uses different levels of voltage to monitor and control the weighments. The T4000 units are available in either a single set point model or a dual set point model. A single set point unit uses one fill rate. A dual set point unit will use two fill rates, a fast fill rate that is referred to as the bulk rate, and a slower fill rate that is referred to as the dribble rate. The controller is comprised of the following components:

- LCD panel
- Key pad
- Cable
- Electrical enclosure

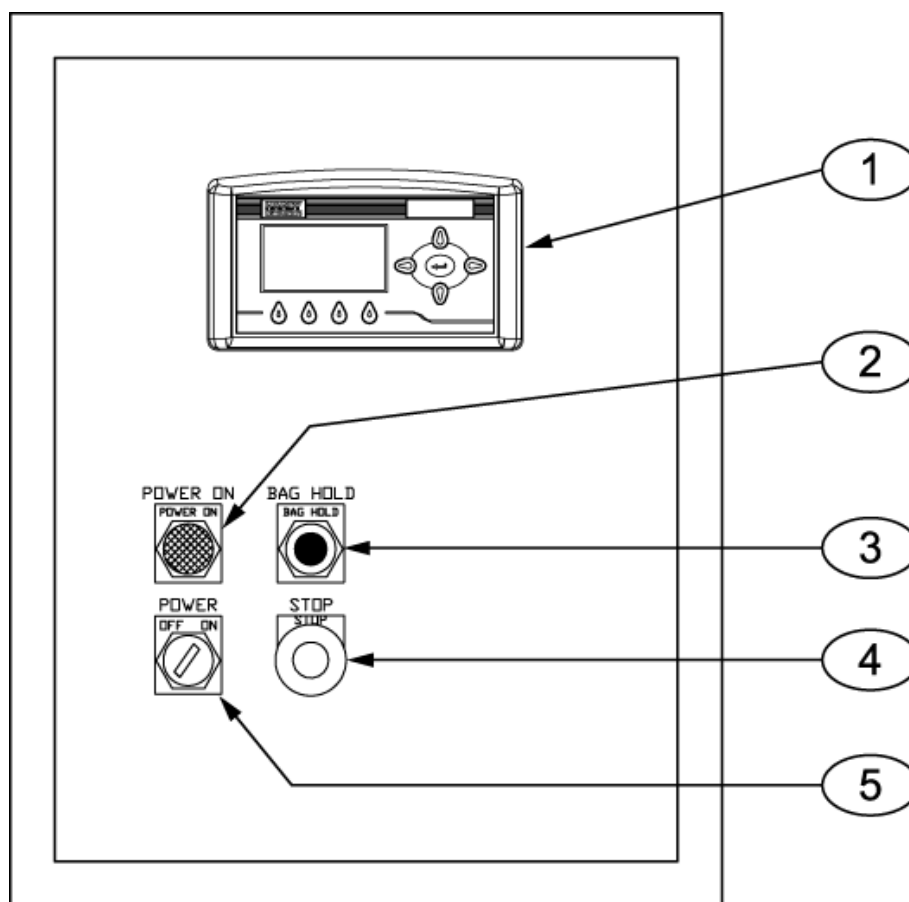


Item #	Description	Item #	Description
1	Control panel	5	Down arrow key
2	Up arrow key	6	Left arrow key
3	Enter key	7	Function keys
4	Right arrow key	8	LCD screen

Figure 4-5. T4000 Faceplate Layout

The control box is typically mounted on the left side of the VG Series. This control box contains the following components:

- T4000 control panel
- POWER switch
- POWER indicator
- STOP button/indicator
- BAG HOLD button



Item #	Description	Item #	Description
1	Weigh meter	6	POWER switch
2	SP 2 indicator	7	DISPLAY SELECT switch
3	SETPOINT 2 adjustment knob	8	SP 1 indicator
4	SETPOINT 1 adjustment knob	9	ZERO knob
5	Fuse holders		

Figure 4-6. Control Box With T4000 Controls

Operation

The machine will fill the bag at the bulk rate until dribble (SP1) weight is achieved. Typically, SP1 is set at approximately 90% of the target weight. Once SP1 is achieved, the vibratory feeder will slow. This reduces the product flow. The bag will continue to fill at the dribble rate until the cutoff (SP2) weight is reached. SP2 is set just below the target weight. Once SP2 achieved, the vibratory feeder will shut off and the cutoff gate will be closed, which will completely stop the flow of product to the spout. There is still a small amount of product that is in free fall. This means that the product is falling from the spout into the bag, so its weight has not yet registered. Once the free fall product settles in the bag, the controller will take the final weight of the bag, which should match the target weight.

Important: When setting the dribble and cutoff points, they should be set far enough apart so there is a noticeable dribble period during operation. Magnum Systems recommends that the dribble period should last for approximately one second per fill cycle.

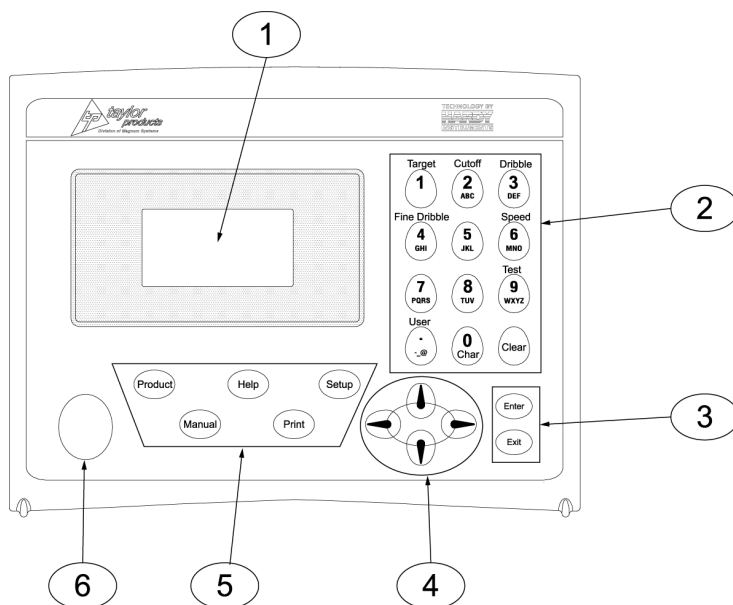
Note: Anytime that the STOP button is pressed, the cutoff gate will close and the vibratory feeder will stop.

The POWER switch on the lower left corner is used to turn the power to the machine on and off. When the power switch is in the ON position, the POWER indicator should illuminate. The POWER indicator is located directly above the POWER switch. Next to the POWER switch is the STOP button/indicator. Pressing this button will result in the vibratory feeder immediately shutting off and the cutoff gate will close. This will completely stop the flow of product into the package. When the button is pressed, the contacts for the lamp that is inside the switch will close and will illuminate the lamp. Some units will also be equipped with a BAG HOLD button. Pressing and holding this button prevents the bag clamps from automatically releasing at the end of the fill cycle. This action allows the operator to check the final weight of the bag, as displayed on the weigh meter, against the desired bag weight.

4.4.2 VG Series With T3000 Controls

The VG Series is available with an optional Taylor T3000 control set. This T3000 is a digital control panel that has been jointly designed by Magnum Systems and Hardy Instruments. The T3000 provides the operator with total monitoring and instrument control. The T3000 features the following functions:

- Weight display
- Alphanumeric keypad
- Function keys
- Enter/Exit keys
- Arrow keys

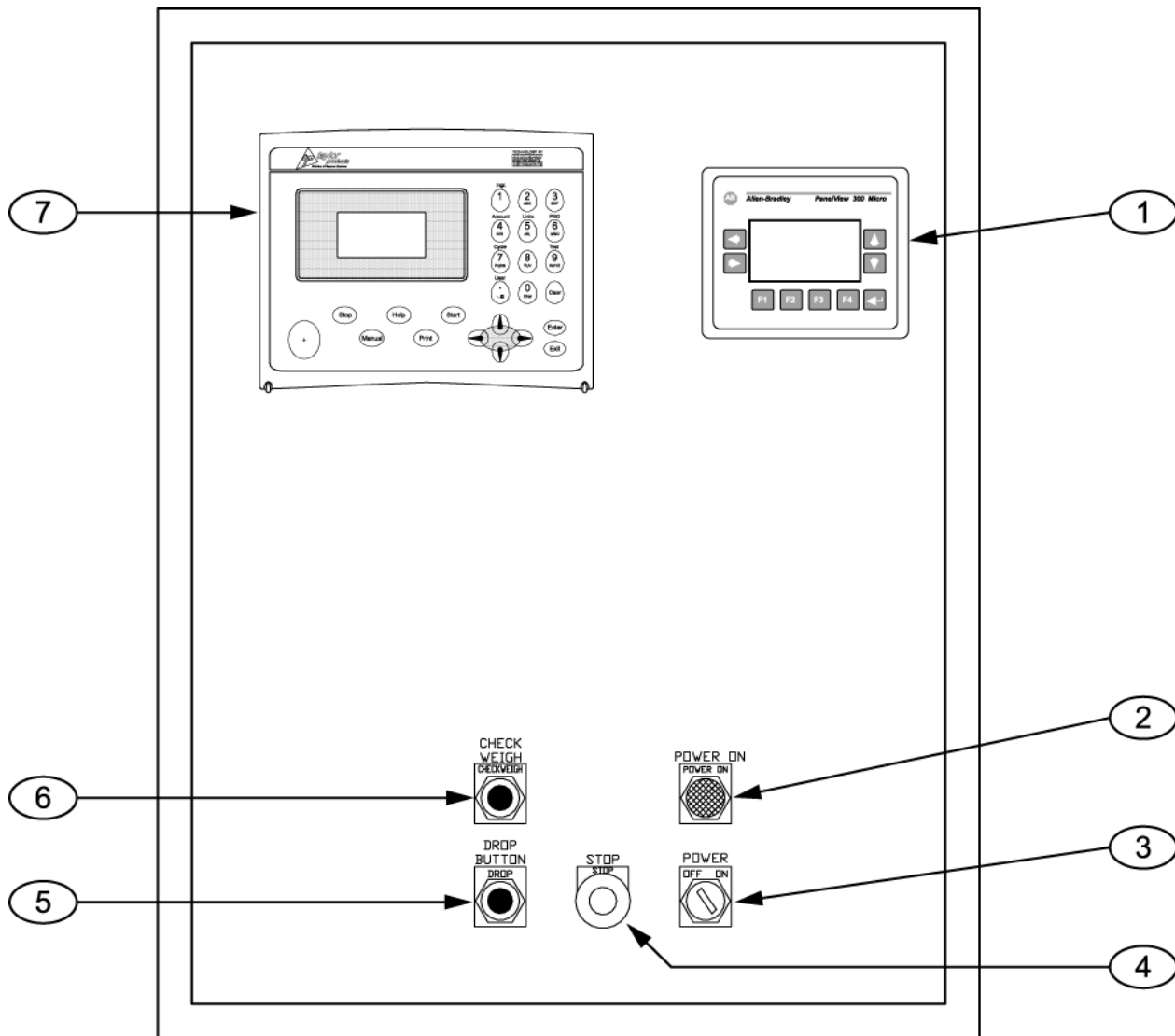


Item #	Description	Item #	Description
1	LCD screen	4	Directional arrow keys
2	Alpha-numeric keypad	5	Function keys
3	Enter and Exit keys	6	Infrared port (not used)

Figure 4-7. Taylor T3000 Control Panel

The front of the T3000 is equipped with a weight display, an alphanumeric keypad, directional arrow keys, function keys, an Infrared PDA port (not used), an Enter key, and an Exit key.

The display has one line of large fonts (5.5 alphanumeric characters), and four lines of smaller fonts (20 alphanumeric characters). The top line displays the currently selected bag weight. The remaining four lines are used for monitoring system statuses, historical data, and configuration settings of the VG Series.



Item #	Description	Item #	Description
1	PV300 control panel	5	DROP button
2	POWER indicator	6	CHECKWEIGH button
3	POWER switch	7	T3000 control panel
4	STOP button/indicator		

Figure 4-8. Control Panel with T3000 Controls

Located at the bottom of the control panel are several other controls and indicators:

- **POWER switch** – This switch controls power for the entire machine.
- **POWER ON indicator** – Illuminates when the power switch is in the ON position to indicate that the power is on.
- **STOP button/indicator** – Pressing the STOP button will immediately stop the machine. When pressed, the STOP button will illuminate.
- **DROP button** – Optional feature that when pressed will result in the bag clamps releasing the bag in the event that the fill cycle is interrupted.
- **CHECKWEIGH button** – As its name implies, pressing this button allows the operator to check the final bag weight prior to the bag clamp releasing the bag.
- **PV300 control panel** – The interface to the PLC. This panel is used to control functions that are not controlled by the T3000.

***Important:** When setting the dribble and cutoff points, they should be set far enough apart so there is a noticeable dribble period during operation. Magnum Systems recommends that the dribble period should last for approximately one second per fill cycle.*

***Note:** If the STOP button is pressed, the cutoff gate will close and the vibratory feeder will stop. If the machine is not equipped with a DROP button, after the bag drop delay runs, the bag clamps will release the bag.*

4.4.3 Allen-Bradley MicroLogix™ 1000

The machine will also be equipped with an Allen-Bradley MicroLogix™ 1000 Programmable Logic Controller (PLC). The PLC is located inside the control box. The PLC is loaded at the factory with a software program that includes adjustable timers for specific functions. The PLC is equipped with multiple input and output connections. The inputs are used to monitor device status, while the outputs are used to control device operation. The processor takes the incoming data and compares that data to the program. When input conditions and the program deem it necessary that the PLC activate or change the state of a device connected to one of the output terminals, the PLC will execute that command.

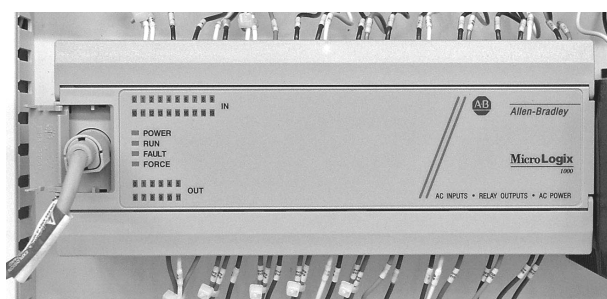


Figure 4-9. Programmable Logic Controller (PLC)

The PLC also provides the ability to monitor the inputs and outputs. The PLC is equipped with LEDs to provide the status of each input and output. The PLC is also equipped with LEDs to provide the status of the power input, the current operational state, if there are any program or hardware faults, and if any of the outputs have been manually activated (forced).

4.4.4 PV300 Control Panel

Some VG Series units may be equipped with an Allen-Bradley PV300 control panel, in addition to the T3000 control panel. When equipped with the PV300, the machine will also have an Allen-Bradley MicroLogix™ 1000 PLC that is located inside the control box. The PV300 is the operator interface for the PLC. The control panel is used to adjust system timers controlled by the PLC. The PV300 uses a series of menus to allow the operator to make these adjustments.

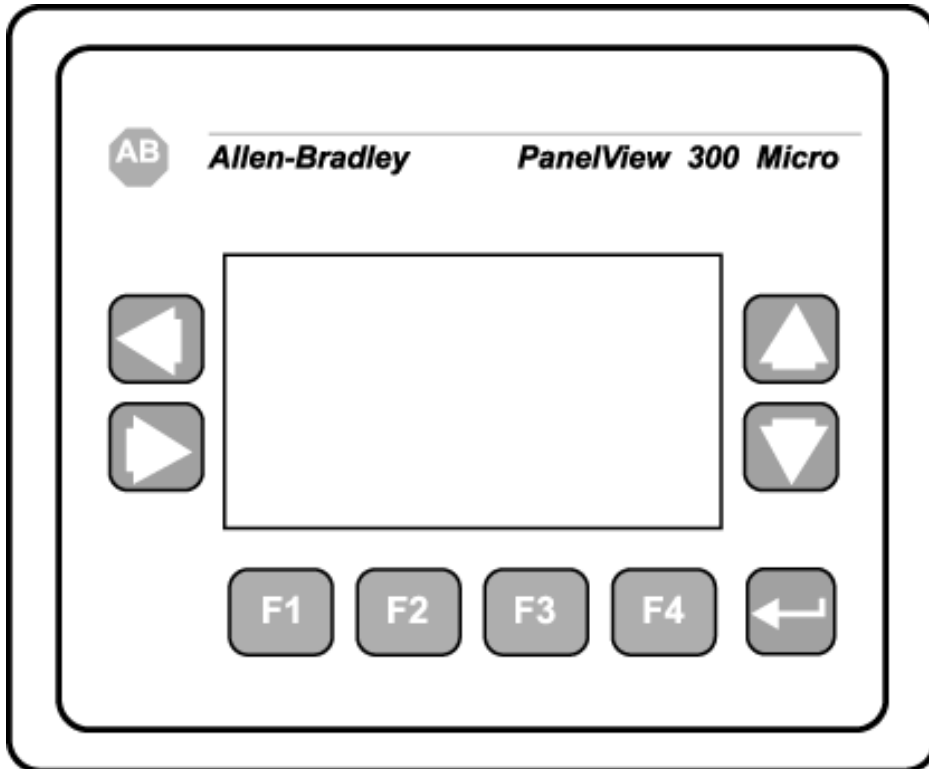


Figure 4-10. Allen-Bradley PV300 Control Panel

4.4.4.1 PV300 Menus

The PV300 has several menus that allow the operator to adjust different timer functions for the VG Series. The available timer functions, and their definitions are listed below:

Note: Some of the timers mentioned below are for optional features. The machine that accompanied this manual may or may not have or use all of the timers listed.

Table 4-1. PV300 Main Menu

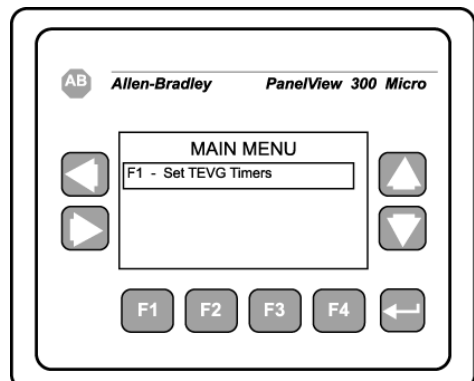

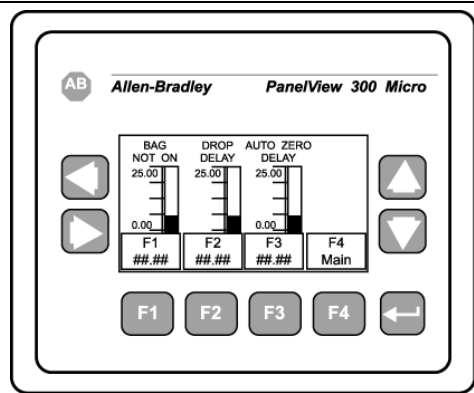




	Key	Function
		Pressing F1 will result in the system accessing the VG Series Timers menu.

Table 4-2. PV300 Timer Menu

	Key	Function
		Pressing F1 will result in the system placing the cursor in the field where the Bag Not On timer can be adjusted.
		Pressing F2 will result in the system placing the cursor in the field where the Drop Delay timer can be adjusted.
		Pressing F3 will result in the system placing the cursor in the field where the Auto Zero timer can be adjusted.
		Pressing F4 will result in the system returning to the Main Menu screen.

4.5 Starting the Unit

Once the unit has been installed, and calibrated, it can now be started. The process for starting the VG Series will be the same, regardless of the type of control set that is used. Follow the steps below to start a VG Series machine with T4000 controls.

1. Check the power connections to make sure that they are connected.
2. Check the pneumatic connection at the FRL. Check the air pressure setting to be sure that the current setting meets specification.
3. Turn the POWER switch to the ON position. Make sure the POWER indicator comes on.
4. Place a bag on the spout so that the bag in place switch is made.
5. Trip the bag clamp actuator switch.

4.6 Initial Setup

The setup procedures for the VG Series will vary, based on the type of controls that it is equipped with.

4.6.1 Setting Up a VG Series With T4000 Controls to Fill

The VG Series is configured as a dual set point machine. This means the VG Series will use two fill speeds, named bulk rate and dribble rate. Both cutoff points and fill speeds must be configured. Use the steps below to setup a VG Series with T4000 controls.

1. Push the STOP button in.
2. Turn the POWER switch to the ON position. Allow 15 minutes for controls to warm up.
3. Set the dribble weight.
 - a. Press the function key under SP1 on the Standby screen.
 - b. Use the arrow keys to set the SP1 weight (approx. 90% of the target weight to start).
 - c. Press the function key under EXIT on the screen.
4. Set the cutoff weight.
 - a. Press the function key under SP2 on the Standby screen.
 - b. Use the arrow keys to set the SP2.
 - c. Press the function key under EXIT on the screen.

Note: Due to the weight of product in free fall, the cutoff weight should be set a little below the target weight. How much below will depend on the bulk density of the material.

5. Set the Fast A feed rate.
 - a. Press the function key below MENU on the Standby screen.
 - b. Select Analog Out from the menu.
 - c. Select Fast A
 - d. Use the arrow keys to set Fast A to approximately 90.
 - e. Press the function key below EXIT on the screen, twice.
6. Set the Slow A feed rate.
 - a. Press the function key below MENU on the Standby screen.
 - b. Select Analog Out from the menu.
 - c. Select Slow A
 - d. Use the arrow keys to set Slow A to approximately 50.
 - e. Press the function key below EXIT on the screen, twice.

Note: The rates listed above are only for the purpose of getting the bagging operation started. Once the operator is familiar with the machine he/she will want to experiment with the vibrator settings until a setting that works well with the product. The vibrator CAN run wide open.

7. Pull the STOP button out.
8. Place a bag on the spout and trip the bag clamp actuator switch bale. The fill cycle will start.

9. As the fill cycle nears completion, press the BAG HOLD button to hold the bag. When the fill cycle ends, compare the actual weight displayed to the desired target weight.
 - a. If the actual weight and the target weight match, setup is complete and the machine is ready for operation. Release the BAG HOLD button.
 - b. If the actual weight and the target weight do not match, adjust the SP2 setting. If the bag weight is higher than the target weight, adjust the SP2 setting down by an amount that is equal to the difference between the target and bag weights. If the bag weight is lower than the target weight, adjust the SP2 setting up by an amount that is equal to the difference between the target and bag weights. For example, if the target weight is 35 lbs, and the actual bag weight was 35.5 lbs. Adjust SP2 down by .5 lbs. Repeat steps 8 and 9 until the actual weight and the target weight match. Release the BAG HOLD button.

Note: Also keep in mind that every time the vibrator speed or the flow gate is adjusted, SP1 and SP2 will most likely need to be adjusted. All of these adjustments alter the amount of product moving across the vibrator pan, thus changing the amount of material in free fall.

4.6.2 Setting Up a VG Series With T3000 Controls to Fill

VG Series units equipped with the T3000 can be programmed to fill as many as 25 different products. Use the steps below to select a specific product from the available list.

1. Check the T3000 to make sure the Filler is configured for the specific product that is being used.
2. Make sure the T3000 is in Standby Mode.
3. If the product shown on the display is the product that is going to be packaged, the setup is complete. If not, continue to Step 4.
4. If the product shown on the Standby Menu is not the product being packaged, do the following:
 - a. Press the Product key once. A list of products that have been programmed into the control panel will appear. The currently selected product will be displayed.
 - b. The operator can change the product using the up or down arrow keys to scroll through the available list of products. When the desired product is found, position the cursor next to it and press the Enter key. The menu for that product will appear, with the cursor adjacent to the Accept Settings line. Press Enter again to accept the settings, or use the up/down arrows to scroll through the available parameters for that product. To change a specific parameter, place the cursor next to that line and key in the new value for that parameter, followed by pressing the Enter key. When finished, scroll back to the Accept Settings line and press the Enter key to accept the changes.

4.6.2.1 Using the T3000 to Set Up A Product From Scratch

To configure one of the 25 available product selections for a specific product, follow the steps below:

1. Press the Setup key once. The Configuration Menu will appear and will have the cursor on the ADJUST PRODUCT line. Press the Enter key.
2. The cursor will be positioned next to the currently selected product ID. Use the arrow keys to scroll down until the cursor is next to the first product number that has not been previously programmed.
3. Press the Enter key to select that product.
4. Position the cursor next to the line for the product name. Use the alphanumeric keypad to enter the name that has been selected for this product configuration. The default name can be used, but it is not recommended. Magnum Systems recommends using a name that provides some indication of what the product configuration is for. Press the Enter key to save the change.
5. Scroll down to the Unit of Measure line. Use the left/right arrow keys to select the appropriate unit of measure (Lb, Oz, Kg, G). Press the Enter key to save the change.
6. Scroll down to the WAVERSAVER line. Use the alphanumeric keypad to enter the desired setting. Magnum Systems recommends setting the WAVERSAVER to 3.50 Hz. Press the Enter key to save the change.
7. Scroll down to the Averages line. Use the alphanumeric keypad to enter the desired setting. Press the Enter key to save the change.
8. Scroll down to the Jog line. Press the Enter key to access the Jog Menu.
9. Set Jog On Time to 0.000s, to disable the jog function. Press the Enter key to save the setting.
10. Press the Exit key.
11. Scroll down to the Fill Timer Line. Use the alphanumeric keypad to enter a new value, if desired. Press the Enter key to save the setting.
12. Scroll down to the Wait Timer line. Use the alphanumeric keypad to enter a new value, if desired. Press the Enter key to save the setting.
13. Scroll down to the Speeds line. Use the left/right arrow keys to select the Dual speed setting. Press the Enter key to access the settings for that fill speed.
14. Use the left/right arrow keys to toggle between OFF and ON. When this option is ON, the controller will auto adjust the dribble point.
15. Leave the Mode setting at the factory preset setting.
16. Scroll down to the Fill Proof Menu and press the Enter key.
 - a. The Fast Switch and Slow Switch settings MUST be off for the machine to run.
 - b. The recommended setting for the Fast Switch Tmr and the Slow Switch Tmr is 5s.
17. Press the Exit key three times to return to the Standby Display.

4.7 Starting the Machine

Once installed, the unit can now be started. The process for turning on the VG Series will vary slightly, based on the type of control set that is used.

4.7.1 Starting a VG Series With T4000 Controls

The POWER switch is located on the lower left corner of the control box. The STOP button/indicator will be located in the same vicinity. The following steps are used to start the machine.

1. Locate the POWER switch and put it in the ON position. The weigh meter should illuminate and perform its initiation sequence. When complete, the weigh meter should display its opening screen.

***Important:** Allow the VG Series to warm up for at least 30 minutes before performing setup procedures or starting the first fill cycle.*

2. Locate the STOP button/indicator on the control panel and press it in.
3. Turn the POWER switch on the control panel to the ON position.
4. Pull the STOP button out.

**CAUTION**

Once the power switch is in the ON position, and the STOP button has been pulled out, the machine could start operating automatically, or someone could accidentally start the machine by hitting the bag clamp actuator switch bale.

5. Place an empty bag on the spout. When placing the bag on the spout, make sure the bag is positioned so the bag in place switch is “made”. The operator’s hand should trip the bag clamp actuator switch lever, which will start the fill cycle.

4.7.2 Starting a VG Series With T3000 Controls

The POWER switch is located on the lower left corner of the control box. The STOP button/indicator will be located in the same vicinity. The following steps are used to start the machine.

1. Locate the STOP button on the control panel and press it in.
2. Locate the POWER switch on the lower portion of the control box and turn it to the ON position. The T3000 should illuminate and perform its initiation sequence. When complete, the T3000 should display its opening screen.

Important: Allow the VG Series to warm up for at least 15 minutes before performing setup procedures or starting the first fill cycle.

3. Pull the STOP button out.



CAUTION

Once the power switch is in the ON position, and the STOP button has been pulled out, the machine could start operating automatically, or someone could accidentally start the machine by hitting the bag clamp actuator switch bale.

4. Place an empty bag on the spout. When placing the bag on the spout, make sure the bag is positioned so the bag in place switch is “made”. The operator’s hand should trip the bag clamp actuator switch lever, which will start the fill cycle.

Chapter 5

Preventive Maintenance

5.1 General Description

To minimize downtime, preventive maintenance should be made a priority. Proper preventive maintenance practices will also extend the life of the equipment. Developing a preventive maintenance schedule will ensure that critical maintenance procedures are not missed.

5.2 Daily Maintenance Procedures

At the start of each working day, the following maintenance tasks should be performed before starting the machine:

1. Thoroughly clean the machine.
2. Check all fasteners.
3. Drain any water that may have accumulated in the water separator in the air supply line.

5.2.1 Cleaning

Keeping the VG Series clean is an important part of the daily maintenance tasks. Remove any dust and/or dirt that may accumulate on a daily basis. Keeping the unit clean will keep debris from entering the control mechanisms, which could cause the performance of the VG Series to suffer. Also, by taking the time to clean the VG Series on a daily basis, the operator will be able to give the VG Series a thorough inspection. Take the time to inspect all components for damage and/or loose fasteners.

5.2.2 Check All Fasteners

The operator should check all fasteners on the VG Series on a daily basis. Loose fasteners can cause unwanted vibration and wear.

5.2.3 Drain Water From the Water Separator

It is very important to remove unwanted moisture from the incoming air to ensure proper operating of the pneumatic components. At the beginning of each day, the operator should empty the water from the water separator. Follow the process below to drain the water.

1. Disconnect the air supply line.
2. Place a container under the drain valve.
3. There are two types of drain valves, follow the appropriate step below to open and close the drain valve:
 - a. If the water separator has a pin-type drain valve, press the pin upward and hold it in to drain the water. Release the pin once all water has drained.
 - b. If the water separator has a screw-type drain valve, turn the screw cap counter-clockwise to completely loosen the cap. After the water has completely drained, lightly push the cap upward to engage the threads and turn the cap clockwise until snug.
4. Discard the water from the container.
5. Reconnect the air supply line.

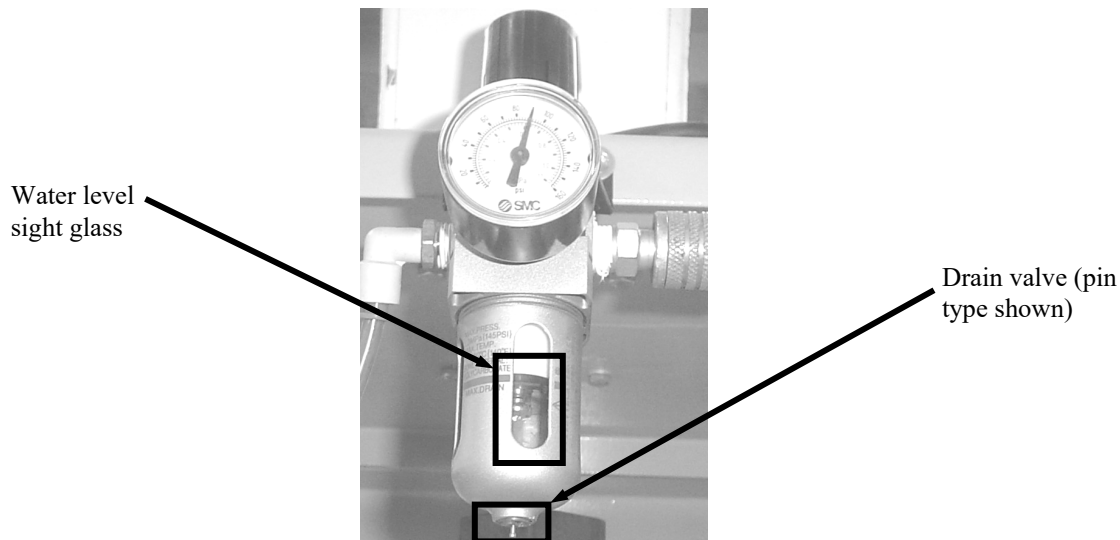


Figure 5-1. Air Supply Line Water Separator

5.3 Monthly Maintenance

On a monthly basis (every 700 operating hours), the operator should do the following items:

1. Inspect and service the filter and lubricator in the FRL.
2. Inspect all hoses, air cylinders, linkages, and bearings. Replace any worn or damaged parts.
3. Inspect the rubber vibrator cutoff gate seal. Replace the seal if it is worn or leaking. Refer to 7.3.9 Cutoff Gate Seal Replacement.
4. Clean any dust or product that may have accumulated around the load cell.
5. Inspect the rubber bag clamp pads (if equipped). Replace them if they are worn. Refer to 7.3.12 Bag Clamp (V-Type Bag Clamp) Pad Replacement.
6. Inspect the inflatable bladder (if equipped). Replace the bladder if necessary. Refer to 7.3.17 Inflatable Bladder Bag Clamp Replacement.
7. Inspect the flow gate for excessive wear. Replace the flow gate if necessary. Refer to 7.3.11 Flow Gate Replacement.
8. Check the calibration. Refer to 3.8 Calibration.
9. Check the retainer flange bolts. Tighten them if they are loose.

Chapter 6

Troubleshooting

6.1 General Description

When a problem occurs, proper troubleshooting techniques will allow maintenance personnel to quickly identify the problem.

6.2 The Troubleshooting Process

The actual troubleshooting process is just as important as the repair process. Use the following troubleshooting keys to assist with the troubleshooting process:

- Identify the trouble symptom
 - What is the problem?
 - What were the circumstances when the problem occurred?
 - Could weather be a factor?
 - Are there any other contributing factors?
- Sectionalize the problem
 - Look at the problem.
 - What area of the machine is the problem occurring in?
 - Has anything changed recently?
- Isolate the problem
 - Try simple things first.
 - Observe indication and trouble codes.
 - Check test points.
 - Avoid complicating the problem.

6.3 Trouble Symptoms

Use the following information to assist in troubleshooting.

6.3.1 Scale is Not Accurate

If the load cell is providing inaccurate readings, check the following:

1. Check for proper calibration. Refer to 3.8 Calibration.
2. Check the surge hopper to make sure an adequate supply of material is available in the product hopper to ensure a consistent head pressure.
3. Check to make sure there is nothing restricting material flow from the surge hopper.

6.3.2 Scale Does Not Return to Zero

If the scale reading does not return to zero, check the following items:

1. Check for adequate slack in the air supply lines to the bag clamp cylinders.
2. Check for adequate slack in the electrical cables to the bag clamp actuator switch and the bag in place switch.
3. Check the calibration. Refer to 3.8 Calibration.
4. Check for any outside interference, such as cords, hoses, etc., that would effect the movement of the spout transition and spout.

6.3.3 The Weighments are Always Too Light

If the weighments are consistently coming up too light, check the following:

1. Try lowering the dribble weight setting. The scale must have time to react, if material is coming in on the bulk rate too fast, the flow can cause a spike that will shut flow off too early.
2. Try lowering the bulk feed rate or try restricting the flow of material to the vibrator feeder tray by adjusting the flow gate.

6.3.4 Load Cell Fails Frequently

If the load cells on a VG Series are failing frequently, check the following items:

1. Check the operating conditions to make sure that the load cell is not jarred, jerked, or being loaded with a sudden excessive force.
2. Check the load cell to make sure that the product being weighed does not exceed the rating of the load cell.

6.3.5 Fill speeds are too slow

If the fill rate is slow, check the following items:

1. Adjust the vibrator rate to a faster speed.
2. Adjust the flow gate to allow for more bed depth in the feeder pan.
3. Use less dribble time (only applies in dual set point units).
4. Check to make sure that the product is not sticking to the feeder pan.

6.3.6 Accuracy Problems While Doing a Wide Range of Weighments

1. Check the surge hopper to make sure that the product is not bridging.
2. Check the calibration. Refer to 3.8 Calibration.
3. Check the unit to make sure that nothing is coming into contact with the weigh mechanism.
4. Ensure that the product is flowing in a smooth and consistent manner.

6.3.7 Vibrator Does Not Run at Full Speed

1. Check the vibrator speed setting.
2. Ensure that nothing is physically dampening the feeder pan on the vibrator.
3. Replace the vibrator control board.

6.4 System Alarms

During the filling process, conditions may occur that result in an alarm from the VG Series. Depending on the type of controller used, the alarms will vary.

6.4.1 T4000 Alarms

During the filling process, conditions may occur that result in one of the following T4000 alarms:

- A/D Failure Error! – An internal electronics error has occurred. Retry the operation. If the failure error re-occurs, power the machine down, then restart the machine and try the operation again. If the operation still fails, contact Magnum Systems technical assistance.
- A/D Convert Error! – The input from the load cell is outside of the acceptable range. Check the load cell for damage. If a new load cell has been installed, check the rating of the load cell to make sure that the correct load cell has been installed.
- Motion Error! – The controller has detected that the vessel or product is in motion and the controller cannot finalize the weighment. Check the machine settings and retry.
- Trad Cal Error! – An error occurred during the calibration process. Try to calibrate the machine again. If the error occurs again, contact Magnum Systems technical assistance.
- C2 Cal Error! – This error should not occur, as Magnum Systems does not use C2[®] type load cells. If this error does occur, contact Magnum Systems technical assistance.
- Too Lo Error! – Verify that the load cell signal level is 0-15 mV. Verify that there is enough weight on the scale. Perform Span then go back and Zero.
- Too Hi Error! – Verify that the load cell signal level is 0-15mV. Verify that there is not too much weight on the scale. Perform Span then go back and Zero.
- No C2 Sensor! – Instrument did not detect a C2[®] Load Sensor. This error should appear if C2[®] Cal is selected, as Magnum Systems does not use C2[®] type load cells. If this error does occur, contact Magnum Systems technical assistance.
- CAL Failed! – There are too few counts between Zero and Span. Reset either of the values, so that the counts are more than 1,000 counts of each other.
- C2 Caps Unequal! – This error should not occur, as Magnum Systems does not use C2[®] type load cells. If this error does occur, contact Magnum Systems technical assistance.
- HI/LO Too Close! – The Zero and Span values are not more than 1,000 counts from each other or there is no change, or there is a negative change. Reset either of the values, so that the counts are more than 1,000 counts of each other.
- Function Error! – The operator has pressed a function key and the function did not work. Try the function again. If it does not work, cycle the power off and on. If it still doesn't work, contact Magnum Systems technical assistance.
- Not Allowed! – The value entered by the operator is outside of the range that is allowed. The operator should try another value that is within the acceptable range.
- Security Violation! – User signed in with a password that does not allow performance of a certain function or entry to certain menus. Security level of the user identified in the User ID, too low for the menu or function.
- Overrange – The final package weight has exceeded the set point target.
- Gross ADC Error – The controller has detected a load cell error. Check all load cell connections. Repair connections as necessary. Check the load cell for damage. Replace the load cell if necessary. Refer to 7.3.2 Load Cell Replacement.

6.4.2 T3000 Alarms

During the filling process, conditions may occur that result in an alarm from the T3000. There are three different categories of alarms:

- Fill Alarms
- Jog Alarms
- Filler Discharge Alarms

For a full description of these alarms, refer to Chapter 3: Operating Procedures/Filler, of the Magnum Systems Filler/Dispenser/IBC T3000 User Guide, that is included in Appendix E of this manual.

6.4.2.1 Fill Alarms

Fill alarms are used to indicate that current conditions will not allow the selected fill feature to function properly. These alarms are:

- Not OK to fill alarm
- Lost OK to fill alarm
- No fast feed alarm
- Feed on alarm
- No medium feed alarm
- No slow feed alarm
- Slow feed on alarm
- Fill timeout alarm
- Underfill/overflow alarm

6.4.2.2 Jog Alarms

Jog alarms are used to indicate that current conditions will not allow the selected jog feature to function properly. These alarms are:

- Did not jog alarm
- Jog stuck on alarm
- Jog count alarm

6.4.2.3 Filler Discharge Alarms

Filler discharge alarms are used to indicate that current conditions will not allow the selected fill feature to function properly. These alarms are:

- Not OK to discharge alarm
- No discharge alarm
- Discharge clogged alarm
- Discharge on alarm

Chapter 7

Repair and Adjustment

7.1 General Description

When troubleshooting procedures have indicated that a component needs to be repaired, replaced, or adjusted, following the repair procedures contained in this chapter will assist maintenance personnel return the machine to operation in a timely manner.

7.2 System Adjustments

Depending on how the VG Series is configured, there are several adjustments that may be required from time to time.

7.2.1 Air Pressure Adjustment

The VG Series requires compressed air to be at approximately 80-100 PSI (.55-.69 MPa) for proper operation. If air pressure is too high or too low, the air pressure regulator can be used to adjust the output air pressure.



Figure 7-1. Air Pressure Adjustment

For VG Series units equipped with an inflatable bag clamp, a secondary regulator that is used to regulate the air pressure for the inflatable bladder. The secondary regulator should be set to 3 to 7 PSI (.02-.05 MPa).

7.2.2 Pneumatic Flow Control Adjustments

If the operator has determined that the actuation speed of a pneumatic component is either too fast or too slow, the operator can adjust the actuation speed of that component by adjusting the flow control on the air supply line that feeds that pneumatic component. Use the steps below to adjust the airflow.

1. Locate the pneumatic component that is not operating at the desired speed.
2. Locate the air flow adjusters on the ports of the pneumatic component.
3. Turn the flow control knobs by hand. To increase the actuation speed, turn the adjustment screw counter-clockwise. To decrease the actuation speed, turn the adjustment screw clockwise.

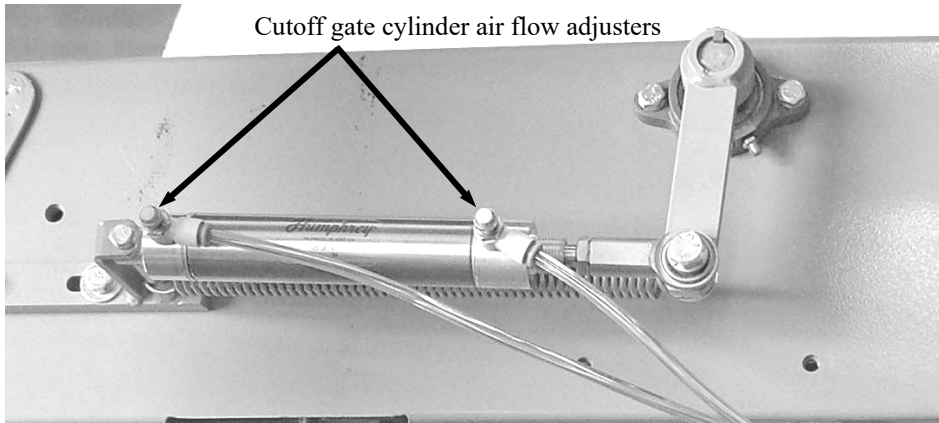


Figure 7-2. Adjusting Airflow to the Cutoff Gate Cylinder

7.2.3 Flow Gate Adjustment

The flow gate is a metal plate mounted at the bottom of the surge hopper. It has two mounting slots, one on each end that allows it to be adjusted up and down. The flow gate mounting slots fit over two studs on the surge hopper and is locked in position by two nuts. The flow gate allows the operator to adjust the amount of material that is allowed to flow out of the hopper onto the feeder pan. To adjust the flow gate, loosen the nuts, slide the flow gate up or down, and then tighten the nuts. Raising the flow gate will increase the flow of material, while lowering the flow gate will restrict the flow of the material.

Adjust the flow gate so that it allows an even steady flow of product down the feeder pan.

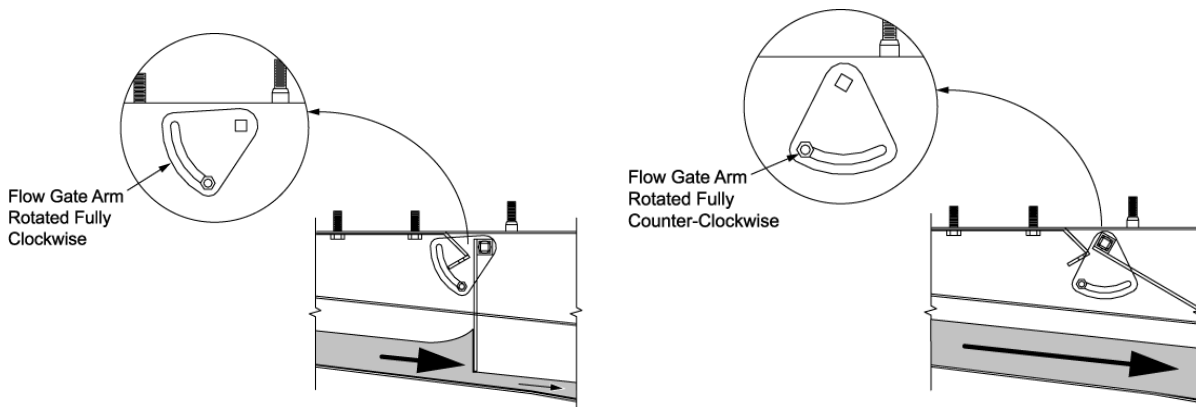


Figure 7-3. Flow Gate

7.2.5 Timer Adjustments

It may be necessary from time to time to adjust the timer settings. Refer to 3.9 Timer Programming for timer definitions. For plugin style block timer adjustments, refer to 3.9.1 Plugin Style Block Timer. For machines equipped with a PLC, refer to 4.4.4.1 PV300 Menus for information on how to adjust.

7.3 System Repairs

Over time, components on the VG Series may become worn or damaged. If this occurs, follow the procedures in this section to repair or replace individual components.



WARNING

When replacing parts, it is critical that only parts approved by Magnum Systems are used.

7.3.1 Spout Replacement

Due to the abrasiveness of the products being packaged, the spout may require periodic replacement. Use the following procedures to replace the spout. The procedure will differ based on the type of spout used.



CAUTION

When replacing the spout, do not apply excessive force to the spout. This could result in damage to the load cells.

Load cells ARE NOT covered under the Magnum Systems warranty.

7.3.1.1 Spout (V-Type Bag Clamp) Replacement

If the spout becomes worn or damaged, or needs to be removed to facilitate the repair of another component, use the steps below:

7.3.1.1.1 Spout (V-Type Bag Clamp) Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Label and disconnect the air supply lines from the pneumatic components on the spout.
4. Remove the bag clamp actuator switch, but do not disconnect it from the control panel. Refer to 7.3.15 Bag Clamp Actuator Switch Replacement.
5. If the spout is being replaced with a new one, remove the bag clamp pads. Refer to 7.3.12 Bag Clamp (V-Type Bag Clamp) Pad Replacement.
6. If the spout is being replaced with a new one, remove the bag clamp cylinders. Refer to 7.3.13 Bag Clamp (V-Type Bag Clamp) Cylinder Replacement.
7. Loosen, but do not remove the four nuts on the spout to spout transition mounting nuts.
8. Choose two nuts on opposite (diagonally) corners of the spout and remove them.
9. While a helper supports the spout, remove the remaining two nuts.
10. Lower the spout.

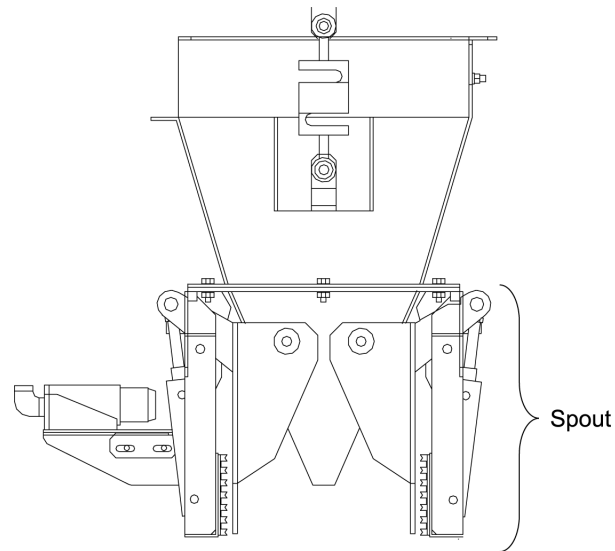


Figure 7-4. Spout (V-Type Bag Clamp)

7.3.1.1.2 Spout (V-Type Bag Clamp) Installation

1. Have a helper lift the spout into position.
2. Insert the mounting bolts and install the mounting nuts to finger tight.
3. Tighten the nuts on the mounting bolts in sequence a little at a time to evenly pull the spout tight against the spout transition.
4. If the spout is being replaced with a new one, install the bag clamp cylinders. Refer to 7.3.13 Bag Clamp Cylinder Replacement.
5. If the spout is being replaced with a new one, install the bag clamp pads. Refer to 7.3.12 Bag Clamp (V-Type Bag Clamp) Pad Replacement.
6. Install the bag clamp actuator switch, but do not disconnect it from the control panel. Refer to 7.3.15 Bag Clamp Actuator Switch Replacement.
7. Connect the air supply lines from the pneumatic components on the spout.
8. Connect the main electrical and pneumatic connections.
9. Turn the VG Series machine on and test for proper operation.

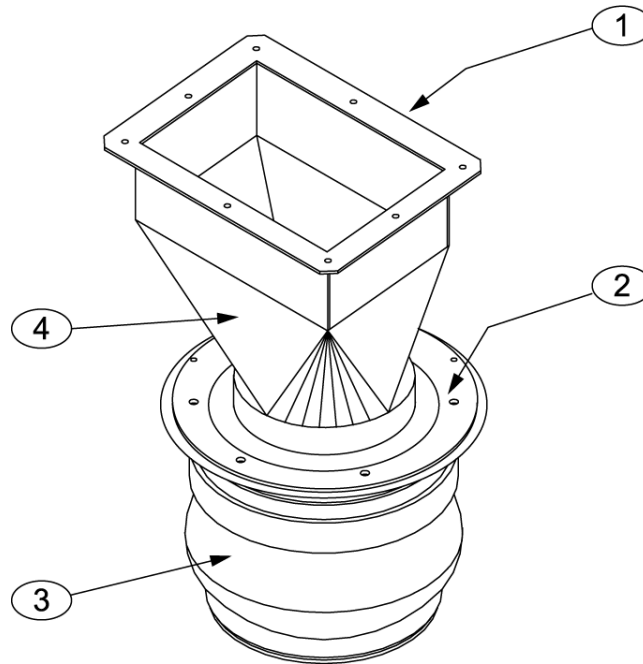
7.3.1.2 Spout (Inflatable Clamp) Replacement

If the spout becomes worn or damaged, or needs to be removed to facilitate the repair of another component, use the steps below:

7.3.1.1.1 Spout (Inflatable Clamp) Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Label and disconnect the air supply lines from the pneumatic components on the spout.
4. Remove the bag clamp actuator switch, but do not disconnect it from the control panel. Refer to 7.3.15 Bag Clamp Actuator Switch Replacement.
5. If the spout is being replaced with a new one, remove the bag clamp pads. Refer to 7.3.12 Bag Clamp (V-Type Bag Clamp) Pad Replacement.
6. If the spout is being replaced with a new one, remove the bag clamp cylinders. Refer to 7.3.13 Bag Clamp (V-Type Bag Clamp) Cylinder Replacement.

7. Loosen, but do not remove the four nuts on the spout to spout transition mounting nuts.
8. Choose two nuts on opposite (diagonally) corners of the spout and remove them.
9. While a helper supports the spout, remove the remaining two nuts.
10. Lower the spout.



Item #	Description	Item #	Description
1	Transition Mounting Flange	3	Inflatable Bladder
2	Spout Mounting Flange	4	Transition

Figure 7-5. Spout (Inflatable Bag Clamp)

7.3.1.1.2 Spout (Inflatable Clamp) Installation

1. Have a helper lift the spout into position.
2. Insert the mounting bolts and install the mounting nuts to finger tight.
3. Tighten the nuts on the mounting bolts in sequence a little at a time to evenly pull the spout tight against the spout transition.
4. If the spout is being replaced with a new one, install the bag clamp cylinders. Refer to 7.3.13 Bag Clamp (V-Type Bag Clamp) Cylinder Replacement.
5. If the spout is being replaced with a new one, install the bag clamp pads. Refer to 7.3.12 Bag Clamp (V-Type Bag Clamp) Pad Replacement.
6. Install the bag clamp actuator switch, but do not disconnect it from the control panel. Refer to 7.3.15 Bag Clamp Actuator Switch Replacement.
7. Connect the air supply lines from the pneumatic components on the spout.
8. Connect the main electrical and pneumatic connections.
9. Turn the VG Series machine on and test for proper operation.

7.3.2 Load Cell Replacement

In the event of a load cell failure, use the following steps to replace it.



CAUTION

A sudden jerk or shock, such as being struck by a tool or hitting the spout etc., can cause load cell damage. The load cell is NOT covered by warranty.

7.3.2.1 Load Cell Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Install the shipping brackets to support the spout transition and spout during load cell removal.
4. Open the control panel.
5. Label and disconnect the load cell wires from the control board in the control panel.
6. Pull the load cell cable out of the control panel.
7. Remove any tie wraps that may be securing the load cell cable to the control panel, cabinet/frame, or to other cables.
8. Loosen and remove the load cell mounting bolts/nuts.
9. Remove the load cell and set it aside.

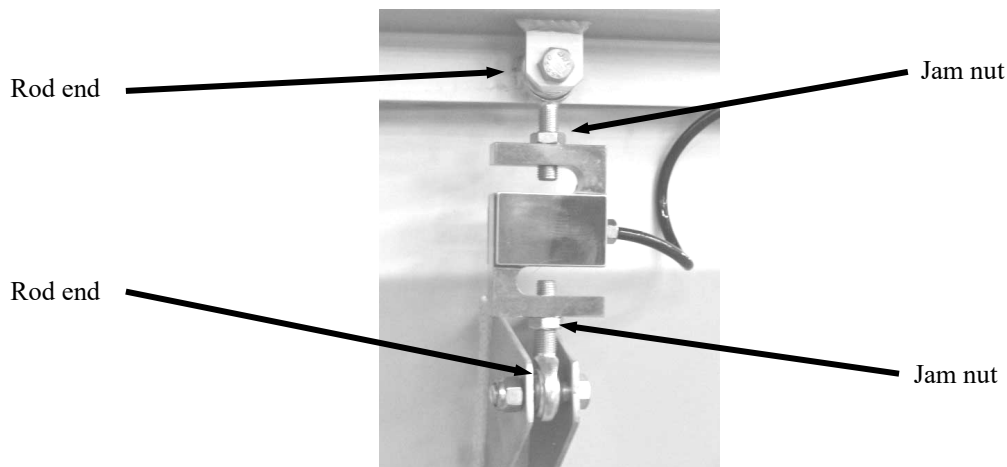


Figure 7-6. Load Cell (1 of 2 shown)

7.3.2.2 Load Cell Installation

1. Carefully place the new load cell on a bench next to the old load cell.
2. Loosen the jam nuts on the rod ends on the old load cell about ½-turn.
3. Back the top rod end out of the old load cell.
4. Install the top rod end into the new load cell until the jam nut just touches the load cell.
5. Back the top rod end out of the new load cell ½-turn.
6. Tighten the jam nut on the top rod end against the load cell. DO NOT over tighten the jam nut.
7. Back the bottom rod end out of the old load cell.
8. Install the bottom rod end into the new load cell until the jam nut just touches the load cell.
9. Back the bottom rod end out of the new load cell ½-turn.
10. Tighten the jam nut on the bottom rod end against the load cell. DO NOT over tighten the jam nut. Over tightening could result in damage to the load cell.
11. Position the load cell and install and tighten the top mounting bolt.
12. Install the lower mounting bolt.
13. Install and tighten the lower mounting nut.
14. Route the load cell cable into the control panel.
15. Connect the load cell wires to the control board.
16. Close the control panel.
17. Connect the main electrical and pneumatic connections.
18. Turn the VG Series machine on.
19. Calibrate the VG Series machine. Refer to 3.8 Calibration.

7.3.3 MAC Valve Replacement

In the event that a MAC valve becomes damaged, or fails to function, or develops a leak, follow the procedure below to replace the MAC valve.

7.3.3.1 MAC Valve Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Disconnect the air line from the quick connect fitting on the MAC valve.
4. Remove the four mounting screws.
5. Unplug and remove the MAC valve.

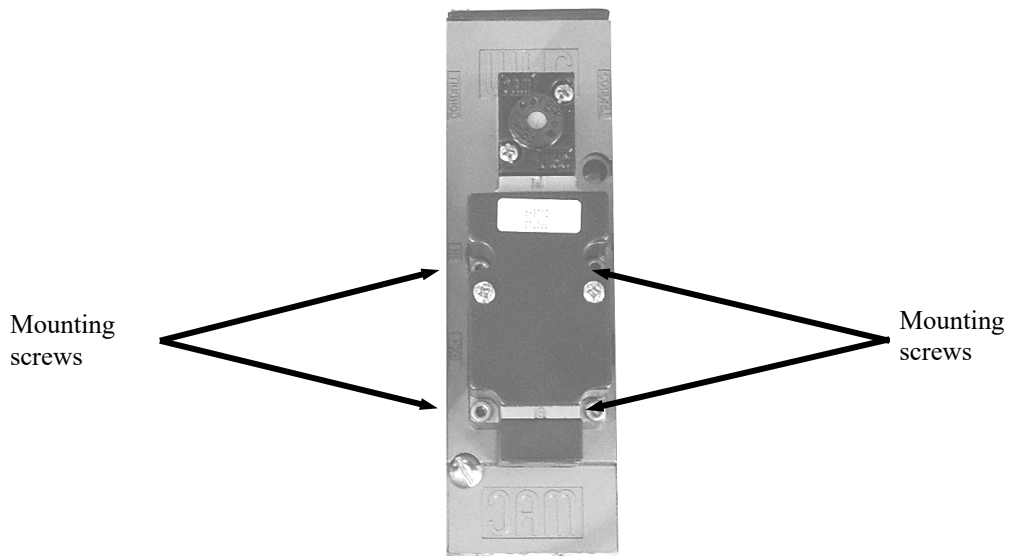


Figure 7-7. MAC Valve Solenoid Mounting Screws

7.3.3.2 MAC Valve Installation

1. Position the valve gasket securely in the groove in the valve base.
2. Position the new MAC valve and plug it in.

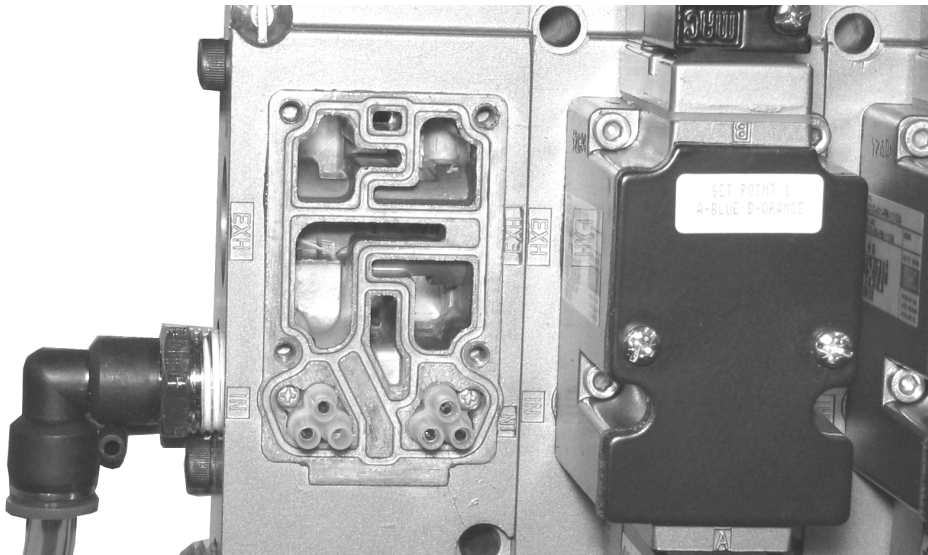


Figure 7-8. MAC Valve (Solenoid Removed)

3. Install and tighten the four mounting screws.
4. Connect the air line to the quick connect fitting on the MAC valve.
5. Connect the main electrical and pneumatic connections.
6. Turn the VG Series machine on and test for proper operation.

7.3.4 Vibratory Feeder Replacement

If the vibratory feeder fails to function and the problem cannot be corrected, use the directions below to replace the vibratory feeder.

7.3.4.1 Vibratory Feeder Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Label and disconnect the air supply lines from the pneumatic components on the spout.
4. Remove the spout. Refer to 7.3.1 Spout Replacement.
5. Remove the spout transition.
6. Open the vibratory control panel.
7. Label and disconnect the wires from the vibratory feeder cable from the vibratory control panel.
8. Carefully support the vibratory feeder. The vibratory feeder is quite heavy. If not properly supported, it could fall when the mounting bolts are removed.
9. Loosen and remove the nylock nuts from the mounting bolts.
10. With the assistance of one or two helpers, lower the vibratory feeder.

7.3.4.2 Vibratory Feeder Installation

1. With the assistance of one or two helpers, lift the vibratory feeder into position and place supports under the vibratory to feeder to hold it in position.
2. Install the mounting bolts.
3. Install the nylock nuts on the mounting bolts. Tighten each nylock nut a little at a time in sequence around the vibratory feeder until the nuts are tight.
4. Route the vibratory feeder cable to the control box and insert it through the access port into the control box.
5. Connect the cable in the same manner as the cable from the old vibratory feeder. Refer to electrical schematics for specific connection information.
6. Close the vibratory control panel.
7. Install the spout transition.
8. Install the spout. Refer to 7.3.1 Spout Replacement.
9. Connect the air supply lines from the pneumatic components on the spout.
10. Connect the main electrical and pneumatic connections.
11. Turn the VG Series machine on and test for proper operation.

7.3.5 Cutoff Gate Replacement

If the cutoff gate becomes damaged or worn, use the directions below to replace the cutoff gate.

7.3.5.1 Cutoff Gate Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Remove the cutoff gate cylinder. Refer to 7.3.6 Cutoff Gate Cylinder Replacement.
4. Remove the cutoff gate return spring. Refer to 7.3.7 Cutoff Gate Cylinder Return Spring Replacement.
5. Loosen the setscrews on each of the cutoff gate bearings.
6. Loosen the setscrews on the cutoff gate.
7. While holding the cutoff gate, slide the cutoff gate shaft out of the VG Series.
8. Remove the cutoff gate and set it aside.

7.3.5.2 Cutoff Gate Installation

1. Position the cutoff gate.
2. Slide the cutoff gate shaft through the bearing on one side, through the cutoff gate, and through the other bearing.
3. Center the cutoff gate and tighten the setscrews on the cutoff gate.
4. Tighten the setscrews on the cutoff gate bearings.
5. Install the cutoff gate return spring. Refer to 7.3.7 Cutoff Gate Cylinder Return Spring Replacement.
6. Install the cutoff gate cylinder. Refer to 7.3.6 Cutoff Gate Cylinder Replacement.
7. Connect the main electrical and pneumatic connections.
8. Turn the VG Series machine on and test for proper operation.

7.3.6 Cutoff Gate Cylinder Replacement

In the event that the cutoff gate cylinder fails or develops a leak, use the following steps to replace it.

7.3.6.1 Cutoff Gate Cylinder Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Label and disconnect the air supply lines from the cutoff gate cylinder.
4. While using a wrench to hold the bolt that connects the cutoff gate cylinder rod end to the gate shaft lever, loosen and remove the nylock nut from the bolt.
5. Remove the washer from the bolt.
6. Unhook the gate arm return spring from the bolt.
7. Remove the nut from the bolt.
8. Remove the bolt from the gate arm.
9. Remove the washer from the bolt.
10. Pull the bolt out of the rod end.
11. Remove the washer from the bolt.
12. While holding the cutoff gate cylinder, loosen and remove the cutoff gate cylinder to mounting bracket bolt.
13. Remove the cutoff gate cylinder.

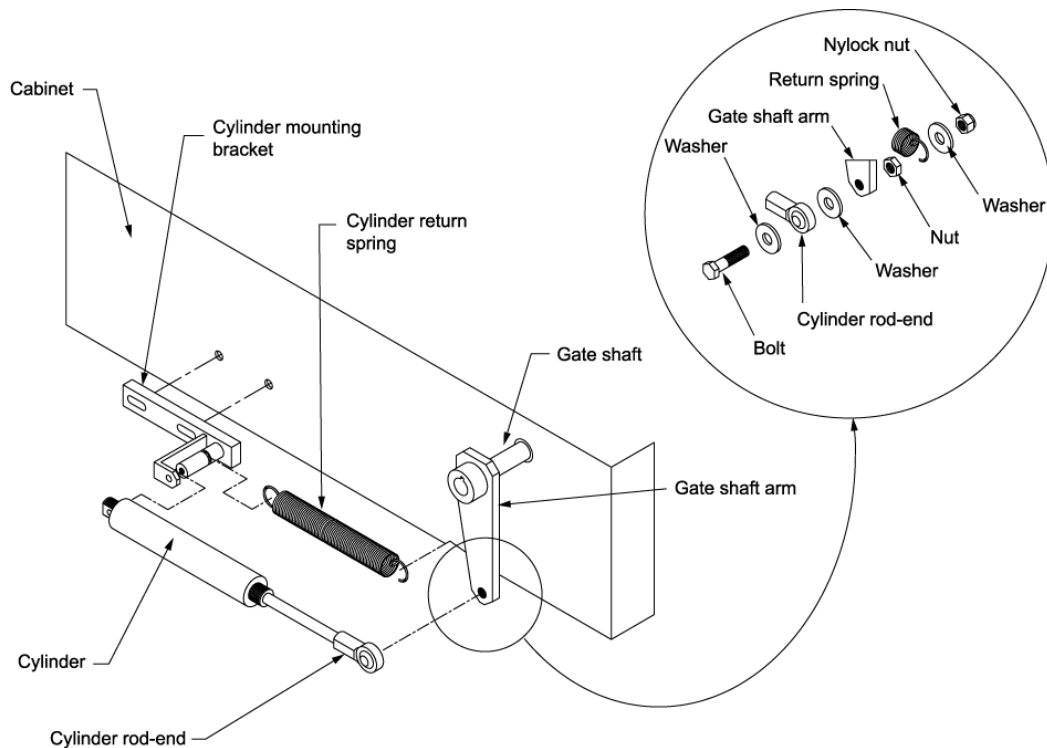


Figure 7-9. Cutoff Gate Cylinder and Associated Components

7.3.6.2 Cutoff Gate Cylinder Installation

1. Place the cylinder end into the cylinder mounting bracket.
2. Install the bolt through the cylinder mount and into the cylinder mounting bracket.
3. Tighten the bolt, but do not over tighten. If the bolt is too tight, it will not allow the cylinder to pivot.
4. Place a washer on the rod end bolt.
5. Insert the bolt through the rod end.
6. Install a second washer on the rod end bolt.
7. Insert the bolt through the hole in the gate shaft arm.
8. Install a nut on the bolt and tighten, but do not over tighten. If the nut is too tight, it will not allow the rod end to pivot.
9. Hook the end of the gate arm return spring over the bolt.
10. Install a third washer on the bolt.
11. Install a nylock nut on the end of the bolt.
12. Install the air supply lines to the cylinder.
13. Connect the main electrical and pneumatic connections.
14. Turn the VG Series machine on and test for proper operation.

7.3.7 Cutoff Gate Return Spring Replacement

Over time, springs will weaken and may even break. Use the following information to replace the cutoff gate return spring.

7.3.7.1 Cutoff Gate Return Spring Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Remove the cutoff gate cylinder. Refer to 7.3.6 Cutoff Gate Cylinder Replacement.
4. Slide the spring off of the cutoff cylinder mounting bracket.

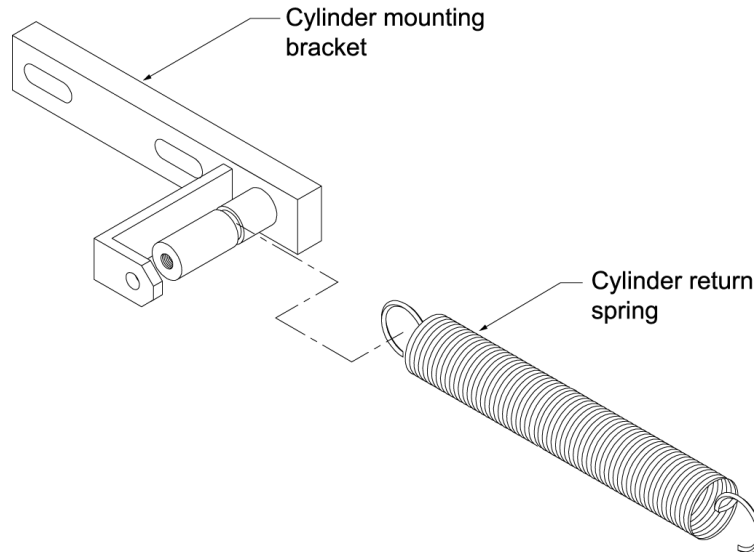


Figure 7-10. Cutoff Gate Return Spring

7.3.7.2 Cutoff Gate Return Spring Installation

1. Slide the spring on of the cutoff cylinder mounting bracket.
2. Install the cutoff gate cylinder. Refer to 7.3.6 Cutoff Gate Cylinder Replacement.
3. Connect the main electrical and pneumatic connections.
4. Turn the VG Series machine on and test for proper operation.

7.3.8 Cutoff Gate Bearing Replacement

If a cutoff gate bearing fails, use the following steps to replace it.

7.3.8.1 Cutoff Gate Bearing Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. If the bearing being replaced is on the same side of the gate as the gate arm, remove the gate arm. Refer to 7.3.10 Cutoff Gate Arm Replacement.
4. Make a mark on the cutoff gate shaft to mark the position of the bearing on the shaft.
5. Loosen the setscrew on the bearing that is being replaced.
6. Loosen and remove the mounting nuts/bolts.
7. Remove the bearing by sliding it off of the cutoff gate shaft.

7.3.8.2 Cutoff Gate Bearing Installation

1. Slide the bearing onto the shaft.
2. Install and tighten the mounting bolts/nuts.
3. Check the alignment of the bearing with the mark that was made on the cutoff gate shaft in step 4 of the removal procedure.
4. Tighten the setscrew.
5. If the bearing being replaced is on the same side of the gate as the gate arm, install the gate arm. Refer to 7.3.10 Cutoff Gate Arm Replacement.
6. Connect the main electrical and pneumatic connections.
7. Turn the VG Series machine on and test for proper operation.

7.3.9 Cutoff Gate Seal Replacement

The cutoff gate is equipped with a rubber seal to prevent product leaking from the feeder pan when the cutoff gate is closed. If the rubber seal becomes damaged or excessively worn, use the following procedures to replace it.

7.3.9.1 Cutoff Gate Seal Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Partially open the cutoff gate.
4. Remove the nuts, washers, and bolts that secure the seal to the cutoff gate.
5. Remove the cutoff gate seal.

7.3.9.2 Cutoff Gate Seal Installation

1. Position the cutoff gate seal on the cutoff gate.
2. Install the bolts, washers, and nuts that secure the seal to the cutoff gate. Tighten the bolts/nuts.
3. Close the cutoff gate.
4. Connect the main electrical and pneumatic connections.
5. Turn the VG Series machine on and test for proper operation.

7.3.10 Cutoff Gate Arm Replacement

If the cutoff gate arm becomes worn or damaged, use the following procedures to replace it.

7.3.10.1 Cutoff Gate Arm Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Remove the cutoff gate cylinder. Refer to 7.3.6 Cutoff Gate Cylinder Replacement.
4. Remove the cutoff gate return spring. Refer to 7.3.7 Cutoff Gate Return Spring Replacement.
5. Loosen the setscrew that secures the cutoff gate arm to the cutoff gate shaft.
6. Slide the cutoff gate arm off of the cutoff gate shaft.

7.3.10.2 Cutoff Gate Arm Installation

1. Slide the cutoff gate arm on to the cutoff gate shaft.
2. Tighten the setscrew that secures the cutoff gate arm to the cutoff gate shaft.
3. Install the cutoff gate return spring. Refer to 7.3.7 Cutoff Gate Return Spring Replacement.
4. Install the cutoff gate cylinder. Refer to 7.3.6 Cutoff Gate Cylinder Replacement.
5. Connect the main electrical and pneumatic connections.
6. Turn the VG Series machine on and test for proper operation.

7.3.11 Flow Gate Replacement

Depending on the abrasiveness of the product being packaged, the flow gate may require periodic replacement. Use the information below to replace it.

7.3.11.1 Flow Gate Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Mark the position of the flow gate.
4. Remove the top panel from the VG Series to allow access to the flow gate.
5. Loosen the setscrews that secure the flow gate to the flow gate shaft.
6. Loosen and remove the flow gate adjustment bolt.
7. While holding the flow gate with one hand, slide the flow gate shaft out the side of the VG Series.
8. Lift the flow gate out of the VG Series machine.

7.3.11.2 Flow Gate Installation

1. Lower the new flow gate into the VG Series from the top.
2. While holding the flow gate with one hand, line the hole in the side of the VG Series up with the center of the hole in the end of the flow gate. Slide the flow gate shaft in through flow gate.
3. Center the flow gate.
4. Tighten the setscrews.
5. Install the top panel.
6. Adjust the flow gate. Refer to 7.2.3 Flow Gate Adjustment.
7. Connect the main electrical and pneumatic connections.
8. Turn the VG Series machine on and test for proper operation.

7.3.12 Bag Clamp (V-Type Bag Clamp) Pad Replacement

Over time, the rubber bag clamps may become worn or may get damaged. Use the following steps to replace them.

7.3.12.1 Bag Clamp Pad Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Remove the four nuts that secure the bag clamp pad to the bag clamp arm.
4. Remove the four lock nuts from the bag clamp pad studs.
5. Remove the bag clamp pad.

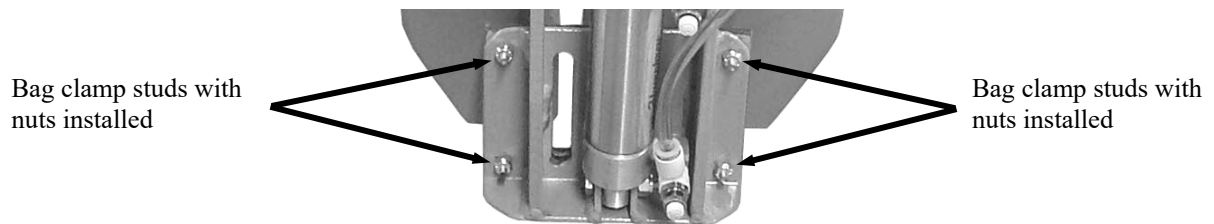


Figure 7-11. Bag Clamp Pad Mounting

7.3.12.2 Bag Clamp Pad Installation

1. Position the new bag clamp pad so that the studs go through the four mounting holes in the bag clamp arm.
2. Install the lock washer and nut on each bag clamp stud.
3. Once all of the washers and nuts have been installed, tighten them.
4. Connect the main electrical and pneumatic connections.
5. Turn the VG Series machine on and test for proper operation.

7.3.13 Bag Clamp (V-Type Bag Clamp) Cylinder Replacement

If one of the bag clamp cylinders fails to operate or develops a leak, use the steps below to replace it.

7.3.13.1 Bag Clamp Cylinder Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Label and disconnect the air supply lines from the bag clamp cylinder.
4. Loosen and remove the nut from the cylinder to bag clamp arm bolt.
5. Remove the cylinder to bag clamp arm bolt.
6. Use a wrench to back the jam nut off about ¼ turn. Back the jam nut off just enough to allow the cylinder rod to turn in the pivot block.
7. While holding the cylinder with one hand, back the rod end out of the pivot block with the other.
8. Remove the cylinder from the VG Series machine.

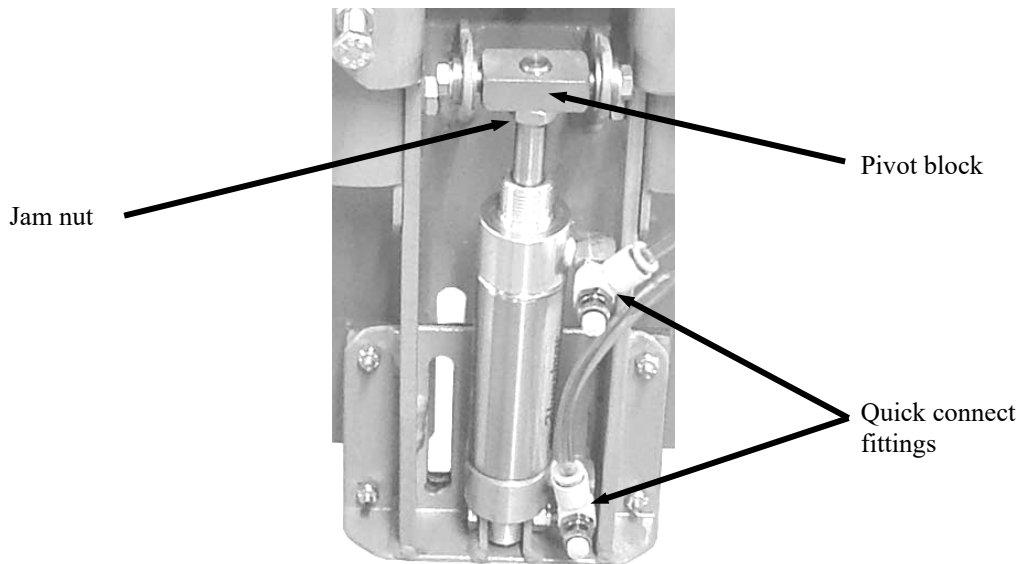


Figure 7-12. Bag Clamp Cylinder (1 of 2 shown)

7.3.13.2 Bag Clamp Cylinder Installation

1. Lay the new bag clamp cylinder next to the old cylinder.
2. Remove the air fittings from the old cylinder and transfer them to the new cylinder. Make sure that the fitting on the rod end of the old cylinder is installed in the rod end of the new cylinder. Refer to 7.3.19 Quick Connect Fitting Replacement.
3. Set the jam nut on the new cylinder to match the position of the jam nut on the old cylinder.
4. Thread the cylinder rod into the pivot block until the jam nut just touches the pivot block. Then back the cylinder rod off about $\frac{1}{4}$ turn.
5. Pivot the cylinder end into the cylinder mounting bracket on the bag clamp arm.
6. Insert the cylinder to bag clamp arm mounting bolt.
7. Install and tighten the nut on the cylinder to bag clamp arm mounting bolt.
8. Connect the air supply lines to the cylinder quick connect fittings.
9. Connect the main electrical and pneumatic connections.
10. Turn the VG Series machine on and test for proper operation.

7.3.14 Bag Clamp (V-Type Bag Clamp) Arm Replacement

If a bag clamp arm becomes damaged or worn, use the procedures below to replace it.

7.3.14.1 Bag Clamp Arm Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Remove the side cover from the cabinet.
4. Remove the bag clamp cylinder. Refer to 7.3.13 Bag Clamp (V-Type Bag Clamp) Cylinder Replacement.
5. Remove the bag clamp arm pivot bolts/nuts.
6. Remove the bag clamp arm.

7.3.14.2 Bag Clamp Arm Installation

1. Position the bag clamp arm so the mounting/pivot holes are aligned.
2. Install the bag clamp arm pivot bolts/nuts.
3. Install the bag clamp cylinder. Refer to 7.3.13 Bag Clamp (V-Type Bag Clamp) Cylinder Replacement.
4. Install the side cover on the cabinet.
5. Connect the main electrical and pneumatic connections.
6. Turn the VG Series machine on and test for proper operation.

7.3.15 Bag Clamp Actuator Switch Replacement

If the bag clamp actuator switch fails to function and troubleshooting techniques have determined that the switch must be replaced, use the following steps to replace the switch.

7.3.15.1 Bag Clamp Actuator Switch Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Open the control box.
4. Trace the cable from the bag clamp actuator switch to the point where it is connected to the controller.
5. Label the wires to indicate how they were connected.
6. Disconnect the switch cable from the controller.
7. Pull the cable free from the control box.
8. Remove any tie wraps that may secure the cable to the VG Series.
9. Pull the cable free of the machine, all the way up to the bag clamp actuator switch.
10. Remove the mounting screws that mount the bag clamp actuator switch to the mounting bracket.
11. Remove the bag clamp actuator switch.

7.3.15.2 Bag Clamp Actuator Switch Installation

1. Position the bag clamp actuator switch so that the mounting holes in the bracket are aligned with the mounting holes in the bag clamp actuator switch.
2. Insert and tighten the mounting screws.
3. Route the bag clamp actuator switch cable to the control box in the same manner as the cable from the bag clamp actuator switch that was removed.
4. Insert the end of the cable through the grommet into the control box.
5. Connect the wires to the controller in the same fashion as the connections from the bag clamp actuator switch that was installed previously.
6. Close the control box.
7. Secure the bag clamp actuator switch cable to the frame of the VG Series using tie straps.
8. Connect the main electrical and pneumatic connections.
9. Turn the VG Series machine on and test for proper operation.

7.3.16 Bag In Place Switch Replacement

If the bag in place switch fails to function and troubleshooting techniques have determined that the switch must be replaced, use the following steps to replace the switch.

7.3.16.1 Bag In Place Switch Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Open the control box.
4. Trace the cable from the bag in place switch to the point where it is connected to the controller.
5. Label the wires to indicate how they were connected.
6. Disconnect the bag in place switch cable from the controller.
7. Pull the cable free from the control box.
8. Remove any tie wraps that may secure the cable to the VG Series.
9. Pull the cable free of the machine, all the way up to the bag in place switch.
10. Remove the mounting screws that mount the bag in place switch to the mounting bracket.
11. Remove the bag in place switch.

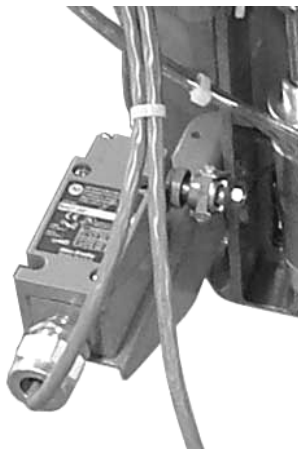


Figure 7-13. Bag In Place Switch

7.3.16.2 Bag In Place Switch Installation

1. Position the bag in place switch so that the mounting holes in the bracket are aligned with the mounting holes in the bag in place switch.
2. Insert and tighten the mounting screws.
3. Route the switch cable to the control box in the same manner as the cable from the bag in place switch that was removed.
4. Insert the end of the cable through the grommet into the control box.
5. Connect the wires to the controller in the same fashion as the connections from the bag in place switch that was installed previously.
6. Close the control box.
7. Secure the bag in place switch cable to the frame of the VG Series using tie straps.
8. Connect the main electrical and pneumatic connections.
9. Turn the VG Series machine on and test for proper operation.

7.3.17 Inflatable Bladder Bag Clamp Replacement

VG Series machines that are equipped with an inflatable bag clamp, utilize an inflatable bladder that is used to hold the bag on the spout and to keep prevent product from spilling out of the bag. If the bladder develops a leak, use the steps below to replace it.

7.3.17.1 Inflatable Bladder Removal

1. Turn the VG Series machine off.
2. Disconnect the input power and compressed air supply line.
3. Label and disconnect the air supply line from the quick connect fitting on the spout.
4. Fold the flap up to expose the tabs and setscrews on the top compression ring.

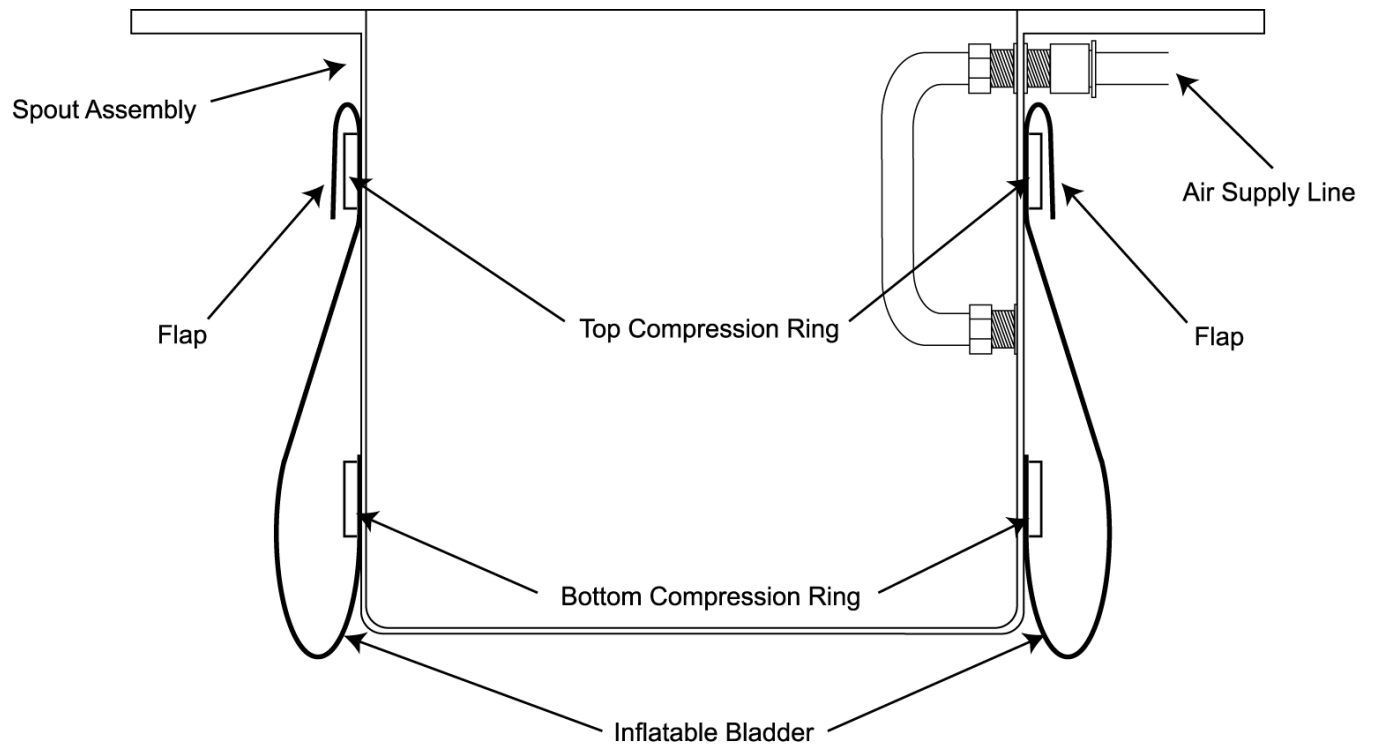


Figure 7-14. Section View of Open Mouth Bag Spout and Inflatable Bladder

5. Using C-clamp style locking pliers, apply pressure to the tabs of the top compression ring.

Repair

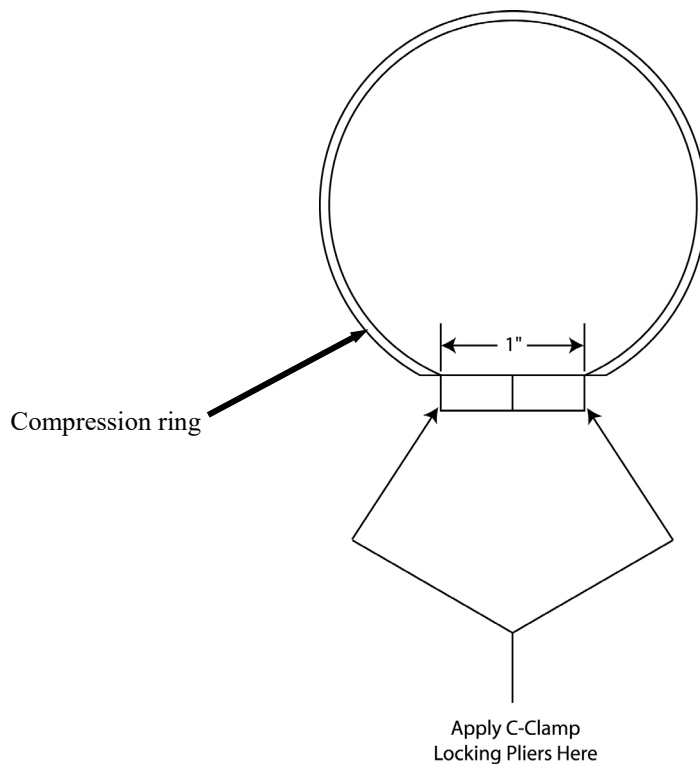


Figure 7-15. Inflatable Bladder Compression Ring

6. Remove the setscrews from the top compression ring.
7. Remove the C-clamp style locking pliers.
8. Slide the top compression ring off of the spout
9. Pull the bladder straight down to expose the second compression ring.
10. Using C-clamp style locking pliers, apply pressure to the tabs on the bottom compression ring.
11. Remove the setscrews from the bottom compression ring.
12. Remove the C-clamp style locking pliers.
13. Slide the bottom compression ring off of the spout.

Note: *The two compression rings are different sizes and cannot be interchanged.*

Note: *Make note of how the bladder is positioned. The new bladder will need to be positioned in the same manner as the one that is being removed.*

14. Remove the bladder.
15. Inspect the compression rings for damage or wear. If they are damaged or worn, discard them and install new ones with the new bladder.

7.3.17.2 Inflatable Bladder Installation

1. Turn the new bladder inside out.
2. Slide the new inflatable bladder on to the spout. Position it on the spout in the same position as the old bladder.

Note: The two compression rings are different sizes and cannot be interchanged.

3. Position the bottom compression ring.
4. Using C-clamp style locking pliers, apply pressure to the tabs on the bottom compression ring.
5. Install and tighten the setscrews for the bottom compression ring.
6. Remove the C-clamp style locking pliers.
7. Grasp the edge of the bladder at the bottom. Roll the edge outward and upward, creating a flap. This motion will begin the process of turning the bladder right side out.

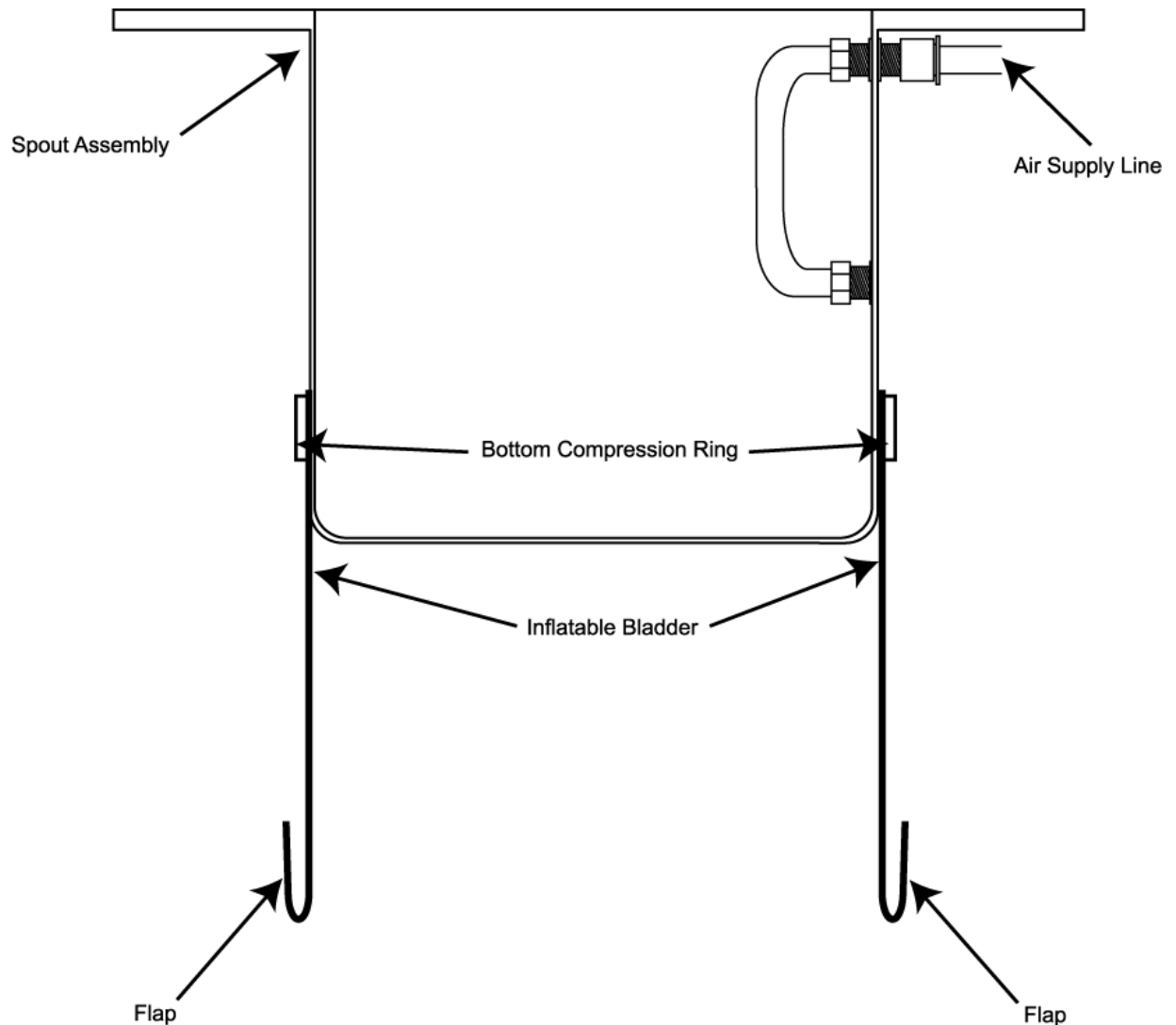


Figure 7-16. Creating the Flap

Repair

- Using the flap, pull the bladder up to the top of the spout and roll the edge outward and downward, creating a new flap.

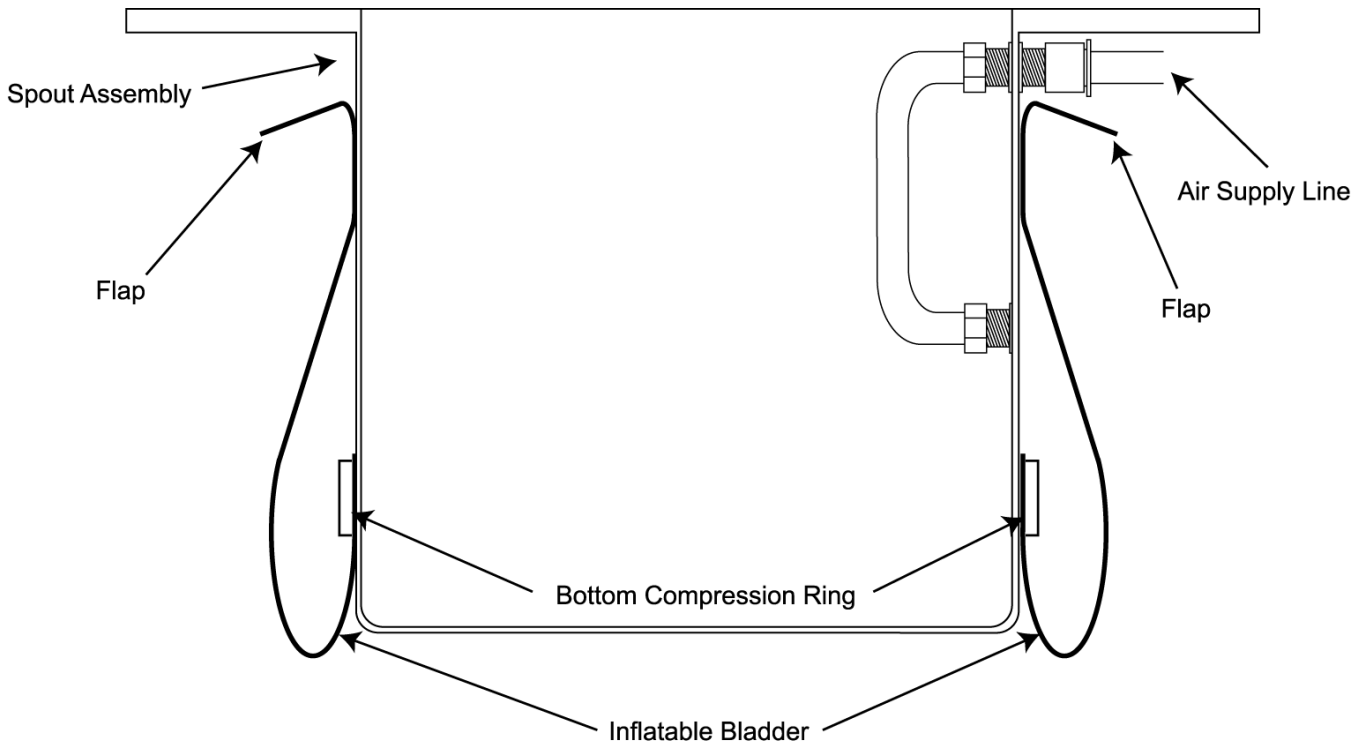


Figure 7-17. Pulling the Bladder Up, and Creating the Upper Flap

- Slide the top compression ring into position.
- Using C-clamp style locking pliers, apply pressure to the tabs on the top compression ring.
- Install and tighten the setscrews for the top compression ring.
- Remove the C-clamp style locking pliers.
- Pull the flap down to cover the top compression ring.
- Install the air supply line into the quick connect fitting.
- Connect the main electrical and pneumatic connections.
- Turn the VG Series machine on and test the bladder for proper operation.

7.3.18 Air Supply Line Replacement

In the event that an air supply line becomes damaged and requires replacement, follow the steps below to remove and replace the air supply line.

7.3.18.1 Air Supply Line Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Remove any clips and/or retainers that hold the damaged air supply line in place.
4. Disconnect the damaged air supply line from the components that it is connected to.
5. Remove the air supply line, making note of how the line is routed.

7.3.18.2 Air Supply Line Installation

1. Measure the air supply line that was just removed.
2. Cut a new length of air supply line, making sure that the ends of the line are cut square. Cut the new line to the same length of the one that was removed.
3. Route the new air supply line in the same manner as the one that was removed.
4. Insert each end of the new line into their fittings.
5. Reattach any clips and/or retainers to secure the air supply line.
6. Reconnect the main pneumatic connection and check for any leaks. If a leak is found, disconnect the main air supply line and then disconnect/reconnect the air connections, then reconnect the main air supply line. Repeat as necessary, until no leaks are present. It may be necessary to trim the end of an air supply line to resolve a leak. The ends must be cut square.
7. Connect the main electrical connection.
8. Turn the VG Series machine on and test for proper operation.

7.3.19 Quick-Connect Fitting Replacement

In the event that a quick-connect air fitting becomes damaged and requires replacement, follow the steps below to remove and replace the air supply line.

7.3.19.1 Quick-Connect Fitting Removal

1. Turn the VG Series machine off
2. Disconnect the main electrical and pneumatic connections.
3. Disconnect the air supply line from the fitting being replaced by pressing and holding the collar in, and pulling out on the air supply line.
4. Using a wrench, unscrew the fitting.

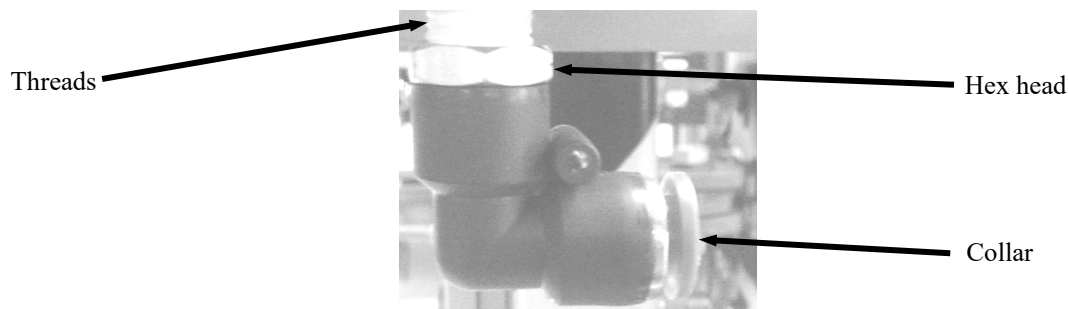


Figure 7-18. Quick-Connect Air Supply Fitting

7.3.19.2 Quick-Connect Fitting Installation

1. Using Teflon® tape, wrap the threads of the new fitting, starting at the bottom of the thread working toward the hex head in the same direction as the threads.
2. Screw the new fitting into the threads and use a wrench to carefully tighten the fitting.



CAUTION

Over tightening the fitting can damage the fitting, or the component that it is being threaded into.

3. Reconnect the air supply line to the fitting.
4. Reconnect the main pneumatic connection and check for any leaks. If a leak is found, disconnect the main air supply line and then disconnect/reconnect the air connections, then reconnect the main air supply line. Repeat as necessary, until no leaks are present. It may be necessary to trim the end of an air supply line to resolve a leak. The ends must be cut square.
5. Connect the main electrical connection.
6. Turn the VG Series machine on and test for proper operation.

7.3.20 Air Filter/Regulator/Lubricator (FRL) Replacement

In the event that the filter, the regulator, or the lubricator experiences a malfunction or becomes damaged, use the procedures below to replace the entire assembly.

7.3.20.1 FRL Assembly Removal

1. Turn the VG Series machine off.
2. Disconnect the main electrical and pneumatic connections.
3. Disconnect the output line from the lubricator.
4. Remove the FRL mounting bolts and remove the FRL.
5. Drain the oil from the lubricator and discard it in accordance to local laws.

7.3.20.2 FRL Assembly Installation

1. Position the new FRL in the mounting location. Install and tighten the mounting bolts.
2. Connect the compressed air output line to the lubricator.
3. Fill the lubricator with the appropriate oil.
4. Connect the main pneumatic connection to the filter.
5. Check for air leaks.
6. Adjust the air pressure to specification.
7. Connect the main electrical connection.
8. Turn the VG Series machine on and check for proper operation.

Glossary

TERM	DEFINITION
AC	Alternating Current
Bag clamp	A paddle like device that has a rubberized pad. A set of two bag clamps are applied and released via pneumatic cylinders. When applied, the two bag clamps hold the bag in place while it is being filled.
Bag clamp actuator switch	A rotary type switch that is used to indicate that the operator is ready for the machine to apply the bag clamps.
Bag clamp pad	One rubberized pad is mounted on each bag clamp arm. These pads provide the grip required to hold a bag while it is being filled.
Bagging cycle	A series of functions that describe the packaging process, from beginning to end, for one bag of product.
Bag in place switches	A pair of switches that are used to determine whether a bag is in place and properly positioned and ready to receive product.
Balancing load cells	The process of combining the inputs from each load cell and producing a single output for the weight display.
Cabinet	The main structure of the VG Series. Serves as the backbone of the machine.
Calibration	The process of adjusting the weighing system to make sure that the load cells matches the weight of the known weight.
Checkweigh	A function that the operator can use to check the weight of the product prior to the product being released from the weigh bucket.
Component	An item of hardware as commonly supplied complete by manufacturers.
Counter	A function of the control system that counts how many specific events occur to complete a process. For example, if the desired package weight is higher than the capacity of the weigh bucket, multiple cycles of filling and emptying the weigh bucket must occur. The counter will keep track of the cycles.
Cubic Feet/Minute (CFM)	A unit of measure that is used to describe the amount of compressed air that is used by a machine.
DC	Direct Current
De-energize	To deprive an electro-receptive device of its operating current.
DROP button	A button on the control panel that allows the operator to force the bag clamps to release.
Dry cycle	The process of checking the operation of the machine components without running product through the machine.
ESD	Electrostatic Discharge
Fast A	This refers to the rate of vibration (feed rate) during the bulk portion of the fill cycle.
Fill cycle	The process of filling one bag.
Flow gate	This gate is used to control the depth of product in the pan of the vibratory feeder. It is adjusted manually.
FRL	Filter/Regulator/Lubricator assembly. This device filters incoming compressed air, regulates the pressure, and introduces a lubricant to protect downstream pneumatic components from wear.
Ground	A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or some other conducting body at a reference potential.
kg	Kilogram
lb or lbs	Pound or pounds

Glossary

TERM	DEFINITION
MAC valve	A device that combines an electric solenoid and a pneumatic valve. Voltage is applied or removed from the solenoid to cause the pneumatic valve to move. Used to control the pneumatic cylinders.
Pivot block	Threads on to the end of a pneumatic cylinder rod and is connected to a bag clamp pad arm. It allows the pneumatic cylinder to pivot slightly as it applies the bag clamp pad.
Power supply	Converts incoming 120VAC power in a usable power, usually 24 VDC, for the control components.
Product	Refers to the material that is being packaged by the machine.
Programmable Logic Controller (PLC)	A microprocessor-based industrial control system. It receives inputs from devices, such as switches and control buttons. The internal processor uses a program to analyze the inputs and will drive outputs based on the results.
Slow A	This refers to the rate of vibration (feed rate) during the dribble portion of the fill cycle.
Spout	The mounting point for the bag clamp mechanism. The bags are placed on the spout for filling.
Spout transition	A funnel shaped device that mounts to the bottom of the cabinet. It serves as the mounting point for the spout. As product falls from the weigh bucket, this device guides the product to the spout.
SP1	Setpoint 1. This is the dribble point. This is the point where the machine stops filling the weigh bucket at the bulk rate and starts filling it at the dribble rate.
SP2	Setpoint 2. This is the cutoff point. This is the point where the machine stops filling the weigh bucket. SP2 is typically set slightly below the target weight.
Surge	A sudden rise of current or voltage.
Surge hopper	A reservoir where product is stored for packaging.
T3000 control panel	This is an optional controller for the VG Series. It is used to monitor and program the functions of the VG Series.
T4000 control panel	This is the standard controller for the VG Series. It is used to monitor and program the functions of the VG Series.
Timer	A function of the control system that forces a specific amount of delay between specific events or functions.
Vibratory feeder	A product feed device that uses vibration to move the product from the supply hopper to the weigh pan via a feeder pan.

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Appendix A

Safety Procedures, Cautions, Warnings, and Notices

- General safety precautions must be observed during all phases of operation, service and repair of the VG Series. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the VG Series.
- The manufacturer assumes no liability for customer's failure to comply with the following requirements:
- Qualified technicians and maintenance personnel should service the equipment described in this manual.
- Do not attempt internal service or adjustments unless another person, capable of rendering first aid and resuscitation, is available.
- Do not substitute parts or modify equipment. This practice could, in some cases, introduce the danger of additional hazards.
- The VG Series contains some electrostatic-sensitive components. Therefore, always ground yourself with a proper wrist strap before handling any modules or printed circuit boards so that static charges are removed from the person. Use static suppressive packaging to protect electronic assemblies removed from the VG Series.
- Observe all procedural cautions and warnings located on the equipment and throughout this manual.
- Read and follow all instructions
- Follow all warnings and instructions marked on the units and listed in manuals.

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Appendix B Spare Parts

Table B-1. VG Series Spare Parts List

	Part Description	Part Number
1	Cutoff gate bearing	50-7039
2	Cutoff gate cylinder clevis	50-7056
3	Cutoff gate cylinder	25-DP-4
4	Cutoff gate arm	WORTZA14
5	Load cell (250 lbs style)	50-1544
6	Load cell clevis	50-7054
7	Bag clamp pads	60-0196
8	Bag clamp bearings	50-7011
9	Bag clamp cylinder	50-1104
10	Bag clamp cylinder ends	60-0193
11	Bag clamp cylinder bearing	50-7010
12	Vibratory feeder	50-1100
13	Flow control valve – out	50-4882
14	Solenoid valve	50-1048
15	Solenoid valve (for machines equipped with Allen-Bradley PLC)	50-1082
16	Filter/Regulator/Lubricator	50-1700
17	Bag clamp actuator switch	50-1017
18	Bag in place switch	50-1017
19	Vibrator control module	50-1019
20	Bag drop timer	50-1654
21	Relay – Double pole, double throw (DPDT)	50-1097
22	Flow gate bearings	50-7039
23	Flow gate cylinder	50-1163
24	Flow gate clevis	50-7056
25	Foot switch	50-1253
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Appendix C Mechanical Drawings

Table C-1. VG Series Mechanical Drawings

	Drawing Title	Drawing Number
1	T4000 Control Box – External View	VG T4000-1-401-00
2	T4000 Control Box – Internal View	VG T4000-1-402-00
3	T3000 Control Box – External View (Pedestal Mounted Control Box)	30069-1-401-00
4	T3000 Control Box – Internal View (Pedestal Mounted Control Box)	30069-1-402-00
5	Gate Callout	Gate Callout
6	Gate Cylinder Assembly	Gate Cylinder Assembly
7	Isometric View	TEVG-ISO-00
8	VG Series Callout	TEVG-101-00 CALLOUT
9	VG Series	TEVG-101-00
10	VG Series	TEVG-101-SALES
11	VG Series – Side & Front Views	TEVG-103-SALES
12	VG Series – Shipping Shim Removal	TevgsbaCALLOUT
13	V-Style Bag Clamp Spout	v-style bag clamp spout
14		
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Appendix D Electrical Drawings

Table D-1. VG Series Electrical Drawings

	Drawing Title	Drawing Number
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Appendix E

Control Panel User Guide

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Appendix F Custom Features

The documents included in Appendix F will provide information regarding any custom features that were ordered and included in the equipment purchase.

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The equipment that accompanies this manual was not ordered with any custom features, thus no custom documentation is included.

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