Model TC3 Electronic Counter

Operation Manual
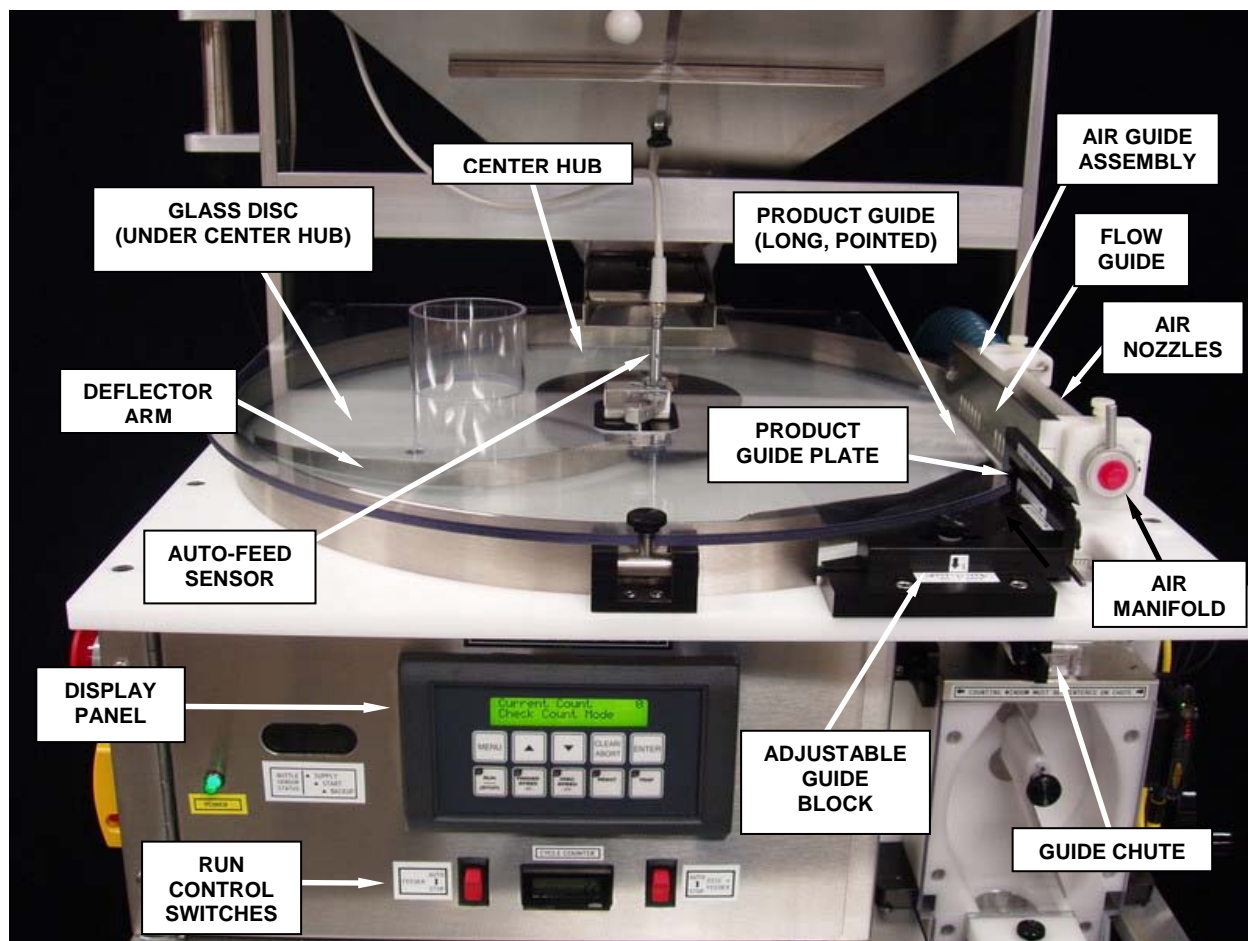
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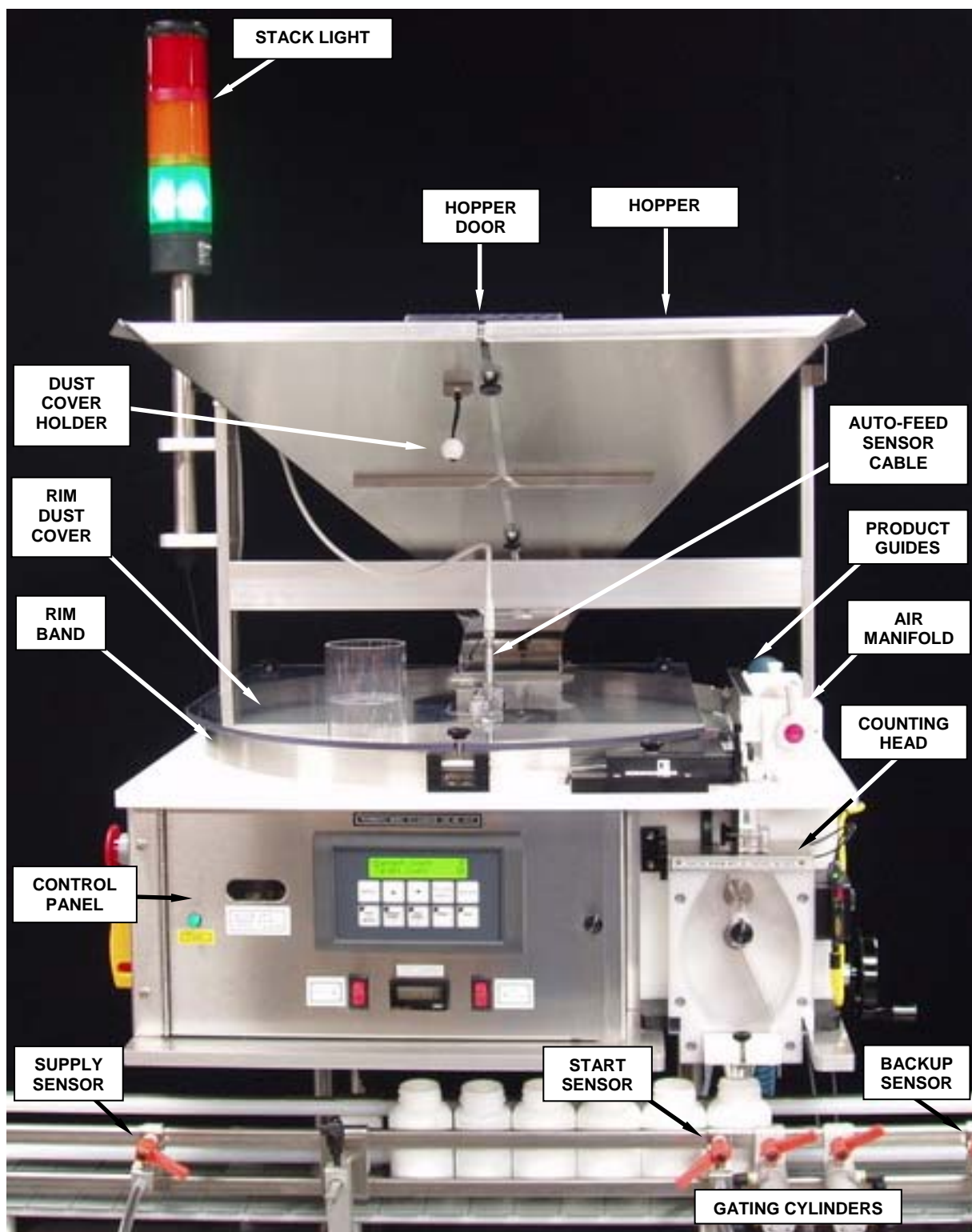
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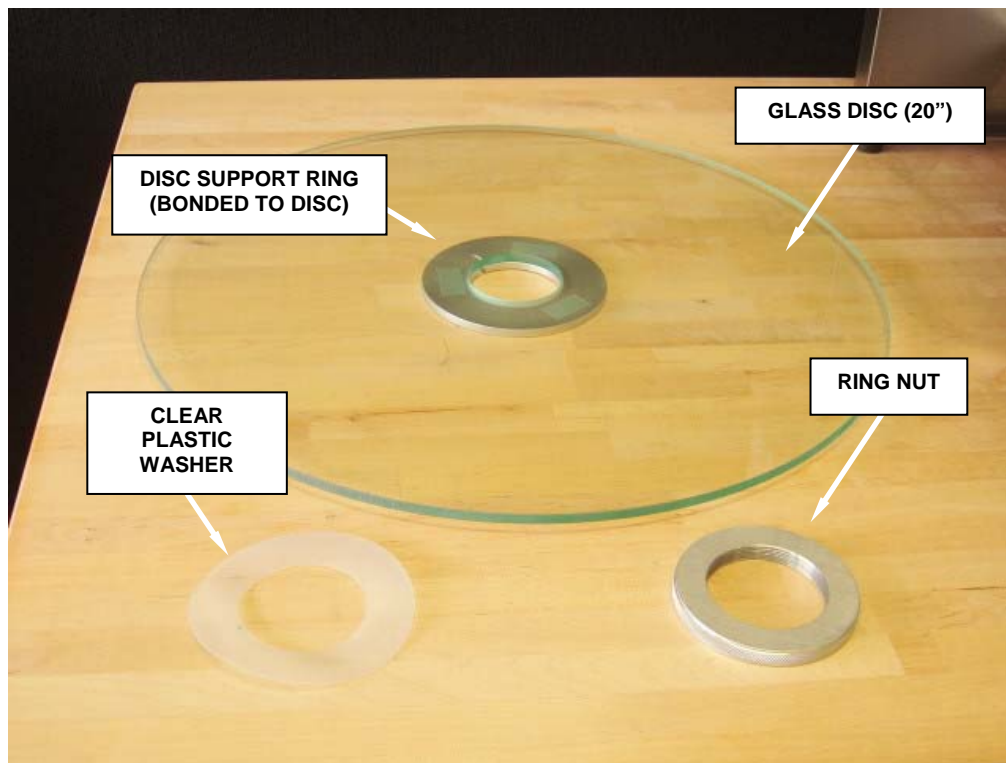
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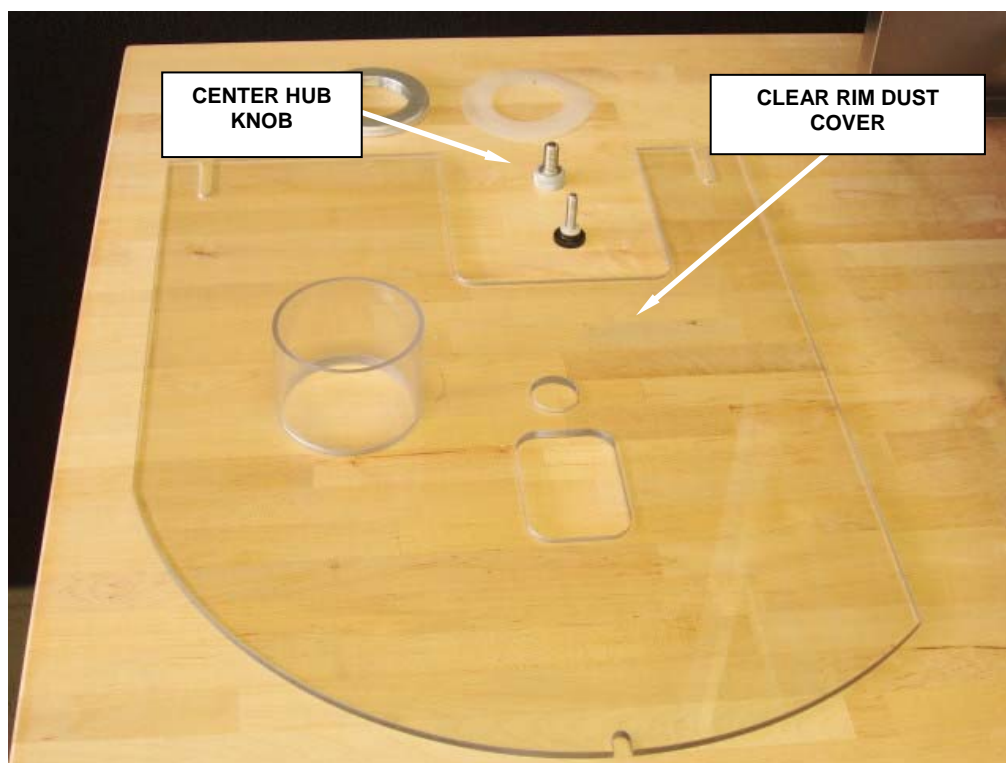
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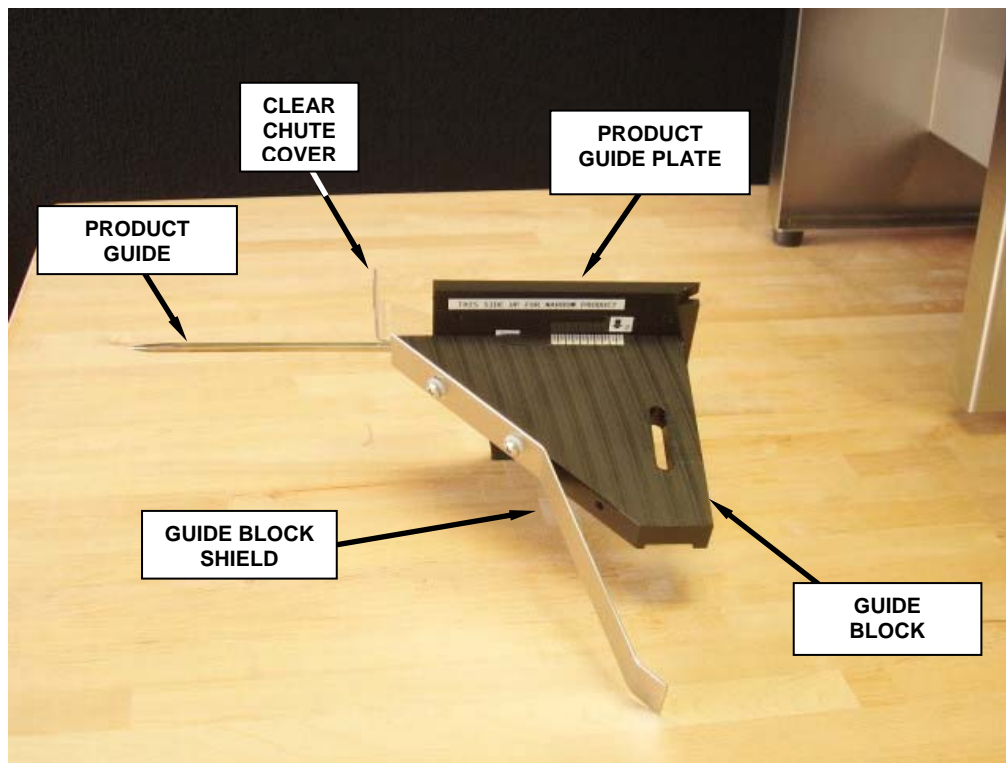
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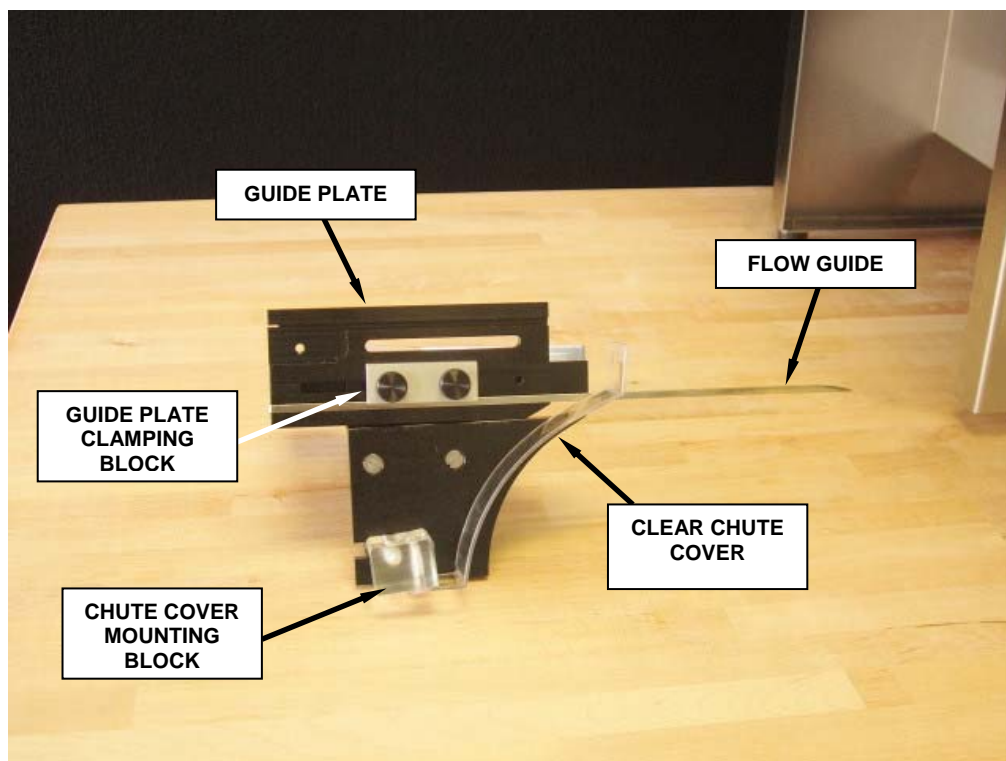
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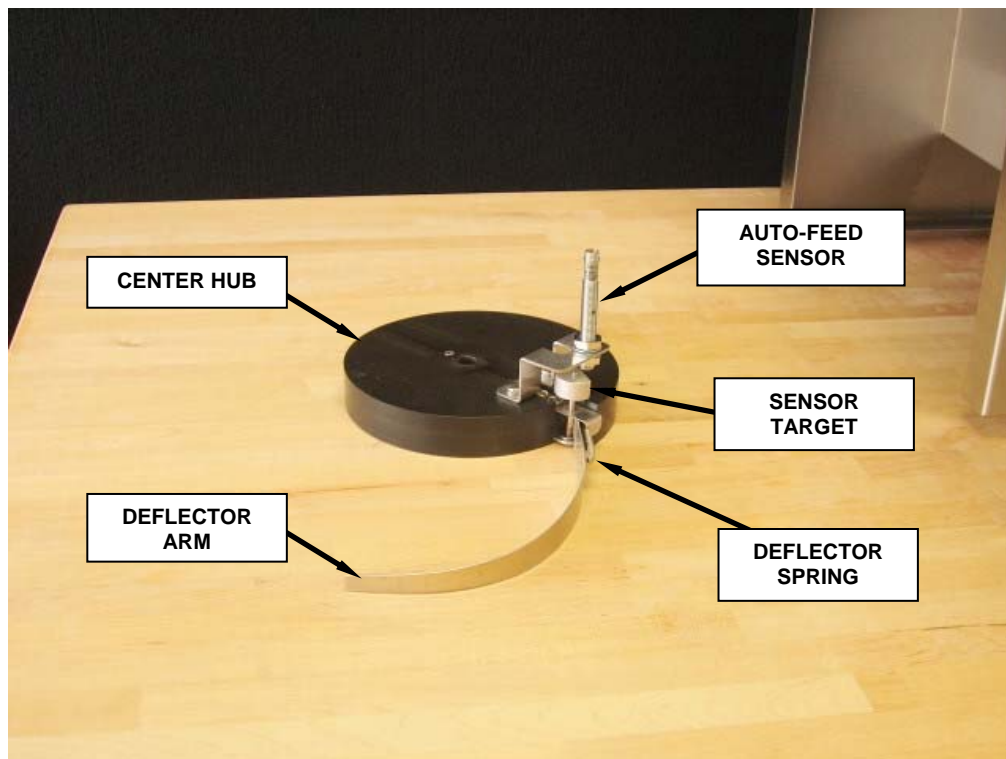
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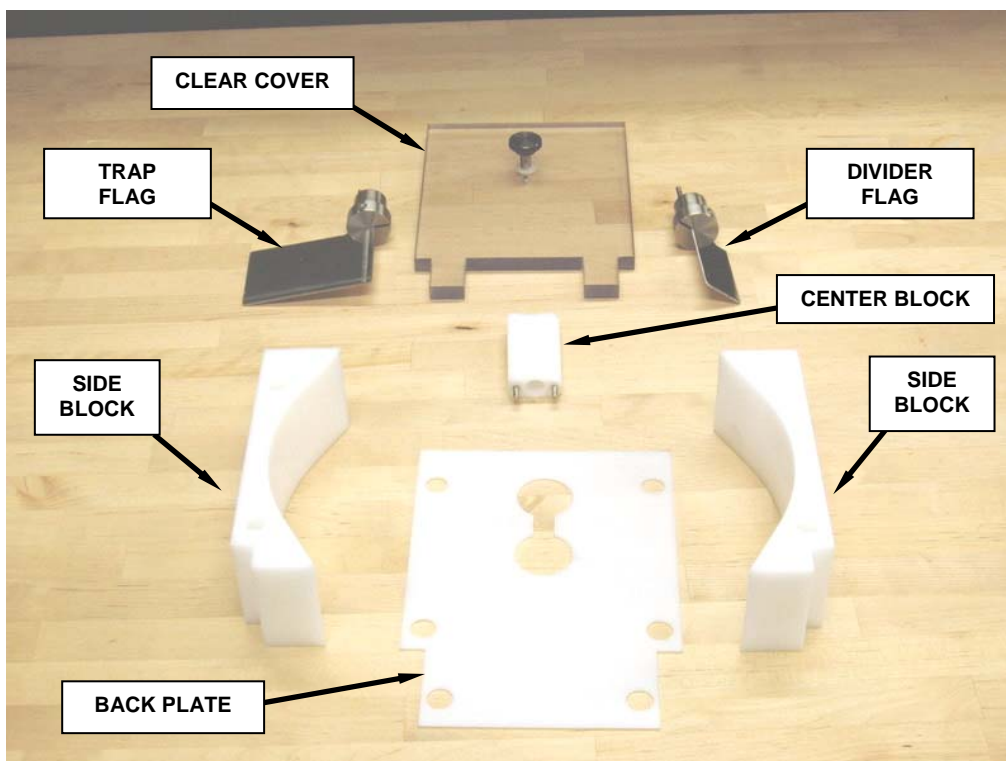
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CLEAR CHUTE COVER

COUNTING WINDOW

COUNTING SENSOR COVER

COUNTING SENSOR

COUNTING SENSOR FIBER OPTIC CABLES

FUNNEL (4 SIZES)

HEIGHT

FUNNEL HOLDER

1.14 – Feeder Chute Sieves

.250 HOLES

.188 HOLES

.156" HOLES

SOLID SIEVE
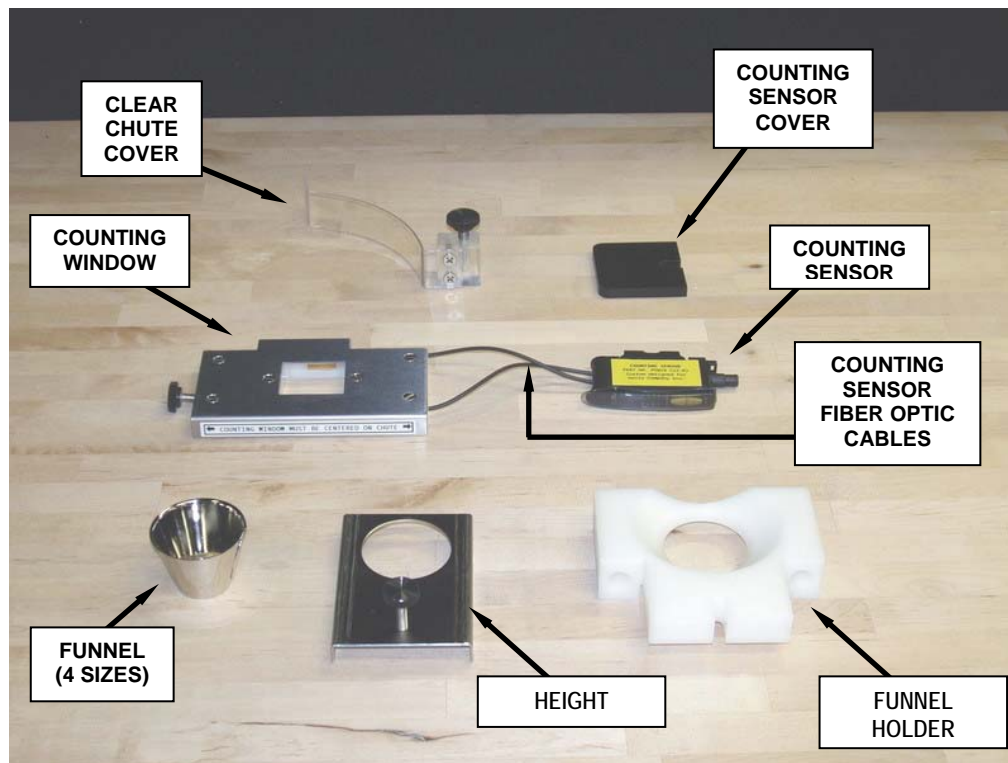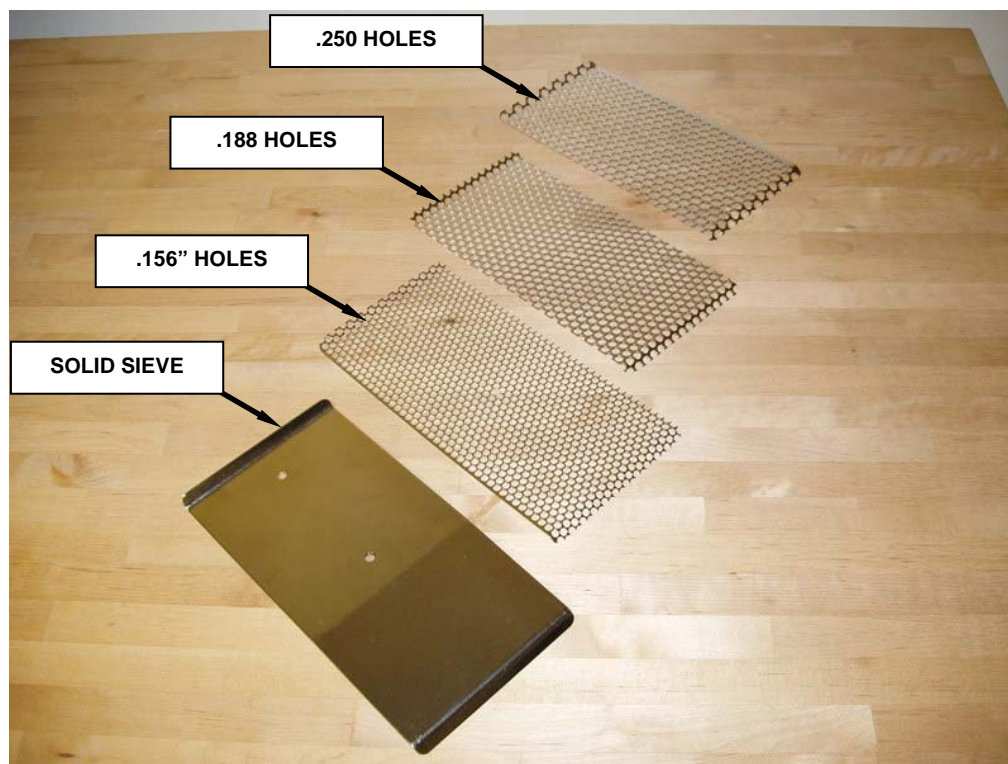
Section 2 - SAFETY REMINDER

Warning

This machine contains moving parts and operates automatically. This may present a hazard to personnel.

Never operate this machine with any covers or guards removed or any guard switches or safety devices removed or bypassed.

Only people who have been correctly trained should operate or clean this machine.

Only people who are correctly qualified and trained should carry out maintenance, installation or any other service work.

Never clean or service the machine without isolating the electrical supply and isolating the air supply.

Always test for the presence of voltage before touching or working on electrical components.

Note that there might be other requirements that could apply.

Refer to the manuals supplied by the component manufacturers for further safety instructions.

Section 3 - INTRODUCTION

Thank you for purchasing a Pharmafill Model TC3 Automatic Pill Counter. We at Deitz Company hope you will find that the Model TC3 meets or exceeds your expectations and requirements for an affordable, reliable and innovative addition to your packaging operation.

Pharmafill products are designed and manufactured by Deitz Company Inc., in Wall, NJ, USA. We have manufactured machinery for the bottle filling industry since 1966 and started our Pharmafill line in 1993. We are a small (but growing) family-owned business that emphasizes quality, innovation and superior customer service.

If you have any questions or comments, please contact us by phone or visit our website. Chances are someone whose last name is Deitz will handle your inquiry personally.

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The operation manual is designed to make it easier for you to know the machine and to make use of its intended range of operation. It contains important instructions on how to operate the machine safely, adequately and economically. Observing these instructions helps to avoid risks, to reduce cost for repair work and machine downtime, and enhances the machine's operational reliability and lifetime.

The operation instructions are to be supplemented by further instructions due to existing national regulations on accident prevention and environmental protection.

If used in compliance with the instructions contained in this manual and provided that safety devices are regularly maintained and properly working, this machine is not dangerous to the operator.

This manual is to be kept accessible to all operators using this machine and it is assumed that before use the operator will read fully, and understand this manual and will follow instruction stated within.

Section 3 – INTRODUCTION (Cont'd)

As this machine may be used in the packaging of hazardous substances the operator should be aware of the precautions required for these substances.

In addition to the operating instructions and the binding regulations on accident prevention valid in the country where the machine is being used and at its operational site, the recognized technical rules on safe and proper working have to be observed as well.

These operating instructions and the information contained therein have been compiled with due care and attention. However, DEITZ COMPANY does not take any responsibility for misprints, translation errors or other errors and any damages resulting there from.

DEITZ COMPANY retains the right to make changes in the described products to improve functionality, reliability and design. The measurements or data shown on schematics, sketches and photos are not binding. They are for description purposes.

The information and drawings found in the operation manual are the intellectual property of DEITZ COMPANY and may not be copied or given to third parties.

Section 4 – SPECIFICATIONS
(Also see technical information at end of manual)

GENERAL

Model	TC3 Automatic Pill Counter
Description	Fully Automatic Electronic Counting Filler
Type	AD1115
Product Capability	Most solid oral dose tablets, capsules and caplets.
	Maximum width or diameter: 0.9 inch (22 mm)
	Maximum length: 0.9 inch (22 mm)
	Maximum height: 0.4 inch (10 mm)
Maximum Counting Rate	Typical coated tablet, diameter .25 inch: 2500-3000 per minute
	Typical capsule, size 00: 1000-1500 per minute
Maximum Filling Rate	50-60 bottle per minute
Accuracy	Typically 99.99% (1 error per 10,000 pills) at optimal conditions

INPUTS

Voltage	110 VAC [1]
Cycles	50/60 HZ
Phase	1
Amperage	6.0A peak
Compressed Air	80 PSI [550 kPa], consumes less than 1.0 CFM [28 LPM]
	AIR MUST BE FREE OF WATER VAPOR AND OIL
Room Humidity	85% RH non-condensing

DIMENSIONS

Floor foot print	25" wide x 37" deep [62cm X 94cm]
Hopper height	Variable from 61" to 70" [155cm to 178cm] [2]
Overall height	Variable from 75" to 84" [191cm to 214cm]
Bottle height	Up to 10"[25cm] [3]
Weight	300 lbs [136 Kg]

OTHER

Hopper Capacity	1.9 cu. ft [.054 m^3], or 2.8 cu. ft [.079 m^3] with 6" extension
Glass Disc	Float Glass 20" diam. X 1/4" thickness [50 cm x 6 mm]
Construction Materials	See Section 10 – Contact Compliance Document

Notes:

1. Other input voltages are available as factory options if specified at the time of order

2. May be adjusted further by adjusting or modifying leveling feet.

3. Bottle height based on 36" [92cm] high conveyor surface.

Section 5 - INSTALLATION AND COMMISSIONING

5.1 - Unpacking

- ❑ Carefully remove the cardboard cover from the pallet.

- ❑ Remove all packing materials any additional boxes that may be inside.

- ❑ Remove the threaded rods, washers and nuts that hold the machine to the pallet.

- ❑ Remove the machine from the pallet and position on the floor.

- ❑ Remove any shrink-wrap, bubble wrap and/or protective cardboard inserts.

- ❑ Inspect all supplied equipment for damage.

- ❑ If any damage is present please notify DEITZ COMPANY immediately.

- ❑ VERY IMPORTANT: Refer to Section 9: "Cleaning – Breakdown and Buildup" to remove the last of the packing material and for cleaning prior to first use. DO NOT attempt to operate the machine before all packing material is removed.

- ❑ Connect compressed air, electrical power and then test. See the procedure on the following pages.

5.2 - Connect Electric, Compressed Air And Blower Air

MAIN POWER CORD

TO 110 VAC OUTLET

COMPRESSED AIR FILTER-REGULATOR (ADJUST TO 80 PSI)

COMPRESSED AIR IN 1/4-NPT

TO TC3

COMPRESSED AIR IN FROM FILTER
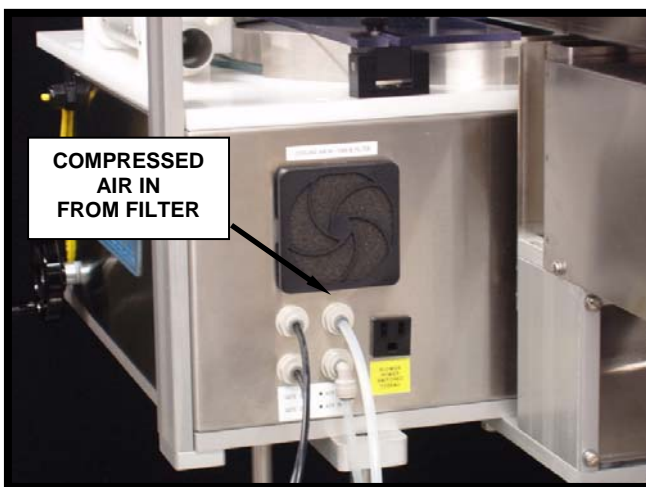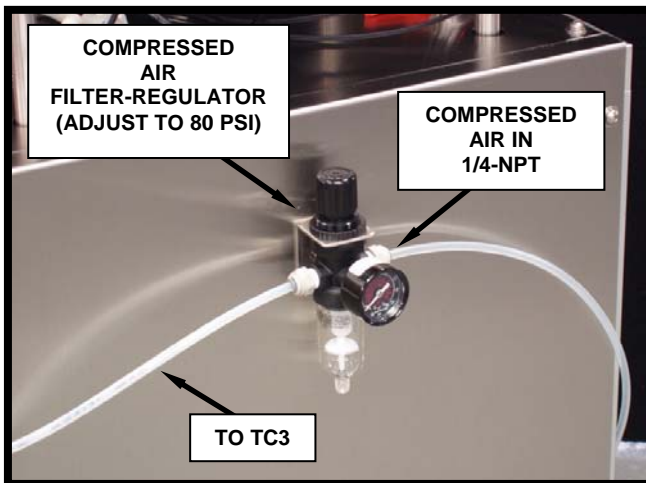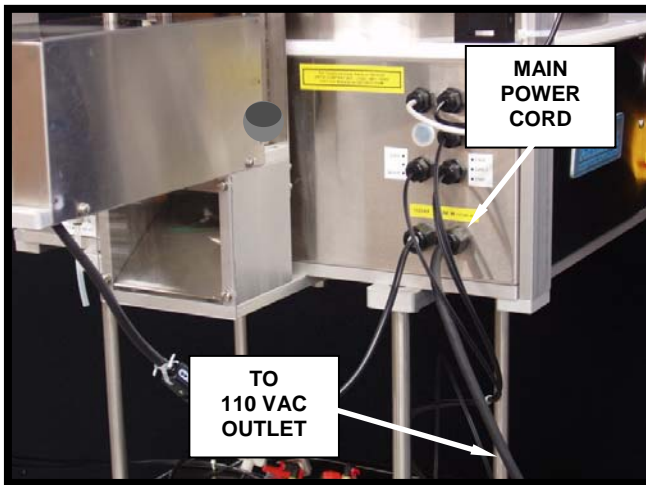
1. Locate the main power cord at the rear of the machine. Plug this into your 110 VAC 6A outlet.

2. Locate the compressed air filter-regulator at the rear of the machine. Attach the air line from your compressor here.

3. Confirm that the air tube coming out of the filter regulator is attached to the machine as shown here.

4. Lift (to unlock) the knob on the regulator and turn until the gage indicates 80 PSI. Press the knob down to lock.

5.2 - Connect Electric, Compressed Air And Blower Air (Cont'd)

BLOWER AIR HOSE

BLOWER POWER CORD

AIR MANIFOLD OPENING

BLOWER POWER OUTLET
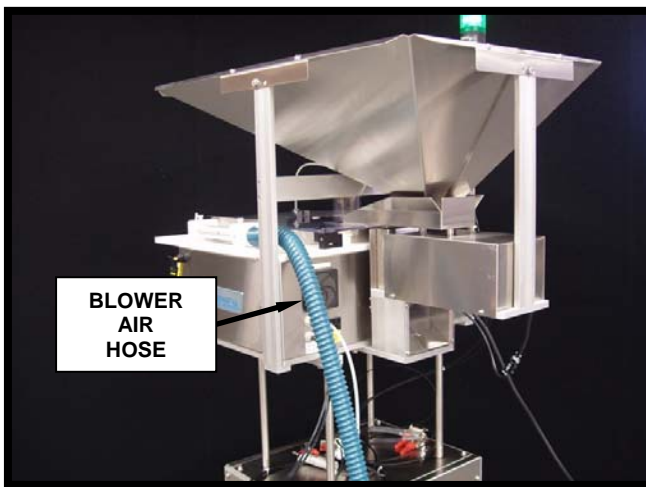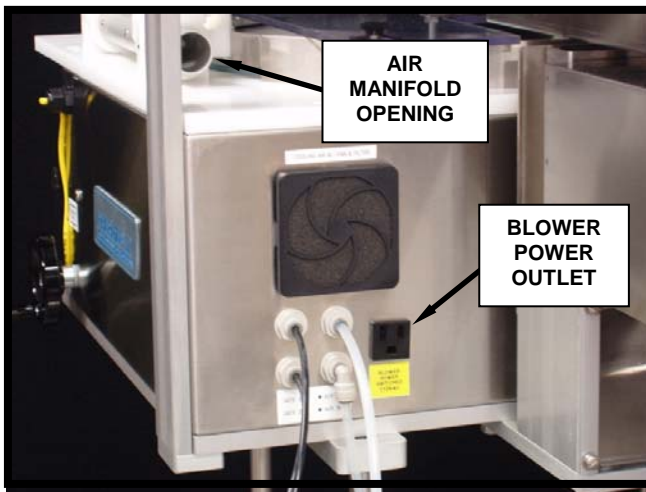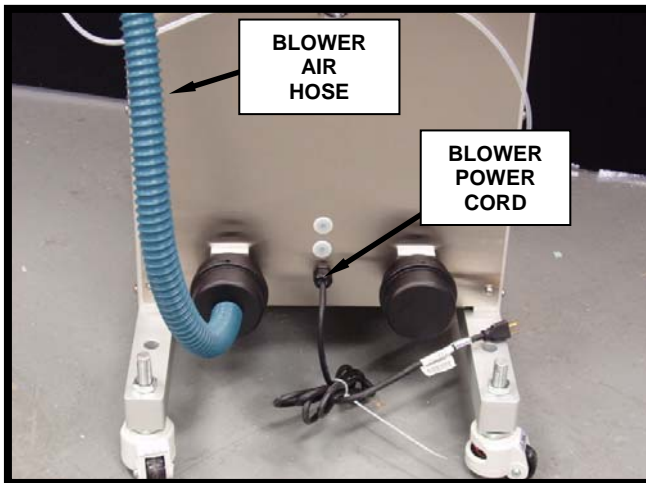
BLOWER AIR HOSE

5. Locate the blower power cord and the blower air hose at the rear of the lift platform.

6. Plug the blower power cord from the lift platform into the blower power outlet on the back of the TC3.

7. Attach the blower air hose from the lift platform to the 1-1/4" opening at the rear of the air manifold tube.

5.3- Systems Check

START   E-STOP

MAIN
POWER
SWITCH

POWER
LIGHT   DISPLAY
PANEL   RESET
BUTTON   TRAP
BUTTON

DIVIDER
FLAG

TRAP
FLAG
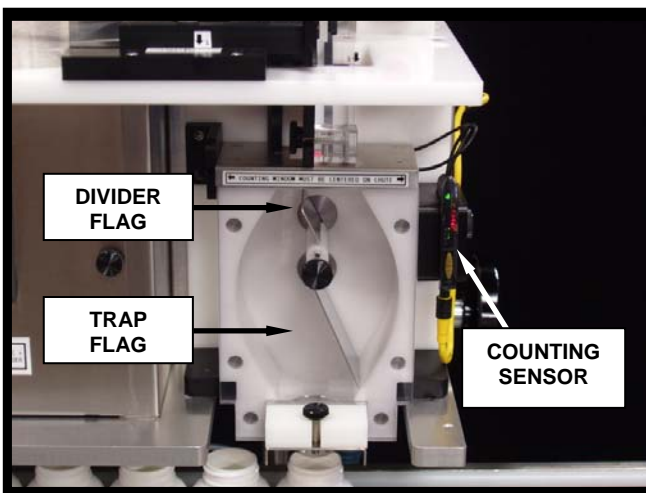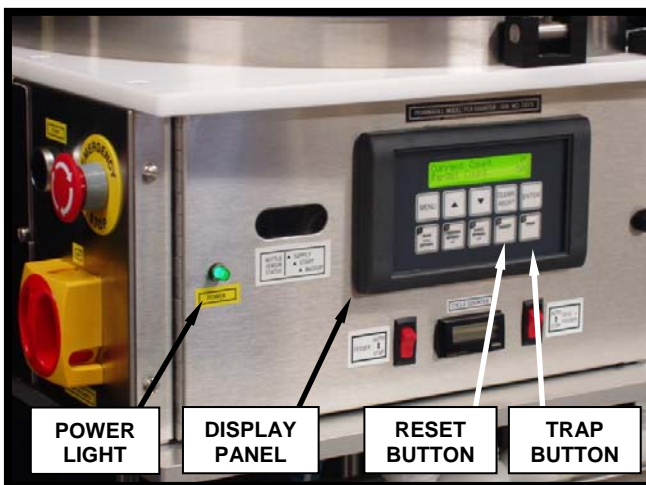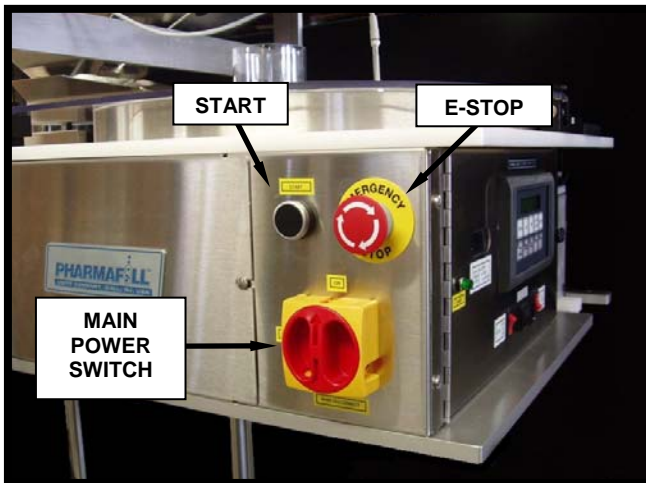
COUNTING
SENSOR

1. Turn on the Main Power Switch by rotating it clockwise.

2. Twist and release the E-stop button.

3. Press the START button.

4. Confirm that the Control Panel lights.

5. Confirm that the counting sensor lights.

6. Press the RESET button several times and confirm that the divider flag flips back and forth smoothly and quickly.

7. Press the TRAP button several times and confirm that the trap flag flips back and forth smoothly (but not as quickly as the divider flag).

Section 6 - GENERAL INFORMATION

6.1 - Standard Features And Capabilities

The Model TC3 Pill Counter is an electronic counter/filler. The TC3 will count most solid oral dose products, including clear, translucent or center-hole. It is designed to be easy to operate and maintain, and is ruggedly built to stand up to hard use and last for decades.

The electronics system includes two computers - one in the programmable logic controller (PLC) and one in the Counting Sensor -, which are specially programmed for this application to provide the most advanced features and performance.

The TC3 is designed for automatic production filling, but it can be used for manual filling (one bottle at a time) and count verification (total counting).

- ❏ Automatic Production Filler – continuously fill one bottle after another with a preset quantity, as a conveyor automatically supplies empty bottles and takes away filled ones.

- ❏ Manual Production Filler – with each push of a button, fill one bottle with a pre-set quantity. Bottles may be supplied by conveyor or by hand.

- ❏ Check Counter – count the total contents of a pre-filled bottle.

The TC3 is a "roll up" design, so that is can be easily positioned over a conveyor that brings bottles to and from the machine. The integral lift platform may be varied in height (manually via hand crank or electrically, using the optional motor). The machine includes two bottle-indexing air cylinders and three bottle sensors (supply, start and backup), with brackets for mounting on industry standard conveyor rails. The TC3 is compatible with our Pharmafill conveyors and most others that are less than 6" in width. .

The large supply hopper at the top of the machine is filled with a bulk quantity of pills. Under the hopper is the variable speed vibratory feeder chute, which regulates the flow of pills onto the rotating glass disc. The pills are rotated around the disc, where a single file row of pills is directed from the edge of the disc to flow into the exit chute. As the flow leaves the exit chute, it enters the counting head.

The first section of the counting head is the photoelectric counting window, where the pills are counted. Below the window is the divider flag, which alternately diverts the flow of pills to the left or right side chamber, as the target count is achieved. Below that is the trap flag, which controls the flow of counted pills exiting the side chambers of the head, according to the status of the bottle on the conveyor below.

6.1 - Standard Features And Capabilities (Cont'd)

When filling a bottle, pills flow through one side chamber and exit through the bottom. The exit of the opposite side chamber is blocked by the trap flag, creating a "closed trap". When the target count is reached, the divider flag splits the flow of pills and diverts it into the closed trap. Counting continues as the filled bottle is removed. When a new bottle is in place, the trap flag switches sides, allowing the pills in the trap to exit and counting continues..

In this manner, pills are continuously counted even as the bottles are moving in and out of the filling station. If a fault occurs with bottles on the conveyor, counting will stop automatically until the fault is cleared.

Section 7 - CONTROLS

7.1 - Control Panel Components

The Control Panel contains all the operator controls necessary to operate the machine and displays text messages and other information to provide feedback to the operator.
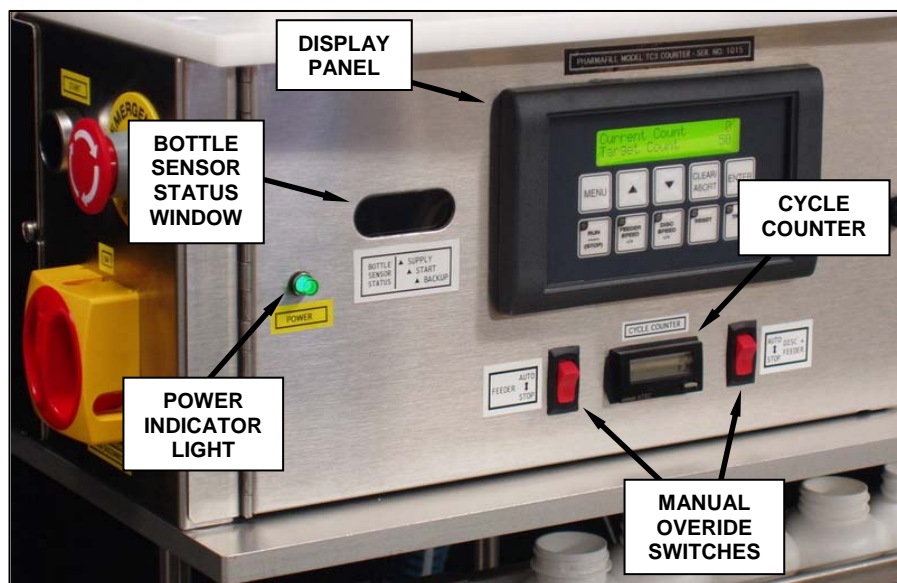
Operator Interface Display Panel – this is the main operator interface, also known as the Human Machine Interface (HMI). It consists of a 2-line LCD display and 10 membrane switches. The five buttons on the upper row are for Menu functions and the five on the lower row are dedicated function switches. A detailed explanation of every function and display follows.

1. **Power Up** – when the machine is first turned on, the message shown at the upper left will display for a moment.

2. **Ready** – after one second, the display will show the Current Count and the Target Count. The machine is now ready for operation.

7.1 - Control Panel Components (cont'd)

The Control Panel includes:

- Operator Interface Display Panel (HMI)
- Feeder Switch
- Disc/Feeder Switch
- Cycle Counter
- Bottle Sensor Status Window
- Power Indicator Lamp

1. **OPERATOR INTERFACE DISPLAY PANEL** – see the following sections for details.

2. **FEEDER AUTO/OFF SWITCH** – when switched off, the feeder will not operate.

3. **DISC + FEEDER AUTO/OFF SWITCH** – when switched off, both the disc and the feeder will not operate.

4. **CYCLE COUNTER** – tallies the number bottles filled by incrementing each of time the bottle gating cylinders are cycled.

5. **BOTTLE SENSOR STATUS WINDOW** – this window in the front panel lets the operator see the status lights on the fiber optic sensors that monitor the presence of bottles on the conveyor. Green light indicates power on. Yellow light indicates an output signal (object detected).

6. **POWER INDICATOR LAMP** – whenever the machine is connected to the electric power source, the green light will be on. This does not indicate the status of the rotary main power switch, nor E-stop pushbutton.

7.2 – Operator Interface Display Panel - Overview

Bottom Row Buttons –

These five buttons are used during **RUN** mode**.** In Run mode, the machine continuously fills bottles with the target count, stopping only when a fault is detected or when the operator intervenes.

See section 7.3 for full information.

Top Row Buttons –

These five buttons are used to control **Menu** functions**:** adjusting the preset values of parameters and accessing other features. The MENU button only works when you are not in any filling mode (RUN, FILL ONE or CHECK COUNT).

The MENU selections are;

1. **Adjust Settings**
2. **Fill One**
3. **Index One**
4. **Half-step Index**
5. **Check Count**
6. **Technician Only**
7.

See sections 7.4 through 7.7 for full information.

7.3 - Run Mode

RUN MODE is the fully automatic filling mode. In Run mode, the machine continuously fills bottles to the target count, stopping only when a fault is detected or when the operator intervenes.

1. Press **RUN (STOP)** to start or stop automatic filling.

> **Blower Delay** – When RUN mode is started, there is a 5 second delay to allow the air blower to come up to speed.

2. **Filling Starts** - After 5 seconds, the disc and feeder will start (if the manual override switches are both in the AUTO position) and product will begin to flow through the counter. As product is counted, the Current Count will increase. Filling will be stopped if faults are detected.

3. **Waiting for Bottle** – If Run Mode is selected without a bottle in the start position, the machine will wait for a bottle, and start filling once a bottle is detected. Starts automatically.

4. **Start Bottle Error** – Filling will stop and this message is displayed when the start sensor detects no bottle after filling has started (due to tipping or sensor misalignment, etc.). When the error is corrected, the message will read "**Start Error – Press CLR**". Does not restart automatically. You must press **CLEAR**.

7.3 - Run Mode (cont'd)

5. **Bottle Supply Error** – Filling stops when there is no bottle at the Supply sensor on the conveyor. Restarts automatically when a bottle is detected.

6. **Bottle Backup Error** – Filling stops when there is a bottle detected at the Backup sensor on the conveyor. Restarts automatically when no bottle is detected.

7. **Trap Full Error** – As a filled bottle is being replaced, the pills flow into the closed trap. This message is displayed and filling stops if the Current Count exceeds the preset Trap Max Count while the trap is closed. When the next bottle does arrive, the error is corrected and the message will read "**TrapError – Press CLR**". Does not restart automatically. You must press **CLEAR**.

8. **RESET Button** – Press this button to cause the Current Count to go to zero and flip the Divider flag to the other side.

  In RUN mode, filling will continue.

  In FILL ONE mode or CHECK COUNT mode, filling will stop.

9. **TRAP Button** – The trap flag position (left or right) in controlled automatically. To temporarily change the position of the trap flag, press and hold this button. The trap flag will switch to the other side. When the button is released, the flag will return to the automatic position.

7.4 – Speed Adjustment

SPEED ADJUSTMENT – The Feeder and Disc speed may be adjusted at anytime, except during Menu mode. The speeds are adjustable in 1% increments (0 to 100%).

1. **FEEDER SPEED** – Press this button to enable adjustment of the feeder speed. Press again when done.

2. **DISC SPEED** – Press this button to enable adjustment of the disc speed. Press again when done.

3. **Adjust 1 at a time! -** Do not press both speed buttons at same time – if both buttons are pressed at the same time, no adjustment is possible.

Use the **UP** Δ arrow button to select a higher speed.

Use the **DOWN** ∇ arrow button to select a slower speed.

Press **ENTER** to accept the change. You will a brief message "Change was entered…"

If you do not press **ENTER** before exiting this mode, you will see a brief message "Change not entered…"

7.5 - Menu 1. Adjust Settings

The menu buttons work in the following manner:

- Press **MENU** to access the menu items.

- Use the **UP** Δ and **DOWN** ∇ arrow to scroll through the menu selections.

- Press **ENTER** to make your selection.

- Press **CLEAR** to exit Menu Mode at any time.

1. **ADJUST SETTINGS** is used to change the preset values:
- Target Count
- Slowdown Count,
- Trap Max Count
- Flag Delay
- Drop Time
- Index Time

TARGET COUNT – This is the total number of pills to be counted into each bottle. When the desired value is displayed, press ENTER.

SLOWDOWN COUNT – When the Current Count exceeds the Slowdown Count, the feeder and disc speed will slow down (see Sec. 7G) until the target count is reached, then normal speed will resume. This produces greater accuracy at the moment the target count is reached, when the divider flag flips to start a new count. The value is usually 10 to 20 less than the Target Count (see section XX for a more detailed explanation).

VALUE MUST BE LOWER! – Slowdown Count must be less than Target Count. This message is displayed briefly if the attempt is made to enter a Slowdown Count that is greater than the Target Count.

7.5 - Menu 1. Adjust Settings (cont'd)

TRAP MAX COUNT – As a filled bottle is being replaced, the product flows into the closed trap. If the Current Count exceeds the Trap Max count before the bottle is detected, filling will stop to prevent over-filling of the closed trap. **This value should be set so that the trap does not fill with more product than can be dropped at once without blocking the funnel.**

VALUE MUST BE LOWER! – Trap Max Count must be less than Slowdown Count. This message is displayed briefly if the attempt is made to enter a Trap Max Count that is a greater than the Slowdown Count.

FLAG DELAY – When the Counting Sensor detects the pill that matches the target count, there must be a brief delay to allow that pill to fall from the sensor area to the Divider flag. Typically this delay is between 0.00 to 0.03 seconds and rarely needs adjustment. Use the Fill One function to test the setting (see menu item 2).

DROP TIME - When the Counting Sensor detects the pill that matches the target count, there must be a brief delay to allow that pill to fall through the counting head, into the bottle. This is the Drop Time. Typically this delay is between 0.20 to 0.40 seconds and rarely needs adjustment.

 INDEX TIME – Once a bottle is filled, the bottle gates cycle to allow the filled bottle to advance one position. The time it takes the bottle to advance one position is the Index Time. The gates then return to normal and the bottle is released. The value for the Index Time depends on bottle width and conveyor speed. See Section 7.12 for a full explanation.

7.6 - Menu 2. Fill One

In **FILL ONE** mode, the operator can fill one bottle at a time, stopping after each bottle is filled and released. Excess pills will be counted into the closed trap and held for the next bottle. The machine will now behave just as it does in RUN mode, but will stop after the target count is reached.

Note: This is a useful tool for setup and testing before going to RUN mode.

1. Press **MENU**

2. Use the **UP** Δ or **DOWN** ∇ arrow buttons to scroll to "**2. Fill One**".

3. Press **ENTER** to select **FILL ONE** mode.

4. Ready to begin – press **ENTER** again to start filling.

    Blower Delay – Before filling begins, there is a 5 second delay to allow the air blower to come up to speed

7.6 - Menu 2. Fill One (cont'd)

6. **Filling starts** - After 5 seconds, the disc and feeder will start (if the manual override switches are both in the AUTO position) and product will begin to flow through the counter. As product is counted, the Current Count will increase. Filling will be stopped if faults are detected.

7. **Filling stops** – When the target count is reached, the divider flag flips, the feeder and disc stop, and the bottle gates cycle. The blower remains on. The excess count is held in the closed trap. Press **ENTER** again to fill another bottle.

8. Press **CLEAR** at anytime to exit this mode.

7.7 - Menu 3. Index One

In **Index One** mode, the operator can manually cycle the bottle gates to release one bottle and bring a new one to the start position. This is intended as an aid in setting up the position of the bottle gates.

1. Press **MENU**

2. Use the **UP** Δ or **DOWN** ∇ arrow buttons to scroll to "**3. Index One**".

3. Press **ENTER** to select Index One mode.

4. Press **ENTER** – the bottle gating cylinders will make one cycle, as follows:

- Step 1 – Open - Gate 1 withdraws and Gate 2 extends so that all bottles move up one position.

- Index Time delay times out.

- Step 2 – Close - both cylinders return to the normal position so that the filled bottle is released.

5. Press **ENTER** again to repeat or press **CLEAR** to exit this mode.

7.8 - Menu 4. Half-step Index

In **Half-step Index** mode, the operator can manually step through the bottle gating cycle, without using the Index Time. This is intended as an aid in setting up the position of the bottle gates.

1. Press **MENU**

2. Use the **UP** Δ or **DOWN** ∇ arrow buttons to scroll to "**4. Half-step Index**".

3. Press (and release) **ENTER** to select Half-step Index mode.

4a. Press **ENTER** once – the bottle gating cylinders will open – Gate 1 withdraws and Gate 2 extends so that all bottles move up one position.

4b. Press **ENTER** again – the bottle gating cylinders will close -Both Gate 1 and Gate 2 return to the normal position so that the first bottle is released.

5. Press **ENTER** again to repeat or press **CLEAR** to exit Half-step Index mode.

7.9 - Menu 5. Check Count
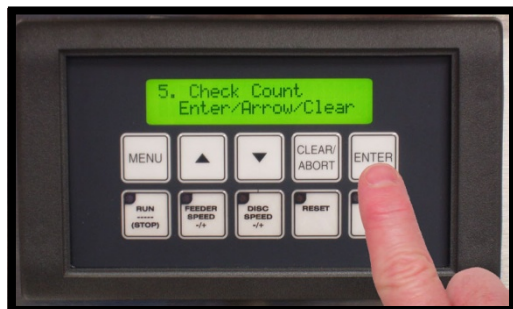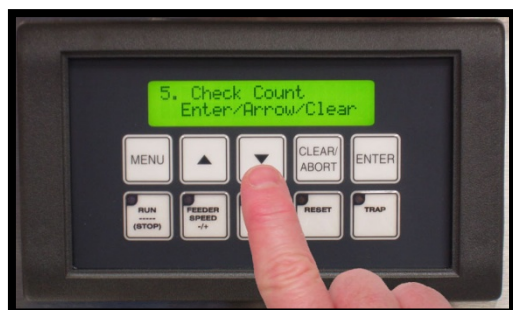
In **Check Count** mode, the machine will count continuously. The Target Count, Slowdown Count and Trap Max Count are ignored. The divider flag will not flip automatically, the trap will stay open and bottles will not be indexed. This mode is used to:

- count the contents of a container
- run accuracy and speed tests.
- run all the product out of the machine

1. Press **MENU**

2. Use the **UP** Δ or **DOWN** ∇ arrow buttons to scroll to "**5. Check Count**".

3. Press (and release) **ENTER** to select Check Count mode.

4. If you intend to keep track of the count, be sure to press **RESET** to set the **Current Count** to zero before starting.

5. Press **ENTER** to begin counting.

> **Blower Delay** – Before filling begins, there is a 5 second delay to allow the air blower to come up to speed.

7.9 - Menu 5. Check Count (cont'd)

6. **Filling Starts** - After 5 seconds, the disc and feeder will start (when the both manual override switches are in the AUTO position) and product will begin to flow through the counter. As product is counted, the Current Count will increase. The maximum count is 9999.

8. Press **CLEAR** to stop counting and to exit this mode.

7.10 - Menu 6. Technician Only

The Technician Only menu is for adjusting certain parameters that are not normally changed, but are available for the technician for special cases:

- Slowdown percentage for the feeder and disc speeds.
- On/off status of the three bottle sensors.

1. Press **MENU**

2. Use the **UP** Δ or **DOWN** ∇ arrow buttons to scroll to "**6. Technician Only**".

3. Press **ENTER** to select Technician Only mode.

The following settings set the slowdown speed as a percentage of the preset speed (which was set using the FEEDER SPEED and DISC SPEED buttons).

4. **Feeder Slowdown %**

Adjust using the **UP** Δ and **DOWN** ∇ arrow buttons. Press **ENTER** to save the value as displayed and move to the next parameter. Press **CLEAR** to exit without saving.

5. **Disc Slowdown %**

Adjust using the **UP** Δ and **DOWN** ∇ arrow buttons. Press **ENTER** to save the value as displayed and move to the next parameter. Press **CLEAR** to exit without saving.

7.10 - Menu 6. Technician Only (Cont'd)

The following settings enable or disable the bottle sensors on the conveyor. Normally all three should be ON.

Press the **UP** Δ arrow button to enable.

Press the **DOWN** ∇ arrow button to disable

6. **Supply Check is ON/OFF**

7. **Start Check is ON/OFF**

8. **Backup Check is ON/OFF**

7.11 - Counting Sensor

OVERVIEW

❑ Detects solid (opaque) product and translucent or clear product, such as gel caps.
❑ Automatically and continuously adjusts light level for maximum sensitivity
❑ Compensates for dust buildup and sets alarm if conditions become marginal.

Threshold Adjustment – how much the light level must drop to count.

When the light in the counting window is unblocked, the sensor detects 100% of the light. When an object falls through the window, the light is blocked. If the threshold size is set to 40%, the sensor will send a count signal when 40% of the light is blocked; that is, when the light level falls below 60%. The sensor will reset when the light level rises above 60% again. This is the factory setting and works with most products. The threshold can be reduced to as low as 5%.

Adjustable in 5% increments
Light bar 1=5%
Light bar 8 = 40% (factory setting, most products)

One-Shot Delay Adjustment – how long the count signal stays on.

This is used to stretch the count signal so a product with a clear center does not produce a "double" count. Normally set at the minimum (5 ms) for solid product. For clear or opaque product, increase the one-shot according to the length of the product. For example, 10 ms for round gel caps .25" long, or 40 ms for oblong gel caps .90" long.

Adjustable in 5 millisecond increments
Light bar 1 = 5 ms (factory setting, for solid product)
Light bar 8 = 40 ms (for long clear products)

7.11 – Counting Sensor (Cont'd)

SETTING THE THRESHOLD AND ONE-SHOT DELAY

The version number on the label of the counting sensor determines how it is adjusted. Both version function the same.

If the label on the sensor says "(2.0)" , use this procedure:

THRESHOLD
To adjust:
- Press and release + (plus)
- Light bar will change to indicate current threshold
- "LO" and "DO" lights will flash alternately
- Press + to increase the threshold (less sensitive)
- Press – to reduce the threshold (more sensitive)
  Will automatically exit adjustment mode after 4 seconds of inactivity
  Will automatically reset light level for maximum performance before returning to normal.

ONE-SHOT DELAY
To adjust:
- Press and release – (minus)
- Light bar will change to indicate current one-shot delay
- "Clock symbol" light will flash
- Press + to increase the one-shot delay.
- Press – to reduce the one-shot delay.
  Will automatically exit adjustment mode after 4 seconds of inactivity
  Will automatically reset light level for maximum performance before returning to normal.
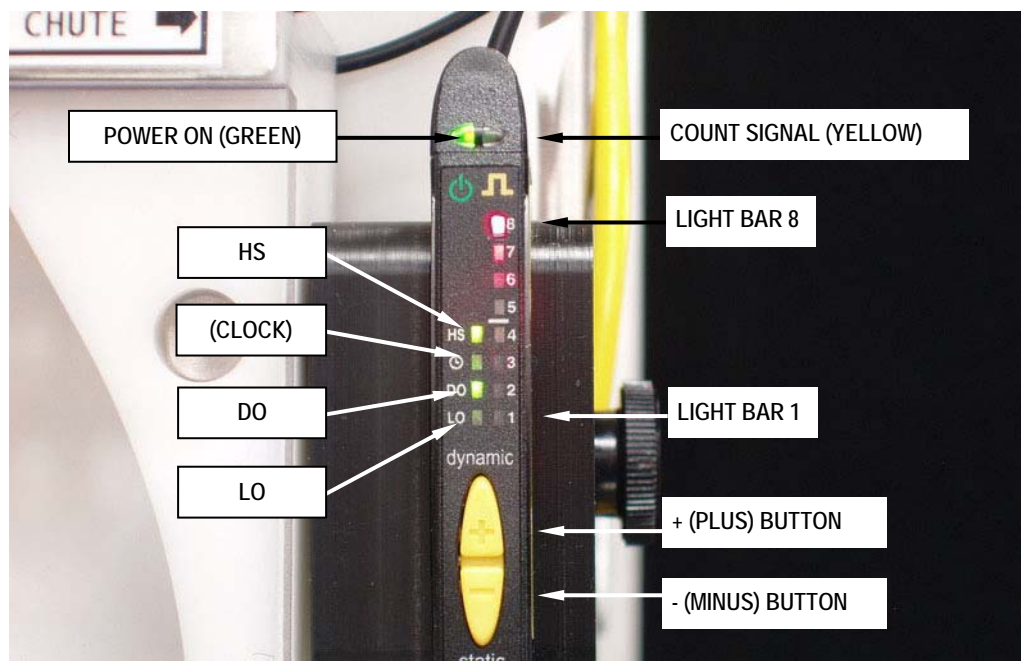
Section 8 – COUNTING & FILLING
8.1 - Product Guide Adjustments

GUIDE BLOCK
ADJ. KNOB
WIDTH SCALE

PRODUCT GUIDE PLATE
GUIDE PLATE CLAMP

PRODUCT GUIDE
CHANNEL
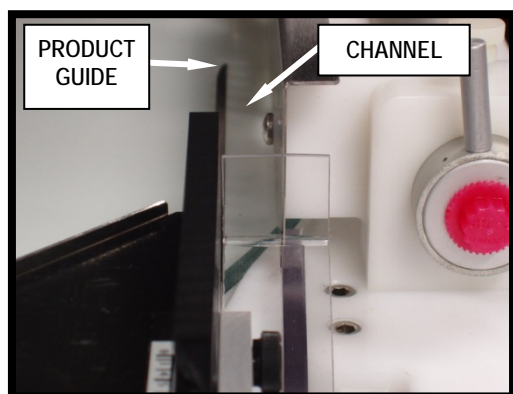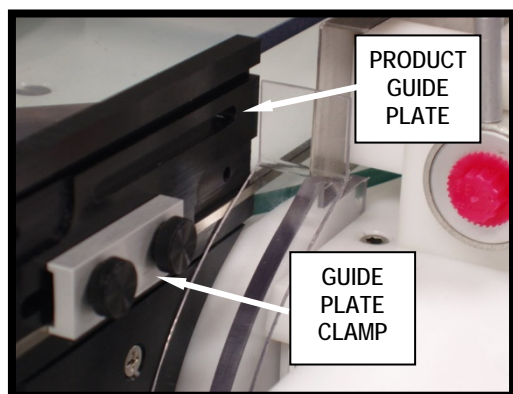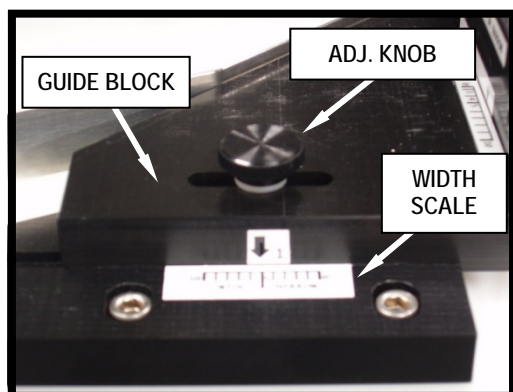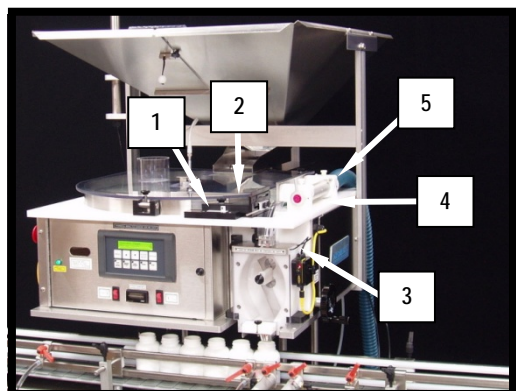
The **Product Guides** must be adjusted to create a steady flow of product down the channel, into the chute and through the center of the counting window. The flow must be single file, one level high. There are five adjustments.

1. **Adjustment 1 - WIDTH**

The width of the channel is adjusted by moving the Guide Block Assembly side-to-side. So that the Guide Block will open fully, make sure that the Guide Plate depth is not limiting the travel. Loosen the two knobs on the Guide Plate Clamp and slide the plate to the front (towards you).
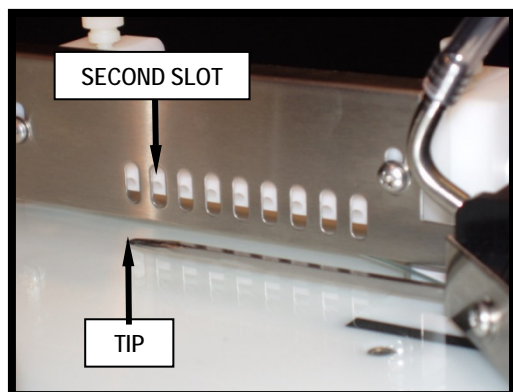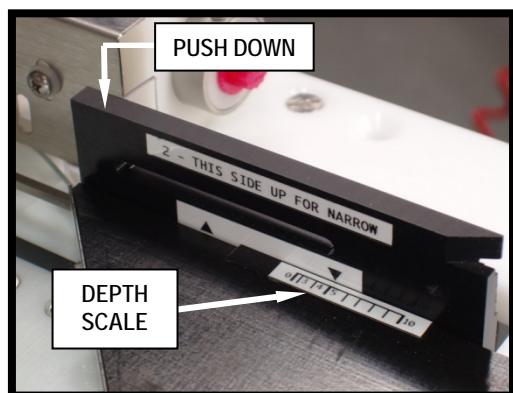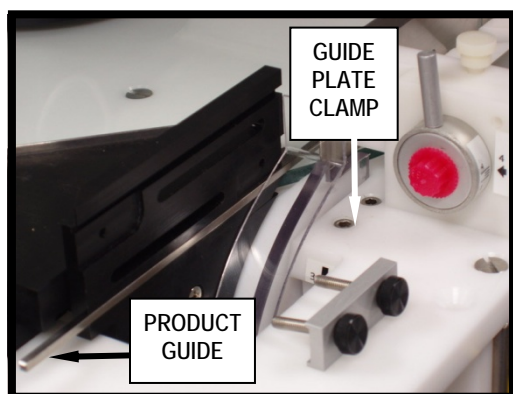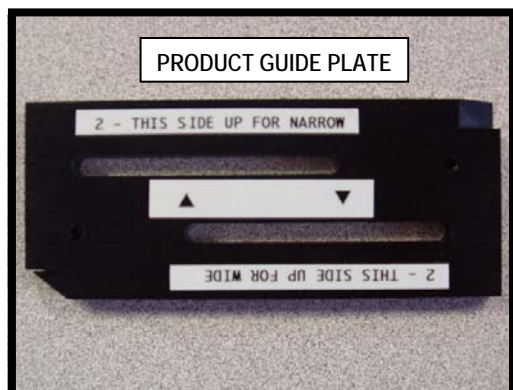
Width Adjustment

To adjust, begin by loosening the knob and moving the guide block to the left.

Place a few pills in the channel and move the guide to the right so that only a single file row may pass down the channel. Leave enough room so that the product will flow freely. Tighten the knob.

Note the width setting on the Guide Block Scale. Note if you are in the WIDE or NARROW zone.

8.1 - Product Guide Adjustments (Cont'd)

PRODUCT GUIDE PLATE

2 - THIS SIDE UP FOR NARROW

2 - THIS SIDE UP FOR WIDE

GUIDE PLATE CLAMP

PRODUCT GUIDE

PUSH DOWN

2 - THIS SIDE UP FOR NARROW

DEPTH SCALE

SECOND SLOT

TIP

Adjustment 2 – DEPTH

Once the width of the channel is set, the Product Guide Plate must adjusted so that it comes close to the glass disc, without touching it. This is to close any gaps where the chute meets the glass disc.

Flip the Guide Plate (if necessary)

First, the Guide Plate must be installed with the proper side up. The Guide Plate is labeled to indicate which side should be up, based in the setting of the Width Scale. If the Width Scale is near the middle (5), either side may be up. To change to Guide Plate, loosen two knobs and remove the Guide Plate. Take the Product Guide out of the slot and place it in the other slot. Re-install the Guide Plate and tighten the knobs.
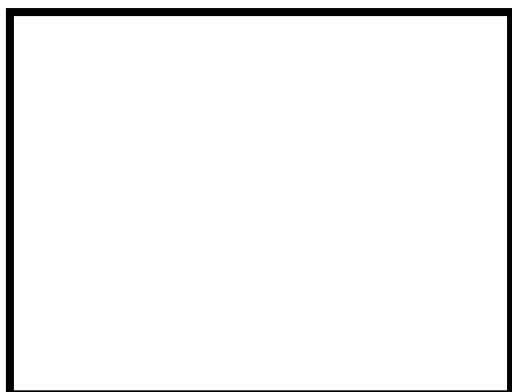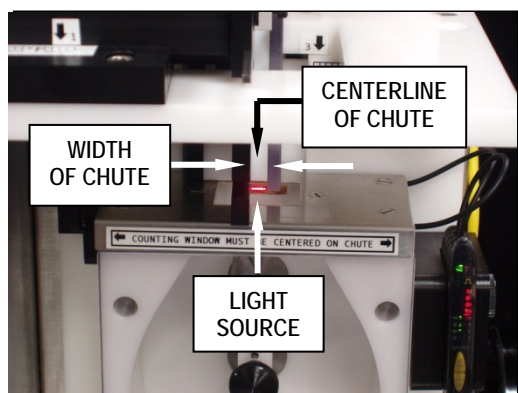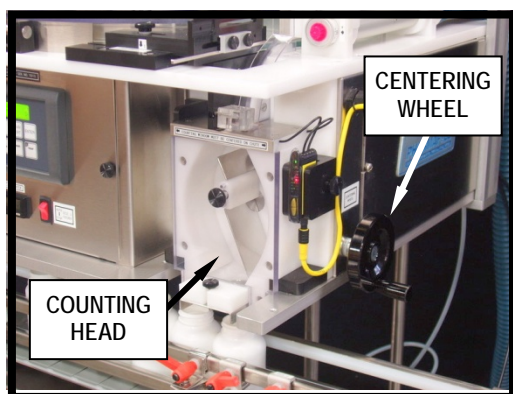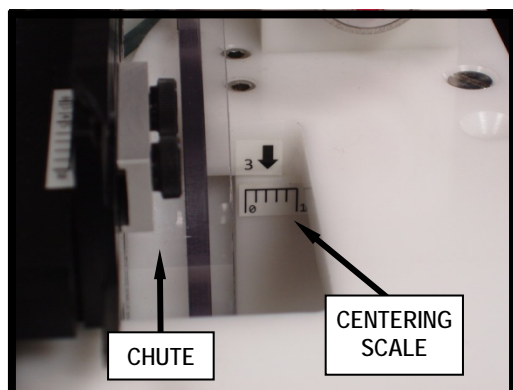
Depth Adjustment

Loosen the two knobs on the Guide Plate a small amount, only enough to move the plate. Slide it forward until it touches the edge of the glass disc, and then move it back a bit, so that it does not drag on the disc (adjust for minimum clearance).

As you tighten the two knobs, push down on the back end of the Guide Plate, so that the pointed tip of the Product Guide is resting on the glass disc. Use your fingertip to confirm the point is down on the glass. If you can feel the point, it is too high.

Note the position of the Guide Plate as indicated on the Depth Scale. It should be approximately the same number as on the Width Scale.

Also, before you tighten the knobs, you may slide the product guide back and forth in it's slot. The default position is when the pointed tip of the Product Guide aligns with the **second slot** in the air guide.

8.1 - Product Guide Adjustments (Cont'd)

CHUTE

CENTERING SCALE

CENTERING WHEEL

COUNTING HEAD

CENTERLINE OF CHUTE

WIDTH OF CHUTE

LIGHT SOURCE

Adjustment 3 – CENTERING

To count properly, objects must fall directly from the chute into the center of the counting head. This way the object will fall through the center of the light source of the counting window and strike the divider flag at the same angle whether diverting right or left.

The centering adjustment is needed because when you make a change to the width of the Product Guide, you are moving the left side of the chute. As the width of the chute changes, so does the location of the centerline.

Centering Adjustment

After changing the width of the Product Guides, center the Counting Head by turning the Centering Wheel on the right side of the machine. Note the position of the Counting Head as indicated on the Centering Scale. It should be approximately the same number as on the Width Scale

Visually confirm that the Counting Head is centered on the chute by looking at the red light source from directly in front of the chute. You may remove the Clear Chute Cover for a better view, or bend down to look up through the Clear Front Cover of the Counting Head.

8.1 - Product Guide Adjustments (Cont'd)

HEIGHT
SCALE

AIR
NOZZLES

AIR FLOW
SCALE

AIR
FLOW
OPENING
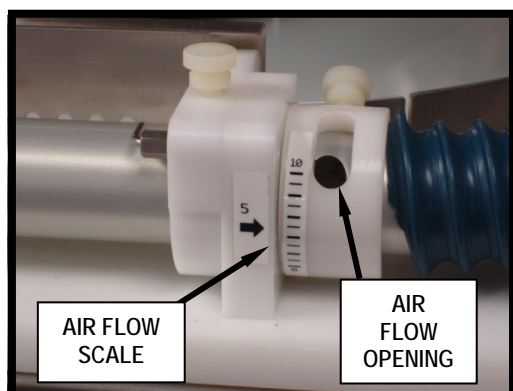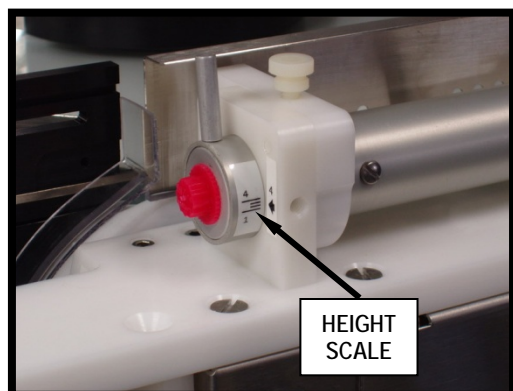
Adjustments 4 & 5 – AIR GUIDE HEIGHT

The Air Guides work for all types of product (tabs, caps, etc.). Compares to solid mechanical guides, they separate the product better, are easier to adjust and are not prone to stoppages that require operator intervention.

Air Guide Height Adjustment

To set the Air Guides, loosen the knobs on the air guide blocks. Use the handle on the air manifold to rotate the Air Jets up or down.

Set the height of the Air Jets so that the air flows just above the pills in the channel. Generally, they should be set at approximately 2 pills high.

If set too low, the air will disturb the flow in the channel, impeding the flow and possibly blowing pills right out of the channel. If set too high, faults might not be rejected. You can fine-tune this adjustment while running the product during testing.

Once set at the right height, tighten the knobs. Note the position on the Height Scale.

Air Pressure Adjustment

This is adjustment is best made while running the product during testing.

For first time setup, set the Air Pressure Relief Ring so that the opening is unrestricted. As you run the product, watch to see if doubles and piggybacks are being rejected. Increase the air pressure by rotating the ring upwards, until you have satisfactory results.

Once set at the right height, tighten the knob. Note the position on the Pressure Scale

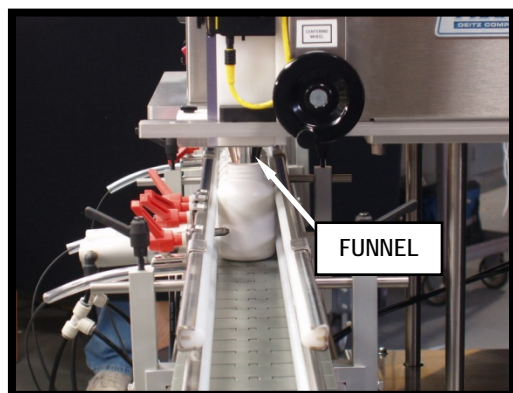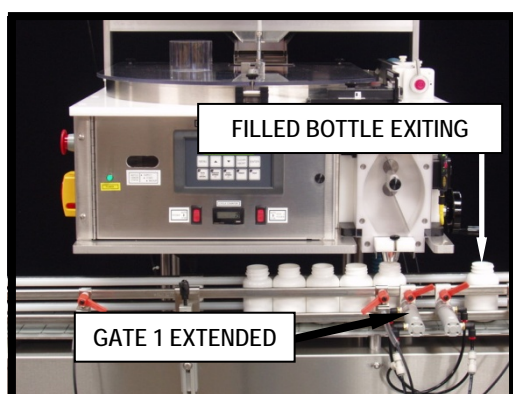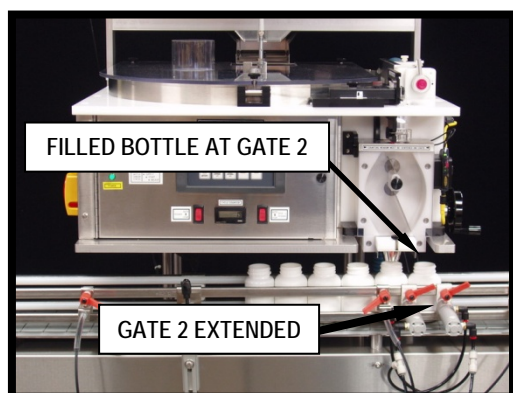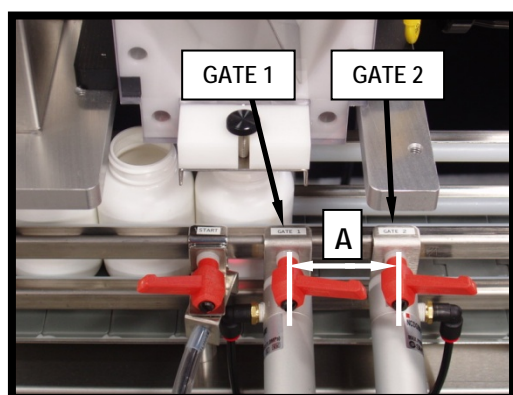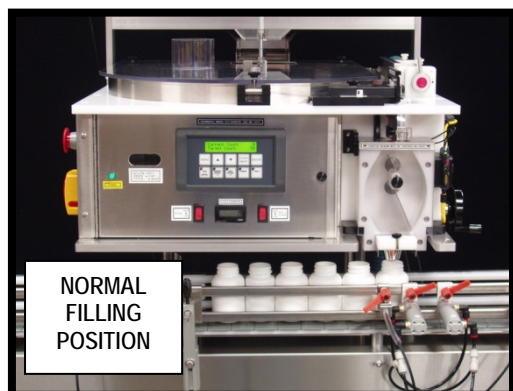## 8.2 - Bottle Gating Cylinder Positioning

FUNNEL

CRANK HANDLE

GATE 1 GATE 2
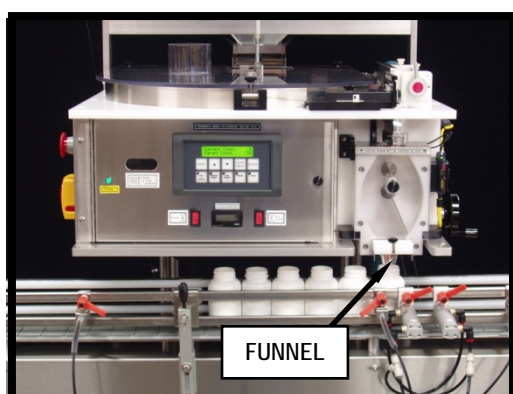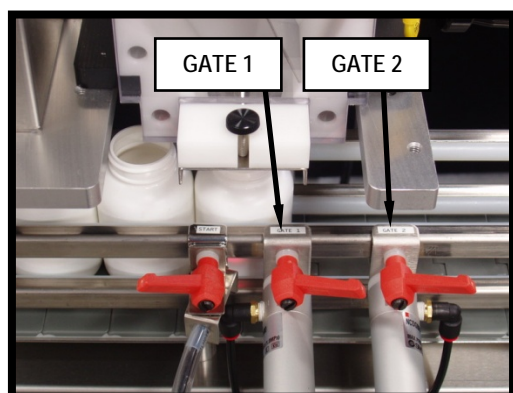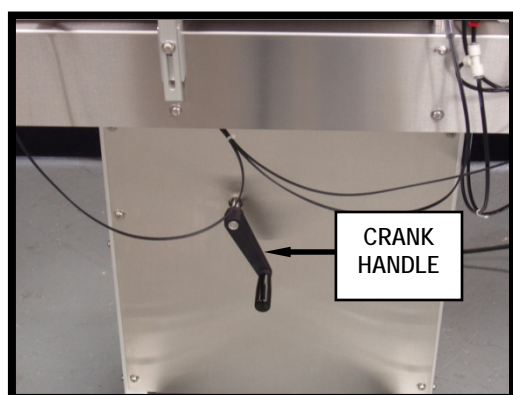
FUNNEL

SETTING UP YOUR BOTTLES & GATING

1. Select a funnel with the bottom opening which best matches the neck of you bottle. You want the the funnel opening to be smaller than the neck of the bottle, but large enough so that the pills do not "bridge" and block the funnel.

2. Adjust the conveyor rails to allow the bottles to pass freely down the conveyor and directly under the filling funnel.

3. Using the crank handle on the front of the lift platform, (or the push-button pendant control, if equipped with motorized lift option), adjust machine height to bring the bottom of the top of the bottle approximately 1/8" to 1/4" below the funnel. Make sure the bottle is centered under the funnel left-to-right and front-to-back.

4. Turn on the conveyor and set to the desired speed. Place 5 to 10 bottles on the conveyor. The bottles will move down until the first one comes to rest at Gate 1

5. Position Gate 1 so that the first bottle is held directly under the funnel. Position Gate 2 so it is a distance downstream from Gate 1 equal to the width of one bottle.

6. Use "4. Half-Step Index" several times to test the position of Gate 2. Adjust the position of Gate 2 so that bottles are not struck by Gate 1 when it extends. Bottle should not be "kicked" by Gate 1.

7. Use "3. Index One" to test the index time. Release several bottles. Adjust the "Index Time" under "Adjust Setting" so that the gates remain open just long enough the let one bottle pass.

8.2 - Bottle Gating Cylinder Positioning (Cont'd)

NORMAL FILLING POSITION

GATE 1   GATE 2

A

FILLED BOTTLE AT GATE 2

GATE 2 EXTENDED

FILLED BOTTLE EXITING

GATE 1 EXTENDED

BOTTLE GATING EXPLAINED

The supply of bottles moves down the conveyor and comes to rest on Gate 1, which holds the bottle at the exact filling position.

Gate 2 is positioned downstream (usually to the right) of Gate 1 by a distance equal to one bottle width (dimension A).

When filling, the first bottle will be held at the filling position by Gate 1 and there will be no bottle at Gate 2.

When the target count is reached, Gate 1 retracts and Gate 2 extends. The supply of bottles moves forward one position. Now a new empty bottle is in the filling position.

When the Index Time has passed, Gate 1 extends and Gate 2 withdraws and filling begins again. The previously filled bottle moves down the conveyor.

8.3 - Bottle Sensor Positioning

SUPPLY
BOTTLE
SENSOR

START
BOTTLE
SENSOR

BACKUP
BOTTLE
SENSOR
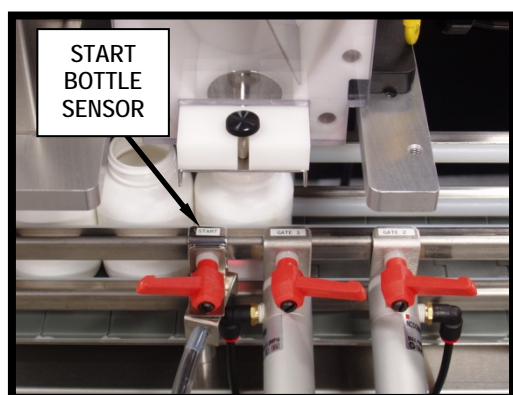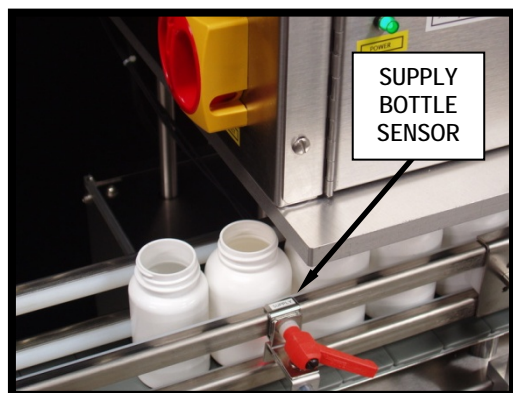
BOTTLE SENSORS

There are three photoelectric fiber optic bottle sensors. They must be positioned along the conveyor rail so that the light source will shine directly at the side of the bottle when the bottle is stopped in a line with other bottles.

1. The **Supply Bottle Sensor** is positioned upstream from the filling station, to assure a supply of empty bottle is available.

2. The **Start Bottle Sensor** must be positioned on the bottle in the filling station. It may be necessary to angle the sensor slightly to get a straight on look at the bottle. Use a ¼" open wrench to adjust the angle bracket. Do not position it at a bottle upstream, or errors at the filling position will not be detected.

3. The **Backup Bottle Sensor** in positioned downstream from the filling station, to detect if bottles backup from a downstream stoppage, which could interfere with the release of bottles from the filling station.

4. You can check the status of the all three bottle sensors can by looking through the **Bottle Sensor Status** window in the control panel. The green light indicates power is on and the yellow light indicates an output signal (bottle detected).

8.4 - Testing To Establish Parameters

For each product to be counted, you will have to establish the correct parameters for the best combination of speed and accuracy. We recommend the following method.

❑ Hand count a certain quantity of product (100 in this example) into a container. This will be your test batch.

❑ Use the test batch to set the basic product guide adjustments to the machine for this product and note the settings.

8.5 – First - Use Count Check Mode

❑ Select Check Count Mode. Count the test batch several times, starting at a very moderate speed.

❑ If the counts are inaccurate, check the guide settings and continue counting.

❑ Once the counts are accurate and repeatable, increase the speed of the feeder and/or disc slightly and continue counting.

❑ Above a certain speed for each product, you will not be able to maintain accuracy. Go back to a lower speed and consider this the maximum speed for that product. Note the speed setting for the feeder and disc.

8.6 – Second - Use Fill One Mode

❑ Select Fill One Mode. Set the TARGET COUNT to 50 and your SLOWDOWN COUNT to 49 (for now). Pour all the test batch of 100 onto the disc and use Manual mode to check the action of divider flag. Do this several times. The excess overrun quantity (for example, 5 or 6 pieces) in the closed trap should be accurately counted. Adjust the FLAG DELAY if it is not accurate.

❑ If the overrun is consistently more when directed to one-side than the other, the head may not be centered properly.

❑ The amount of the overrun can help you to set the SLOWDOWN COUNT value: for example, if the overrun is consistently around 10 pieces, you should set the Slowdown Count to be **at least** 10 less than the Target Count (because that is how many pass before the disc is can slow down or stop.)

8.7 – Last - Use Run Mode

❑ Only go to Run Mode after proving the speed and accuracy are optimized.

8.5 – Summary

1. PREPARATION

NOTE: The machine should be cleaned before first use, and before running a new product.

- ❑ Set all the product guides to the correct setting for the product.
- ❑ Set the FEED and DISC speeds.
- ❑ Adjust the conveyor for the preferred container.
    - o Rail width
    - o Bottle Gating Cylinders
    - o Bottle Sensors
    - o Conveyor Speed
- ❑ The correct funnel should be in place.
- ❑ The correct feeder sieve should be in place.
- ❑ The hopper should be filled and the hopper door opened.
- ❑ Set the preset values for Target Count, Slowdown Count, Trap Max Count and Flag Delay, Drop Time and Index Time.

2. CHECK COUNT MODE – count the contents of a pre-filled container.

- ❑ Count a known test batch to confirm accuracy.
- ❑ The contents will be counted and the tally will be displayed until RESET is pressed again.
- ❑ Press CLEAR to exit.

3. FILL ONE MODE

- ❑ One container will be filled to the Target Count and the machine will stop.
- ❑ Any pills that run on after the stop will be counted and held in the closed trap.
- ❑ To continue, press ENTER again.
- ❑ Press CLEAR to exit.

4. AUTOMATIC MODE

- ❑ Press RUN.
- ❑ Bottles will be filled continuously.
- ❑ Press RUN again to stop.

Section 9 –BREAKDOWN, CLEANING AND BUILDUP

9.1 - Breakdown Of Remove-To-Clean Contact Parts (Summary)

NOTE: The line numbers below refer to the illustration in the next section.

1. Remove the **Chute Clear Cover** by loosening the mounting knob at the bottom and sliding it off.

2. Remove the **Auto-feed Sensor** Cable from the **Auto-feed Sensor**, by unscrewing the knurled ring at the end of the cable.

3. Remove the **Clear Rim Cover** by loosening the hold-down screw in front and the mounting screws in back and sliding the cover forward.

4. Remove the **Rim Band** from the groove in the top cover by lifting it up, starting at one end and working around.

5. Remove the **Adjustable Product Guide Assembly** by removing the adjustment knob..

6. Pull out the **Manifold Release Pin**, then...

7. …rotate the **Air Guide Assembly** up and out of the way
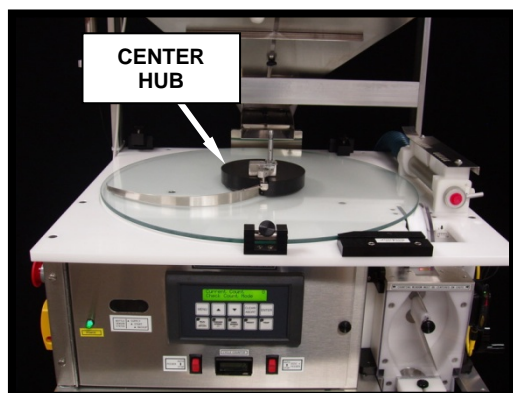
8. Remove the **Center Hub Assembly** by removing the center knob.
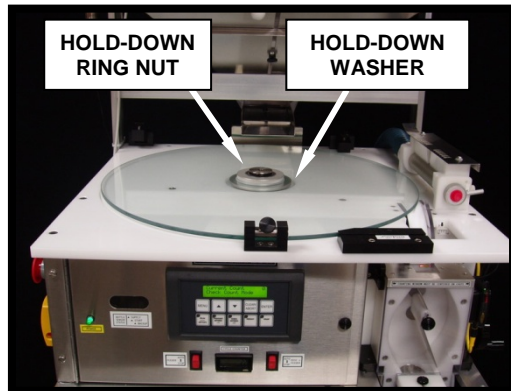
9. Unscrew the Disc **Hold-down Ring Nut.** Remove the **Plastic Hold-down Washer**.
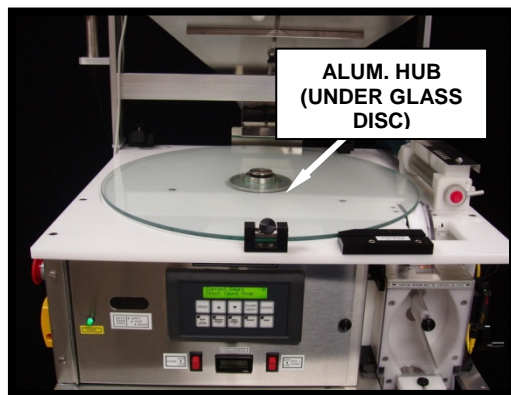
10. Carefully lift and remove the **Glass Disc** (with **Aluminum Support Disc** attached). Note that the support disc has a slot which aligns with a pin on the drive hub. Make sure this is oriented correctly when you install the glass again.
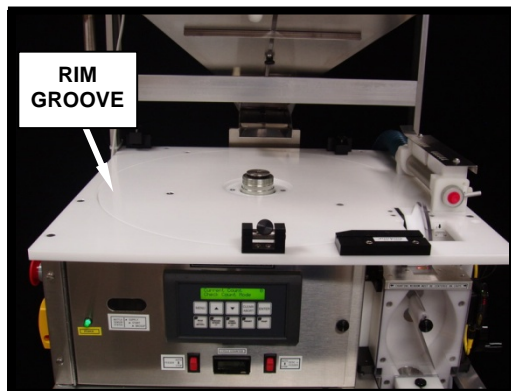
11. This is the top of the machine with contact parts removed. Wipe down as needed. Make sure the **Rim Groove** is clear of any dust or debris.
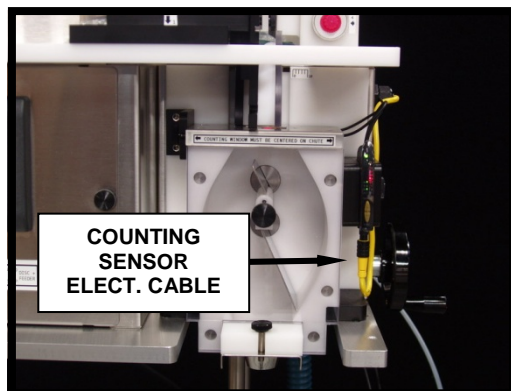
12. Disconnect the **Counting Sensor Electrical Cable**. First, slide the black collar down to unlock the cable, then pull down on the connector to disconnect the cable.

13. Remove the **Counting Sensor Cover**. Slide the **Counting Sensor** to the right to remove it from two the mounting pins.

14. Remove the **Counting Window** and **Counting Sensor** as one unit. Do not disconnect the fiber optic cables from the top of the Counting Sensor.

15. Remove the **Funnel Holder** and the **Funnel**.

9.1 - Breakdown Of Remove-To-Clean Contact Parts (Summary)(Cont'd)

16. Remove the Clear Front Cover.

17. Remove the **Funnel Mounting Block**.

18. Remove The two **Side Blocks**, one on the left and one on the right. They are identical and interchangeable.

19. Remove the **Center Block**

20. Remove the **Divider Flag** and the **Trap Flag**.

21. Remove the **Back Plate**.

22. **Backplate** partially removed.

23. Remove the **Hopper Door Adjusting Knobs**.
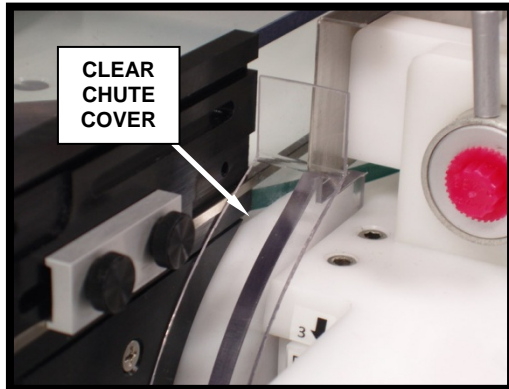
24. Loosen the three **Hopper Mounting Screws**.

25. Tilt the Hopper forward and remove the **Hopper Door**. The Hopper can be wiped down in this position.

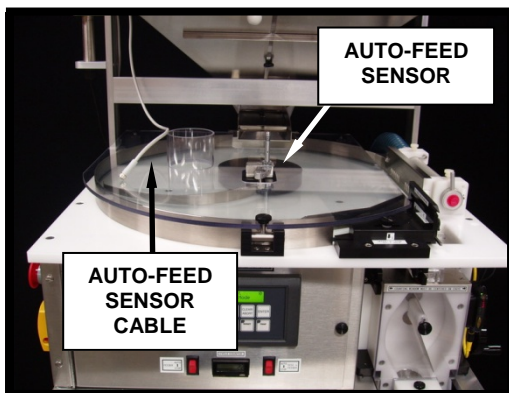26. Remove the two **Sieve Mounting Knobs** in the **Feeder Chute**. Remove the **Feeder Sieve**.

27. Wipe clean the **Feeder Chute** in this position, or remove the two **Feeder Chute Mounting Screws** and remove the Feed Chute.

28. Remove four screws and take off the Chip Chute Clear Cover. Clean out the Chip Chute.
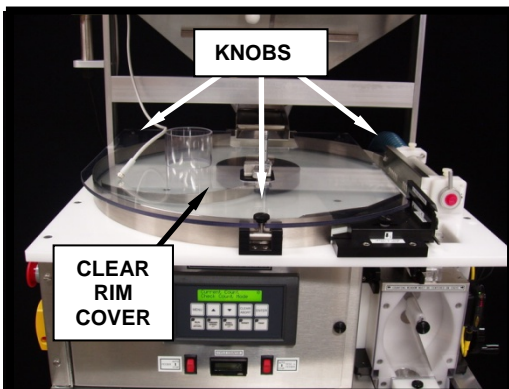
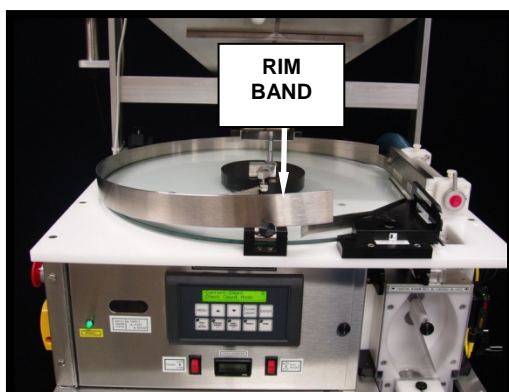## 9.2 - Breakdown Of Remove-To-Clean Contact Parts (Illustrated)

1. Remove the **Chute Clear Cover** by loosening the mounting knob at the bottom and sliding it off.

2. Remove the **Auto-feed Sensor** Cable from the **Auto-feed Sensor**, by unscrewing the knurled ring at the end of the cable.

3. Remove the **Clear Rim Cover** by loosening the hold-down screw in front and the mounting screws in back and sliding the cover forward.
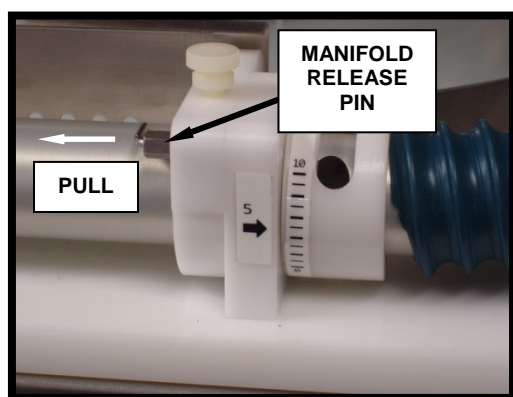

4. Remove the **Rim Band** from the groove in the top cover by lifting it up, starting at one end and working around.

9.2 - Breakdown Of Remove-To-Clean Contact Parts (Illustrated) (Cont'd)

|	
ADJUSTABLE PRODUCT GUIDE	5. Remove the **Adjustable Product Guide Assembly** by removing the adjustment knob.
MANIFOLD RELEASE PIN / **PULL**	6. Pull out the **Manifold Release Pin**, then...
AIR GUIDE	7. …rotate the **Air Guide Assembly** up and out of the way
CENTER HUB	8. Remove the **Center Hub Assembly** by removing the center knob.

9.2 - Breakdown Of Remove-To-Clean Contact Parts (Illustrated) (Cont'd)

HOLD-DOWN RING NUT
HOLD-DOWN WASHER

9. Unscrew the Disc **Hold-down Ring Nut.** Remove the **Plastic Hold-down Washer**.

ALUM. HUB (UNDER GLASS DISC)

10. Carefully lift and remove the **Glass Disc** (with **Aluminum Support Disc** attached). Note that the support disc has a slot which aligns with a pin on the drive hub. Make sure this is oriented correctly when you install the glass again.

RIM GROOVE

11. This is the top of the machine with contact parts removed. Wipe down as needed. Make sure the **Rim Groove** is clear of any dust or debris.

COUNTING SENSOR ELECT. CABLE

12. Disconnect the **Counting Sensor Electrical Cable**. First, slide the black collar down to unlock the cable, then pull down on the connector to disconnect the cable

9.2 - Breakdown Of Remove-To-Clean Contact Parts (Illustrated) (Cont'd)

COUNTING SENSOR COVER

13. Remove the **Counting Sensor Cover**. Slide the **Counting Sensor** to the right to remove it from two the mounting pins.

COUNTING WINDOW

COUNTING SENSOR

14. Remove the **Counting Window** and **Counting Sensor** as one unit. Do not disconnect the fiber optic cables from the top of the Counting Sensor.

FUNNEL HOLDER & FUNNEL

15. Remove the **Funnel Holder** and the **Funnel**.

CLEAR FRONT COVER

16. Remove the **Clear Front Cover**.

9.2 - Breakdown Of Remove-To-Clean Contact Parts (Illustrated) (Cont'd)

17. Remove the **Funnel Mounting Block**..

18. Remove The two **Side Blocks**, one on the left and one on the right. They are identical and interchangeable.

19. Remove the **Center Block**

20. Remove the **Divider Flag** and the **Trap Flag**.

9.2 - Breakdown Of Remove-To-Clean Contact Parts (Illustrated) (Cont'd)

21. Remove the **Back Plate**.

22. **Backplate** partially removed..

23. Remove the **Hopper Door Adjusting Knobs**.
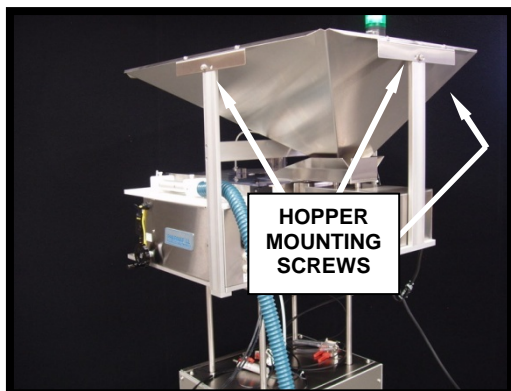
24. Loosen the three **Hopper Mounting Screws**.

9.2 - Breakdown Of Remove-To-Clean Contact Parts (Illustrated) (Cont'd)
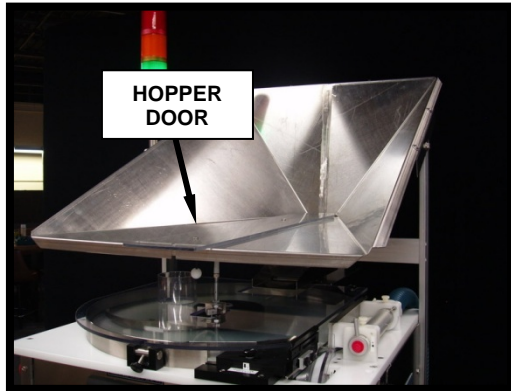
HOPPER DOOR

25. Tilt the Hopper forward and remove the **Hopper Door**. The Hopper can be wiped down in this position.

SIEVE   **KNOBS**

CHUTE

26. Remove the two **Sieve Mounting Knobs** in the **Feeder Chute**. Remove the **Feeder Sieve**.

CHUTE MOUNTING SCREWS

27. Wipe clean the **Feeder Chute** in this position, or remove the two **Feeder Chute Mounting Screws** and remove the Feed Chute.
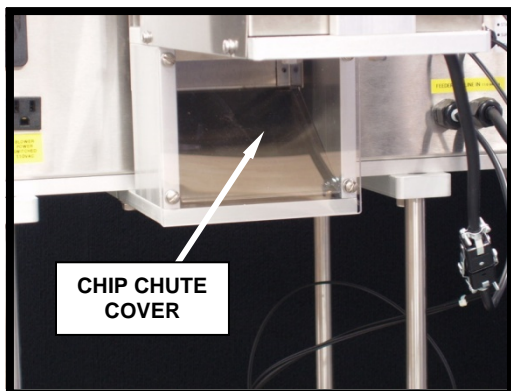
CHIP CHUTE COVER

28. Remove four screws and take off the **Chip Chute Clear Cover**. Clean out the **Chip Chute**.

9.3 - Buildup Of Remove-To-Clean Contact Parts (Summary)

Use the pictures in section 9B – "Breakdown Of Remove-To-Clean Contact Parts (Illustrated)" in reverse order to help with this procedure.

>NOTE: The numbers in (parenthesis) below refer to the illustration in the next section.

>1. Remove four screws and take off the Chip Chute Clear Cover. Clean out the Chip Chute. (28)

>2. Wipe clean the Feeder Chute in this position, or remove the two Feeder Chute **Mounting Screws** and remove the Feed Chute. (27)

>3. Remove the two **Sieve Mounting Knobs** in the **Feeder Chute**. Remove the **Feeder Sieve**. (26)

>4. Tilt the Hopper forward and remove the **Hopper Door**. The Hopper can be wiped down in this position. (25)

>5. Loosen the three **Hopper Mounting Screws**. (24)

>6. Remove the **Hopper Door Adjusting Knobs**. (23)

>7. **Backplate** partially removed. (22)

>8. Remove the **Back Plate**. (21)

>9. Remove the **Divider Flag** and the **Trap Flag**. (20)

>10. Remove the **Center Block**. (19)

>11. Remove The two **Side Blocks**, one on the left and one on the right. They are identical and interchangeable. (18)

>12. Remove the **Funnel Mounting Block**. (17)

>13. Remove the **Clear Front Cover**. (16)

>14. Remove the **Funnel Holder** and the **Funnel**. (15)

>15. Remove the **Counting Window** and **Counting Sensor** as one unit. Do not disconnect the fiber optic cables from the top of the Counting Sensor. (14)
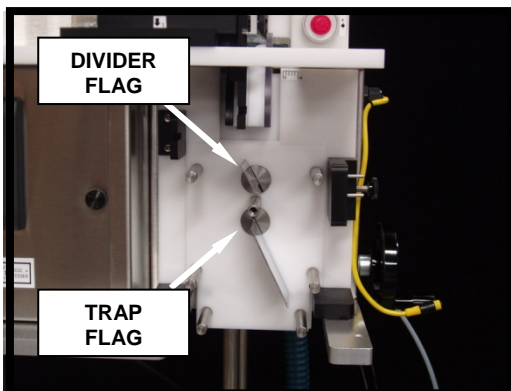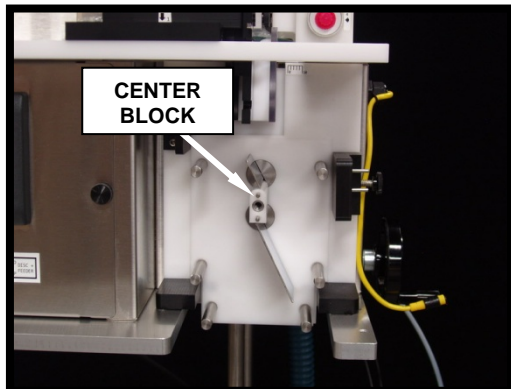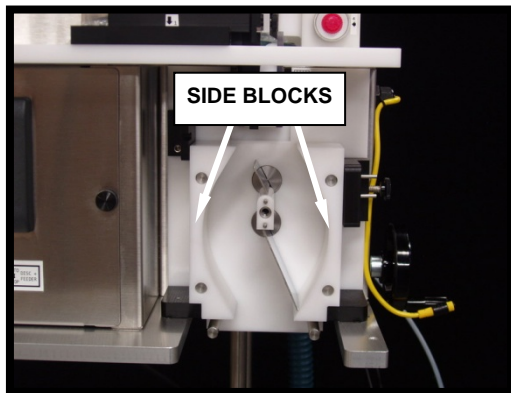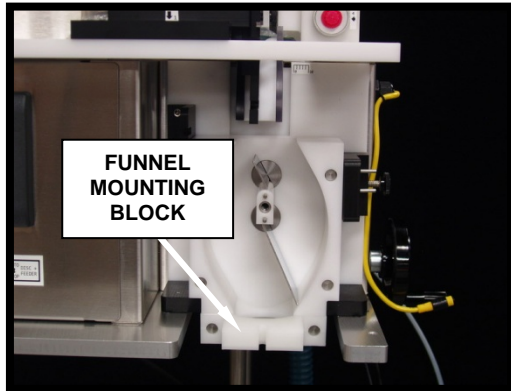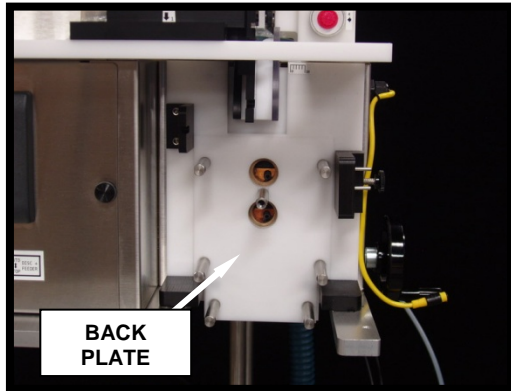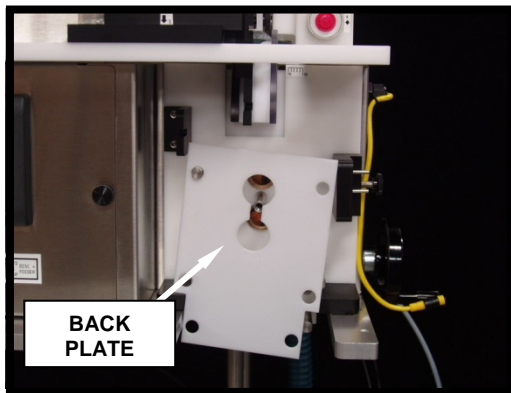
>16. Remove the **Counting Sensor Cover**. Slide the **Counting Sensor** to the right to remove it from two the mounting pins. (13)

9.3 - Buildup Of Remove-To-Clean Contact Parts (Summary) (Cont'd)

17. Disconnect the **Counting Sensor Electrical Cable**. First, slide the black collar down to unlock the cable, then pull down on the connector to disconnect the cable. (12)

18. This is the top of the machine with contact parts removed. Wipe down as needed. Make sure the **Rim Groove** is clear of any dust or debris. (11)

19. Carefully lift and remove the **Glass Disc** (with **Aluminum Support Disc** attached). Note that the support disc has a slot which aligns with a pin on the drive hub. Make sure this is oriented correctly when you install the glass again. (10)

20. Unscrew the Disc **Hold-down Ring Nut.** Remove the **Plastic Hold-down Washer**. (9)

21. Remove the **Center Hub Assembly** by removing the center knob. (8)

22. …rotate the **Air Guide Assembly** up and out of the way (7)

23. Pull out the **Manifold Release Pin**, then... (6)

24. Remove the **Adjustable Product Guide Assembly** by removing the adjustment knob.. (5)

25. Remove the **Rim Band** from the groove in the top cover by lifting it up, starting at one end and working around. (4)

26. Remove the **Clear Rim Cover** by loosening the hold-down screw in front and the mounting screws in back and sliding the cover forward. (3)

27. Remove the **Auto-feed Sensor** Cable from the **Auto-feed Sensor**, by unscrewing the knurled ring at the end of the cable. (2)

28. Remove the **Chute Clear Cover** by loosening the mounting knob at the bottom and sliding it off. (1)

9.4 – Clean-In-Place Contact Areas

The following must be cleaned in place unless further disassembly is done using tools. Contact the factory if you need assistance.

1. Hopper – wipe down inside surfaces.

2. Feeder pan - wipe down inside surfaces.

3. Inner chute – wipe down the all visible inside surfaces

9.5 – Cleaning Non-Contact Areas

1. Feeder pan dust chute and dust box – clean out dust box by removing four screws from the rear cover and wiping or blowing with compressed air (wear eye protection, please).

2. All other surfaces – follow guidelines in the next section.

9.6 - Cleaning Recommendations

Washdown

This machine is not waterproof and is not intended for full wash down. If full washdown is performed on the equipment near the machine, it must be completely protected by a waterproof cover or by other means. Washdown will void the warranty.

Cleaning solutions

Glass and stainless steel are resistant to most cleaning solutions. Other contact materials such as aluminum and nonmetallics (plastics, or rubber) are generally less corrosion-resistant and care should be exercised in their cleaning. Aluminum is readily attacked by acids as well as highly alkaline cleaners, which can render the surface non-cleanable. Plastics are subject to stress cracking and clouding from prolonged exposure to corrosive cleaning agents. Use a USDA approved sanitizing solution that is safe for all materials listed below, in a spray bottle, by lightly wiping down all contact surfaces. In the absence of such a cleaner, recommendations follow.

Recommendations

Glass (tempered): This material is resistant to damage from most cleaners. Routine cleaning can be done with soap and water, alcohol or acetone.

Stainless steel: This material is resistant to damage from most cleaners. Routine cleaning can be done with soap and water, alcohol or acetone.

9.6 - Cleaning Recommendations (Cont'd)

Anodized aluminum: Any highly acidic or alkaline cleaner will etch the aluminum over time and damage it. Soap and water, or alcohol is acceptable.

Clear plastic: The clear plastic material is polycarbonate (known as Lexan). Cleaning with alcohol or acetone will damage it and should never be used. Ammonia or any strong cleaner will make it cloudy over time. It may be safely cleaned with soap and water.

Other plastic: All other manufactured plastic parts are made from acetal (known as Delrin). It is resistant to damage from most cleaners. Routine cleaning can be done with soap and water, or alcohol. White acetal will yellow over time due to exposure to ultraviolet light in the environment. This is normal and cannot be removed by cleaning. Some cleaner may accelerate this process.

Section 10 - TECHNICAL INFORMATION

10.1 - PRINCIPLE OF OPERATION

The Pharmafill Model TC3 is an electronic pill counter/filler. It can count objects other than pills, but the primary purpose is to count pills (tablets, capsules, caplets, most solid oral dose products). The pills are counted using photoelectric sensing. Once counted the pills are directed into pre-staged bottles. It may be used as a check counter, as a manual bottle-filling machine (one bottle at a time), or as a fully automatic filler (one bottle after another, continuously).

A supply of product to be counted is distributed to a rotating glass disc. A single-file stream of pills is guided off the edge of the glass and down a curved chute, where the pills space out as they fall. As the pills exit the chute, they pass though the counting window, containing a light source and light receiver that are connected to a microprocessor-controlled Counting Sensor. As each pill briefly blocks the light source, the Counting Sensor detects the change in light level and sends a count signal to a programmable logic controller (PLC), which maintains the tally.

The PLC compares the tally against three pre-set values: trap max count, slowdown count and target count. The trap max count must be less than the slowdown count and the slowdown count must be less than the target count. When the slowdown count is met, the rotation speed of the glass disc slows down. This aids in the action of the divider flag (see below). When the target count is matched, the glass disc resumes full speed.

After passing through the counting window, the pills strike the divider flag, which directs the stream of pills into the active side of a 2-sided chamber. Both chambers converge at the bottom to a single discharge point. The trap flag closes the chamber that is not active. When the tally matches the target count, the divider flag switches sides, starting a new count at zero into the closed chamber. The filled bottle will be released and a new bottle brought in.

The action of the divider flag is must be timed perfectly to split the stream of pills precisely after last pill of the target count and before the first pill of the next count.

When a new bottle is detected under the discharge area, the trap flag switches sides, which opens the active chamber and closes the inactive one. Should the bottle be removed during filling, the trap flag switches sides again, closing the active chamber and filling is stopped.

In Run Mode, this process goes on continuously, except as stopped by error detection.

In Fill One Mode, the process will stop each time the target count is met. The divider flag will flip and any excess pills will be tallied but the stream will stop.

In Check Count Mode, the process will only deliver and count the product. It will not automatically reset to zero, flip the divider flag, nor the trap flag; the user must press RESET or TRAP to do this. The Target and Slowdown counts are not used.

10.2 - CYCLE OF OPERATION

When power is on, the counting function is active and anything that passes through the counting window will be tallied.

Run Mode

     1. If RUN button is pressed (latch)
     2.   Glass disc rotates at high speed
           Feeder starts
           If tally >= SLOWDOWN COUNT,
     3.   Glass disc rotates at low speed (set by percent)
                If tally=TARGET COUNT
     4.   Divider flag flips
                    Count tally reset to zero
                    Glass disc resumes HIGH speed
     5. If RUN button is pressed again (unlatch)
           Glass disc stops
           Feeder stops

Fill One Cycle

     1. If ENTER button is pressed (momentary)
     2.   Glass disc rotates at high speed
           Feeder starts
            If tally >= SLOWDOWN COUNT,
     3.   Glass disc rotates at low speed (set by percent)
                If tally=TARGET COUNT
     4.   Divider flag flips
                    Count tally reset to zero
                    Glass disc stops
                    Feeder stops
                    Excess pills are counted and tally is maintained

Check Count Cycle

     1. If ENTER button is pressed (momentary)
     2.   Glass disc rotates at high speed
           Feeder starts
     5. If CHECK COUNT button is pressed again (unlatch)
           Glass disc stops
           Feeder stops
           Count tally reset to zero

10.3 - TROUBLESHOOTING

1. No power overall or to some components (no green light on front panel)
   - ❑ Check power cord is plugged in and in good condition
   - ❑ Check Main Disconnect switch is on
   - ❑ Check main circuit breaker inside left side access panel
   - ❑ Check component fuses inside left side access panel
     (LED on indicates blown fuse)

2. Have power but front display does not light up.
   - ❑ Check Emergency Stop switch is not depressed (twist to release)
   - ❑ Check Start push button has been pressed
   - ❑ Check power connector is plugged in to front display (inside front door)
   - ❑ Check 24VDC power supply (inside left side access panel)
   - ❑ Check component fuses (inside left side access panel)
     (LED on indicates blown fuse)

3. Have power but no response in operator interface action keys.
   - ❑ Check component fuses (inside left side access panel)
     (LED on indicates blown fuse)
   - ❑ Check PLC is in run mode and terminal mode (inside front door)
   - ❑ Check PLC data cable is connected to front display (inside front door)

4. Have power but divider flag and trap flag do not respond when RESET is pressed.
   - ❑ Check that compressed air is connected and turned on (80 psi)
   - ❑ Check electric solenoid air valves are working (inside right side access panel)

5. Disc does not rotate in any mode
   - ❑ Check Disc+Feeder override switch is in the AUTO position (up)
   - ❑ Check speed setting is not zero
   - ❑ Press RESET and try again
   - ❑ Check component fuses (inside left side access panel)
     (LED on indicates blown fuse)

6. Feeder does not operate in any mode
   - ❑ Check Feeder override switch is in the AUTO position (up)
   - ❑ Check Disc+Feeder override switch is in the AUTO position (up)
   - ❑ Check speed setting is not zero
   - ❑ Press RESET and try again
   - ❑ Check component fuses (inside left side access panel)
     (LED on indicates blown fuse)
   - ❑ Check function of the Auto-feed Sensor (center hub)

10.3 – TROUBLESHOOTING (Cont'd)

7. Disc and Feeder stop before target count in reached
   - ❑ Check Disc+Feeder override switch is in the AUTO position (up)
   - ❑ Check Slowdown % is not set to zero
   - ❑ Press RESET and try again

8. Feeder stops too often (if equipped with Auto Feed Sensor)
   - ❑ Check mechanical adjustments of the Auto-feed Sensor (center hub)
   - ❑ Check function of the Auto-feed Sensor (center hub)

9. Count is not accurate – too many in container (large error)
   - ❑ Check Counting Sensor adjustment – One-shot Delay not too long
   - ❑ Check Counting Head is properly centered on product flow.
   - ❑ Check adjustment of product guides – no doubles getting through

10. Count is not accurate – too few in container (large error)
    - ❑ Clear gels or product with hole - Check Counting Sensor adjustment – One-shot Delay too short
    - ❑ This is very rare – possibly due to electrical interference from nearby machinery

11. Count is not accurate – small error, random over/under
    - ❑ Check product flow down exit chute – sliding freely and adequate separation
    - ❑ Check setting of Flag Delay using Fill One Mode.
    - ❑ Check Counting Head is properly centered on product flow.
    - ❑ Check adjustment of product guides – no doubles getting through
    - ❑ Check Counting Sensor adjustment – One-shot Delay not too long
    - ❑ Check Counting Sensor adjustment – try various Threshold settings
    - ❑ Check Counting Sensor for dust buildup

10.4 - Index of Technical Notes/Drawings (document section begins after this page)

Doc. No.	Title	No. of Pages
TC3-AD1115-DIM	Dimensions and specification	__
TC3-AD1115-CCD	Contact Compliance Document	__
TC3-AD1115_PM-Safety	Preventative Maintenance & Safety Device	__
TC3-AD1115_Wear-Spare	Wear and Spare Parts	__
TC3-AD1115_woBOM	Bill of Materials	__
TN0099 CSS	Counting Sensor Specification	__
SC 1012	TC3 Electrical Schematic	__

Addendums or additional technical data

_____	_____	__
_____	_____	__
_____	_____	__
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