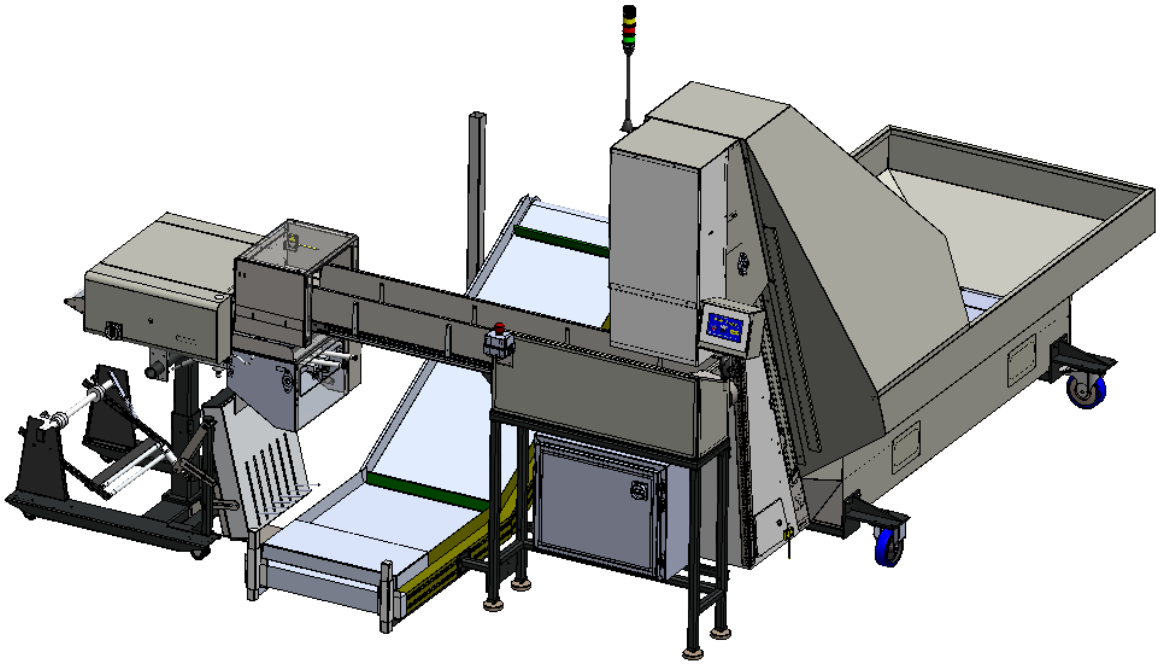
T-1000 Advanced Poly-Bagger™ Automatic Towel Packaging System

Advanced Poly Model ST-1000

Operation Guide, Version 3

Setup, Operation and Parts Manual



Advanced Poly-Packaging, Inc.

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Acknowledgments

Acknowledgments

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Reviewed By: Stuart Baker

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Limited Warranty and Disclaimer

Warranty period is 12 months or 1,000,000 cycles whichever comes first. The warranty commences on the date of delivery of the equipment to the Purchaser. APPI warrants to the Purchaser that the equipment is free from defects in workmanship or material under normal use and service. During the warranty period, APPI agrees to repair or replace, at its sole option, without charge to Purchaser, any defective component part of the equipment. To obtain service, Purchaser must return the equipment or component to APPI or an authorized APPI distributor or service representative in an adequate container for shipping. Any shipping charges, insurance, or other fees must be paid by Purchaser and all risk for the equipment shall remain with Purchaser until such time as APPI takes receipt of the equipment. Upon receipt, APPI, the authorized distributor or service representative will promptly repair or replace the defective component and then return the equipment or component to Purchaser, shipping charges, insurance, and additional fees prepaid. APPI may use reconditioned or like new parts or units, at its sole option, when repairing any component or equipment. Repaired products shall carry the same amount of outstanding warranty as from original purchase. Any claim under the warranty must include a dated proof of delivery. In any event, APPI's liability for defective components or equipment is limited to repairing or replacing the components. This warranty is contingent upon proper use of the equipment by Purchaser and does not cover: expendable component part such as Print Heads, thermocouple wire, heater cartridge, rollers, bushings, and the like; or if damage is due to accident, unusual physical, electrical or electromechanical stress, neglect, misuse, failure of electric power, water damage (from airlines), improper environmental conditions, transportation, tampering with or altering of the equipment, packaging of corrosive or contaminating products or other products damaging to components, and equipment or components not owned or in the possession of original Purchaser. APPI will not be liable for loss of production, profits, lost savings, special, incidental, consequential, indirect, or other similar damages arising from breach of warranty, breach of contract, negligence, or their legal action even if APPI or its agent has been advised of the possibility of such damages or for any claim brought against the Purchaser by another party. This warranty allocates risks of equipment failure between Purchaser and APPI. APPI's pricing reflects this allocation of risk and the limitations of liability contained in this warranty. The warranty set forth above is in lieu of all other express warranties, whether oral or written. The agents, employees, distributors, and dealers of APPI are not authorized to make modifications to this warranty, or additional warranties binding on APPI. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by APPI and should not be relied upon. Warranty on equipment is considered void when outstanding balances become delinquent (over 30 days late - 60 days after ship date). Equipment Integration to other Equipment: APPI assumes no responsibility for the integration of its products to other products or within a system unless APPI performs the integration, testing and provides the results of the tests to the purchaser in writing. Furthermore, APPI assumes no responsibility for bag sizing whether suggested or recommended.

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Chapter 1: Introduction

Welcome
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1.1 Welcome

Thank you for upgrading your packaging facilities with the ST-1000 Automatic Towel Packaging System™ from Advanced Poly-Packaging, Inc.! Our equipment, materials and services are designed to take your packaging capabilities to the next level. Where labor reduction and fast changeover are important, the system provides a reliable bagging solution by using pre-opened bags on rolls, manufactured by Advanced Poly-Packaging, Inc. Extensively equipped with several "built-in", ready-to-use options, the ST-1000 can package bar towels, shop towels and other towels and linens.

1.2 Overview

The ST-1000 Automatic Towel Packaging System™ is a system designed to lower your shop towel packaging costs with high speeds, versatility, reliability, and simplicity.

High Speeds: Indexes, opens, seals, and tears off a bag at very high rates. Actual packaging speed depends on the bag size, equipment options, product characteristics and method of loading.

Versatility: Mobile on rugged castors for packaging at any production station throughout your facility. Ideal for numerous short runs with virtually no production loss for job changeovers since all that is required is a roll change and recalling the bag settings from memory.

Reliability: Crafted from the highest quality components and materials to withstand the most rigorous manufacturing environment; sturdy mounts with castors, and rugged frame guarantee long life and usefulness with minimal maintenance.

Simplicity: A user-friendly, menu-driven touch screen program allows operators to set up the bag, options, and auxiliary equipment, save settings in memory and recall those settings for repeat runs.

1.3 Standard Features

The ST-1000 comes standard with the following features:

Energy Conservation & Component Saver - To extend its life and conserve energy in your plant, the System is programmed to sequentially shut components down when not in use for extended periods. Electric current to the heater bar will discontinue and place the ST-1000 AUTOMATIC TOWEL PACKAGING SYSTEM in the stop mode during a preset period of nonuse. Shortly thereafter, air flow will be shut off preserving compressed air. A screen saver is also provided.

Pass code Protection - Settings screens can be protected from alterations by unauthorized individuals. Once turned on, this function acts as a “screen save” feature. After a preset amount of time, the pass code screen will be displayed from the Bagger Operation screen. Factory settings are protected by a Level 1 pass code and should only be accessed by authorized maintenance personnel

Predetermined Counter - Preset the ST-1000 to stop after a predetermined number of bags have been packaged. Set the quantity of finished bags to complete a work order or fill a shipping container. Once the work order is complete or the container is full, the ST-1000 stops to alert the operator to begin the next work order or to push aside the box to begin filling another. Pressing anywhere on the screen resets the counter and starts the bagging operation with minimum delay.

Totalizing Counter - Reset this counter at the beginning of each shift or day to record packaging production over a period of time.

Maintenance Counter/Chart - Periodically check this counter (total machine cycles) to determine preventative maintenance / component inspection intervals for inspection / maintenance criteria and intervals.

Continuous Strip Option - Leave bags connected in an "endless" strip or a predetermined number of strips of sealed bags.

Communications Port - Provides for auxiliary communications and screen data transfer.

Anti-jam Device - Detects rigid objects of at least 3/8" to safeguard the equipment and product. During the loading and sealing operation, this device will automatically reverse the pressure bar and discontinue cycle operation if an obstruction is detected.

Castors Assembly - Rugged castors are standard for plant mobility.

Internal (PLC) and External (USB) Recipe Management System: Stores up to twenty-four recipe settings internally, or hundreds of recipes externally. Optional Ethernet card can allow for remote recipe management.

1.4 System Integration

The ST-1000 is preprogrammed to integrate automatically to major brand vibratory counters and feeders, weigh scales, volumetric fillers, auger fillers and infeed conveyors. As an OEM for numerous equipment manufacturers of infeed systems, we can offer the best available system, with the ST-1000 Advanced Poly-Bagger as the integral packaging component. However, APPI cannot be responsible for the successful integration of third party equipment, unless approved and integrated by APPI.

FREE CONSULTATION AND PRODUCT EVALUATION: We invite you to call to discuss your packaging requirements and our free product packaging analysis.

1.5 Using this Manual - Typographical Conventions

The following manual conventions are frequently used to assist in understanding important information, alerting the operator of potentially dangerous or damaging practices, and the normal functions of the System.

Text	Normal text.
Italics	Used for emphasis.
NOTE:	Identifies important information.
BOLDFACE	Used to identify heading names and touch screen buttons.
CAUTION:	Warning messages. To avoid physical harm, damage to equipment or damage to the product, be sure to read these messages carefully.

1.6 Contact Information

To better serve your bagging needs, call **(330) 785-4000** or toll free **1-(800) 754-4403** for convenient service solutions, Monday through Thursday, 9:00 AM to 5:30 PM EST, or Friday 9:00 AM to 5:00 PM EST. For technical assistance with current machinery, ask for **Service**. To order spare parts for your system, ask for **Parts**. To order auxiliary equipment for your current system, ask for **Machine Sales**. To place an order for bags, ask for **Bag Sales**.

You may also contact any of these departments by email:

Reach Service at Service@advancedpoly.com

Reach Parts at Parts@advancedpoly.com

Reach Machine Sales at MachineSales@advancedpoly.com

Reach Bag Sales at Bagsales@advancedpoly.com

For general inquires: Sales@advancedpoly.com

Or visit us online at www.advancedpoly.com

To provide the best service possible, please have model and serial number ready.

1.7 Warranty Registration

(This section must be completed and returned to Advanced Poly Packaging, Inc. to register the ST-1000 Automatic Towel Packaging System for Warranty Protection)

ST-1000 Automatic Towel Packaging System Serial Number:

_____

(Serial Number located on the back panel)

Company Name & Address	Contact Name(s) / Title(s) / Phone Number
_____	_____
_____	_____
_____	_____

Please fax or mail this page to:

Service Manager
Advanced Poly-Packaging, Inc.
1331 Emmitt Road
Akron, OH 44306
USA

Fax # (USA) 330-785-4010
Or email the information above to: service@advancedpoly.com

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Chapter 2: Getting Started

Chapter Summary
Safety, Risks
Theory of Operation
System Overview
Installation Procedures
Air and Power Requirements
Assembly Instructions
Air and Power Hookup
Main Power
Bag Threading
Cycle Operation of the ST-1000
Quick Setup Procedures
Note on Adjustments to the ST-1000

2.1 Chapter Summary

This chapter describes procedures to receive and set up the ST-1000, including uncrating instructions, environmental, air and power requirements, risks, required safety precautions, quick start procedures assembly instructions and height adjustments. Additionally, this chapter describes safety precautions, how to power on the ST-1000 and how to properly thread bags through the machine.

2.2 Safety, Risks

Many safety features have been included in the mechanical, electronic, and pneumatic systems of this machine. Despite these safety precautions, operators may receive lacerations, minor burns, or crushed or broken bone injuries if they come in contact with the heater bar or any other moving components. Improper use, improper adjustments and neglect of preventative maintenance may result in serious personal injury. No special personal protective equipment is required to operate the equipment, but eye protection, gloves or other protection should be worn, depending on the characteristics of the product being packaged and the method of loading the product.

Please carefully read the following precautions to operate the equipment properly and avoid injury:

CAUTION: Initial Setup of the machine must be performed by Specialized Personnel. Qualified Service Engineers should uncrate, assemble (if required), test and connect power sources, test the equipment for proper operation and otherwise setup the equipment for use.

CAUTION: Maintenance must be performed by Specialized Personnel. Qualified Service Engineers must remove guards or covers to gain access to electrical or mechanical areas.

CAUTION: To avoid injury do not reach under the equipment or guards. Do not place hands or fingers in the seal area, near the seal or heater bar, load shelf, or other moving components.

CAUTION: To avoid injury, do not operate the equipment if funnels, guards, or covers or other access panels have been removed. If any of these safety measures have been removed or modified or if any openings have been increased, the operator will have access to moving components and extreme temperature areas that can cause crush, cut, or burn injuries to hands or fingers.

CAUTION: To avoid injury, do not reach under guards or elsewhere under the machine.

CAUTION: Do not remove or loosen fasteners on the frame. If loosened the equipment may drop suddenly causing injury or damage to the machine.

CAUTION: Do not attempt to adjust the height without assistance and without supporting the weight of the machine. Attempting to make a height adjustment without assistance could cause the machine to drop suddenly, causing severe injury. APPI offers several optional accessories that can reduce the risk of injury during height adjustments. These accessories include carts, motorized height adjustment components and stabilizing bars.

CAUTION: Ensure that any height adjustments allow for sufficient movement of the operator. Improper height adjustments could negatively affect operator movement, causing strain, added stress, discomfort and fatigue.

CAUTION: Be careful when opening the seal frame on the bagger as it may drop suddenly causing injury or damage to the equipment.

CAUTION: To avoid injury, avoid coming in contact with pinch points including rollers, automatic funnel doors or other moving components.

CAUTION: To prevent injury, avoid contact with Roller "Fingers" as they may be sharp.

CAUTION: To prevent injury, avoid contact with Conveyor "Claws" as they may be sharp.

CAUTION: Exercise care when adjusting or relocating the touch screen. Movement of the touch screen could cause unexpected movement of the machine and injury to the operator.

CAUTION: If control or air pressure settings are set too high, higher noise levels may result from increased part on part contact or part on machinery contact. Limit these settings and add guards or covers to reduce airborne noise.

CAUTION: Exercise extreme care when clearing jams, replacing materials, changing controls or mechanical settings, and cleaning internal parts. Be sure to de-energize energy sources prior to removing guarding. Failure to do so may result in unexpected movement or flying objects, which could cause crush, cut, or eye injuries.

CAUTION: Maintenance must be performed by specialized personnel. Qualified service engineers must remove guards or covers to gain access to electrical or mechanical areas.

CAUTION: Maintenance must be performed regularly to ensure that the machine is operating properly and to protect against injury. Routine maintenance includes: periodic inspections, the replacement of worn or damaged components, the tightening of loose bolts or components, and regular cleaning and adjustments. Contact APPI and/or service centers for service support if there is not sufficient maintenance staff at your facility to perform regular maintenance.

2.3 Theory of Operation

Operationally, shop towels that are loaded into the Hopper Assembly are picked by the integrated Pick Conveyor and transported to the Accumulator. When the Accumulator is full (as determined by a Photoelectric Eye), the Accumulator Gate opens, transferring the towels to the Scale Conveyor which weighs the towels using four (4) integrated Load Cells. Towels are transported and bagged in lots according to the programmed specifications. Sealed bags are loaded onto the Takeaway Conveyor.

2.4 System Overview

The ST-1000 System consists of 7 major components:

A. Hopper Assembly
B. Pick Conveyor
C. Accumulator
D. Scale Conveyor
E. T-1000 Bagger
F. Takeaway Conveyor
G. Power Distribution

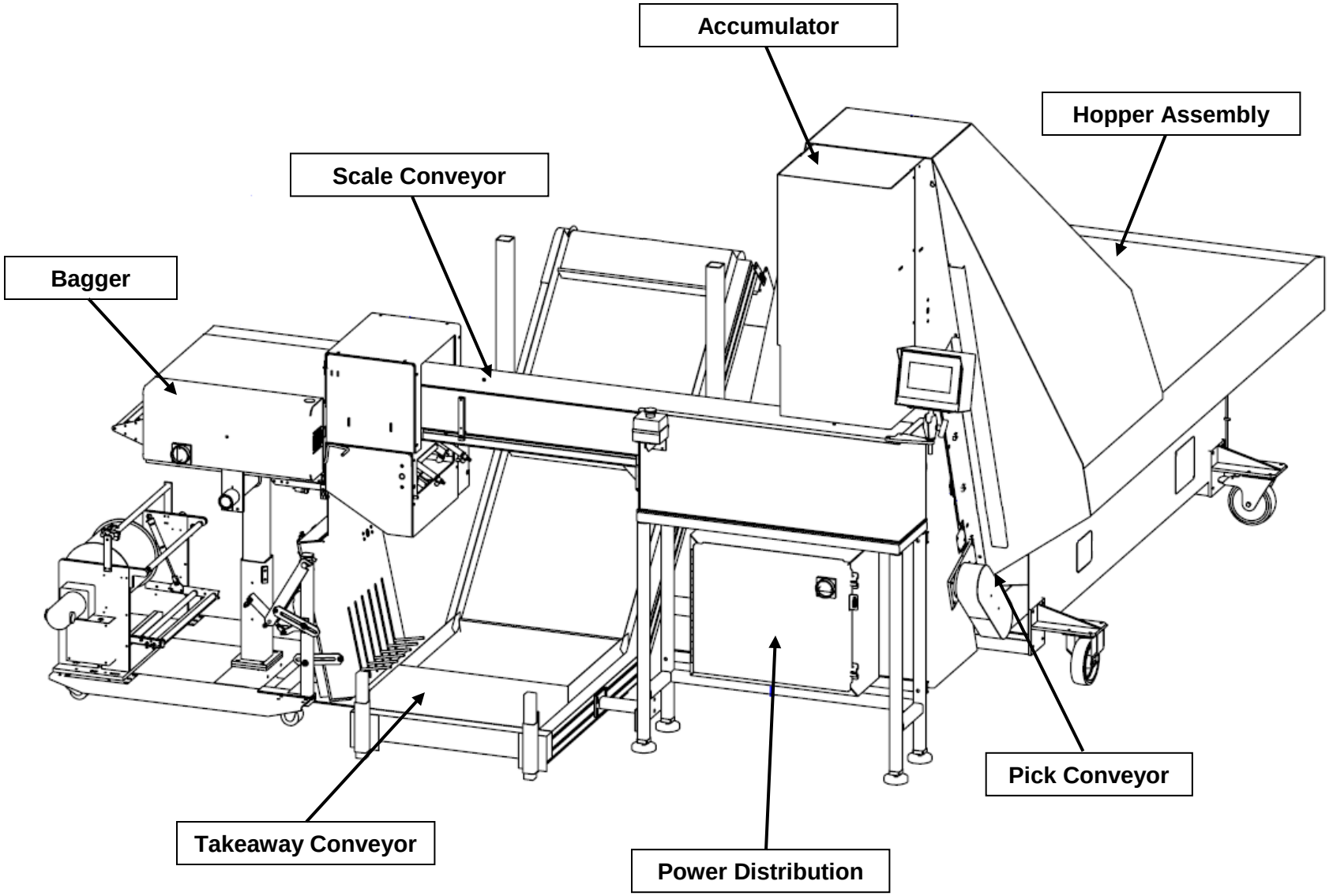
Accumulator
Hopper Assembly
Scale Conveyor
Bagger
Pick Conveyor
Takeaway Conveyor
Power Distribution

Figure 2- 1

A. Hopper Assembly

The Hopper Assembly includes an integrated bi-directional Conveyor that moves the loaded product to the Pick Conveyor.

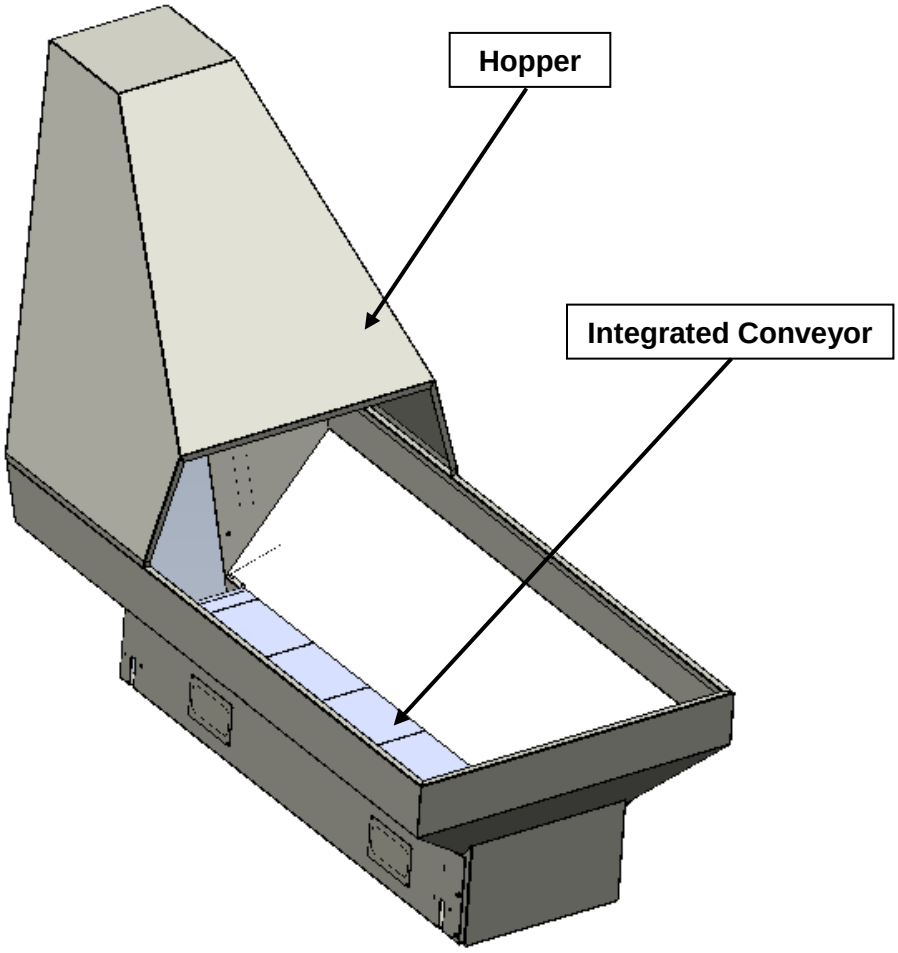

Figure 2- 2

B. Pick Conveyor

The Pick Conveyor "picks" product from the Hopper by means of specially designed cleats mounted to the Conveyor Belt. The Pick Conveyor transports the product out of the Hopper and to the Accumulator.

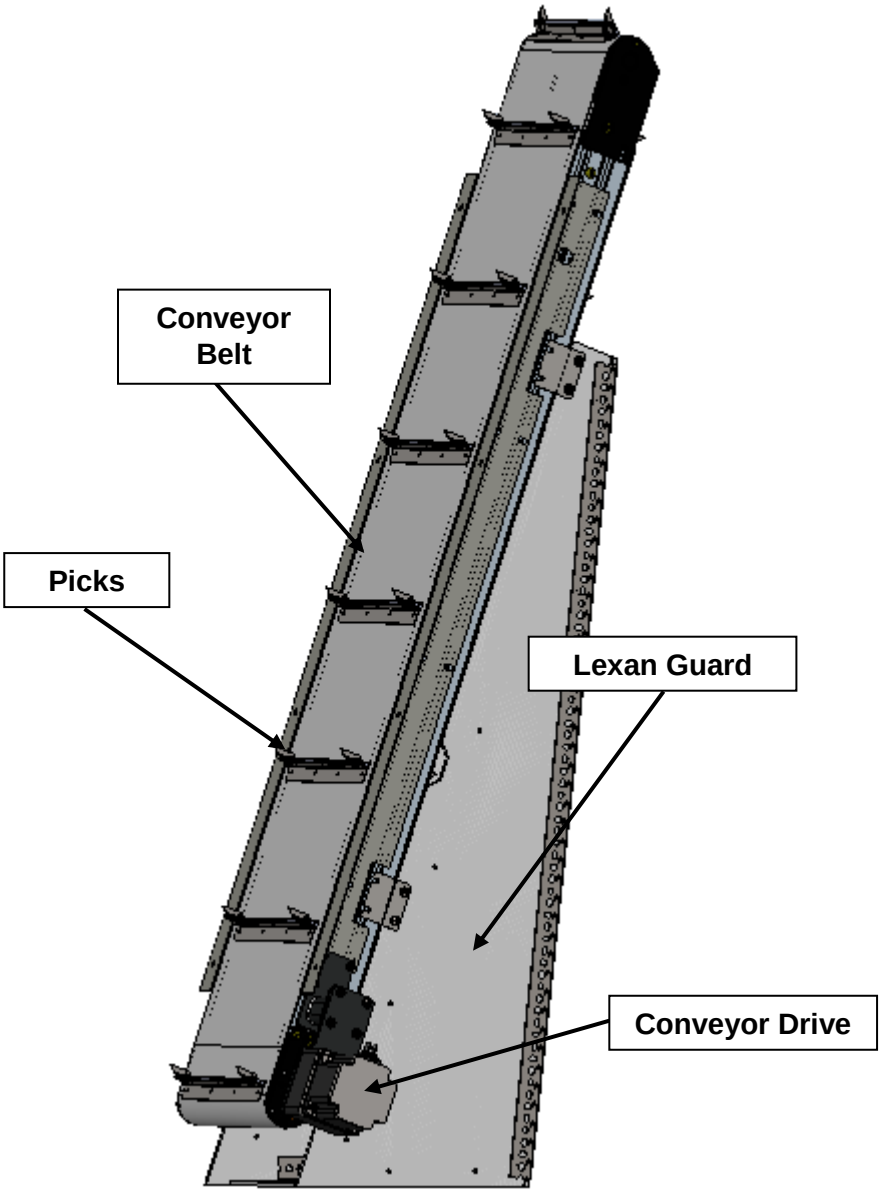

Figure 2- 3

C. Accumulator

Product is stacked in the Accumulator until the stack interrupts the Photoelectric Eye Sensor. When the Accumulator is full, the sensor signals the Control System to stop the preceding Conveyors. Product is moved away from the Pick Conveyor by means of compressed air nozzles integrated into the Accumulator.

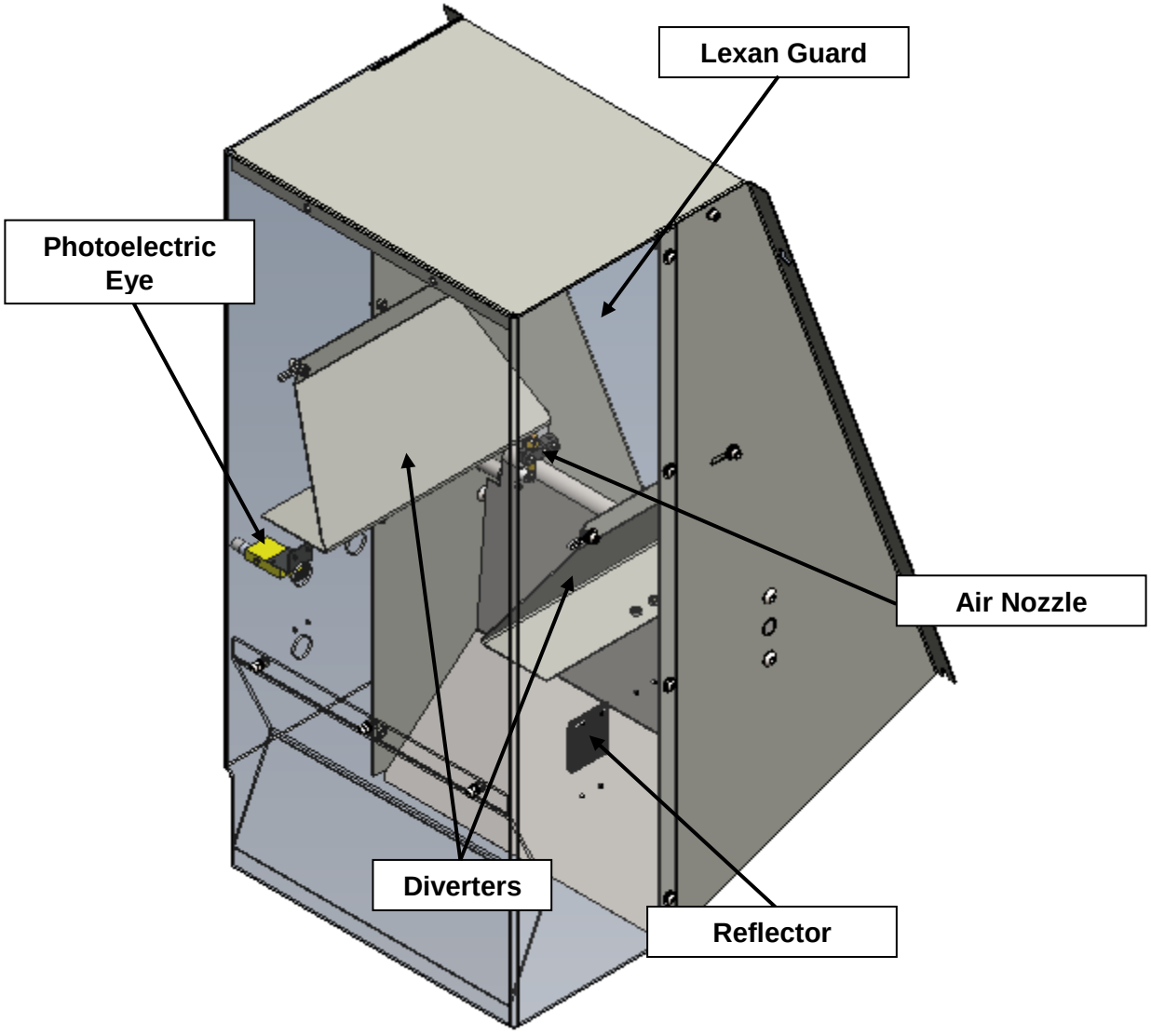

Figure 2- 4

D. Scale Conveyor

The Scale Conveyor distributes the product from the Accumulator to determine the weight of the product more accurately using the incorporated Load Cells. The Scale Conveyor then transports the product to the T-1000 Bagger.

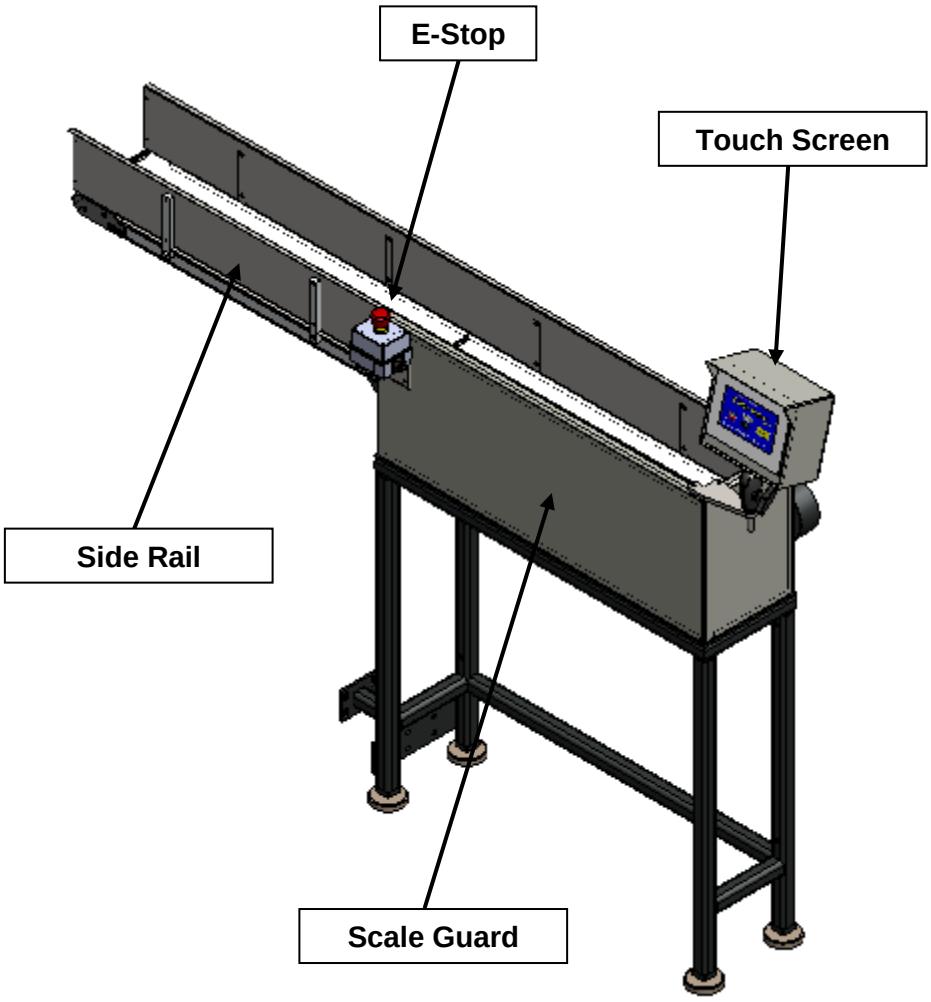

Figure 2- 5

E. T-1000 Bagger

The Bagger included in the ST-1000 System is the standard T-1000 Bagger with installed options essential for the ST-1000 System, including a Load Shelf that can shake the bagged product to ensure consistent loading.

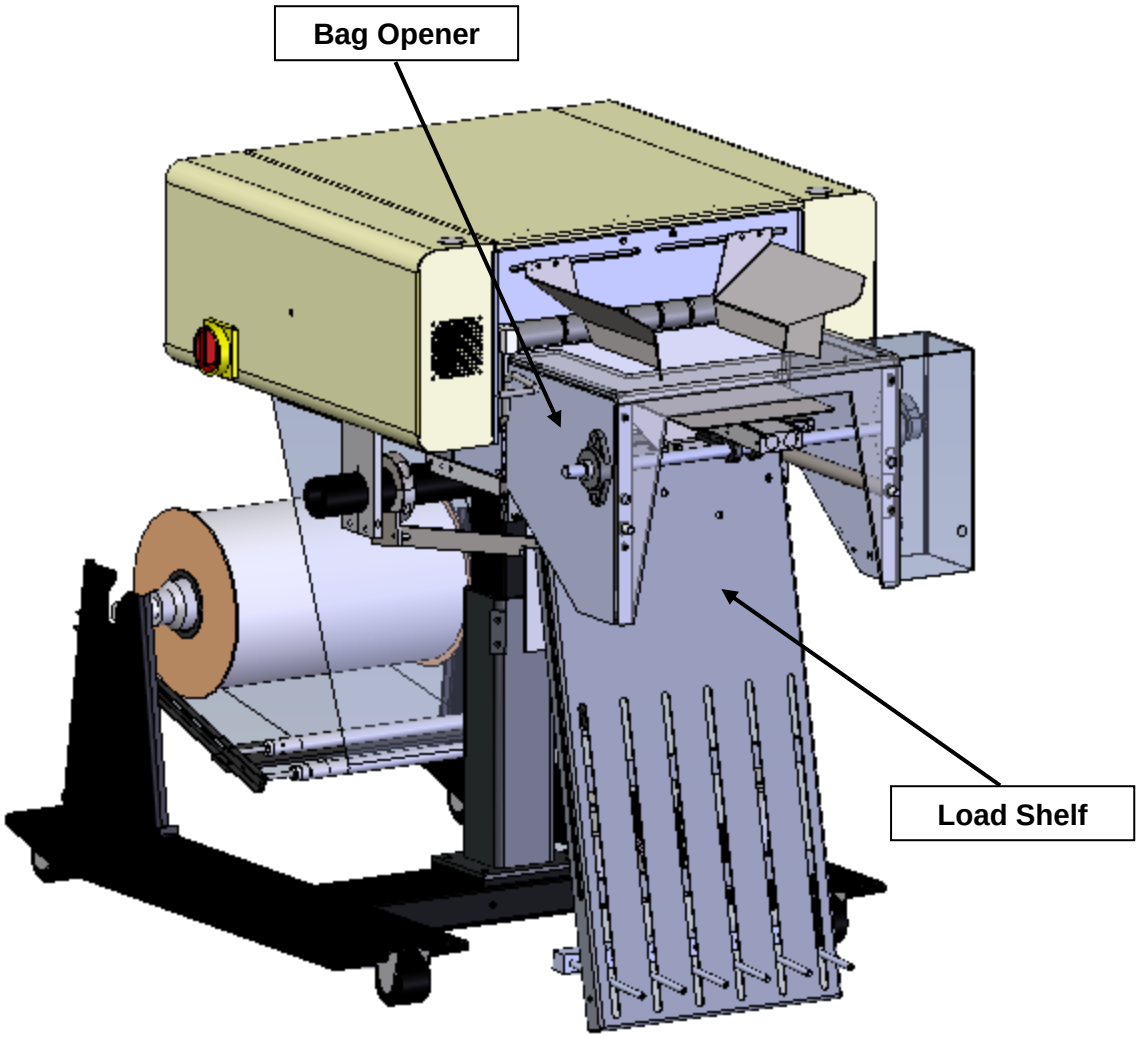

Figure 2- 6

F. Takeaway Conveyor

The Takeaway Conveyor is a manually-controlled Conveyor for transporting the bagged product away from the ST-1000 System.

Note: For more detailed information on the Takeaway Conveyor, including parts and servicing, please refer to the current UF-2000 Operations Manual.

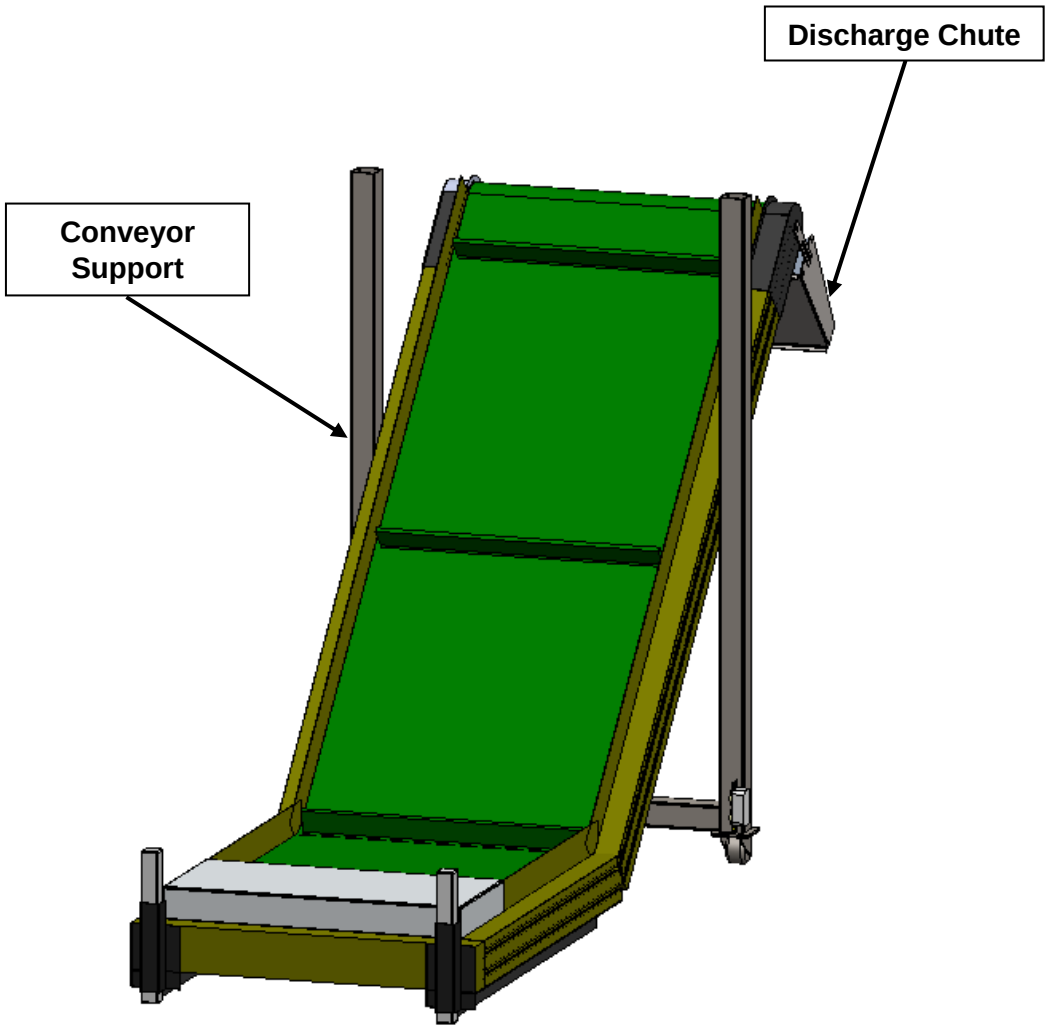

Figure 2- 7

G. Power Distribution

The electronics in the Power Distribution Box serve multiple functions. In addition to controlling all 100 VAC Power to the system, it also acts as the central interchange for Conveyor control, connecting sensors and motor controllers to the T-1000.

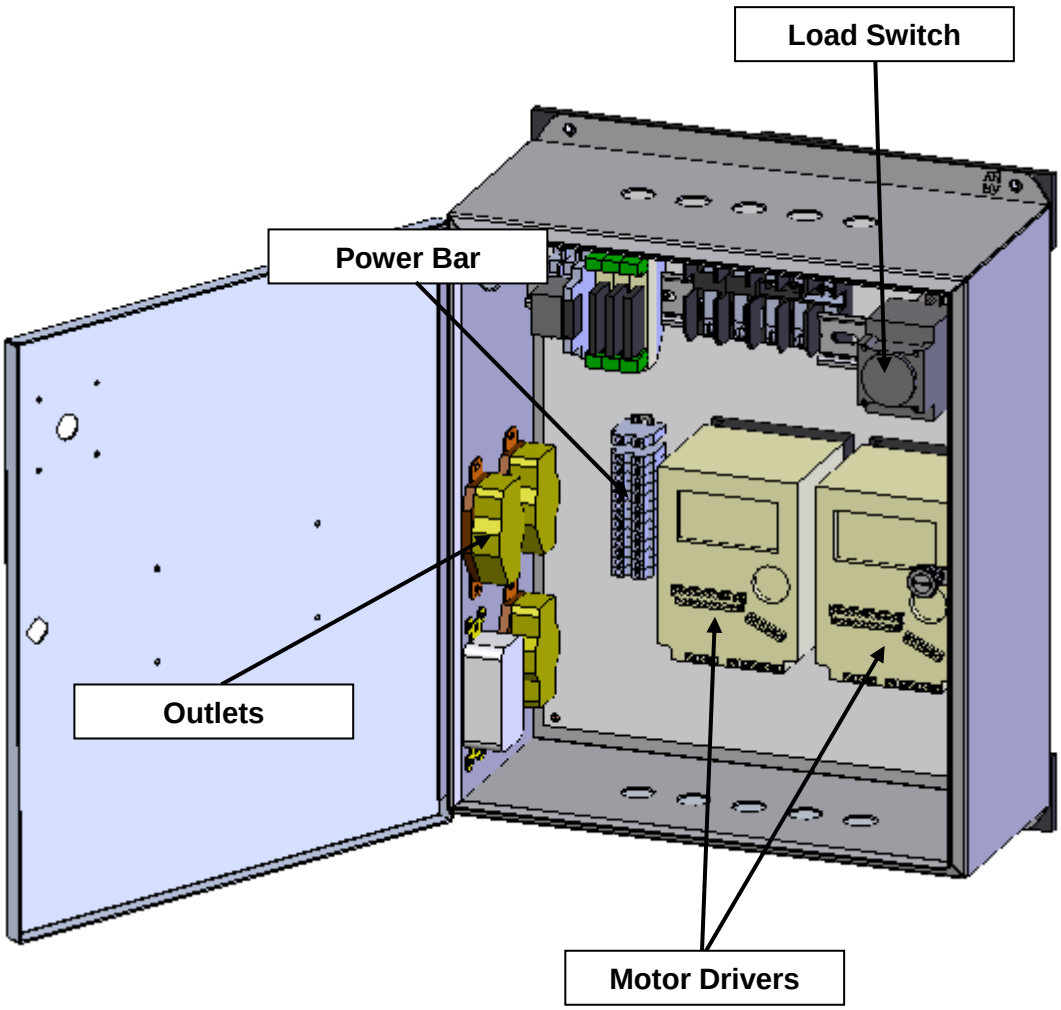

Figure 2- 8

2.5 Installation Procedures

The ST-1000 is transported in four (4) custom crates designed to protect the machine during shipment for a few items which are easily attached during installation with final adjustment for proper placement of touch screen, Dancer assembly, foot switch, funnel, and guards.

Unpacking: After removing the stretch wrapping, remove the outer crate from the skid that contains the ST-1000. Unfasten the base support brace from the skid. Carefully lower the ST-1000 from the skid. Transport the ST-1000 to the operating location prior to placing the touch screen in position and unfastening the Dancer assembly.

Operating Environment: The ST-1000 should be placed in an area free of excessive heat, moisture, dirt, and dust. Operating room temperature should range from 50°F to 100°F (10°C to 37.7°C).

2.6 Air and Power Requirements

Power Requirements: Provisions must be made for 115 VAC, 50/60 Hz line current with ground. The full load current for the ST-1000 is 12 Amps. APPI recommends a dedicated 20 Amp circuit for the ST-1000.

CAUTION: A qualified electrician should ensure that the ST-1000 power outlet is properly grounded, voltages are as required and amperage capacity is sufficient.

NOTE: A qualified electrician should ensure that voltages are as required, amperage is sufficient, power outlets are the required 115 VAC and power outlets are properly grounded before hooking up the power. If the unit is not properly grounded, it will produce a shock and will not function properly.

Air Requirements: At least 2 CFM free air is required, regulated to 60 PSI (4.14 BAR). Air should be dry and oil-free.

NOTE: Running the ST-1000 at a higher PSI setting than 60 PSI (4.14 BAR) *will cause excessive wear and may cause damage to components on the machine or parts being packaged. The anti-jam function may also be adversely affected.*

2.7 Assembly Instructions

Choose an operating location considering traffic flow, availability of bag supplies, supply of product to be packaged, takeaway of finished packages, placement of auxiliary infeed equipment and placement of takeaway conveyor(s). At the operating location, the first step is to remove any inner packaging, banding or wires.

Touch Screen Assembly / Position: The Touch Screen is attached to the Scale Conveyor and has been secured for transportation in a "face-in" position with protective wrapping. Holding the touch screen to prevent it from falling, loosen the Ball Clamp Lever and position the touch screen. See Figure 2- 9.

CAUTION: To avoid damage to the touch screen module, hold the screen until it is in the desired position and then be sure the screws and ball clamp lever are securely tightened.

Dancer Assembly: The Dancer Assembly, located on the stand at the rear of the ST-1000, is secured with tape strapping during shipment. After the removal of the strapping, the Dancer should be checked to

ensure it will rotate freely in a semicircular path. The shaft assembly may then be inserted into the Dancer frame brackets so it is over the brake stop for tension.

CAUTION: The seal bar should not contact the funnel during sealing. Raise the funnel to avoid contact.

CAUTION: To avoid injury, do not operate the ST-1000 without a funnel, guard or covers properly positioned. APPI offers a variety of funnels and chutes. Guarding may need to be added to prevent operators from reaching in, around or under the guard or funnels.

CAUTION: To avoid injury, do not reach underneath guards while the machine is plugged in.

CAUTION: Do not attempt to adjust the height of the Takeaway Conveyor without assistance and without supporting the weight of the machine. Attempting to make a height adjustment without assistance could cause the machine to drop suddenly, causing severe injury. See Figure 2- 10**.**

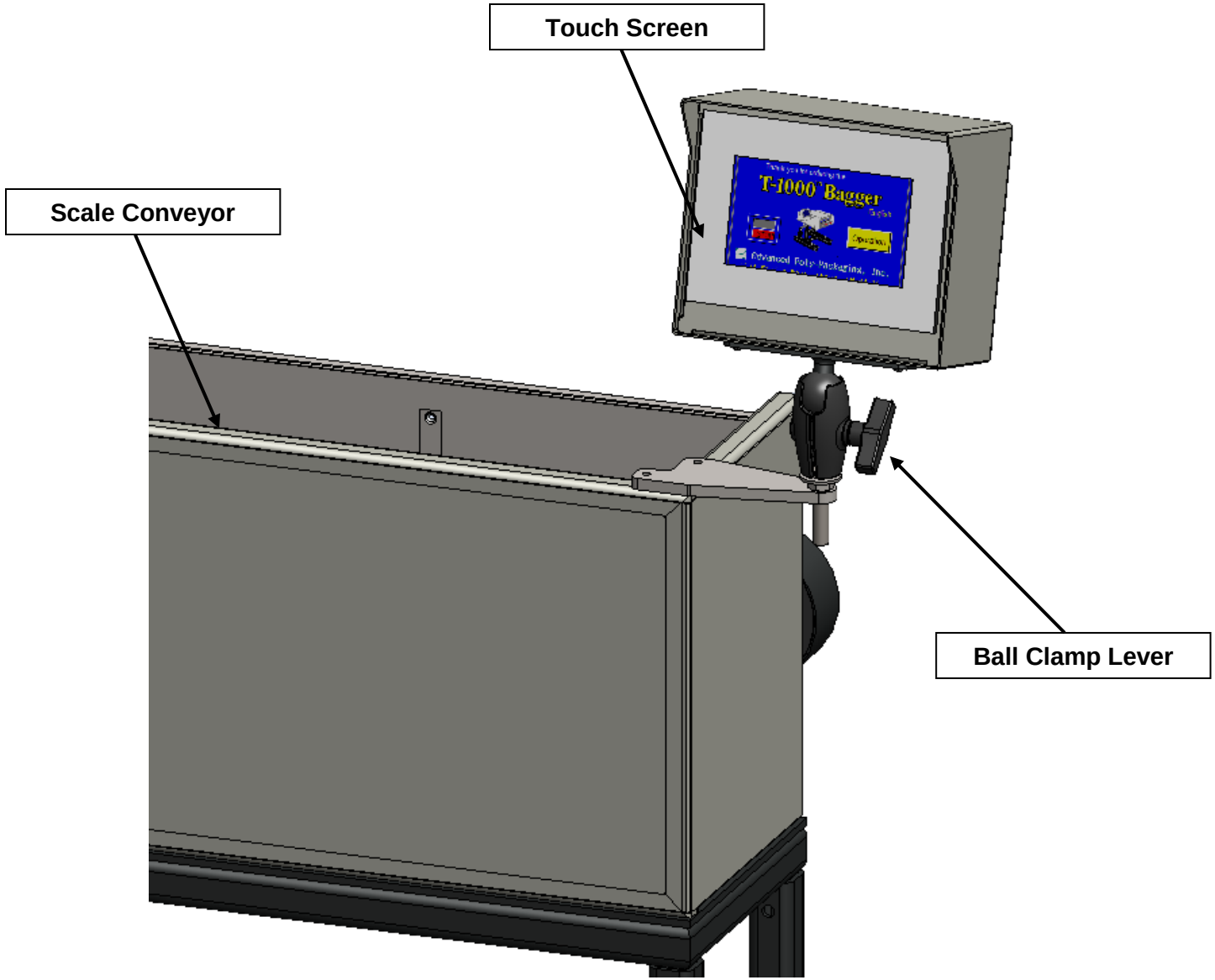

Figure 2- 9

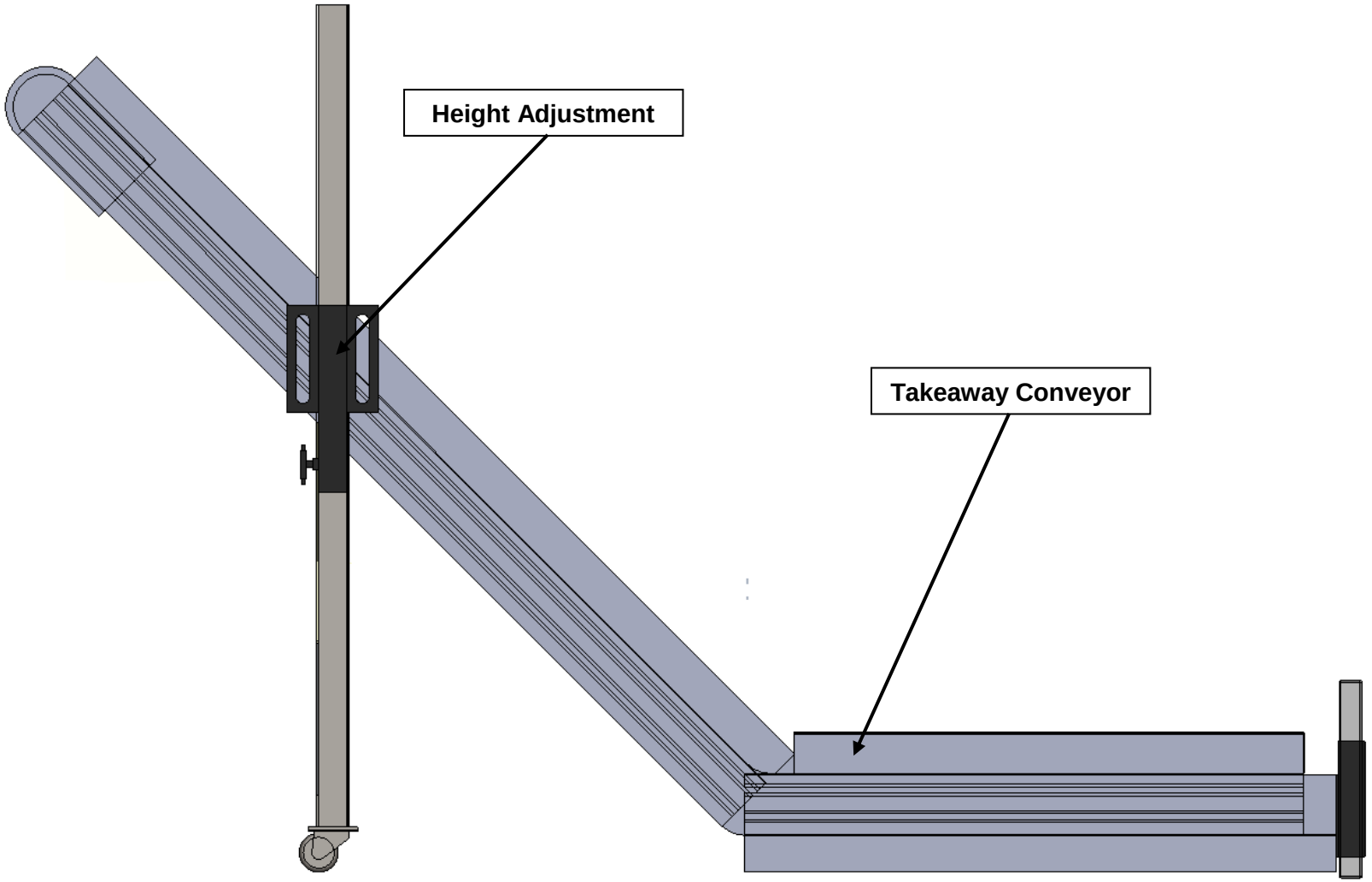

Figure 2- 10

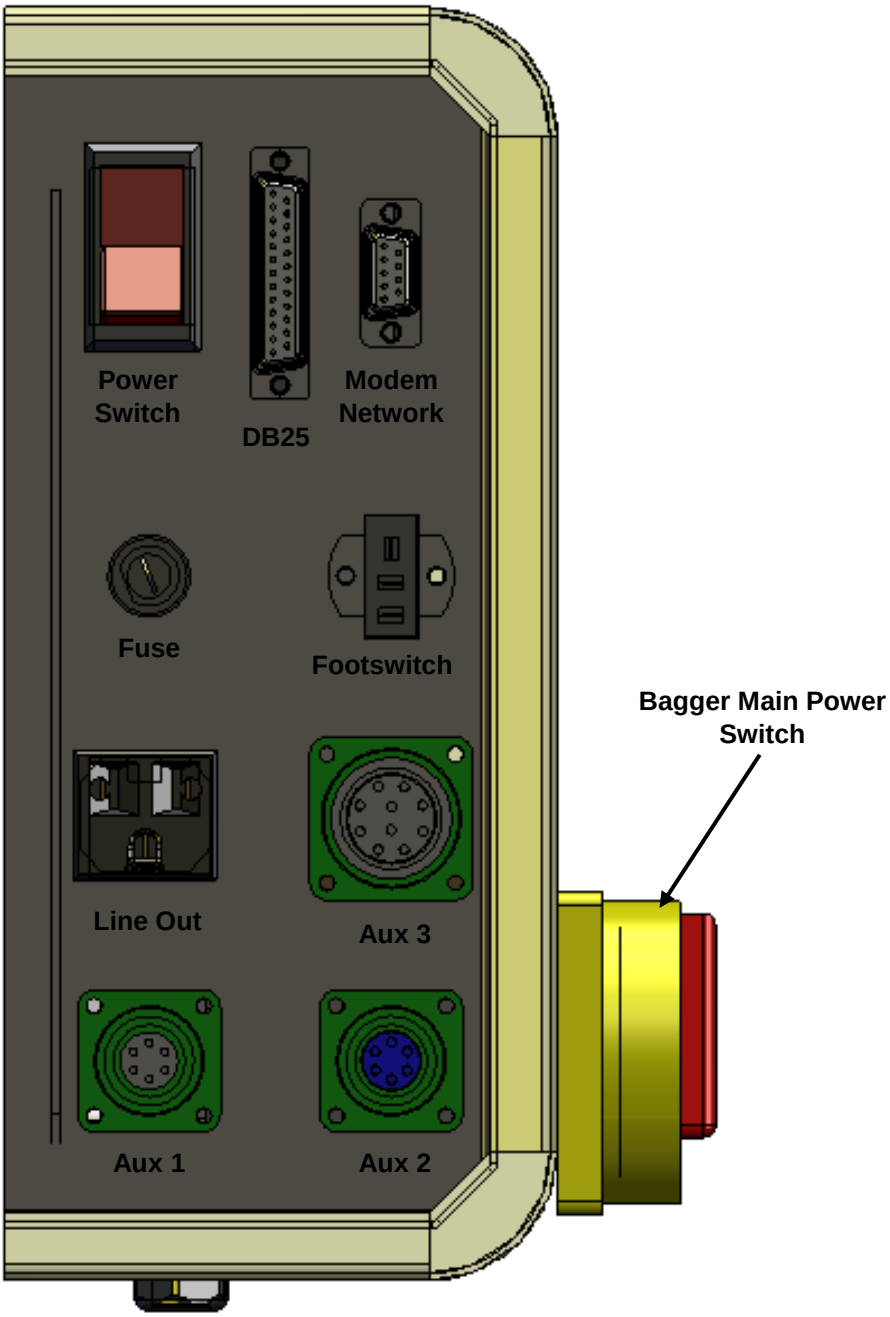
Power Switch
DB25
Modem Network
Fuse
Footswitch
Bagger Main Power Switch
Line Out
Aux 3
Aux 1
Aux 2

Figure 2- 11

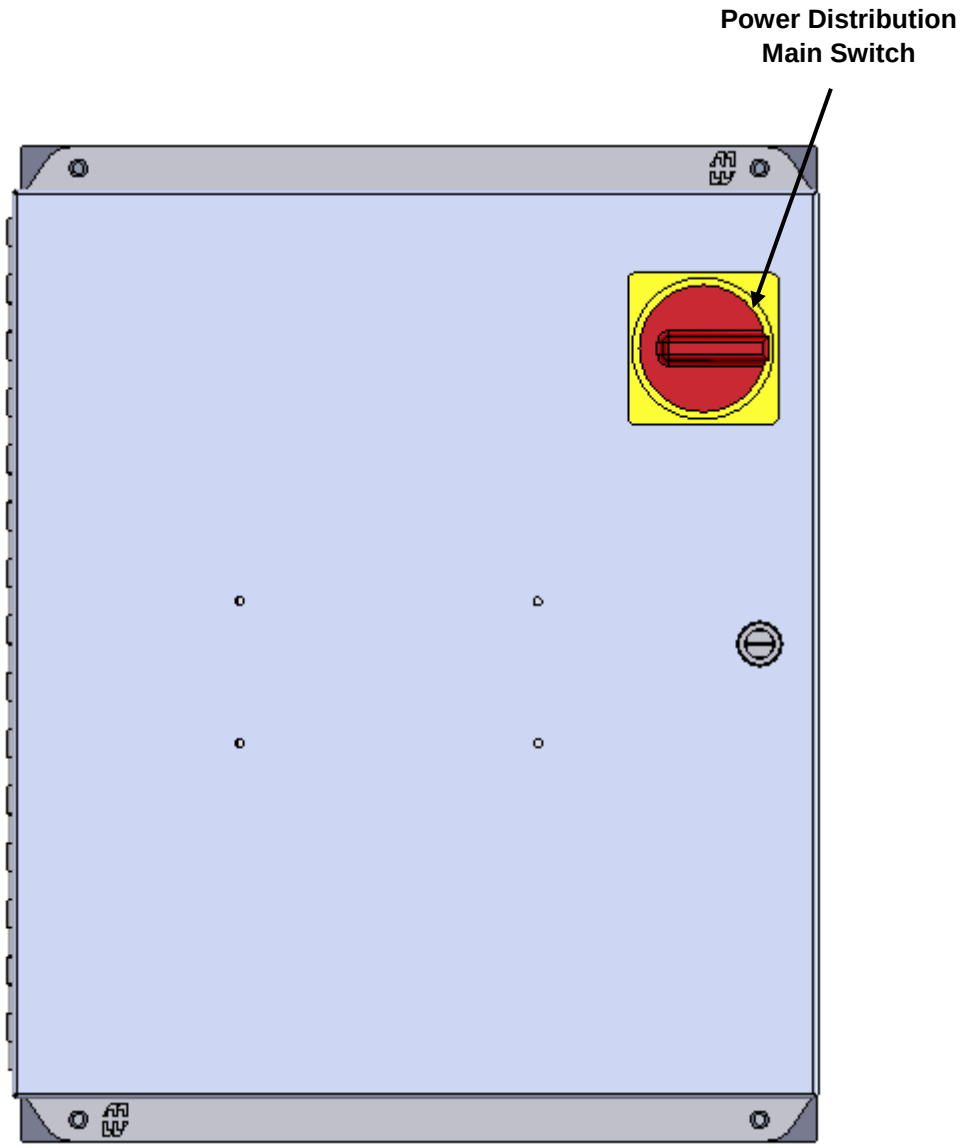

Figure 2- 12

2.8 Air and Power Hookup

This section describes how to hook up air and power and the air and power requirements.

NOTE: A qualified electrician should ensure power outlets are the required 115 VAC and properly grounded before hooking up power. If the unit is not properly grounded, it will produce a shock and the machine will not work properly.

The air supply should be fed to the ST-1000 with 3/8 ID flexible tubing. This tubing affixes to the coupler adapter (quick disconnect not provided). Connect the air to the regulator by holding the regulator firmly in one hand and pushing the air line connector on the male regulator connector. After connecting air, the regulator should be adjusted so the gauge reads 60 PSI. Insert the ST-1000 power cord into a 115 VAC, 60 Hz, grounded power outlet.

2.9 Main Power

The Bagger Main Power Switch is located on the side cover of the machine. See Figure 2- 11. The Main Power for the system is located on the Power Distribution Box. See Figure 2- 12. To turn the ST-1000 on, turn the switch counterclockwise from its vertical OFF position to its horizontal ON position. The green Power light on the touch screen will illuminate and the Introduction screen will be displayed. The program version will also be identified. The Introduction screen will only appear for a few seconds until automatically changing to the Bagger Operation screen or Main Menu.

NOTE: If the touch screen does not power up to the Introduction screen, see Chapter 4 for troubleshooting steps.

2.10 Bag Threading

The first step to threading the machine is to place a roll of bags on the shaft. Remove one of the chucks from the shaft by loosening the chuck knob and sliding the roll of bags over the shaft, locking the chuck pin in the small hole in the core plug. Tighten the knob. Replace the second chuck, also locking the chuck pin to the core plug. Remove the tape from the bags so that the bags fall freely and hang down from the top of the roll towards the back of the machine. Insert the right side of the roll shaft in the right side of the shaft holder (circular holder). Then drop the roll shaft in the slot located on the left side of the Dancer assembly.

Center the bags on the shaft by loosening the chuck knobs and sliding the roll of bags, along with the chucks, to the desired location. Ensure the chuck pins remain in the core plug holes when sliding left or right. Pull the bags over the roller immediately above the Dancer assembly, then down between the roll of bags and the outer Dancer Roller. Pull the bags around the outer Dancer Roller, over the rear "guide" roller and into the back of the ST-1000. Push the bags at least halfway through the machine.

From the front of the ST-1000, lower the frame by slowly pulling the frame handle forward and downward while holding the guard assembly, supporting the weight of the seal frame assembly.

CAUTION: You must support the weight of seal assembly while lowering it with the handle. Otherwise, you may drop the seal assembly, possibly causing personal injury or damage to the equipment.

Carefully reach inside and pull the bags through the front of the ST-1000 so that one bag is centered on the roller. Ensure only one bag extends through the front of the machine. Slowly raise the frame by pulling forward and upward on the handle while holding the bag in position. Holding the guide roller shaft, slide the roller guides approximately 1/8" from the sides of the bag to assist the tracking of the web of bags.

CAUTION: Roller "fingers" may be sharp. To avoid injury when reaching into the ST-1000, ensure that you do not come in contact with the roller fingers.

NOTE: The roller guides are for fine adjustments only, after proper tracking has been achieved. If the web of bags is not properly tracking, make proper adjustments. If not tracking properly, the web of bags may "ride" up the side of the guides, causing the bags to fold over.

Two Threading Diagrams are available based on the design of the machine, with or without a Power Unwind (See Figure 2- 13. If your machine has special features or other equipment that changes the function of the bagger, the specific threading diagram will be included with that particular manual or addendum. If you need further assistance with bag threading, please contact APPI Technical Support.

2.11 Cycle Operation of the ST-1000

If all prior installation procedures have been performed properly, the ST-1000 should be in its operating location with air and power connected. All guards, funnels and covers should be in position and securely fastened.

Locate the foot switch and plug it into the rear foot switch connector. See Figure 2- 11. Press the foot switch to index one bag through the "nip" rollers. If a foot switch is not being used, press the **Manual Cycle** button. One bag should index, blow open and stop between the pressure bar and the heater bar. If the ST-1000 is not up to temperature, the machine will not cycle unless the **RUN / SETUP** button is toggled to **SETUP**.

If the web of bags breaks prematurely, further adjustments will be required. See Chapter 4 for troubleshooting. If one bag indexed through the machine, press the foot switch a few more times. Each previously indexed bag should detach completely from the web of bags. If the bag is not indexing and/or stopping or not tearing off properly, see Chapter 4 for troubleshooting.

NOTE: The web of bags may track right or left for a few feet until "settled" on the web path. The roll of bags or the roller guide may require readjustments or realignment after the first few feet of bags are indexed.

NOTE: If bags were delivered with the ST-1000 or the bag size was known to APPI, the ST-1000 may be ready to run. Therefore, very few changes to the Bagger Settings screen will be required.

2.12 Quick Setup Procedures

(Perform prior to operating the machine on a daily basis)
Considering that the machine has been setup by Maintenance Personnel, the following quick start procedures should be followed before daily operation of the equipment.

Power off tasks (perform these tasks prior to turning on the power):

Clean the blue rubber roller, print rollers, perforation sensor, idler rollers and product contact surfaces with a clean cotton cloth and alcohol.

Inspect the machine to ensure all guards, covers and funnels are in position.

Inspect the machine for maintenance issues and report issues such as loose or broken components, frayed wires, etc. to maintenance personnel.

Check that the air pressure is set to 60 psi (4.14 BAR).

Power on tasks (perform these tasks after cleaning and inspecting the machine):

Threading: A threading diagram has been provided to illustrate the proper bag path through the machine. It is recommended that the appropriate diagram be copied and mounted to the side cover of the machine.

Setup Cycle Operation: Prior to loading parts, place the bagger in the Start / Manual / Setup mode and press the footswitch or touch the **Manl Cycle** button. Test the bag seals, seal location or other inspection requirements.

Manual Cycle Operation (if applicable): If manually loading parts, load parts into the bag ensuring all parts are going into the bag. Toggle the machine from Setup mode to Manl mode. Press the **Manl Cycle** button on the screen. Inspect the bag seals, seal location or appearance and continue the bagging operation.

Automatic Cycle Operation (if applicable): If loading automatically with a conveyor, counter, or scale infeed system, ensure auxiliary equipment is turned on and press the **Manl Cycle** button to start the system. If all equipment in the system is operating properly, toggle the machine from the Manl mode to the Auto mode.

2.13 Note on Adjustments to the ST-1000

Upon receipt, it is not unusual for the ST-1000 to be out of alignment due to shipping and excessive handling. Unless physically damaged, the ST-1000 will function properly after minor adjustments are made. Refer to Chapter 4 for information on adjustments to the ST-1000.

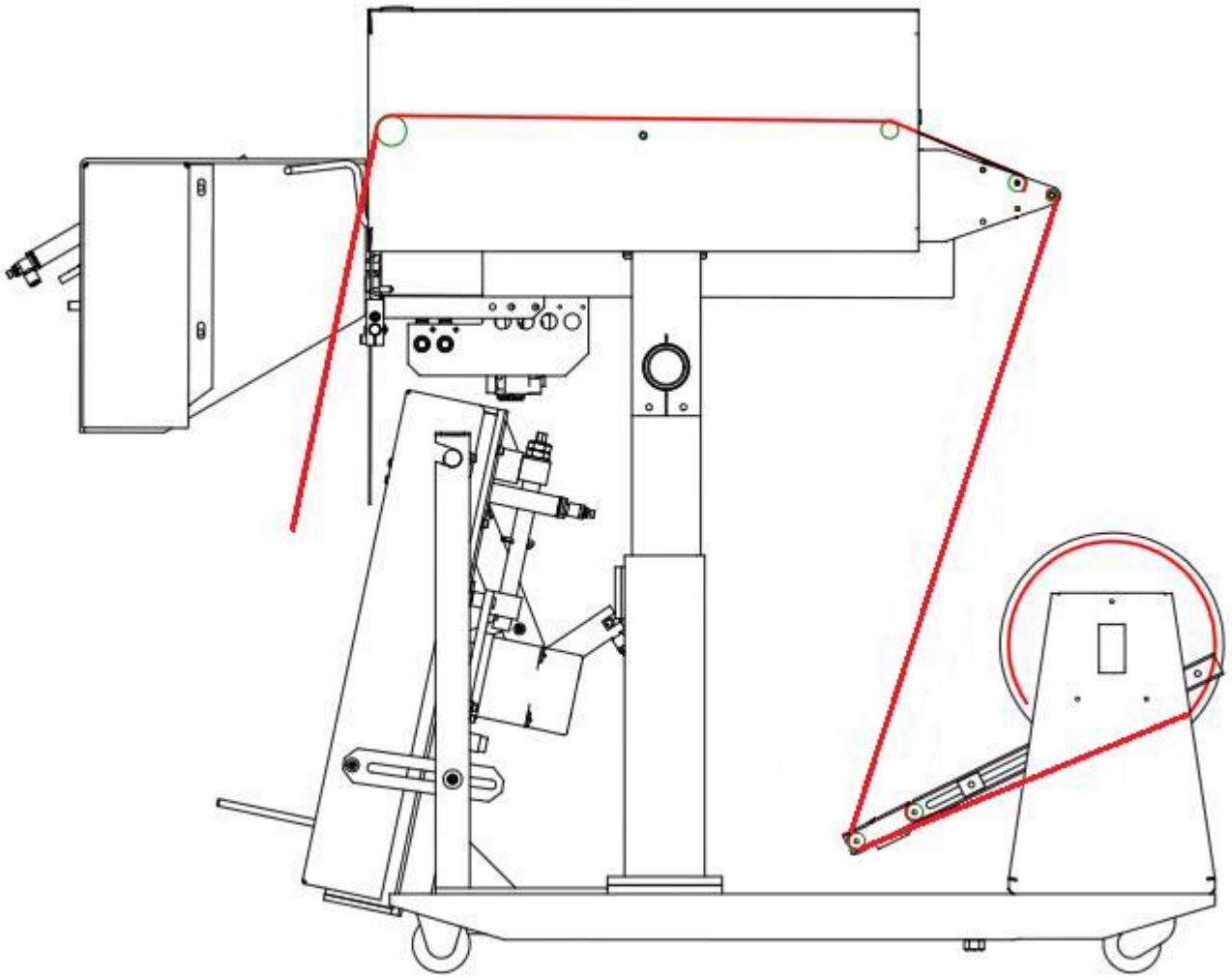

Figure 2- 13

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Chapter 3: Touch Screen Operation

3.1 Chapter Summary

This chapter describes the identification, operation, and adjustments of the touch screen program.

3.2 Touch Screen Identification

FRONT PANEL:

1. **System** button
2. **F1**: Displays the Help Screen
3. **F2**: Increases brightness when **System** button is pressed
4. **F3**: Resets screen to midpoint brightness when **System** button is pressed
5. **F4**: Decreases brightness when **System** button is pressed
6. **F5**: Displays Job Save / Recall screen
7. **Green LED** (Power): Lights up when touch screen is turned on

BACK PANEL:

1. RS-232 Communication port to PLC
2. Programming (For APPI use only)
3. Power Supply: Power terminal for touch screen operation.

3.3 Touch Screen Specifications/Features

Power	24 VDC (+/- 10%)
Operating Environment	0-50°C, 85% RH or less
Display	Color LCD
Resolution (W x H)	320 x 240 dots
Display Area	174 x 131mm (5.7")
Backlight	CCFL
Backlight Hours	Approx. 75,000
PLC Connection	RS232

3.4 Touch Screen Contrast Adjustment

The contrast of the LCD may be adjusted if the screen is difficult to read. To adjust the contrast, press the **System** button located to the right side of the active touch screen area. Then press the **F2** button to increase brightness and the **F4** button to decrease brightness. **F3** will go to the midpoint position.

3.5 Touch Screen Program

The touch screen program is a user-friendly, menu-driven setup and operation program. Pop-up windows are incorporated for quick and easy setting adjustments. Each time a setting is changed, the settings are saved so that if power is lost, the "job" will be recalled automatically, without the need for reprogramming. A general color scheme has been used to identify functions:

1. **Blue**: Background color used for text information. No "buttons" or functions are blue.
2. **Green**: Used for buttons that change settings. For example, pressing a green button may display a pop-up window or turn a function on/off.
3. **Red**: Indicates that a function is off or stopped. For example, pressing a red button may turn a function on.
4. **Yellow**: Used for menu buttons. Pressing a menu button displays another screen and allows for movement throughout the entire program.

3.6 Introduction Screen

When the ST-1000 is turned on, an Introduction Screen is displayed, See Figure 3-1. The Introduction screen is a welcome screen and has a button to take you to the Operations Menu.

Figure 3-1

3.7 Operation Screen

The Operation Screen is provided to function with Pass code Protection function of the machine. If the pass code function is enabled in the Technical Assistance Screen, the touch screen will default to the Operation Screen after a preset time has elapsed. This function prevents unauthorized operators from making setting changes that could affect the operation or performance of the unit. Since no settings are displayed on the Operations Screen, the operator cannot change settings unless a pass code is enabled. See Figure 3-2.

Note: For more information regarding the pass code function, refer to Section 3.30 Pass Code Setup Screen.

The Operation Screen also displays the current job number, the current count, the number of towels bagged per minute and per hour, the bag (total) count, part count and the production time.

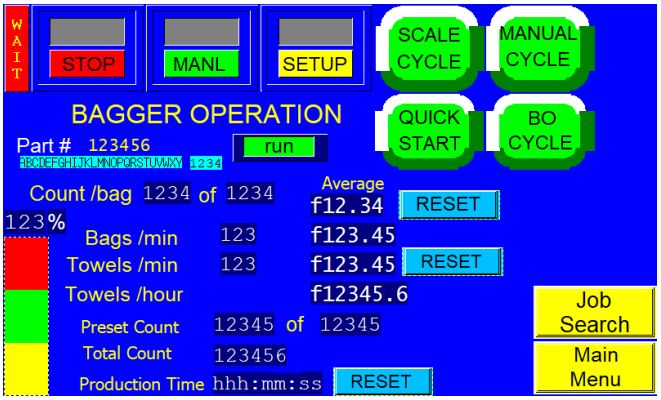


Figure 3-2

Cycle Buttons: Press Scale Cycle or BO Cycle button while the RUN button is in SETUP to manually cycle.

Quick Start: Press the **Quick Start** button

Manual Cycle: Press the **Manual Cycle** button to cycle the whole system manually one time. Acts like a foot pedal.

BO Cycle: The **BO Cycle** button allows the operator to test cycle the Bag Opening Device alone, without initiating other equipment or the ST-1000 seal operation.

Current Job: Displays the current job number.

Count / Bag: Displays the number of towels going into the bag. Will count up from zero and end at the desired amount.

Bags / Min: Displays the number of bags that are produced per minute. Count per bag will determine Bags / Min.

Towels / Min: Displays the number of towels processed per minute.

Towels / Hour: Displays the number of towels per hour. This is the best indicator for production needs based on daily requirements.

Average: Displays the average for Count/Bag, Bags/Min, Towels/Min, and Towels/Hour over five bags worth of cycles.

Preset Count: The number of total bags desired per production run. The system will stop and a message screen will display when preset count is reached.

Total Count: Running count of total cycles of bagged cycles. (Towels are not counted, bags only).

Production Time: Displays the amount of time the machine has been turned on and operating. Press Reset to set this number to zero.

NOTE: The Totalizing Counter feature must be turned ON from the Counters Screen to track cycle operations.

3.8 Main Menu

The Main Menu is initially accessed from the Operation screen. The Main Menu screen allows the operator to quickly navigate to other areas in the program. The yellow buttons located in the center of the Main Menu screen are menu command buttons. Pressing a menu command button changes the screen currently displayed on the touch screen, See Figure 3-3. To access another screen, simply press the corresponding menu command button. Menu buttons appear throughout the touch screen program and are normally located on the right side of the screen.

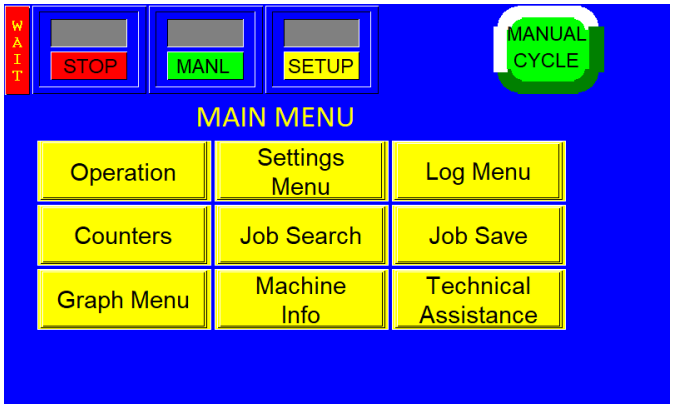


Figure 3-3

- **START / STOP**: This button controls the operation mode, the mode that allows the equipment to cycle. Toggle this button to START to begin operation. Toggle this button to STOP to pause operation.
- **MANL / AUTO**: This button can be toggled to enter the machine into either Automatic or Manual mode. Automatic mode allows the machine to cycle automatically. Manual mode requires the operator to press the **Manual Cycle** button or the footswitch to cycle the machine.
- **RUN / SETUP**: This button can be used to deactivate functions and allow cycling when the heater bar is not up to temperature. Toggle this button to SETUP to stop counters, production timers and auxiliary signals so the equipment can be operated independently. Toggle this button to RUN to begin operation.

Ready / Waiting LED: This LED displays "Ready" when the heater bar has reached the temperature set point. "Waiting" is displayed when the machine is not at temperature.

Pressing **Graph Menu**, **Settings Menu**, or **Log Menu** will access submenus for these functions. For an example of the **Settings Menu**, See Figure 3-4.

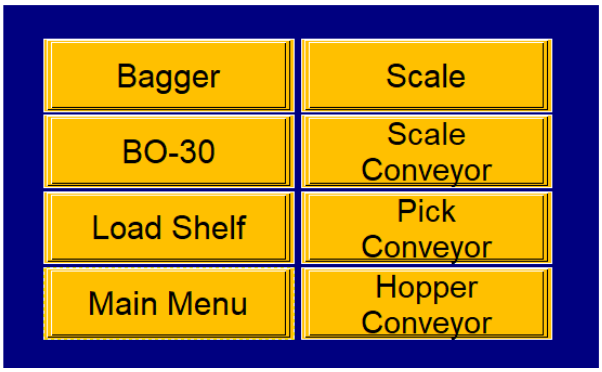


Figure 3-4

3.9 Bagger Settings Screen

The Bagger Setup screen allows the operator to access, view and adjust the basic machine settings. These settings include Fill Time, Air Pulse, Seal Point, Seal Time, Reverse, Blow Off, Index Speed and Seal Temperature. Bag size, thickness and product characteristics affect these settings. See Figure 3-5. Once set, the operator may save the bagger settings, along with the options settings and auxiliary settings, for later recall.

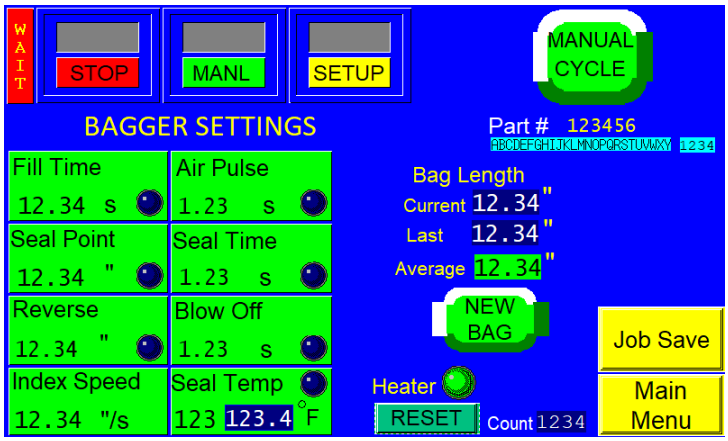


Figure 3-5

All settings will be entered numerically on a keypad. To adjust any value on this screen, press the green button of the setting you wish to change (i.e. **Reverse**) and then enter the desired value on the numeric keypad. Press the **ENT** button to accept the setting change.

Most entries and adjustments of machine operation settings will occur on the Setup screen. When a new bag size or thickness is introduced, the ST-1000 must be set up properly in order to run the bags.

The **New Bag** button can be pressed at any time if the bag is not consistently stopping in the correct seal point. The **New Bag** button starts an internal program that calculates average bag length. This information is required so that if a perforation is not detected, the bag will still stop in the correct seal position. Press the **New Bag** button if bags are not consistently stopping at the correct seal point or after switching bag size. To manually adjust the average bag length, press the green numeric button under Average, enter a value on the numeric keypad and press the **ENT** button.

NOTE: A Feed Error message will be displayed if the perforation is not detected within the accepted bag length range. Once a Feed Error occurs, the bagger will restart to calculate bag length.

Bag Length displays: The current, previous, and average bag lengths are displayed on the Setup screen. These values should be close to the actual bag length and are displayed to assist with troubleshooting in case the seal point becomes inconsistent and erratic. Once the average bag length is calculated, the bag will index to this position even if the perforation is not detected.

NOTE: The bag length information displayed on this screen may not exactly match the bag length due to mechanical tolerances in the equipment (i.e. roller diameter fluctuations).

Job Save is also accessible from the Bag Settings screen. See section 3.16 Internal and External Memory for more information.

A. Fill Time

Fill Time is the amount of time, in seconds, auxiliary infeed equipment or an operator must load product into the bag before seal operation begins. Fill Time functions differently depending on which mode the ST-1000 is operating in: 1) Manual, 2) Automatic or 3) Auxiliary.

1. In **Manual** mode with no accumulating funnel, Fill Time delays operation from starting. When the ST-1000 is equipped with an accumulating funnel, Fill Time is the amount of time before the bagger begins to seal the bag after the accumulating funnel door has closed.

2. In **Automatic** mode with no auxiliary equipment, Fill Time is the amount of time before the seal bar actuates after the bag is blown open. In Automatic mode, a foot switch or other actuator is not required.
3. In **Auxiliary** mode, Fill Time is the amount of time a product, automatically loaded into the bag by auxiliary equipment, must be completely settled in the bag before the seal bar actuates.

A suggested setting for Fill Time is 0.3 seconds.

CAUTION: **To avoid physical harm, DO NOT cycle the equipment in Automatic or Auxiliary mode if the funnel, guards, or covers are removed or out of position. Since the seal bar actuates automatically, operators must keep fingers, hands, and other parts of the body away from the sealing mechanism and all other moving parts.**

NOTE: In AUXILIARY cycle mode, FILL TIME displays, in seconds, the time for which a product, automatically filled by auxiliary equipment, must be completely settled in the bag before the seal bar is actuated. This time is typically referred to as the DELAY TIME.

B. Air Pulse

Air Pulse is the amount of time, in seconds, that a burst of air will initially blow the bag open. Wider bags and heavier gauge bags require a longer burst of air to initially open the bag. Narrower and thinner gauge bags require less air to initially open the bag. In addition to adjusting the time value on the touch screen, you can also manually adjust the flow control valves located on the right lower side of the seal frame assembly to increase or decrease air through the air pulse tube or blower. To *increase* the volume of air from the air pulse tubes, turn the air pulse valve counterclockwise. Turn the valve clockwise to *decrease* the volume of air. A suggested setting for Air Pulse is 0.3 seconds.

NOTE: The volume of air set should be the minimum amount and duration required to consistently open the bag.

C. Seal Point

Seal Point is the position of the seal, in inches, measured from the top perforation of the bag. Seal Point can be set to the desired or required location. The proper positioning of the seal on the bag varies due to bag size and product characteristics. Wider bags generally require greater sealing area than narrower bags. Additionally, bags packaged with bulky products require greater sealing area than bags packaged with thinner products. A suggested setting for Seal Point is 1 inch.

D. Seal Time

Seal Time is the amount of time, in seconds, the time the pressure (rubber) bar will remain touching the surface of the bag for proper sealing. Sometimes referred to as "dwell time", seal time is one of three critical components to obtain a strong seal. Other critical factors include seal temperature and seal pressure. A suggested setting for Seal Time is 0.3 seconds.

E. Reverse

Reverse is the distance, in inches, the rollers will reverse the bag into the ST-1000, while the pressure bar grips the bag, in order to break the perforation between bags. For wider bags, the reverse distance may need to be increased. A typical setting for Reverse is between 0.5 inch and 1inch.

F. Blow Off

Blow Off is the amount of time, in seconds, that the blow off tube will release a burst of air to remove sealed bags from the machine. The blow off tube, located immediately below the seal bar, decreases the possibility of bags sticking to the Anti-Stick PTFE. Increase the Blow Off time if bags are not falling from the machine. A suggested setting for Blow Off is 0.3 seconds.

G. Index Speed

Index Speed is the bag feeding speed, in inches per second, at which the bag will feed/index into position. Index Speed can be set to improve production. If bags are prematurely breaking at the perforation, reduce the Index Speed. For shorter bags, the speed can be significantly decreased (to 10"/Sec, for instance). For longer bags, the setting can be increased. A typical setting is between 15” and 25” per second.

H. Seal Temperature

Seal Temperature is the temperature the heater bar must reach before full operation can begin. When the power is ON, the heater bar element receives electrical current. The PLC pulses electrical current to the element until the temperature setting is reached. Shorter pulses indicate maintaining the temperature. The indicator light on the **Seal Temp** button illuminates while the element is receiving current. The longer the light is illuminating, the longer the “pulse” of current and the further away the machine is from the required temperature setting.

If the temperature of the heater bar is not within a preset range around the preset Seal Temperature, “Waiting” will be displayed on the top left screen. If “Waiting” is displayed on the top left corner of the screen, the ST-1000 can only be operated in Setup mode. When the heater bar is up to temperature, “Ready” will be displayed on the top left of the screen. If “Ready” is displayed in the top left corner of the screen, the ST-1000 is ready for full operation. A suggested setting for Seal Temperature is 333°F (167°C).

NOTE: After making adjustments, test the seal strength prior to beginning production. It is normal for the indicator light to illuminate (pulse) during operation. As the actual temperature approaches the set temperature, the pulses will get shorter and shorter. When the heater bar is up to temperature, the Waiting LED indicator will change to Ready. From a "cold" start, it takes approximately four minutes to reach the set temperature.

Note on Seal Quality

Quality seals are achieved by making adjustments to Seal Time, Seal Temperature and Seal Point and by having the proper seal pressure. As an additional seal function, an adjustment of the Cool Time setting may also be required for heavy or bulky products. If too hot, the seal may separate when the pressure bar releases the bag after sealing. Cool time is considered a factory setting and can be adjusted on the Bagger Factory screen.

If, after making necessary adjustments, seal quality remains insufficient, additional options may be purchased to enhance seal appearance, integrity, or strength. See Chapter 1 for description of available options: FS-10 Flat Seal Assembly, TS-10 Trim Seal Assembly, BD-10 Bag Deflator, LS-10 Load Shelf, Twin Seal option). Wider seal bars are also available to increase the consistency of seals.

NOTE: Ensure Regulator Pressure is set to 60 PSI.

3.10 US-6000 Scale Settings Screen

See Figure 3-6.

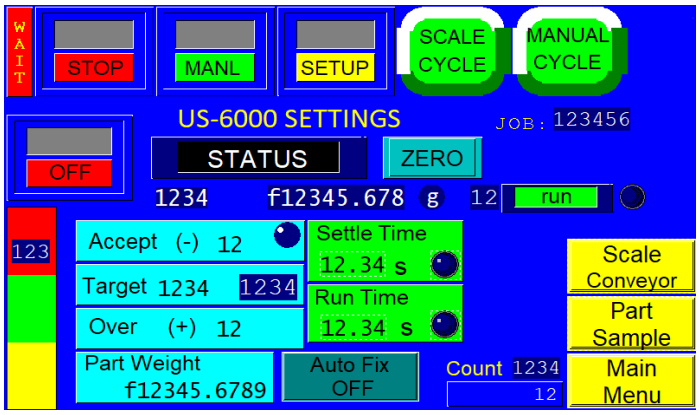


Figure 3-6

ON /OFF: Turns the scale ON or OFF.

Accept: The number of allowable towels under the target range that is acceptable for the system to continue running.

Target: Set the total number of towels per bag.

Over: The number of allowable towels over the target range that is acceptable for the system to continue running.

Part Weight: The total weight of the desired number of towels per bag.

Auto Fix: Can be turned ON or OFF. When ON, allows for slight changes in weight due to variations in towel density. When OFF, Auto Fix will not change Part Weight.

Settle Time: Starts after target weight is reached, pauses for set length of time to fully weigh the desired count. A typical setting is between 1.25 seconds and 3 seconds.

Run Time: The length of time the conveyor will move the towels forward into the bag. *NOTE: the accumulator door will not open until the Run Time is complete.*

3.11 Pick Conveyor

The Pick Conveyor picks towels out of the Hopper and transfers them to Scale Conveyor through the open Accumulator. 'Fast' and 'Slow' speed settings. Switch to slow speed after 'Slow Count' is reached. When a batch of towels is accepted and is carried by Scale conveyor, the Accumulator Door stays closed until the Scale Conveyor indexes are competed. The Pick Conveyor continues running at slow speed during Scale Index until the Accumulator is full ('Flow Count' eye is blocked). See Figure 3-7.

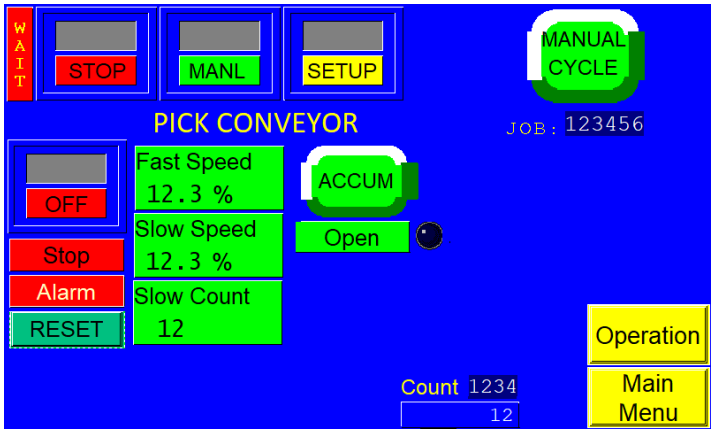


Figure 3-7

Pick ON / OFF: Turn the Pick Conveyor ON or OFF. *NOTE: The Scale can be run in Manual when the Pick Conveyor is OFF.*

STOP: An illuminated Stop button indicates that the machine is in STOP mode.

Fast Speed: Pick Conveyor speed setting to quickly get close to the Final Count of Towels. A typical setting is 70.

Slow Speed: Reduces the Pick Conveyor Speed when close to the final count (2-3 towels remaining). A typical setting is 55.

ACCUM ON / OFF: Turns ON / OFF the door that accumulates towels while bagger and conveyor cycle. In the ON position the accumulator door opens and closes as the system cycles. In OFF mode the accumulator door stays open.

3.12 Hopper Settings

The Hopper Conveyor sits at the bottom of the Hopper and is used to feed towels from the back of the Hopper to the front Pick Conveyor area. When there are too many towels in the Pick Conveyor area it gets crowded and prevents optimal towel picking. The Hopper Conveyor also reverses, relieving some of the crowding and allows the Picks to catch the towels with ease. See Figure 3-8.

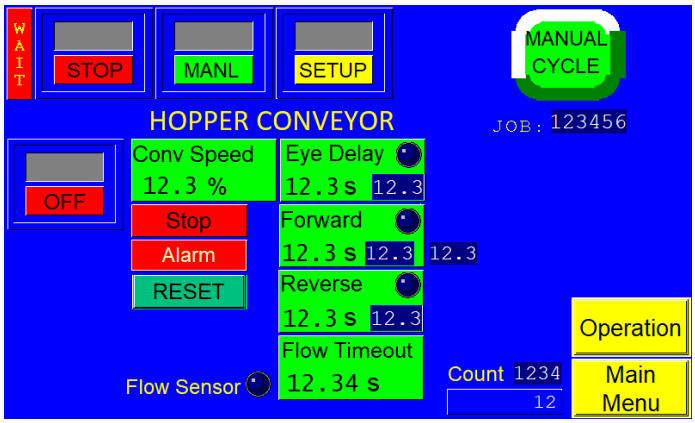


Figure 3-8

ON / OFF: Turns Hopper Conveyor ON or OFF.

SPEED: Speed control for forward and backward operation of the Hopper Conveyor. A typical Setting is 40.

Reverse Time: The Conveyor will reverse after the accumulating funnel is blocked as towels pass. Set the length of time the conveyor will reveres by pressing the **Reverse Time** button and entering a number on the green numeric keypad. A typical setting is 1 second.

Eye Delay: If no towels are detected, the Conveyor starts moving after the "Eye Delay" time has expired.

Forward Time: The maximum time the Conveyor belt can move forward. Belt is moving forward until a towel is seen by the eye or forward time expired.

Reverse Time: The maximum time the Conveyor belt can move in reverse. Belt moves in reverse each time after moving forward. Actual reverse time matches the previous Forward Time.

Forward Delay: The length of time the Hopper Conveyor pauses after reverse time has completed.

Flow Time Out: If towels are not seen by the Accumulating Eye within Flow Time Out settings, the bagger will be put into STOP mode. This function is mostly used for unmanned operation.

Flow Count: The number of towels that pass by the Accumulating Eye that stop the Hopper Conveyor from moving forward. A typical setting is 1.

Flow Sensor LED: Displays when the Flow Count has been reached.

3.13 Options Menu

Several options can be added to the ST-1000 at the factory and then set up and adjusted from the Options Menu. If the option was not installed at the factory, then N/A (Not Available) will be displayed to the left of the option button. Otherwise, the area to the left of the option will display ON or OFF. See Figure 3-9.

NOTE: If options are added in the field, a pass code is required to enable use of the option. Contact APPI for pass codes. Options that have been purchased separately must be installed by specialized maintenance personnel.

NOTE: If this option was purchased with the machine, the option will be enabled at the factory. Otherwise, contact APPI Service Department for instructions on how to enable options.

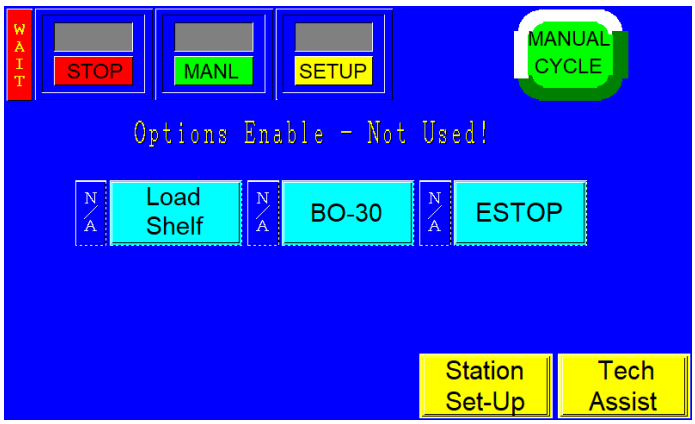


Figure 3-9

To determine if a specific option has been activated, press the **Options** button from the Main Menu. The Bagger Options Menu will be displayed. Press the button of the option you wish to view (i.e. Load Shelf, Bag Opener). If an information screen is shown with an **Activate Option** button at the bottom of the screen, then the option has not been activated yet. Contact APPI Technical Support for information on how to activate the option. If the option has been activated, a settings or operation screen will be displayed after the option button is pressed.
The following sections describe the settings for optional equipment on the ST-1000. If your ST-1000 is not equipped with these options, please disregard these sections. Most of the listed options are not standard and must be purchased separately.

NOTE: Due to specialized nature of some options or if your machine has custom programming, setting descriptions may not be included in this manual. Please contact APPI for special instructions.

3.14 Load Shelf

This option is used as a support shelf for the bagged product. It prevents the bag from prematurely tearing off at the perforation when the product is inserted in the bag. The Load Shelf allows the product to drop onto the shelf relieving the pressure on the bottom of the bag. See Figure 3-10.

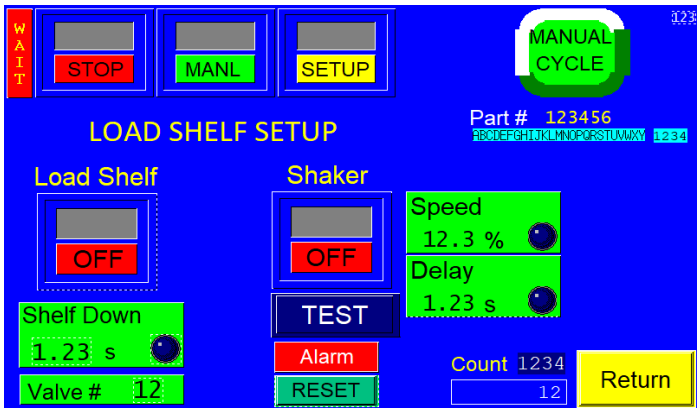


Figure 3-10

Load Shelf ON / OFF button: Press to turn the Load Shelf on and off.

Tapper ON / OFF button: Press to turn the vibratory tapper on and off. The tapper vibrates the Load Shelf and settles product in the bottom of bag.

Shelf Down: The length of time the shelf is in the down position. To adjust this setting, press the **Shelf Down** button, enter a value into the numeric keypad and press **ENT**. Increase the time for longer bags.

Speed: The rate at which the tapper moves up and down, faster, or slower. This helps settle towels lower in the bag. Increasing this number reduces the possibility of anti-jams.

Test: Tests the setting without having to cycle the whole machine.

NOTE: Valve # X indicates the Valve Station number assigned to this option. Valve #0 indicates that no valve is assigned to this option. The option will not operate unless a Valve Station number is assigned, other than 0.

3.15 Bag Opener (BO-30)

The Bag Opening Device, or BO-30, is a special device to assist in opening and maintaining a bag opening offered by APPI. This device enters the bag with one or more "fingers" and then pulls the bag open to a stop. The stop holds the bag open during loading and validates that there is bag material present in the "gripper". Air can also be shut off at this point. This special purpose device is not included in the standard ST-1000 package and must be purchased separately.

To turn ON this option, press the Toggle button, See Figure 3-11.

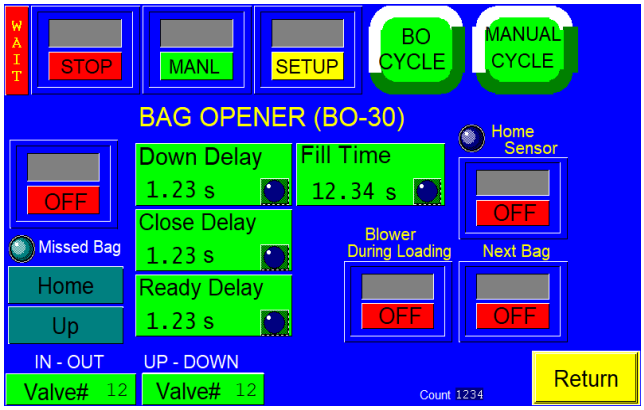


Figure 3-11

There are several settings on this screen that alter operation:

- **DownDelay** is the delay time, in seconds, before the finger will attempt to enter the bag after the bag is initially blown open. A typical value is .7 seconds.

- **CloseDelay** is the amount of time, in seconds, after the fingers have entered the bag before the fingers will pull the bag to the gripper point. A typical value is .5 seconds.

- **Ready Delay** is the amount of time, in seconds, it takes the fingers to cycle before the machine looks for an error.

NOTE: It is very important that Ready Delay is set correctly, as the entire operation of the machine is affected by this setting. If Ready Delay is too short, the machine could drop the product before it confirms the bag opening. The bag will not be ready and an error will occur. If Ready Delay is too long, the machine will cycle slower and there will be a loss of production.

- **Fill Time**: The amount of time, in seconds, auxiliary infeed equipment or an operator must load product into the bag before seal operation begins.

Blower During Loading: When this button is toggled to ON, air will be blown into the bag while the product is dropped. When this button is toggled to OFF, the air will shut off after the bag is grabbed by the bag-opener fingers.

The **Next Bag** toggle button can be turned ON to automatically reject an empty bag after failed attempts to open the bag. If this option is OFF and an error occurs, an error message will be displayed and the machine will not continue to another bag.

Home / **Away** and **Up** / **Down** display the operation of the fingers. When the fingers are withdrawn, Home and Down are displayed. When the fingers are out and the product is in the bag, Away and Up are displayed. A Home Sensor LED indicator illuminates when the fingers are in the home position. This sensor can be toggled on and off.

BO Cycle button allows you to test cycle the Bag Opening Device alone, without initiating other equipment or the ST-1000 seal operation.

NOTE: Valve # X indicates the Valve Station number assigned to this option. Valve #0 indicates that no valve is assigned to this option. The option will not operate unless a Valve Station number is assigned, other than 0.

3.16 AF-10 Accumulating Funnel

This photo optic, preset-counting, special purpose funnel has several functions:

1) To accumulate a product before dropping the full contents of the accumulator into the bag.
2) To contain a product while the bagger is in cycle operation (sealing, tearing off and indexing a bag into position).
3) To insert the funnel into the bag and keep the product away from the sealing portion of the bag.
4) To physically open the bag with a gate that enters the bag while the product exits the funnel.

The Accumulating Funnel can provide increased production in both manual and automatic operations. In a manual operation, the operator can insert the product into the funnel without waiting for the bag to be opened and in position. When the bagger is ready to receive product, the door at the bottom of the funnel will open, drop the product, and then shut, allowing the funnel to be loaded again. In an automatic operation, increased production can be achieved by allowing counters, fillers, scales, and other infeed equipment to feed the funnel without regard for the status of the bagger.

The Accumulating Funnel can be operated in an Open mode or a Closed mode.

In Open mode, the door is closed only during the sealing operation. The door opens when the bag is in position and will remain open until the bag has been filled. The door will then close until the next bag is in position.

On the Accumulating Funnel Open Mode screen, several settings are provided to delay opening or to maintain the opening until product has passed through. See Figure 3-12.

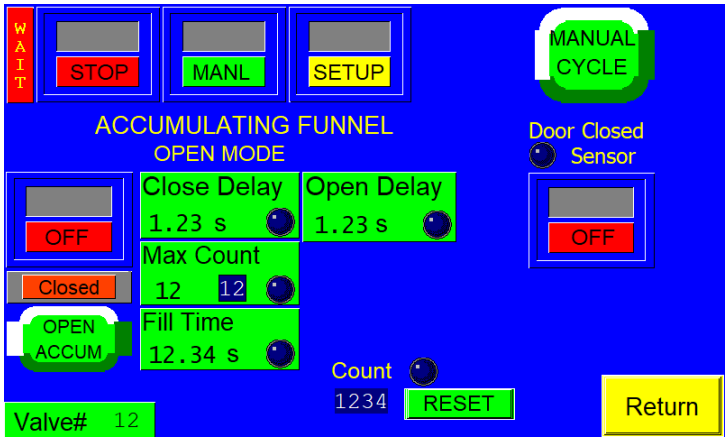


Figure 3-12

- **ON / OFF button**: Press to enable and disable funnel.
- **Close Delay**: The amount of time, in seconds, before the funnel door closes after parts have dropped into the bag.
- **Max Count**: Press the **Max Count** button to adjust the maximum number of parts that can be in the accumulator. Adjusting this number will help avoid overfilling the accumulator. To disable this function, set the Max Count to zero.
- **Open Delay**: The amount of time, in seconds, before the funnel door opens after a part has been read by the sensor.

Home Sensor: The ST-1000 is equipped with a sensor that monitors the position of the accumulator door. If the sensor does not detect movement from the door during the appropriate times in the operation sequence, the home sensor LED will illuminate and an error message will be displayed. To turn the home sensor off and prevent the

display of an error message, toggle the Home Sensor button to OFF. To activate the home sensor, toggle the Home Sensor **ON / OFF** button to ON.

Count: Displays the amount of parts in the accumulator. When the preset count is reached, this LED will illuminate.

In Closed mode, the door remains closed until the full batch is in the funnel. When the full batch is in the funnel, the funnel door will open until all product drops from the funnel.
On the Accumulating Funnel (Closed Mode) screen, several settings are provided to delay opening or to maintain the opening until product has passed through. See Figure 3-13.

- **ON / OFF button**: Press to enable and disable funnel.
- **Open Delay**: The amount of time, in seconds, before the funnel door opens after a part has been read by the sensor or after the preset amount of parts has settled in the accumulator.
- **Open Time**: The amount of time, in seconds, the accumulator remains open after dropping parts.

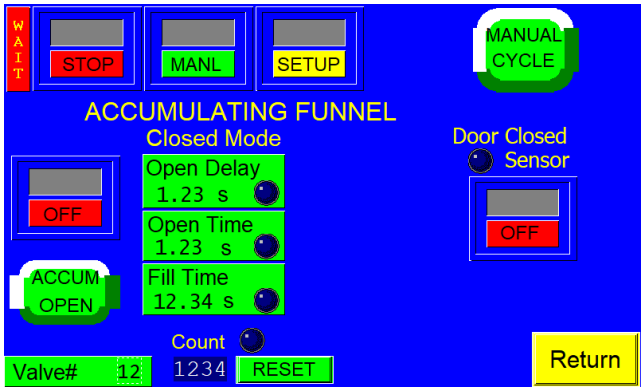


Figure 3-13

Home Sensor: This button functions the exactly like the Home Sensor toggle button on the Accumulating Funnel (Open Mode) screen.

NOTE: Valve # X indicates the Valve Station number assigned to this option. Valve #0 indicates that no valve is assigned to this option. The option will not operate unless a Valve Station number is assigned, other than zero.

3.17 CF-10 Counting Funnel

This photo optic, preset counting option automatically cycles the bagger when a preset number of parts have fallen through the funnel. See Figure 3-14.

Photo optic eyes may vary depending on the product, so parts should be sent to APPI for testing to determine the correct components. Parts must be separated to be counted accurately through the eye. If two parts fall at the same time, they may be counted as one. Contact APPI Sales Support for additional options, programming, or operations for automatic infeed equipment.

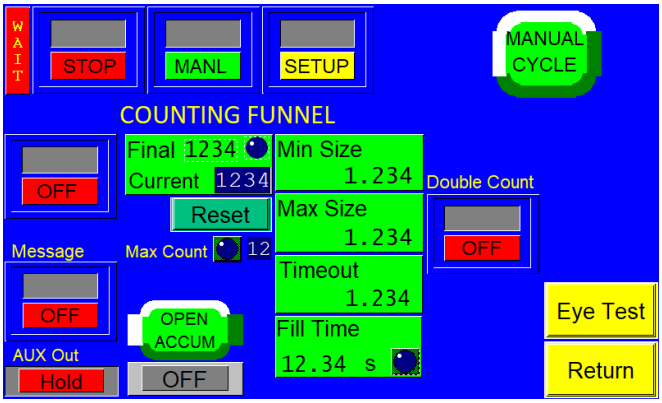


Figure 3-14

ON / OFF button: Press to turn the Counting Funnel on and off.

Final / Current: Final displays the total, preset count. Current displays the count the machine is processing. Press the green **Final / Current** button, enter a value on the numeric keypad and press the **ENT** button to adjust the final count. The Final LED will illuminate when the final count is reached.

Min Size: This setting affects how parts are counted and is used to filter scrap. Min Size can either be manually set by the operator or automatically set after an eye test is performed. If manually set, Min Size should be set to reflect the minimum size that can be counted as one part. For example, if the Min Size is set to 0.4, a part measured at 0.3 would not be counted, while a part measured at 0.5 would be counted as one part (assuming 0.5 falls below the Max Size setting). If automatically calculated, Min Size is 80% of the Min measurement. To adjust Min Size manually, press the green **Min Size** button on the Counting Funnel screen, enter a value on the numeric keypad and press the **ENT** button.

Max Size: This setting affects how parts are counted and is used to count connected parts or parts falling through the eye together as two parts. Max Size can either be manually set by the operator or automatically set after an eye test is performed. If manually set, Max Size should be set to reflect the maximum size that can be counted as one part. For example, if the Max Size is set to 0.8, a part measured at 0.6 would be counted as one part (assuming 0.6 is above the Min Size setting), while a part measured at 0.9 would be counted as two parts. If automatically calculated, Min Size is 160% of the Max measurement. To adjust Max Size manually, press the **Max Size** button, enter a value on the numeric keypad and press the **ENT** button. To adjust Max Size manually, press the green **Max Size** button on the Counting Funnel screen, enter a value on the numeric keypad and press the **ENT** button.

NOTE: If Min Size is set too close to the actual minimum test value, some parts may not be counted, causing overcounts. If Max Size is set too close to actual maximum test value, one part may be counted as two, causing overcounts.

Count To: The length of the time (time out time) the eye does not take a measurement while reading a part. Press the **Duration** button, enter a value on the numeric keypad, and press the **ENT** button to adjust the value.

Message ON / OFF button: If this button is turned on, a message will be displayed when the final count is reached. This message will inform the operator to stop loading until the bagger is ready to receive the next batch.

Aux Out: The **Aux Out** button will display either READY or HOLD (or OFF if there is no auxiliary equipment). When Aux Out displays READY, the bagger is ready to drop bagged parts. When Aux Out displays HOLD, the bagger is still cycling.

Max Count LED: Max Count is the maximum number of parts that can be in the funnel. When this maximum number has been reached, this indicator light will illuminate.

To manually open the accumulator and drop product into a bag, press the **Accum Open** button. Press the **Reset** button on the Eye Sample screen to reset the sample values.

To ensure the accuracy of the count, an eye test must be performed. Press the **Eye Test** button on the Counting Funnel screen to display the Eye Test screen and perform an eye test.

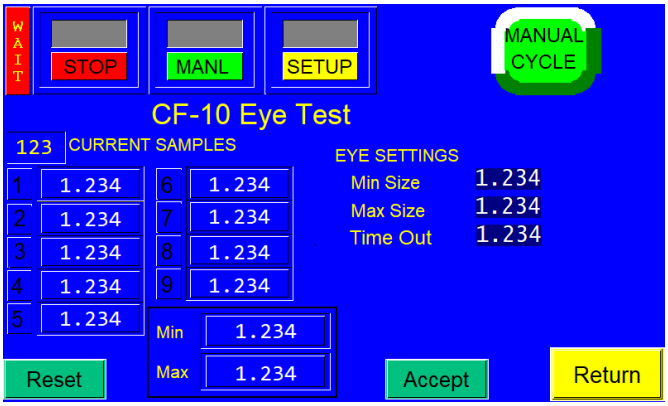


Figure 3-15

Parts Length Test (Eye Test): With the Counting Funnel option turned on, press the **Reset** button on the Eye Test screen. Toggle the **START / STOP** toggle button to STOP. Then, drop parts (samples) individually through the photo sensor / funnel. The Min and Max values at the bottom of the screen will change as parts are dropped through the eye. If parts will be fed automatically, parts should pass through the eye as they would if feeding automatically. See Figure 3-15.

NOTE: While the Eye Test screen displays the last nine part readings, there is no limit to the number of parts that can be used while performing the Eye Test.

Max: The largest size recorded during a test.

Min: The smallest size recorded during a test.

Time Out: This setting is automatically calculated based on the "sample" parts values and the eye test results. Time Out displays the period of time the eye does not take a measurement while reading a part.

Press the **Accept** button if the Min / Max values do not change after dropping many sample parts. If the Min / Max values continue to change, continue dropping samples until the values do not change. Once the values remain consistent, press the **Accept** button and return to the Counting Funnel screen. Test the settings by dropping one part at a time, ensuring that each count is a value of one. If not counting correctly, return to the Eye Test screen or change the Min / Max Size settings manually. If the eye is blocked for an extended period of time (parts jam), the machine will stop and a message will be displayed.

3.18 E-Stop Option

This option can be used to stop the cycle operation of the ST-1000 and possibly other auxiliary infeed or outfeed equipment. The E-Stop is useful if you have purchased a full system that will run in an automatic operation. One or more E-Stop buttons may be equipped. See Figure 3-16.

Figure 3-16

If depressed, the E-Stop button will cut power to the drive motors, turn off air pressure and otherwise halt moving components within the system. However, due to the wide range of equipment options, E-Stops may function differently from one system to another, depending on the components and safety requirements requested. When the E-Stop is pressed, a message screen will be displayed. See Figure 3-17.

3.19 ST-10 Stack Light Option

The ST-10 Stack Light option is not included in the standard ST-1000 package and must be purchased separately. This option consists of two or three LED options. The two LED option indicates on operation condition (green) or a stop/fault condition (red). The three LED option indicates the same as the two LED option, but adds a warning condition (yellow), which can be used for low materials or other warnings within a system.

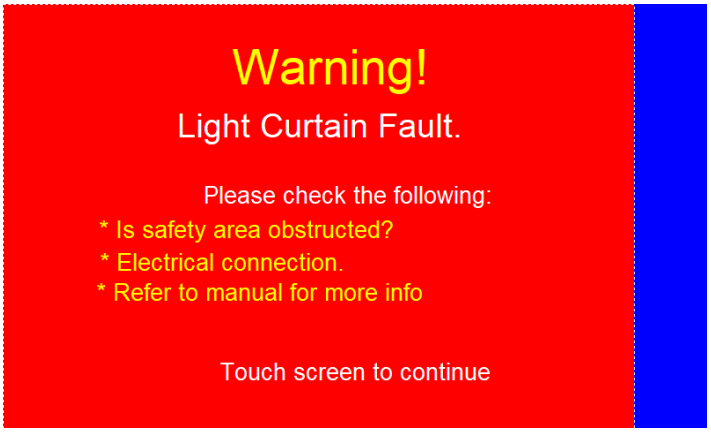


Figure 3-17

3.20 Valve Station Setup

The ST-1000 is equipped with a valve station that is wired from DB25 connector/open ended cable to the PLC. Each wire is pre-assigned to a PLC output, but options that are available are not assigned to a solenoid valve until the machine is ready to ship from the factory.

Each valve is assigned a "station" number. Stations 1 through 4 are fixed and programmed to operate a standard ST-1000 in a fixed sequence of operation. However, when options are added, the sequence of operation changes. Additionally, outputs from the PLC to the valve are assigned, depending on the options equipped.

For instance, if a LS-10 Load Shelf option is added and the valve station assigned is #5, the ST-1000 Valve Setup Screen must be accessed and the Load Shelf option assigned to Station #5. See Figure 3-18.

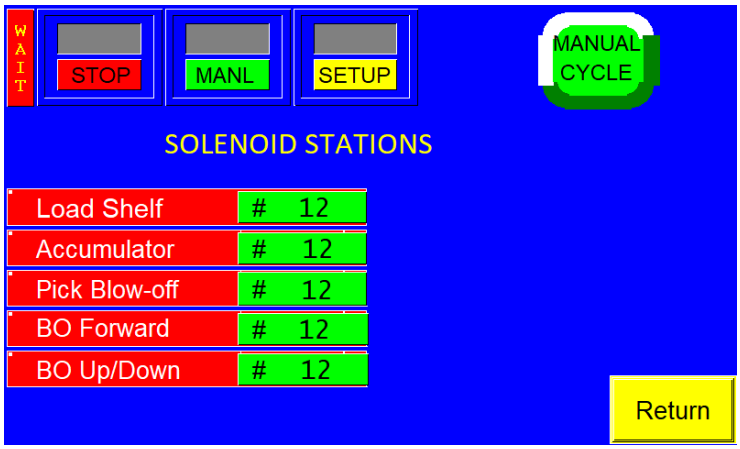


Figure 3-18

To assign an option to a Valve Station, press the option and on the number keypad, press the number followed by the **Enter** button.

NOTE: You will not be able to assign two options to the same Station number. A message screen will be displayed if you attempt to assign two options to the same Valve Station number. The message will also be displayed if you attempt to leave the Valve Station setup screen with two options assigned to the same valve.

To start over, press the **Reset** button. Contact APPI Technical Support for assistance.

3.21 Counters Screen

The ST-1000 is equipped with three internal counters as a standard feature. To access the counter screen, press the **Counter** button from the Main Menu. See Figure 3-19.

NOTE: If you don't want the bags separated ever, you can either set the counter value to very large number or simply change the Reverse setting to zero in the Bag Setup Menu.

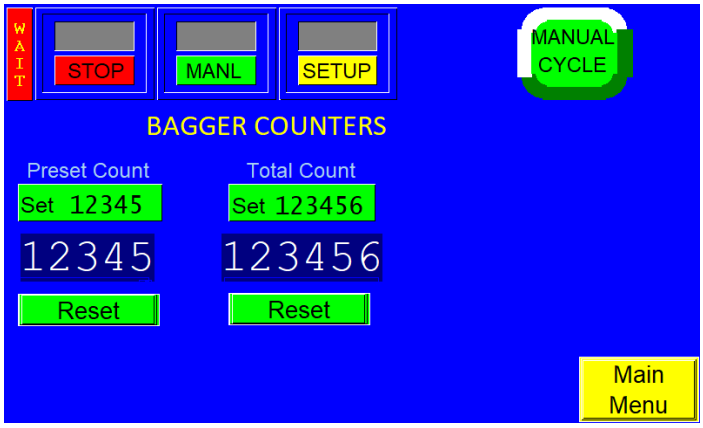


Figure 3-19

Preset Count: To halt production after a preset number of cycle operations, use the Preset Count. When the final count has been reached, a message screen will be displayed.

Totalizing Counter: To track production, use the Totalizing Counter to count cycle operations of the ST-1000. Press the **Reset** button to reset the counter to zero. This counter value is also displayed on the Operation Screen.

Set the value by pressing the **Set** button and then type the value on the number keypad followed by the **Enter** button. To disable the Predetermining Counter set the value to "0"

3.22 Job Save and Recipe Management

From the **Main Menu** touch <Technical Assist> and enter the Level 1 Pass Code. Touch the <Bagger Factory> button to access the Bagger Factory screen. From there touch the <Bag Registration> button located along the right-hand side of the screen. Once in the Bag Registration screen, locate the **Job Save toggle button** along the bottom of the screen, see Figure 3-46. If the toggle button reads "**PLC**" the machine will save all jobs internally on the PLC. If the button reads "**USB**" all jobs will be saved externally to a USB memory stick. Press the button to toggle between the two. Once you have made your selection exit back to the **Main Menu** by pressing the <Tech Assist> button and press <Exit> when the numeric keypad is accessed.

Note: There must be a USB Flash Drive / Memory Stick inserted into the machine for the External Memory function to operate. If there is no memory stick inserted, ensure the Job Save is in PLC mode to save job recipes.

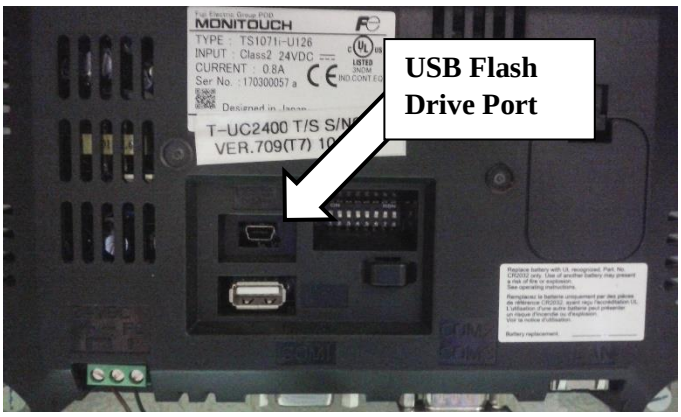


Figure 3-20

Note: All units with a 7" Touch Screen should support Recipe Management; a Bagger without a Touch Screen will have only PLC Storage.

There are benefits to using either memory option. The PLC Internal option, referred to as "Job Save", allows the user to save up to 24 jobs to the PLC without any extra hardware required. The USB External option has the additional functionality of Recipe Management and allows the user to save an unlimited number of jobs to the USB memory stick as well as performance data. A file will be automatically created on the memory stick that contains Recipes, Alarm data, and Production data from the machine. These files can be viewed when the memory stick is inserted into a PC. Please refer to **3.23 "Memory Files and Data Structures"** for more information regarding the files and directory structure.

Note: Remove the back cover of the touch screen housing to locate the USB port and insert a memory stick (not included). See Figure 3-20.

Note: These instructions are for saving Bagger settings only. Labels are saved using printer software (such as LabelView).

A. Internal Memory (PLC)

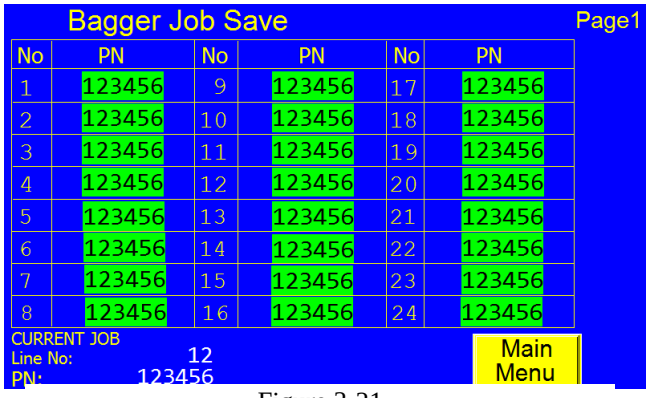


Figure 3-21

Saving a job to Internal Memory: Select <PLC> in the Bag Registration screen (as described above) and exit to the **Main Menu**. Go to **Settings** and set the specifications for your job. Once the job is set, touch <Job Save> on the right side of the screen to access the **Bagger Job Save** screen, see Figure 3-21. Select the designation under PN where you would like to save the job (#1-24), which will access a green numeric key pad. Enter a numeric name for your job and touch <Ent>. A warning screen will ask if you would like to overwrite the job. The PN of the current job at that location will be displayed in a box to the side. This box will display "0" if it is not being used. Select <Yes> to overwrite and continue. Your job is now saved to the Internal Memory on the PLC.

To recall a job from Internal Memory: Touch <Job Search> on the Main Menu to access the Touch to Recall screen, see Figure 3-22. The jobs that are saved to the PLC will be displayed in this table. Touch the job you would like to recall. This will take you to the Job Load screen that displays the settings for this job, see Figure 3-23. Ensure this is the correct job and touch <Load>. This will take you to the Bagger Settings screen with all the settings loaded and ready to start the job.

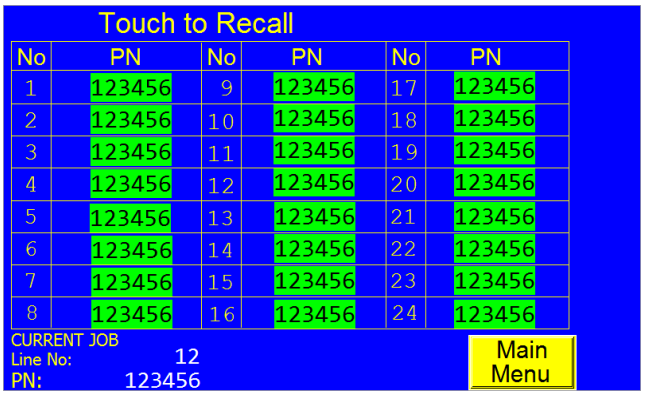


Figure 3-22

Figure 3-23

B. External Memory (USB)

To save a job to the External Memory: Select <USB> in the Bag Registration screen and exit to **Main Menu**. Go to **Settings** and set the specifications for your job. Once the job is set, touch <Job Save> which will take you to the Job Save screen, see Figure 3-24. Press the box that reads "**Part**" which will access a keypad. In the USB Mode, Jobs can be saved by either numbers or letters. Enter the name or number you wish to save the job as and press enter. To enter a note, press the box that says **Note**, and enter the information using the keypad that is displayed. Touch

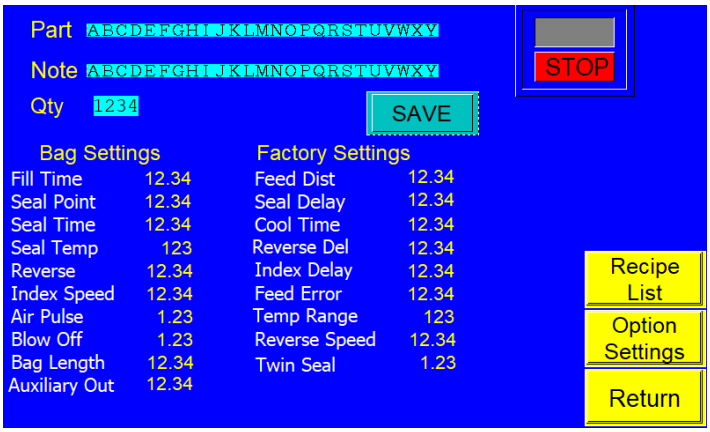


Figure 3-24

<Enter> to continue or <Exit> to cancel. Touching the **QTY** box will access a green numeric keypad where the operator can enter the number of products that will go into each bag. For instance, if three items go into the bag before it is sealed, the number 3 can be entered into that field. When all the information is setup touch <Save> to save to the External memory stick.

Note: In the Job Save screen there is a Recipe List button and an Options Settings button. When the <Recipe List> button is pressed, the recipe list screen will be accessed. A record "REC0000" will be displayed. This is the file created by the program which records all the activity on the bagger and where the recipe information is stored. This information can only be viewed when the USB is plugged into a PC. To recall a job, you must type in the name of the job and touch <Enter> in the Job Load screen. When the <Options Settings> button is pressed all the information for that recipe is displayed. The Part, Note, and QTY information can all be changed in this screen. If you do choose to change the information on this screen, go back to the Job Save screen and press <Save> to ensure your changes are saved.

To recall a job from External Memory: Press **Job Search** from the **Main Menu** to access the Job Search screen. From there either scan (if you have a bar code reader option) or enter the job name using the keypad, (accessed by pressing the area under the heading "Current Scan") and press <Search>, see Figure 3-25. This will access a screen listing all the Bag and Factory Settings for this job. Press <Load>, see Figure 3-26. This will take you to the Printer Operation Screen with all the settings loaded and ready to start the job.

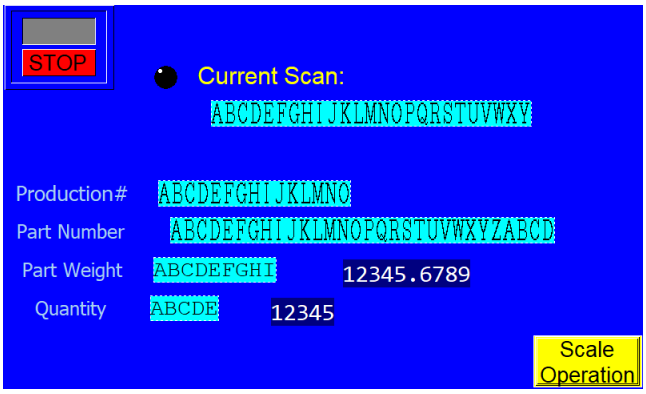


Figure 3-25

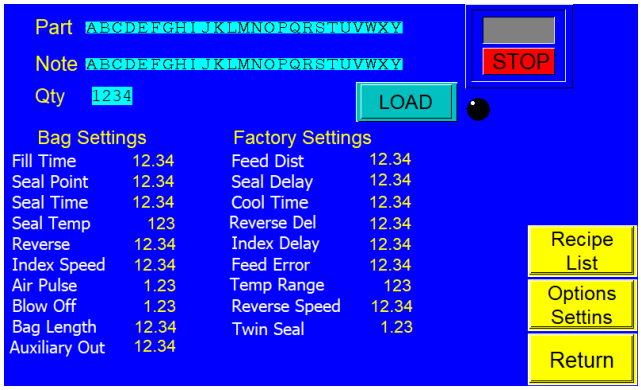


Figure 3-26

3.23 Memory Files and Data Structures

While the information related to Bagger settings may be stored internally on the PLC or externally on a USB Memory Stick (Flash Drive) is similar in content, the data structures and methodology are different.

PLC Storage

Information regarding the settings for a particular job, such as Fill Time, Seal Temperature, and Bag Length, are stored in the PLC as data files of various types. These data types include:

- Integers – data type used to store whole numbers
- Floating Point – data type used to store decimal numbers
- Strings – an array used to store characters

These data files are stored in PLC memory and are accessible to the Ladder Logic of the PLC Program File. See Figure 3-27.

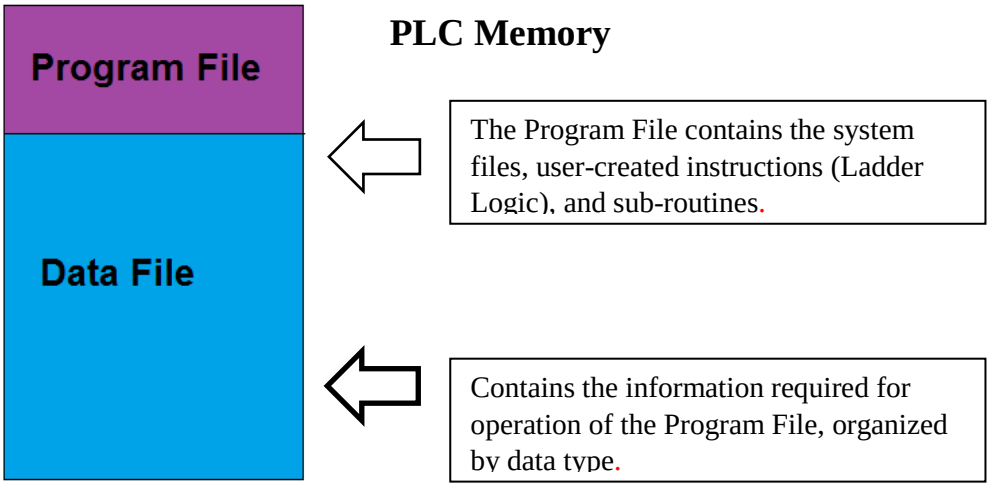
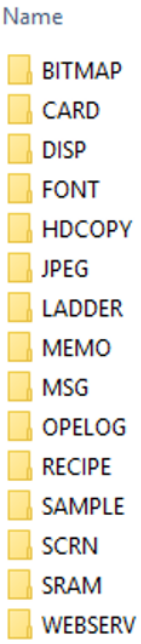


Figure 3-27

External Storage

The Memory Stick contains several types of data from the machine. The Bagger Settings are stored, similar to the information in PLC Storage. There are also files for the additional functionality of Recipe Management, and information on Alarm and Production Data. To access this information, plug in the memory stick from the bagger to your PC and open the DAT0000 folder. There will be a list of folders that have been set up by the touch screen program, (see Figure 3-28). The two folders that contain the Recipe Data and Production Data are called Recipe and Sample.

Inside DAT000 Folder:



Folder Name	Contents
BITMAP	Pattern (bitmap) data
CARD	Recipe data using the V6-compatible memory manager function
DISP	Screen data
FONT	Gothic fonts or language data
HDCOPY	Hard copy image (JPEG/BIN format selectable for 128-color display)
JPEG	JPEG file (except for some models)
LADDER	Ladder data associated with the ladder monitor function
MEMO	Memo pad data
MSG	Message file
OPELOG	Operation log file
RECIPE	Recipe data
SAMPLE	Data of data logging and alarm history
	Title file
SCRN	Header file
	Screen file Component parts (macro blocks, sampling messages)
	3D parts file
	Windows font file (graphics, messages)
SRAM	Backup copy of SRAM
WEBSERV	Files to be accessed from the Web browser

Figure 3-28

BITMAP, CARD, DISP, FONT, HDCOPY, JPEG, LADDER, MEMO, MSG, OPELOG, SCRN, SNAP, SRAM, WAV, and WEBSERV are folders used by the touch screen software and will appear empty on the PC. This is because the files are hidden to prevent damage, and therefore do not show up in Windows Explorer. Do not store any information in these files as it will alter the program and will not function when the memory stick is re-inserted in the touch screen.

Note: These hidden files include types used to store images, fonts, functions, database information, and macros that are used to control the Touch Screen, so it is important to not accidentally over-write these files.

RECIPE—contains REC0000.CSV which is a list of all the jobs / recipes saved to the USB memory stick as a .CSV (**C**omma-**S**eparated-**V**alues) file. This file type is essentially just a table of data in plain text where the values are separated by commas, as in the following example:

Item 1, Item 2, Item 3

This type of file (CSV) can be opened as an Excel spreadsheet.

To access this information, open the **<Recipe>** directory, and then on **<REC0000>,** this will open an Excel file containing all the information pertaining to each job as it was saved on the bagger. This file must be saved (copied) to the PC without the original file changed. Once the file has been saved as a different name than the original, then the operator can use the file and save it as a MS Excel file for full use of the MS Excel formulas.

On the spreadsheet, each row is a separate job / recipe that has been saved in the USB mode on the Bagger, and the columns list all the specifications as it was set on the bagger. Information for each of the jobs starts at column "C" and goes all the way through column "DU". Some of the common settings are in column C-QTY, AF-Blow-off, AG-Seal Point, AH-Reverse, AI-Seal Temp, AJ-Index Speed, AK-Fill Time, AL-Seal Time, AM-Air Pulse, AN Bag Length, AS-Feed Distance, AT-Seal Delay, AU-Cool Time, AV Reverse Delay, AW-Temp Range, AY-Aux Out.

Note: The program does not save headings for the information being recorded. Also, the data logged is specific to each job; more data is acquired the longer the machine is run. It is recommended that you record each setting for your initial job. This information will be used the first time the spreadsheet is viewed by matching / updating the data to improve your records.

Note: DO NOT change the data in the memory stick. However, you can copy the files and past them into a folder on your PC and then use MS Excel to manipulate the data.

Note: If you are going to change anything on this file, remember to "Save As" a different name to keep the original intact.

SAMPLE—contains **.BIN** files and **.CSV** files. The **.BIN** files are data files stored in a binary format and should not be accessed. Use the **.CSV** files to view the spreadsheet for each file that contains a different kind of data. The files are:

- **Cycle Log – SMP0003.CSV**
- **Production Time Log – SMP0004.CSV**
- **Event Logs – SMP0005.CSV, SMP0006.CSV and SMP0007.CSV**
  (see below for full description of these .CSV files).

This data can be used to provide information about the machine, including number of parts per month. However, these files must be saved (copied) to a PC without the original file changed. Then, the files can be used and saved as MS Excel files for full use of the MS Excel formulas.

Note: There are .BIN files and .CSV files in the Sample folder. DO NOT try to open or change the program used to run the .BIN files. This is the file the touch screen uses to read the information and if it is changed the program will no longer recognize the file. Use the files that have been saved as .CSV.

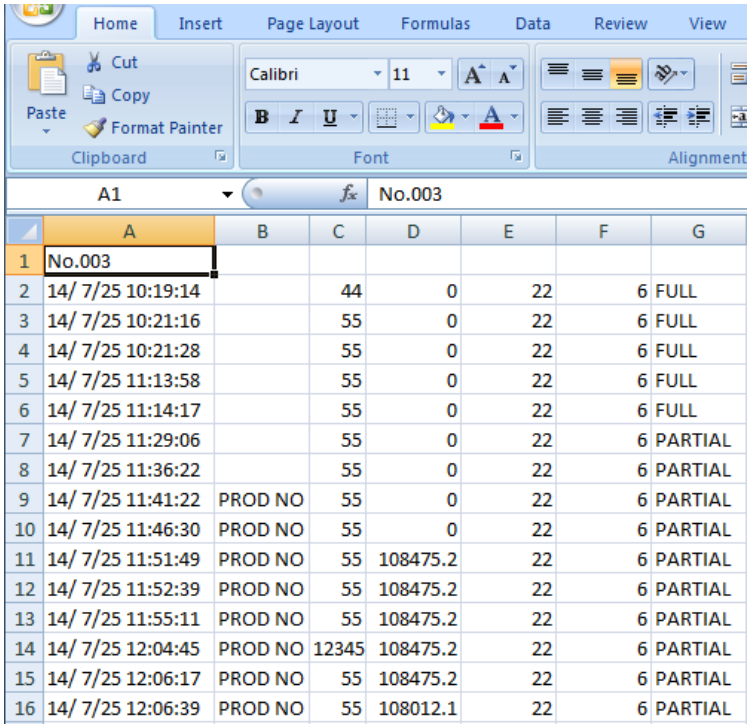
Note: If you wish to change the data listed in the spreadsheet, "Save As" a different name, then make your changes, keeping the original intact.

Note: Some files may not be used depending on the options of the machine. For instance, if your machine does not have a scale, you will not have any information recorded in the SMP0003.CSV file.

SMP0003.CSV Cycle Log – records every Scale production cycle. (See Figure 3-29). The data recorded in each column is as follows:

A. Date & Time—Records when the occurrence happened
B. Production#--the number assigned to the production run.
C. Part#--the number to identify each part.
D. Part weight—the weight of the part
E. Target quantity—records the quantity that is to go in the bag.
F. Actual quantity—records the actual quantity that is in the bag.
G. FULL/PARTIAL mode—records if the kit is in Full or Partial mode.

Note: There is a Backup Period every day at midnight. A new backup file with full day data is created; old data is then cleared from the buffer to start the new day. Previous records are not erased. Cycle count and timing start over from Zero every day.

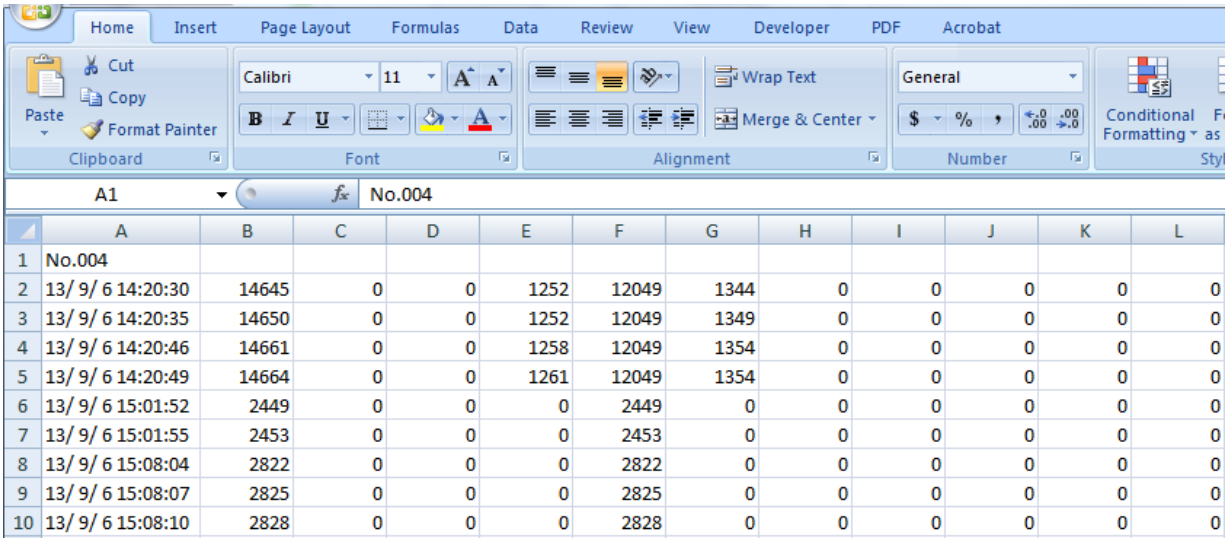


	A	B	C	D	E	F	G
1	No.003						
2	14/ 7/25 10:19:14		44	0	22	6	FULL
3	14/ 7/25 10:21:16		55	0	22	6	FULL
4	14/ 7/25 10:21:28		55	0	22	6	FULL
5	14/ 7/25 11:13:58		55	0	22	6	FULL
6	14/ 7/25 11:14:17		55	0	22	6	FULL
7	14/ 7/25 11:29:06		55	0	22	6	PARTIAL
8	14/ 7/25 11:36:22		55	0	22	6	PARTIAL
9	14/ 7/25 11:41:22	PROD NO	55	0	22	6	PARTIAL
10	14/ 7/25 11:46:30	PROD NO	55	0	22	6	PARTIAL
11	14/ 7/25 11:51:49	PROD NO	55	108475.2	22	6	PARTIAL
12	14/ 7/25 11:52:39	PROD NO	55	108475.2	22	6	PARTIAL
13	14/ 7/25 11:55:11	PROD NO	55	108475.2	22	6	PARTIAL
14	14/ 7/25 12:04:45	PROD NO	12345	108475.2	22	6	PARTIAL
15	14/ 7/25 12:06:17	PROD NO	55	108475.2	22	6	PARTIAL
16	14/ 7/25 12:06:39	PROD NO	55	108012.1	22	6	PARTIAL

Figure 3-29

SMP0004.CSV Production Time Log – records the length of time the machine has been in production and gives details on the length of time the machine has been in the modes listed below. (See Figure 3-30). The data recorded in each column is as follows:

A. Date & Time—records the date and time the mode was switched.
B. Power On time—the length of time the power has been turned on.
C. Auxiliary mode time—the length of time the machine has been in Aux Mode.
D. Auto mode time—the length of time the machine has been in Auto Mode.
E. Manual mode time—the length of time the machine has been in Manual Mode.
F. Stop time—the length of time the machine has been in Stop Mode.
G. Setup time—the length of time the machine has been in Setup Mode.
H. Power On total cycles—the number of cycles made since the machine has been powered on.
I. Auxiliary mode cycles—the number of cycles made since the machine has been in Auxiliary Mode.
J. Auto cycles—the number of cycles made since the machine has been in Auto Mode.
K. Manual cycles—the number of cycles made since the machine has been in Manual Mode.
L. Setup cycles—the number of cycles made since the machine has been in Setup Mode.



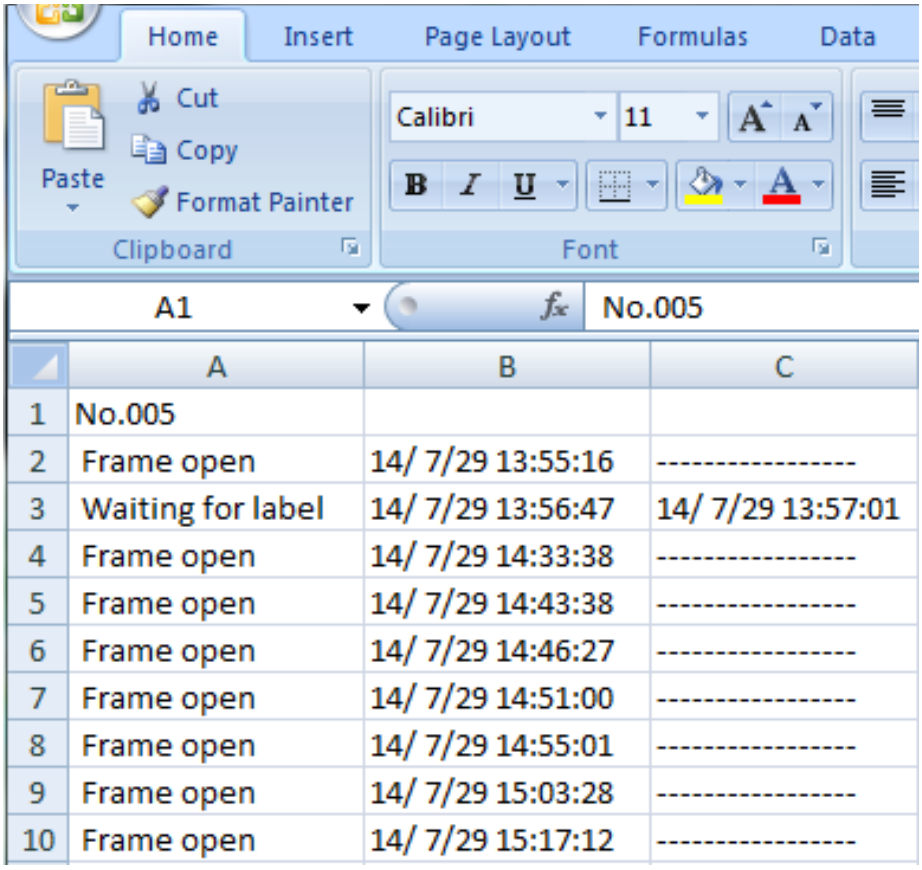
	A	B	C	D	E	F	G	H	I	J	K	L
1	No.004											
2	13/ 9/ 6 14:20:30	14645	0	0	1252	12049	1344	0	0	0	0	0
3	13/ 9/ 6 14:20:35	14650	0	0	1252	12049	1349	0	0	0	0	0
4	13/ 9/ 6 14:20:46	14661	0	0	1258	12049	1354	0	0	0	0	0
5	13/ 9/ 6 14:20:49	14664	0	0	1261	12049	1354	0	0	0	0	0
6	13/ 9/ 6 15:01:52	2449	0	0	0	2449	0	0	0	0	0	0
7	13/ 9/ 6 15:01:55	2453	0	0	0	2453	0	0	0	0	0	0
8	13/ 9/ 6 15:08:04	2822	0	0	0	2822	0	0	0	0	0	0
9	13/ 9/ 6 15:08:07	2825	0	0	0	2825	0	0	0	0	0	0
10	13/ 9/ 6 15:08:10	2828	0	0	0	2828	0	0	0	0	0	0

Figure 3-30

SMP0005.CSV, SMP0006.CSV and SPM0007.CSV Event Logs – records every Bagger fault event during operation, (See Figure 3-31). The data recorded in each column is as follows:

A. Fault description—the name of the error that has occurred.
B. Occurrence time—the initial time the occurrence happened.
C. Clear time—the time the error was acknowledged / reset. ***Note: Dashes (---) or asterisks (***) in a field on the spreadsheet indicate no data was recorded for that error.***

Note: There is a Backup Period on 1st of the month at midnight a new backup file with the event list is created. Then old data is cleared from the buffer to start new month.



	A	B	C
1	No.005		
2	Frame open	14/ 7/29 13:55:16	----------
3	Waiting for label	14/ 7/29 13:56:47	14/ 7/29 13:57:01
4	Frame open	14/ 7/29 14:33:38	----------
5	Frame open	14/ 7/29 14:43:38	----------
6	Frame open	14/ 7/29 14:46:27	----------
7	Frame open	14/ 7/29 14:51:00	----------
8	Frame open	14/ 7/29 14:55:01	----------
9	Frame open	14/ 7/29 15:03:28	----------
10	Frame open	14/ 7/29 15:17:12	----------

Figure 3-31

Manual Backup: Data is recorded and saved automatically as described above. It can also be done manually using buttons on Log screens:

- '**Write**' - overwrite (save) the same file
- '**Backup**' - create new file (save as)
- '**Record**' - add a new record
- '**Reset**' - clear buffer.

3.24 Production Chart

APPI provides a simple graph to chart production throughout the day. See Figure 3-32.

Press the < (left arrow key) to scroll back, 1 hour at a time, to review past production. Press the > (right arrow key) to check more recent production information. Press the **CURNT** Current button to display the current hourly production information.

Press the **Reset** button once to reset the production time and twice to reset the graph.

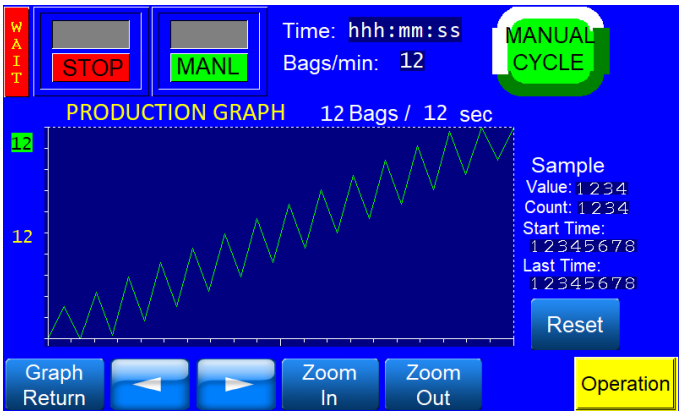


Figure 3-32

3.25 Temperature Graph

APPI provides a temperature graph to display the operating temperature during production. This information is useful if bags are found to have weak seals, in isolating the problem by reviewing previous operating temperatures. See Figure 3-33 and Figure 3-34.

The << (left arrow key) is used to view prior operating temperatures and the >> (right arrow key) is used to view more recent temperatures. Pressing the **Curnt** Current button will display the current hour of operating temperatures. Press the **Reset** button to reset the graph information.

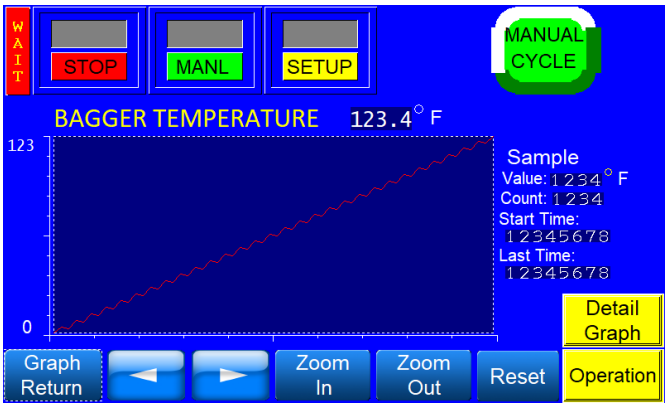


Figure 3-33

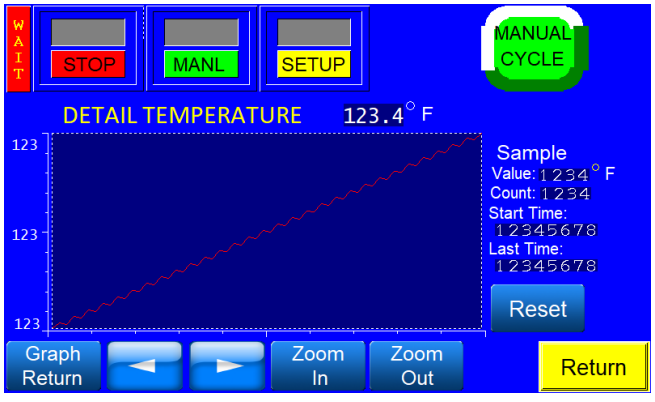


Figure 3-34

3.26 Bagger Production Timers

The Bagger Production Screen displays the time and frequency of an operation. See Figure 3-35. It also provides access to the Production and Bagger Event Log screens.

The colored bar at the bottom of the Bagger Production Timers Screen is color-coded to reflect the percentage of time the machine has been in the following modes: Power On/Off, Auxiliary On/Off, Auto On/Off, Manual On/Off, Stop, and Setup.

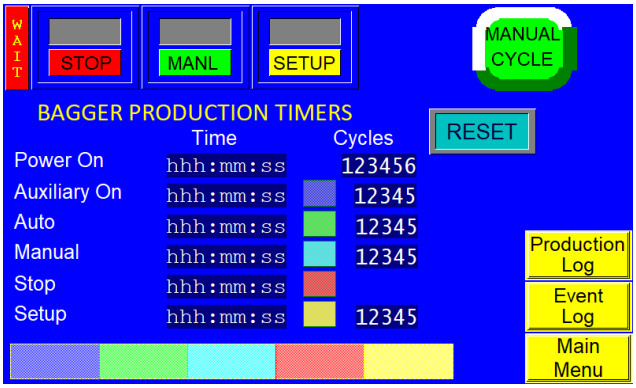


Figure 3-35

The Bagger Event Log list all will provide information on the status and/or warning signals for devices. (e.g. “US5k Tray Not Home”). See Figure 3-36 . The Count History Log screen is shown in Figure 3-37.

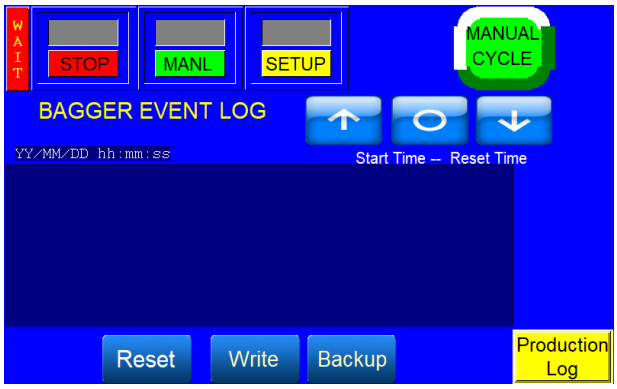


Figure 3-36

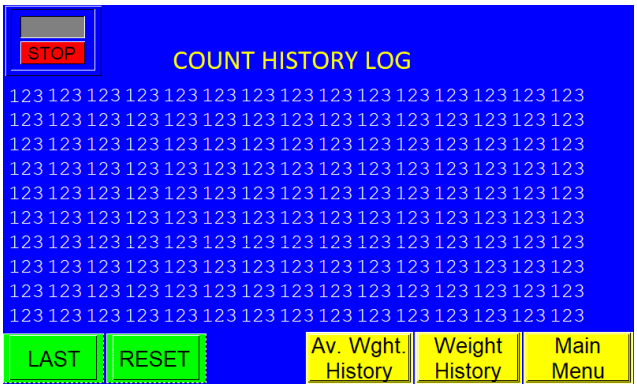


Figure 3-37

3.27 Machine Info

This screen will provide information about the machine, such as the model number, serial number, part number and line number. See Figure 3-38.

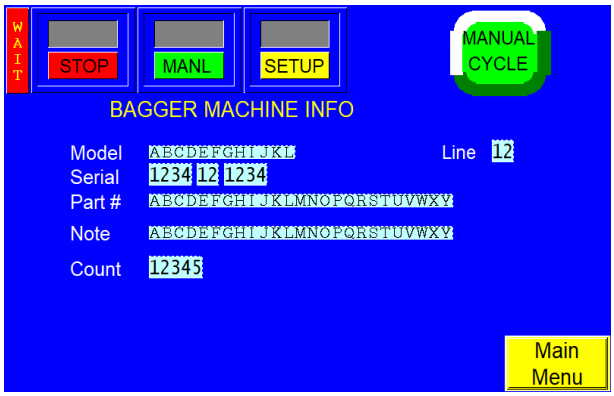


Figure 3-38

3.28 Technical Assistance

The Technical Assistance screen provides manufacturer information, factory settings adjustments, functions testing and troubleshooting. It also displays the program version for the PLC controller and touch screen. See Figure 3-39.

The screen is protected from access with a Level 1 pass code. The pass code is set by default (from the factory) to 1001. This code can and should be changed when the system is put into operation.

Several menu options are available from the Technical Assistance screen that will assist with troubleshooting the T-1000-S14 and change settings that affect the operation of the equipment.

NOTE: Technical assistance sections of the touch screen program should only be accessed by specialized personnel. These sections are provided for troubleshooting and advanced setup by qualified service engineers.

Figure 3-39

3.29 Options Enable Pass Codes

The Options Enable Screen is used at the factory to "enable" options for use by the operator. A status box is located to the left of the option to indicate if the option is available to operator. If OFF, the option settings screen will not be displayed for use by the operator. See Figure 3-40.

A status box is located to the left of the option to indicate if the option is available to operator. If OFF, the option settings screen will not be displayed for use by the operator.

Options must be purchased from Advanced Poly-Packaging, Inc. to obtain the password. Contact Advanced Poly-Packaging, Inc. Service Dept. for more information regarding options available for the ST-1000.

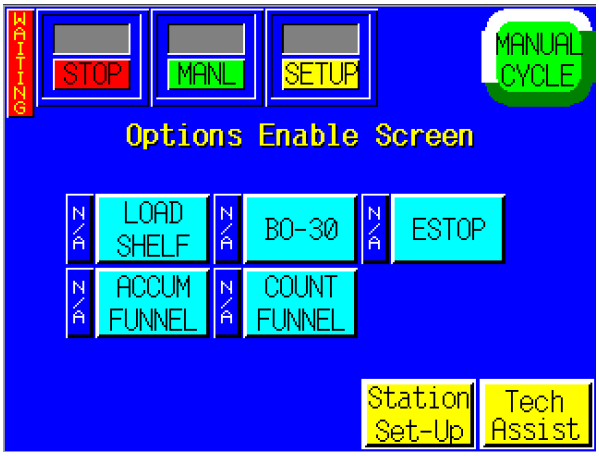


Figure 3-40

3.30 Pass Code Setup Screen

Advanced Poly-Packaging, Inc. (APPI) has included a pass code function in all touch screen equipment to prevent operators from changing settings. See Figure 3-41.

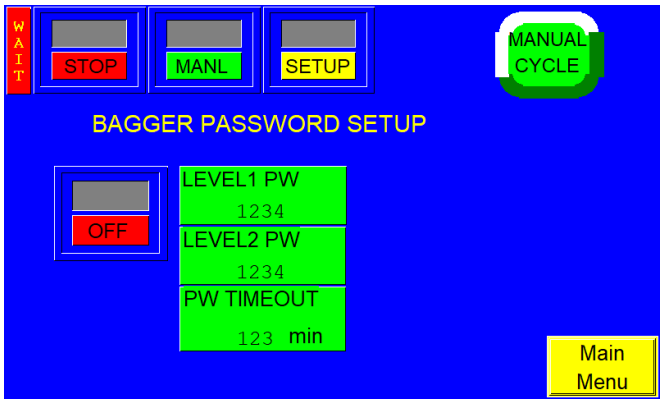


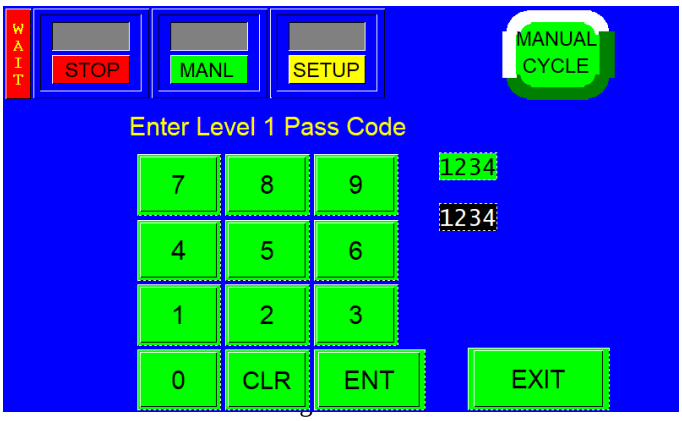
Figure 3-41

There are two pass code levels described as follows:

1. Level 1: This is the highest-level pass code which prevents operators from accessing the Technical Assistance functions of the machine. The default pass code, when shipped from the factory, is 1001. See Figure 3-42.

2. Level 2: This level pass code, when the pass code function is enabled, prevents the operator from accessing settings screens that affect the operation of the equipment. See Figure 3-43.

Pass codes prevent unauthorized individuals from tampering with settings. When equipment is shipped, APPI uses the following codes which should be changed prior to putting the ST-1000 into operation.



Factory Set Pass Codes:

1. Level 1 pass code: 1001
2. Level 2 pass code: 1002

To enable the pass code function, press the **Tech Assist** button from the Main Menu. Type in the Level 1 pass code (1001 by default from APPI). Press **Bagger PassC** then press ON to toggle the pass code function ON. If you change the pass codes, ensure that these codes are written down.

Once the pass code function is enabled, the operator will have a programmed amount of time (time-out time) to make changes. Once this time has elapsed, the Operation Screen will automatically be displayed. This time can be changed by accessing the Bagger PassC setup screen.

If you misplace or forget the pass codes, contact APPI Service Dept. for assistance. APPI will prove a “factory code” so that the current pass codes can be displayed. Once you receive the factory code, press F5 function key, located to the right of the touch screen, to enter the factory code and your current pass codes will be displayed.

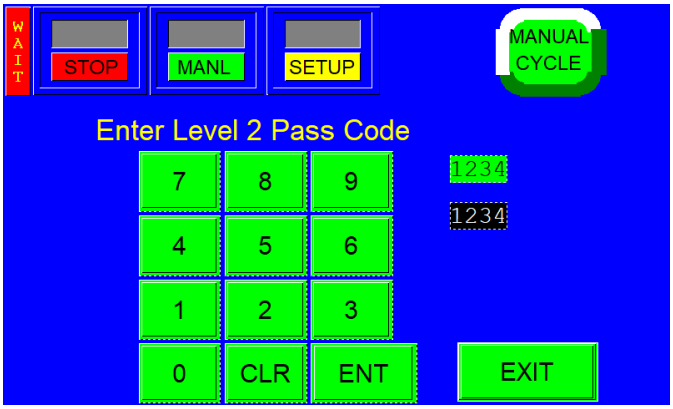


Figure 3-43

3.31 Bagger Factory Settings

These settings are additional bagger settings which should only be set by qualified technicians or by the factory. See Figure 3-44.

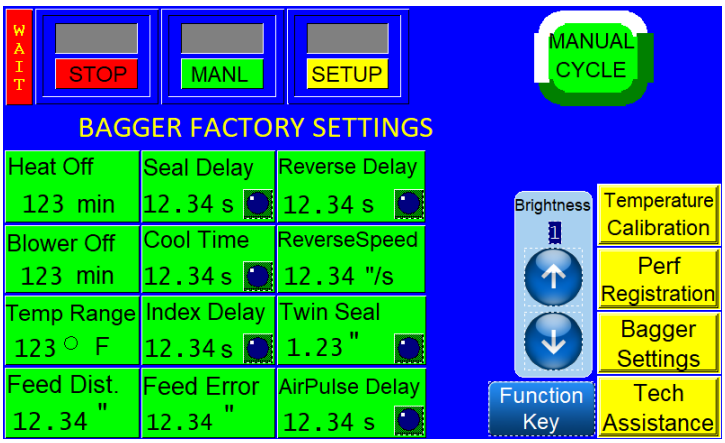


Figure 3-44

Heat Off - The amount of time that will pass before the heater bar will turn off automatically, while the machine is still "ON" during, for example, operator breaks.

Blower Off – The amount of time that will pass before the compressed air will shut off automatically, from non-use. A typical setting is 2 to 5 minutes.

Temp Range - The range above and below the temperature set point where the bagger will display "Ready" and allow normal operation. If the temperature is out of this ranging a Warning signal will display.

Feed Dist- displays a distance in inches where perforation sensor is not looking for a perforation. Example: if there are other holes in the bag. *NOTE: Normal distance is 0"-2".*

Seal Delay - amount of time the seal is delayed after the air is turned off, so that the air can escape the bag.

Cool Time - after the pressure bar and the heater bar come into contact, the amount of time the pressure bar is released to ensure the seal is cool enough to be torn off.

NOTE: It normally takes 3-4 minutes to bring the heater bar to temperature depending on the Seal Temp. value and the current temperature of the heater bar.

Reverse Delay (**Revrs Dly**) – The amount of time the Hopper Conveyor pauses before it starts to back up. Creates a "fluff" area between pick and load.

Index Delay - after the bag is released the next bag is fed into place, the delay allows the previous bag time to get out of the way so that the bag doesn't beat the seal bar coming into contact and causing a bag "jam".

Feed Error – Sets the length of bag that can pass without sensing a perforation. There is a natural variance of approx. ¼" when the bags are in operation. If the Feed Error button is set to zero, the bagger will fault out every time the perf is not sensed right away and will stop the bagger. When set at 1" to 2" (well above the variance), the sensor will look for a perf that far ahead and the bagger will continue to cycle as normal. If a perf is not detected, check to ensure setting is not at zero. If setting is at 1 or 2, go to the **Bag Registration Setup** screen under the **Bagger Factory Settings** and perform the perf sensor test (See Figure 3-46).

Revrs Spd – speed at which the Hopper Conveyor reverses during the reverse time.

Hopper: ReverseTm – The time the conveyor backs up the load from the pick conveyor. If too long, the load will back up too far away from the pick conveyor causing difficulty for the picks to grab towels. Conversely, if the load is not backed up enough it may cause damage to towels from piling up too close to pick conveyor.

A. Help

Select to queue "Timers Help Screen" which contains the description of each setting's capabilities. See Figure 3-45.

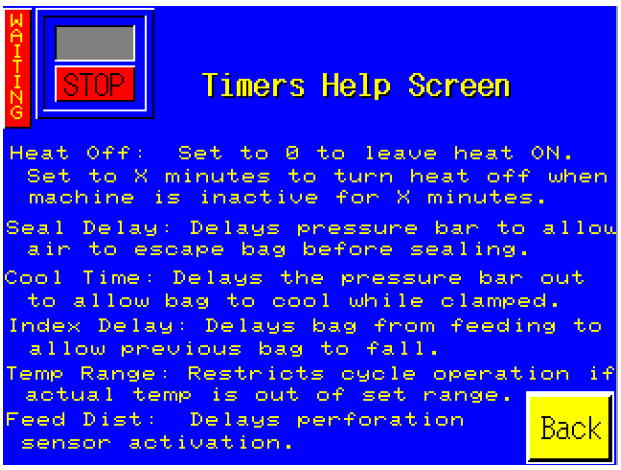


Figure 3-45

B. Bag Registration Setup

To setup the perforation, press the **Perf Registr** button on the Bagger Factory Settings screen and follow these steps (See Figure 3-46):

1. Select the **Find Perf** button.
2. The bagger will advance the perforation until the perf sensor finds it. Once the perf sensor finds the perforation, the bagger will stop.
3. Hold the **JOG+** button until the perforation moves down to the middle of the PTFE sheet area at the heater bar. Release the **JOG**+ button. Push the **Zero Seal** button once.
4. Next hold the **JOG-** until the perforation moves up to just in front of the Nip rollers. Push the **Max Reverse** button once.

The Bag Perforation Registration is now set for all bag indexing.

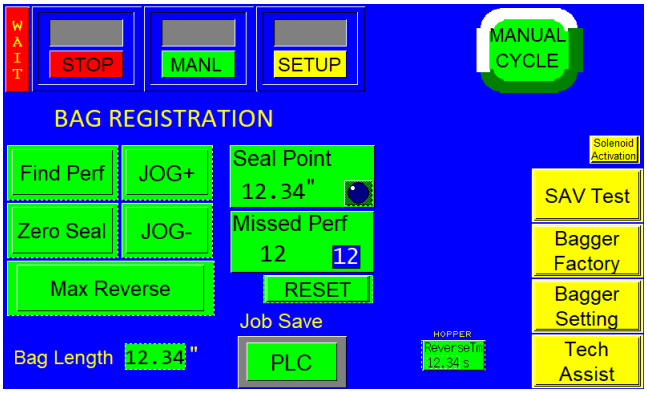


Figure 3-46

3.32 Scale Factory

This screen contains additional scale settings that should only be set by qualified technicians or by the factory. See Figure 3-47.

Time Out: The length of time the scale can stay idle before it turns off.

Zero Range: The range of weight that is considered zero. This function allows for small amounts of dirt that may fall on the scale due to environmental conditions. For example, if the Zero Range is set to 0.04 grams, the scale will be at zero even if there is 0.04 grams on the scale. However, once the Zero Range value is exceeded (i.e. there are 0.05 grams of dirt on the scale), the scale will not automatically zero. To adjust this setting, press the **Zero Range** button, enter a value on the numeric keypad and press the **ENT** button.

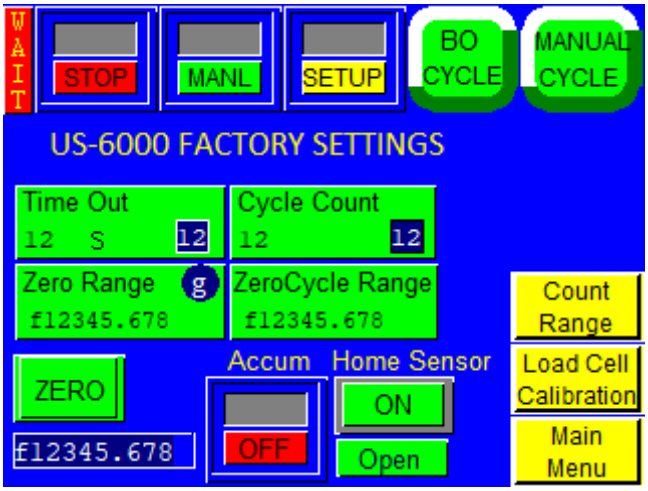


Figure 3-47

Auto Zero Settings (**Time Out** and **Zero Range**): The ST-1000 is programmed with an auto zero function that allows the scale to automatically zero the scale if two conditions are met:

1.) The current weight is within the zero-range setting.
2.) The weight has been within the range setting for a preset amount of time (Time Out).

For example, if the Zero Range is set to 0.003 lbs. and the Time Out value is 3 seconds, the scale will automatically zero if the scale is not in cycle operation and the current weight displayed is stable at 0.002 lbs. This function allows for more infrequent cleaning of the tray and for environmental conditions that may affect the load cell. However, this function may not eliminate the need to periodically zero the scale manually.

Zero: Pressing this button will zero the scale manually.

<g> Press the Units button to toggle between grams (g), pounds (lb.), and ounces (oz.).

Count / Weight: Toggle between Count and Weight modes.

3.33 License Activation

The License Activation Screen controls access to Advanced Poly-Packaging's proprietary software for controlling the T-1000 Bagger, and must be activated in order to operate the machine. When shipped from the factory, a 60-day trial activation is included. After full payment for the software is received, a full software license will be granted

The License activation screen features several LEDs that indicate the status of the license and trial period and illuminate and change during various stages of operation. This screen should only be accessed by a qualified technician.

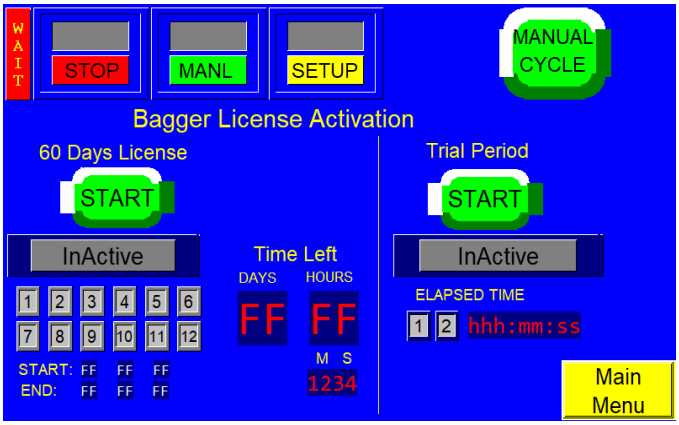


Figure 3-48

As shown in Figure 3-48, the License portion of the screen will display "Inactive" in grey if the License has not been activated yet, 'In Progress" in green if the trial is in progress, and "Expired" in red if the License has expired.

When the license is expired, the bagger will stop and all outputs are disabled and the machine is locked in a safe condition with the temperature shut down until a new activation code is entered.

The **Time Left** will be displayed in days, hours, minutes and seconds.

- Start: Displays when the license period has begun.
- End: Displays when the License period will end.

3.34 Calibrate the Scale: Load Cell Calibration

1. From Main Menu go to the **Tech Assist** > **Scale Factory**>**Load Cell Calibration.**
2. Follow the messages displayed during the procedure.
3. Press the **Start Cal** button located near the center left of the screen.
4. Wait for the prompt message "**New Zero**".
5. Next press the **Enter** button. Now wait for the "**Cal Weight"** prompt.
6. Put the sample weight on the scale. The weight must be between 1000g (35.274 oz.) and 9000g (317.4657 oz.) and must weigh exactly what will be entered in the next step.
7. Press **Cal Weight** located under the **Enter** button. Enter the exact Cal Weight that was placed on the scale and press **Enter**.

8. When the display shows "**Cal OK**" Press **Enter**.
9. When prompt shows "Save?" press **Enter.**
10. When prompt shows "**Exit Setup?**" Press **Enter.**
11. Now press the **End Cal** button.

This ends the calibration procedure.
Run should now be in the top center of the screen.
Now test the scale with a known weight.
NOTES: ***Comm*** *(Green) /* ***Stop*** *(Red) is only located in the Calibration Screen.*
Comm *must be O and Green to register a change in weights.*
In ***Stop*** *the Operation Screen will display only ZEROS.*
*"****Low Battery****" will display as a full screen warning.*

3.35 US-6000 Conveyor Settings

Conveyor is mounted on top of 4 load cells connected to summing board, 40 kg total capacity. Conveyor can be set to make short indexes when 25%, 50% and 75% of accept count is registered to spread towels along the conveyor belt. After accept count is reached, Scale runs long index to transfer all towels into the open bag. See Figure 3-49.

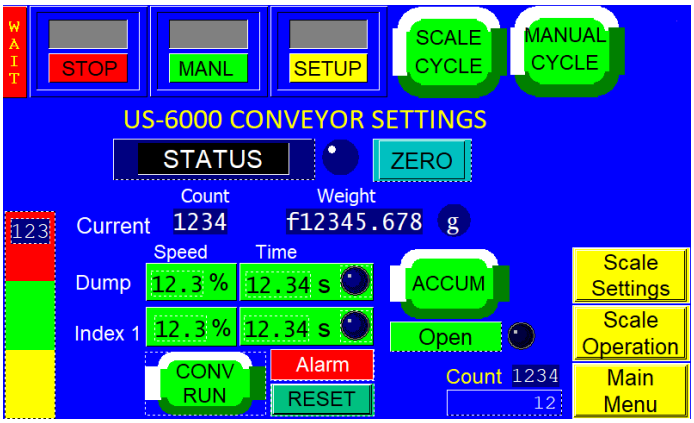


Figure 3-49

Current Count: Keeps count of towels as they fall onto the conveyor, in real time (one at a time).

Current Weight: weight in real time of towels on conveyor as they fall. Displayed in g/lb./oz., whichever is set in Factory Settings.

Dump Speed: The speed of the conveyor when dumping towels into the bagger.

Dump Time: this is the length of time in seconds the conveyor stays ON to feed current load into bag.

Index 1 Speed: A function that allows the conveyor to stagger forwards slightly. This allows for more towels to accumulate in smaller piles and prevents one big single pile from forming. Set the speed by pressing the green button to access the numeric keypad.

Index 1 Time: The time between each index to move conveyor ahead. This ensures uniform flow of towels, as opposed to a large pile of towels that would lead to an anti-jam. A typical setting is 3-5 seconds.

Scale Auto-Fix: Operation starts by setting 'Target' count, 'Accept' and 'Over' counts (e.g. Set Target = 25; Accept = 0; Over = 1). That means that towel counts 25 and 26 are accepted. During operation, Average towel count is calculated for every 30 bags. If Calculated Average is greater than Set Target, -1 is added to Accept, reducing target by 1 count, making Temporary Target of 24 (for the next 30 bags). If Average still greater than Set Target, Temporary Target is reduced for 1 more count to 23. If Average is calculated as less than Set Target, Temporary Target is increased by 1 count.

3.36 Auxiliary Screen

The ST-1000 Touch Screen Program is preprogrammed to accept most infeed equipment signals so that the two or more pieces of equipment "talk" to each. Occasionally, reprogramming will be necessary to interface auxiliary (infeed) equipment that is not manufacturer by APPI. Additional cabling may be required which will transfer the signals between the ST-1000 and your existing equipment. See Figure 3-50.

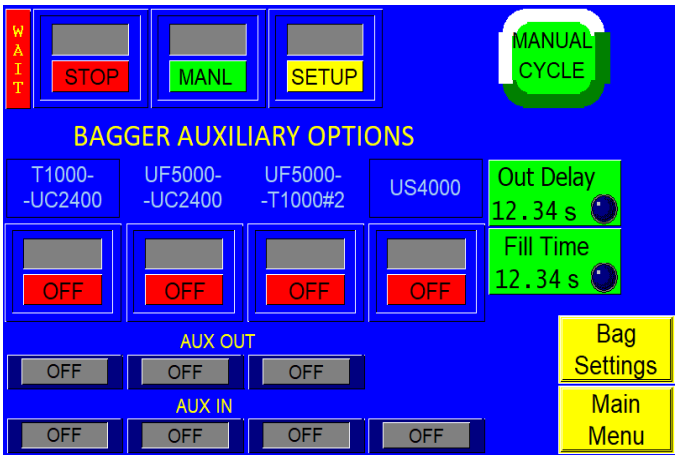


Figure 3-50

Once connected and with both systems running independently, turn the Auxiliary Signal ON by pressing the ON/OFF toggle button from the Auxiliary Screen. An output time delay is provided which delays the bagger from sealing after the auxiliary infeed signal has cycled and signaled the bagger to seal. To adjust the delay timer, press the **Output Delay** button and enter the value, in seconds, on the number keypad.

Help screens are available See Figure 3-51 thru Figure 3-53.

CAUTION: We recommend that APPI technicians provide the cable(s) linking the equipment. Contact APPI customer support for information which will be required for the integration.

When the Auxiliary setup procedures are complete, toggle the ST-1000 from **Manual** to **AUTO** by pressing the **Manual/Auto** toggle button. This will place the ST-1000 in the Automatic / Auxiliary mode.

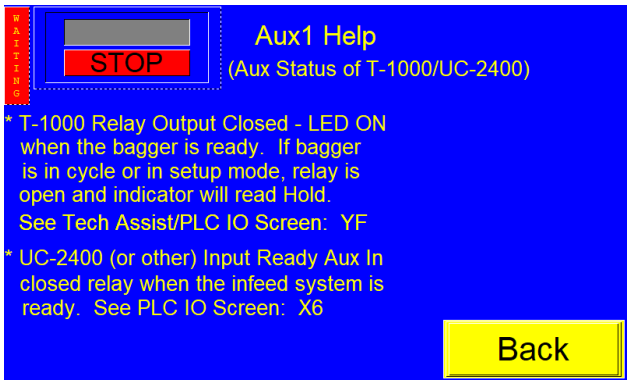


Figure 3-51

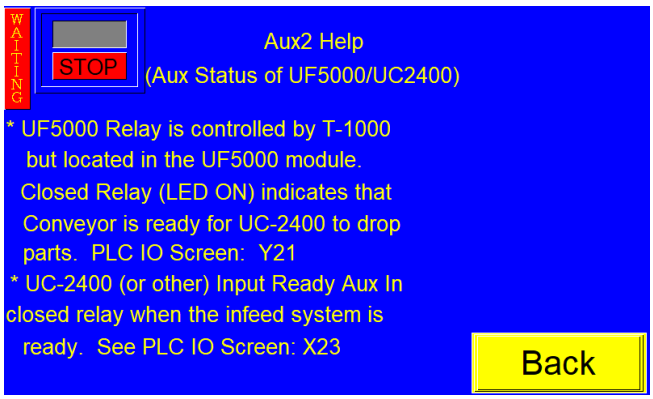


Figure 3-52

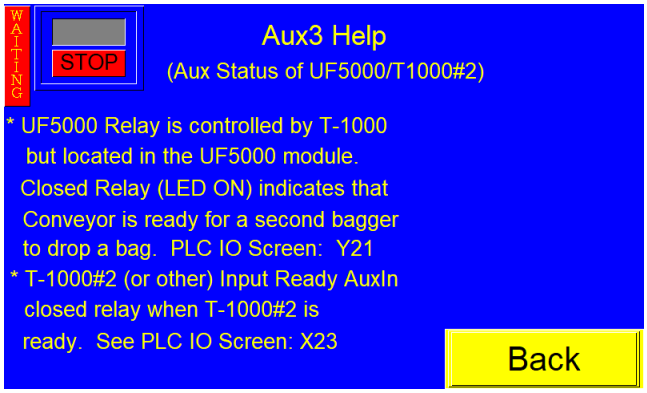


Figure 3-53

3.37 PLC Info

The PLC I/O screen is provided for maintenance personnel to determine the status of the PLC and review the mode of Outputs and Inputs. PLC I/O screen(s) are also used to assist APPI Service Technicians, working with your Maintenance Personnel to troubleshoot the ST-1000 in the field. See Figure 3-54 and Figure 3-55.

To determine the function of each Input / Output, press the LED to display a brief description. The PLC I/O screen also provide the run Hours and Cycles counters. These counters cannot be reset by the operator.

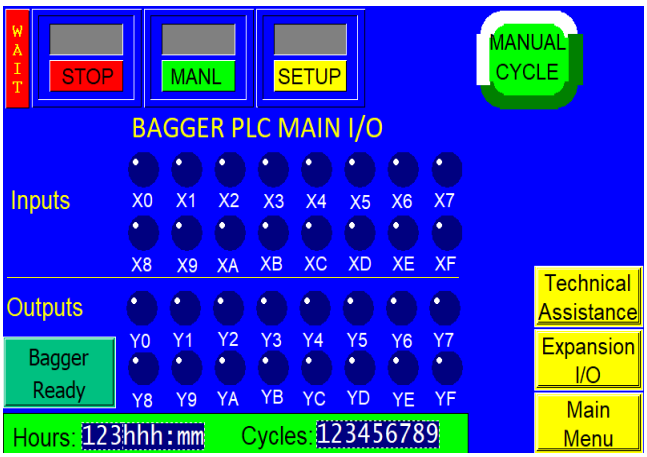


Figure 3-54

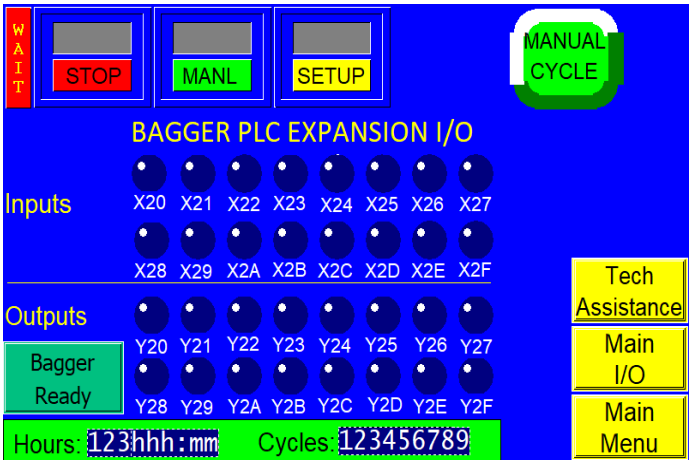


Figure 3-55

3.38 Information Screens / Message Screens

The ST-1000 touch screen program provides for many informational screens that provides descriptions of functions or screens. See through Figure 3-56 through Figure 3-59 for examples of messages that indicate the status of the bagger. Some messages provide functional messages that describe errors or the status of equipment and some provide instructions for operators to follow to bring the bagger back online.

To reset a message screen, clear the condition first (if required) and then touch the screen.

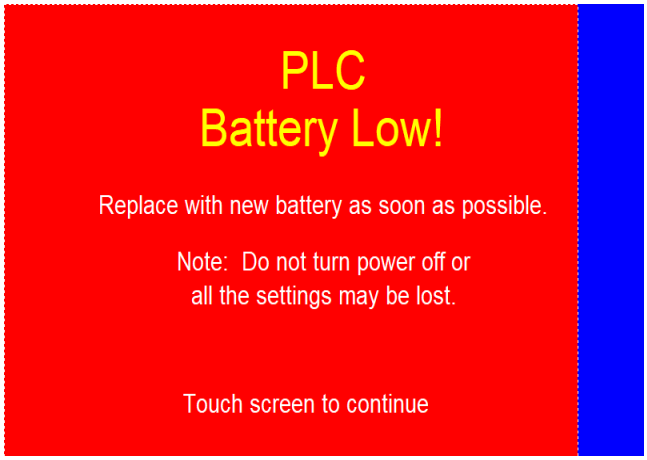


Figure 3-56

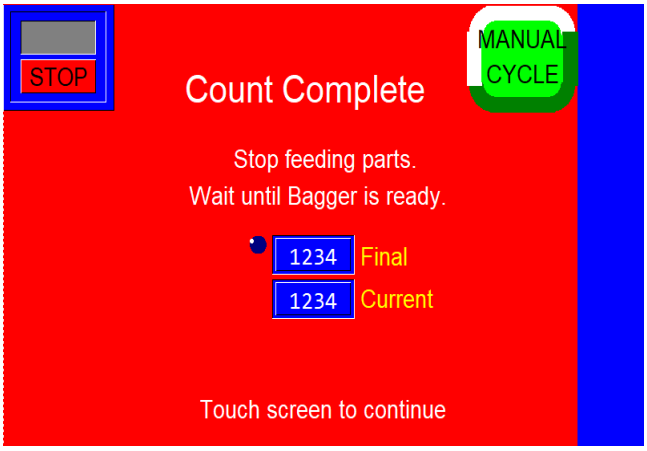


Figure 3-57

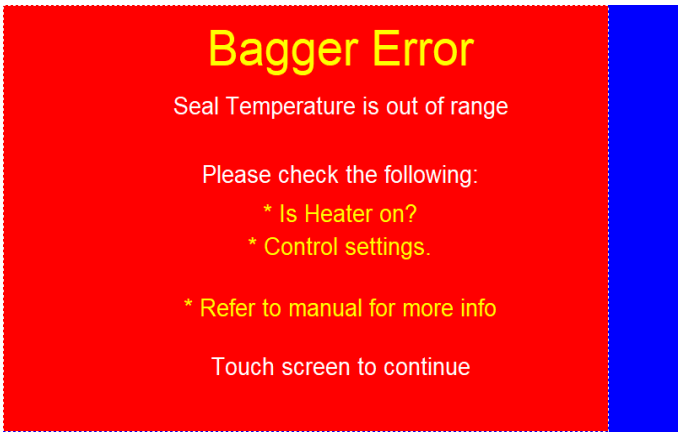


Figure 3-58

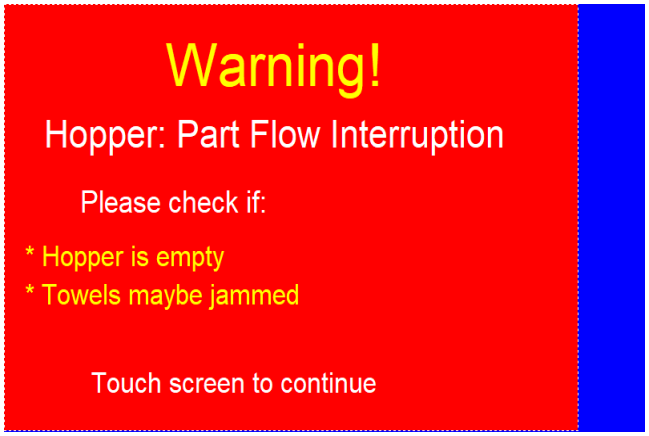


Figure 3-59

Chapter 4: Settings & Adjustments

Bagger Machine Adjustments
Compression (Nip) Roller Adjustment
Dancer Assembly Adjustments (Roller Shaft)
Dancer Bar and Break Strap Adjustment
Upper Roller Guides
PTFE Adjustment
PTFE Replacement
Pressure Bar Adjustment
Sealer Cylinder Adjustment
Pressure Bar (Rubber) Replacement
Anti-Jam Adjustment
Heater Cartridge Replacement
Replace Thermocouple Wire

4.1 Bagger Machine Adjustments

Periodically, the ST-1000 will require readjustments or realignments of components to ensure proper operation. Adjustments may be required after transportation, excessive handling or due to normal wear and tear.

CAUTION: Machine adjustments, electrical troubleshooting and component replacement should be performed by qualified maintenance technicians familiar with safety practices including, but not limited to, equipment lock-out / tag-out, voltages and pneumatics. If you are not familiar with the equipment or have not received training on the ST-1000, consult with APPI Technical Support before attempting adjustments or repairs.

4.2 Compression (Nip) Roller Adjustment

The drive roll compression is the force that exists between the two feed rolls (rubber-covered grooved roll and grooved steel roll). Too little drive roll compression will prevent the bags from tearing off after each sealing operation. Too much drive roll compression will cause extra wear on the drive roll and the motor.

NOTE: Always clean rollers before adjusting.

Turn the power switch to the OFF position and unplug the power cord. Remove the left and right-side covers. The compression adjustment is located on the lower outside right and left side plates. See Figure 4-1 and Figure 4-2.

Compression adjustment is a two-step process. First, the lower roller is adjusted so that it is parallel to the upper roller. Then, the lower roller is adjusted (raised) for proper compression.

On both the left panel and right panel, loosen the two locking bolts on the upper block of the compression tension assembly. Loosen the nut on the adjustment screw. With the Seal Frame locked in the UP position, lower the lower (steel) roller by turning the adjustment screws clockwise until the lower (steel) roller is parallel to the upper (blue) roller, leaving a 1/16" gap between the rollers. Turn the adjustment screw counter-clockwise alternatively, keeping the lower roller parallel with the upper roller until the rollers come in contact across the width of the rollers. Slightly lower the inner frame and raise again to ensure that when raised again, the rollers touch simultaneously. Then "snug" the upper block bolts and recheck the alignment.

NOTE: A light source (lamp) positioned to the rear of the T-1000-S14 Bagger showing light in the gap of the rollers will assist in judging whether the upper and lower roller are parallel.

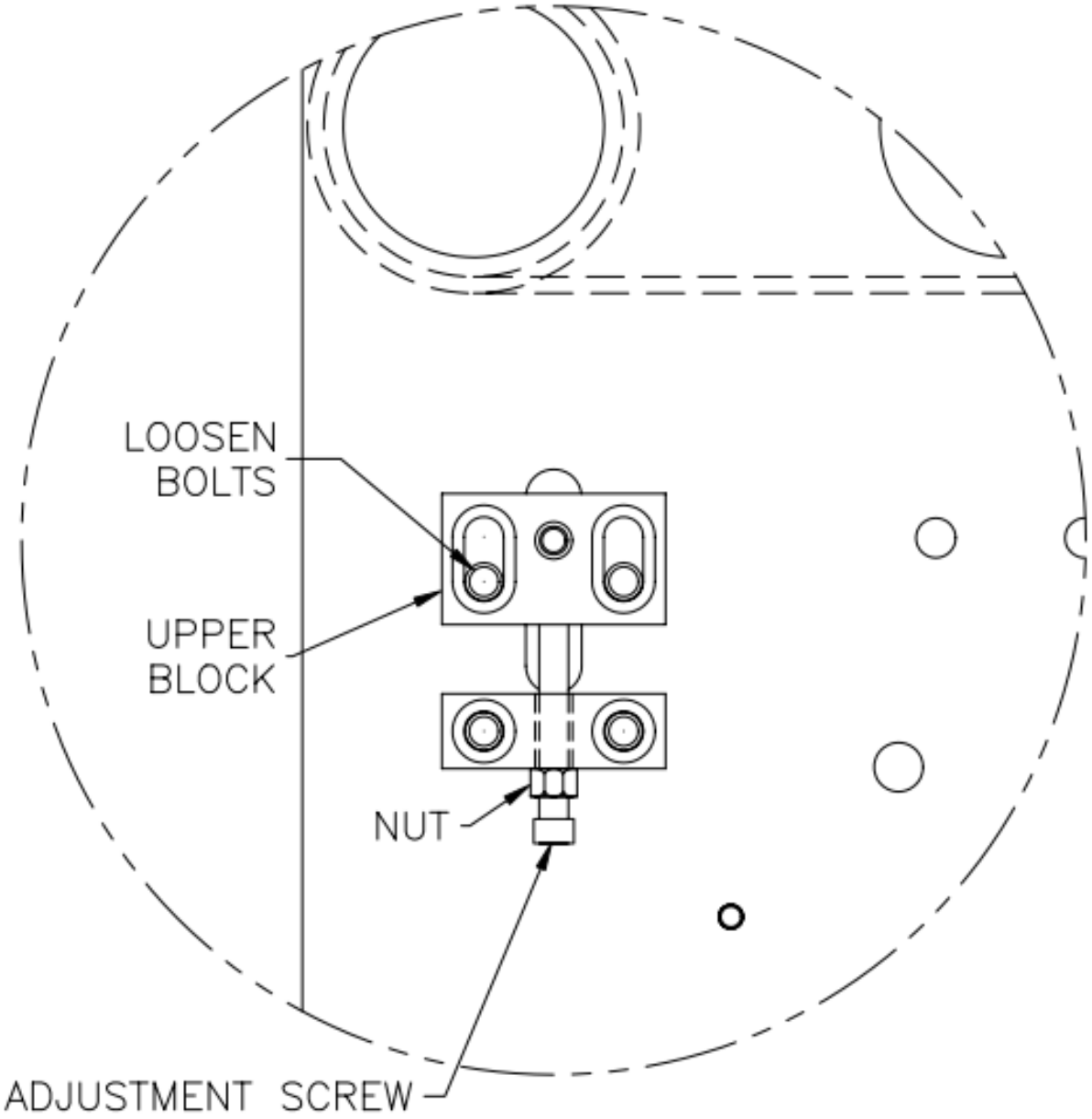
With the rollers parallel and slightly touching, turn each adjustment screw approximately 1/8 turn counter-clockwise. Then test the compression by putting a bag between the rollers and attempting to pull the bag between the rollers. If the bag pulls out easily, turn the compression adjustment screws 1/8 turn counter-clockwise. Continue this adjustment until the bag is slightly difficult to pull out of the rollers.

CAUTION: Over-tightening of the compression adjustment screws may cause damage to the upper (rubber) roller or the motor.

When you are satisfied with the compression, slightly lower the Seal Frame, and then slowly raise it until it almost touches the upper roller. If the gap is consistent across the width of the rollers and it appears parallel, lock the Seal Frame upward and retighten the two locking bolts on the upper block of the compression tension assembly. Then retighten the nut on the adjustment screws. Replace the covers, plug the cord into the power outlet, and turn the main power on.

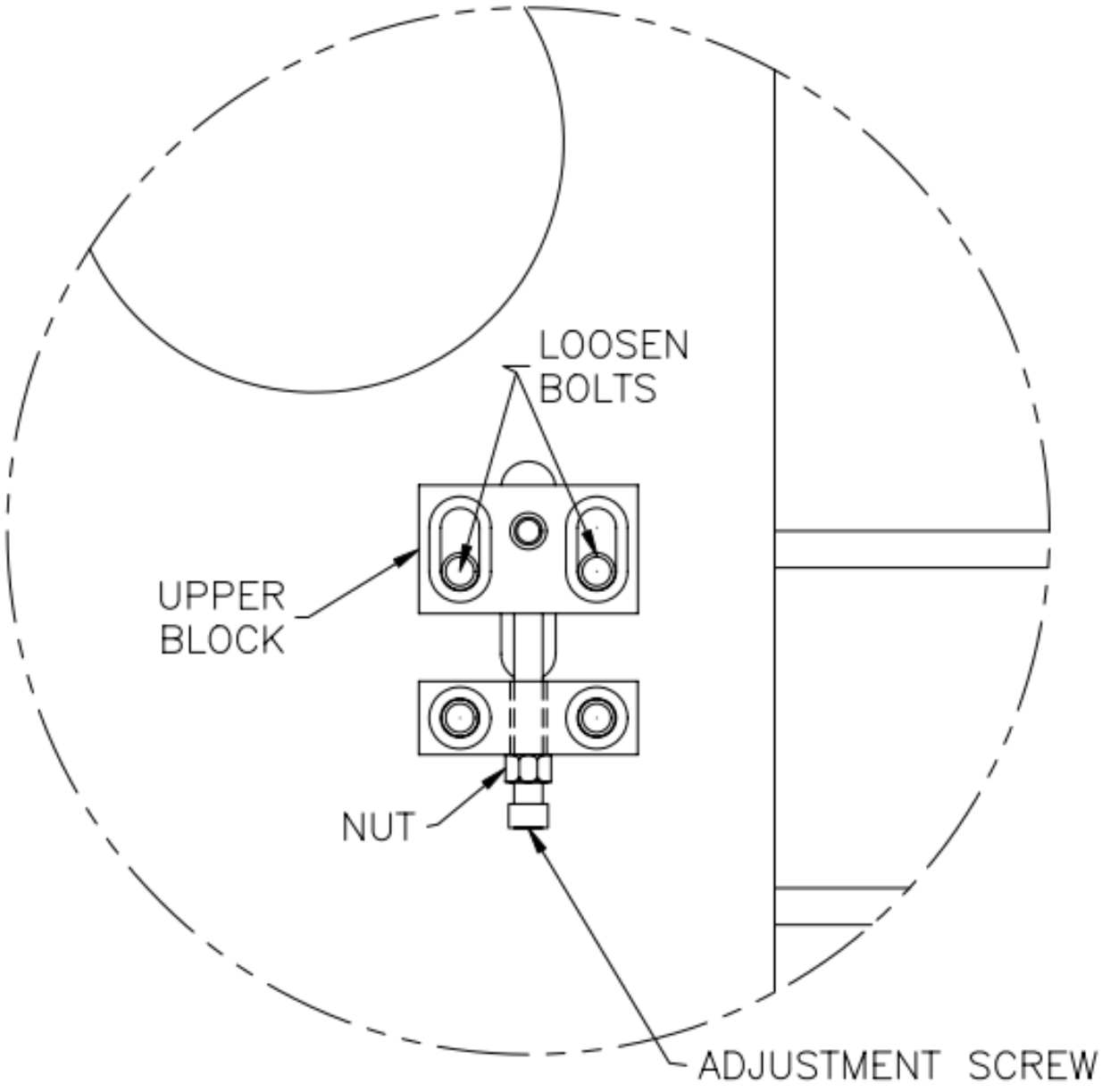
LEFT SIDE PANEL COMPRESSION NIP ROLLER ADJUSTMENT

Figure 4-1



RIGHT SIDE PANEL COMPRESSION NIP ROLLER ADJUSTMENT

Figure 4-2



4.3 Dancer Assembly Adjustments (Roller Shaft)

Please refer to 5.25 T-1000-S14 Dancer Assembly when using these instructions. A roller shaft, holding in position a roll of bags, will rest on the side plates of the Dancer assembly. The roller shaft must be parallel to the upper and lower guide rollers to allow proper tracking through the center of the T-1000-S14 Bagger. If the roller shaft is not parallel, the web of bags may track to the left or right.

NOTE: The roller shaft should not be out of alignment unless damaged or jolted in shipment.

If the rollers are not parallel, loosen two Socket Head Bolts on Dancer Frame and move Dancer Frame backward or forward until the Dancer Roller is parallel with Guide Rollers on the T-1000-S14 Bagger. When Guide rollers are parallel with Dancer Rollers, tighten the bolts on the Dancer Frame.

4.4 Dancer Bar and Break Strap Adjustment

The Dancer assembly maintains proper bag web tension throughout the stop/start feed motion. Web tension is required for proper tracking. If the tension is insufficient, the web may track left or right. Thinner bags require less tension than thick bags. Web tension is created by the friction of the brake strap along with the weight of the Dancer bar pulling downward on the web of bags. Friction of the brake is created by the weight of the bag roll and the spring tension on the brake strap. As the Dancer bar rises, spring tension is decreased and friction is decreased. If the web of bags is slack between the Dancer Roller and Nip Rollers, there is not enough tension on the bags. If the web of bags breaks prematurely, the tension is too high.

To correct the web tension, the Dancer bar or brake strap spring must be adjusted. To increase brake strap tension, relocate the spring on the Dancer rail by sliding the block closer to the Dancer Roller. To decrease tension with the brake strap, move the spring on the Dancer bar and slide the block back away from the Dancer Roller.

The Dancer bar pivots on two shoulder bolts that extend from the side plates. The downward force can be adjusted by repositioning the pivot point. To increase tension with the pivot position, move the pivot position away from the Dancer Roller. To decrease tension, move the pivot position closer to the Dancer Roller.

NOTE: For the brake strap to function correctly, the roll shaft must be installed so the strap wraps around the roll shaft. Inspect the Dancer bar to ensure that it is parallel to the roller shaft.

4.5 Upper Roller Guides

Two plastic web guides are located on the upper rear roll of the T-1000-S14 Bagger and are used for *fine* adjustment of tracking. Once the web is tracking within +/- 1/8" (0.31 cm) left to right, the plastic web guides can be used to further assist with tracking. Hold the upper roller in place while turning and sliding the plastic guides close to the bags without touching the bags.

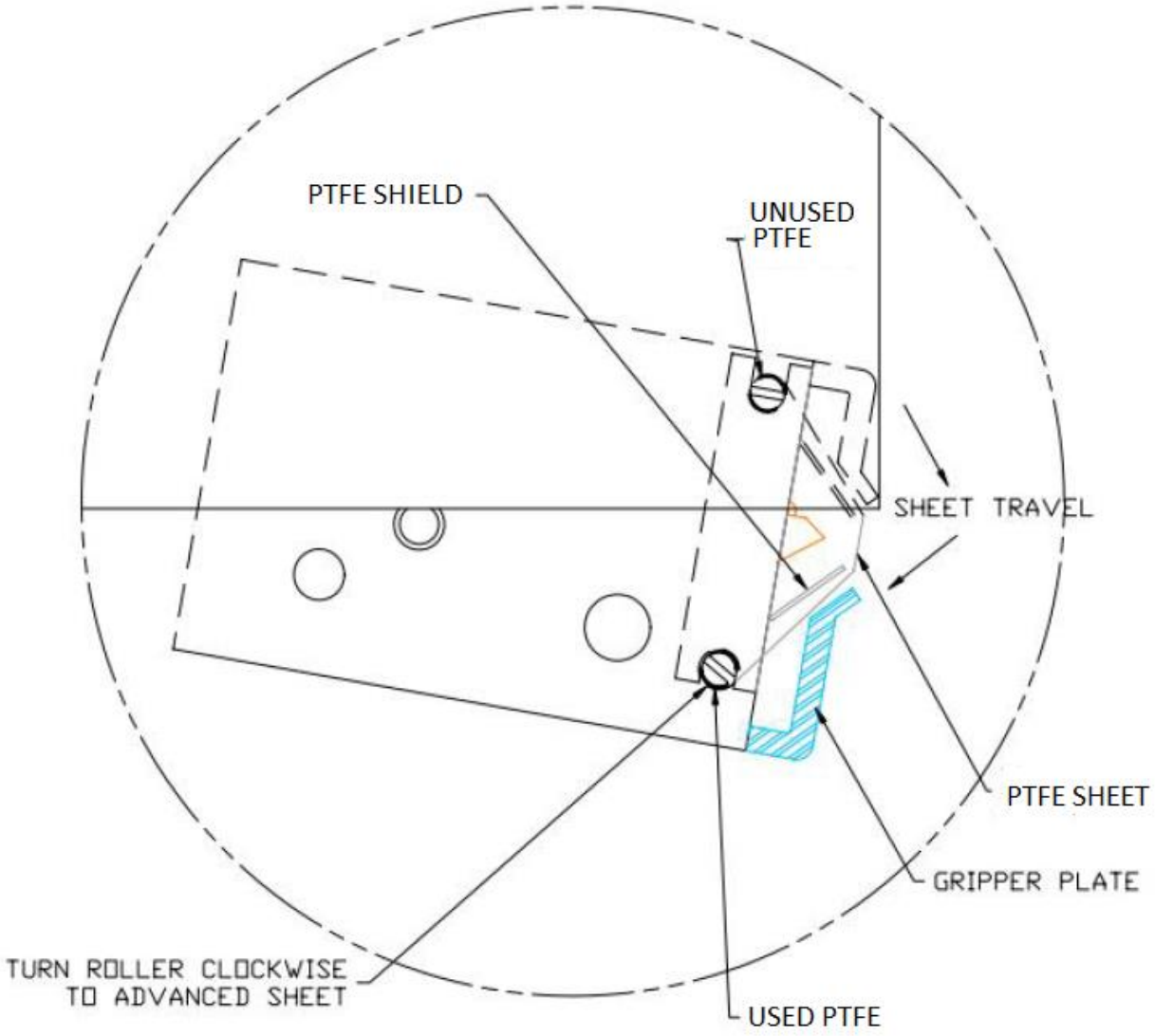
NOTE: If the bags are not tracking properly, the plastic guides could cause the bag web to turn or fold over. If this occurs, slide the guides further away from the web and make adjustments to correct tracking issues.

NOTE: If bags have an air relief hole or hanger hole, shift the bag to the right or left of center to avoid having the hole pass directly under the perforation sensor.

NOTE: Use the web guides for minor adjustments only. Major adjustment of the guides requires relocation of the bag roll on the bag roll shaft.

LEFT SIDE PLATE PTFE ADJUSTMENT

Figure 4-3



4.6 PTFE Adjustment

A non-stick PTFE sheet that prevents the bag from sticking to heater bar surfaces is located immediately behind the front plate. The PTFE should periodically be inspected for wear or damage. If holes or tears exist, the rolls can be turned (rotated) to cover the contact surfaces with fresh material.

If an adjustment of PTFE is required, turn the main power OFF and unplug the power cord. Lower the inner frame by pulling the handle downward. The rollers are located on the outside lower frame, on the left and right side of the inner frame that extends beneath the side plates. See Figure 4-3.
To adjust the material, turn the lower roller counter-clockwise approximately ¼ of a turn using a flathead screwdriver. If there is too much tension on the sheet, turn the roller counter-clockwise, releasing tension on the sheet. If there is too much slack in the sheet, turn the top clockwise.

CAUTION: If sheet tension is not released, the material will tear when the seal bar engages.

4.7 PTFE Replacement

Once the PTFE Sheet has reached the end of the roll, it is time for it to be replaced. To order a replacement sheet, call APPI Service and refer to part number TP-300500.

1. Turn the power to the OFF position and unplug the power cord. Let machine cool for at least an hour.
2. Remove the Lexan guard by unscrewing the two acorn nuts connected to the shafts. Remove the four Button head screws that hold the Front Plate to the inner frame. Set these aside in a safe place.

Note: Fiber spacers located behind the front plate may fall when removing the Front Plate screws.

3. Slide the Front Plate back and remove PTFE Guide. Determine if your machine is a Standard Frame or a Drop Frame. Look closely at the PTFE Sheet Bracket. If you have a Standard Frame the LONG side of the PTFE Sheet Bracket goes up. If you have a Drop Frame the SHORT side goes up. This is important for reassembly.
4. Remove the two springs and clean the adhesive from both shafts. See Section 5.10c for Exploded Diagram.
5. Separate the two shafts.
6. Lay one Shaft on the top of the PTFE Sheet and measure from the edge of the sheet to the edge of the Shaft. Ensure the sheet is in the center of the Shaft.
7. Wrap a piece of tape on the Shaft at the edge of the material.
8. Take the second Shaft, lay the first Shaft next to it and wrap tape around the end of the second Shaft in the same place as the first. Keep the taped ends on the same side of the PTFE Sheet.
9. Remove the adhesive backing from one end of the PTFE Sheet.
10. Align one Shaft parallel to the PTFE Sheet with the taped end of the Shaft meeting up with the edge of the PTFE Sheet. Once the shaft is in position, lower onto adhesive side of the PTFE Sheet.
11. Roll the Shaft until you reach the end of the adhesive part.
12. Repeat with the other Shaft, ensuring the taped ends are on the same side. Once the PTFE Sheet has been rolled over the Shafts, the tape may be removed.
13. Determine if your machine is a Standard Frame or a Drop Frame. Look closely at the PTFE Sheet Bracket. If you have a Standard Frame the LONG side of the PTFE Sheet Bracket goes up. If you have a Drop Frame the SHORT side goes up.
14. Lay the PTFE Sheet Bracket in the middle of the PTFE Sheet.

15. Place the Shaft into the cutouts of the Bracket then pull the spring so that you have two wraps between the Bracket and the Shaft. Be sure the Spring is in the groove on the Shaft.
16. Repeat the same procedure on the other Shaft.
17. Wind the PTFE so that the supply is at the TOP of the PTFE Sheet Bracket. Standard Frame, LONG side up; Drop Frame, SHORT side up (refer to step 13)
18. Place PTFE Sheet Bracket Assembly back into the bagger. If your machine is a Standard Frame, ensure the LONG side is up, and for a Drop Frame the SHORT side is up.
19. Slide the Front Gripper Plate back into position.
20. Place Front Plate Spacers behind Front Plate, insert button head screws, then tighten.

4.8 Pressure Bar Adjustment

The pressure bar, when actuated by the seal cylinder, is forced against the front plate. The pressure bar must be parallel to the front plate to avoid excessive wear of components. Please contact Advanced Poly-Packaging Service for Pressure Bar adjustment instructions.

NOTE: Pressure bar adjustment should only be necessary after rod or bushing replacement.

4.9 Sealer Cylinder Adjustment

Flow controls operate the air flow which dictates the speed of the cylinder in an “in-and-out” motion that brings the Pressure Bar against the front plate (gripper plate). Increasing the speed of the Pressure Bar will increase production. But if the Pressure Bar moves in or out too fast, the Pressure Bar will “bang” and excessive wear will occur. The inline Flow Control that controls the Pressure Bar cylinder is located on the tubing to the main center cylinder on the inner frame. See Figure 4-4.

The adjustment knob (B) controls the speed of the Pressure Bar INWARD (towards the front gripper plate). To increase the speed of the Pressure Bar INWARD, turn the knob (B) counterclockwise. To decrease the speed of the Pressure Bar INWARD, turn the knob (B) clockwise.

NOTE: There is no OUTWARD adjustment for the Pressure Bar.

The adjustment knob (A) controls the speed of the heater Bar OUTWARD (away from the front gripper plate). To increase the speed of the Heater Bar OUTWARD, turn the knob (A) counterclockwise. To decrease the speed of the Heater Bar OUTWARD, turn the knob (A) clockwise. Adjust the speed of the Pressure Bar so that it moves in and out rapidly, in a fluid manner, without causing the Pressure Bar to "bang" in or out.

NOTE: There is no INWARD adjustment on the Heater Bar.

4.10 Pressure Bar (Rubber) Replacement

Located along the inside of the pressure bar is a strip of rubber, held on the pressure bar by a channel, pressing on the edges of the rubber. The rubber compresses against the front (gripper) plate holding the bag in place during sealing and bag tear-off. If the rubber becomes brittle, torn, gouged, or otherwise worn, it should be replaced to assure strong seals.

To replace the pressure bar rubber, simply pull one end of the rubber from the channel. The rubber will come out of the channel quickly and easily. To install a fresh piece of rubber, press one edge of the rubber into the channel, then the other edge. Work the rubber into the channel in small increments along the length of the channel. See Figure 4-5 and Figure 4-6. If you used PTFE tape to cover the surface of the

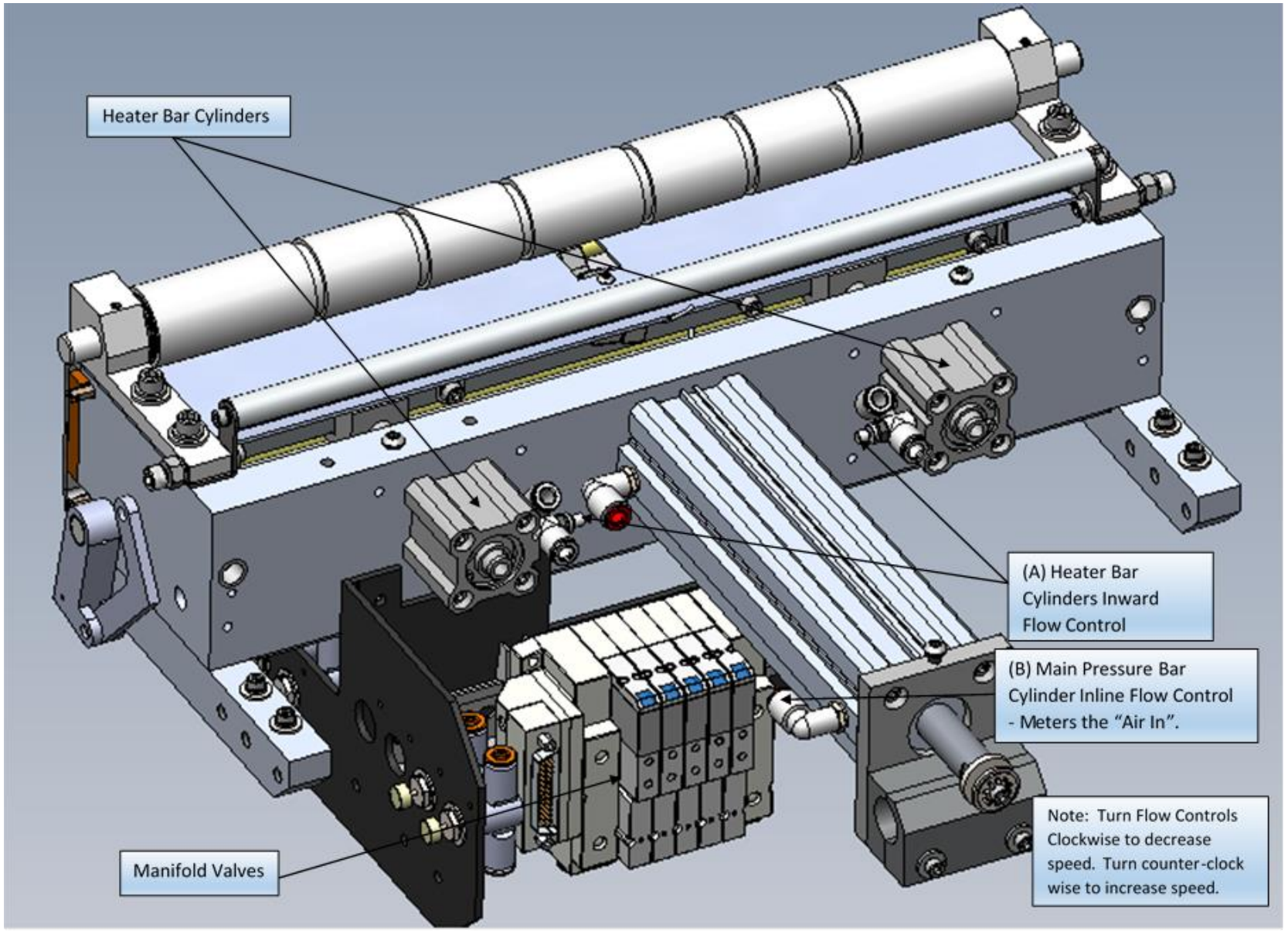
rubber, place the PTFE on the rubber along its length. If the PTFE extends beyond the rubber, cut off the excess.

NOTE: PTFE may be added to the pressure bar rubber if the bag sticks to the rubber after loading and sealing. The bag may stick to the rubber if the product and bag are lightweight and if the rubber is dirty.

NOTE: Frequently clean the rubber with alcohol to remove buildup of dirt or other contaminants.

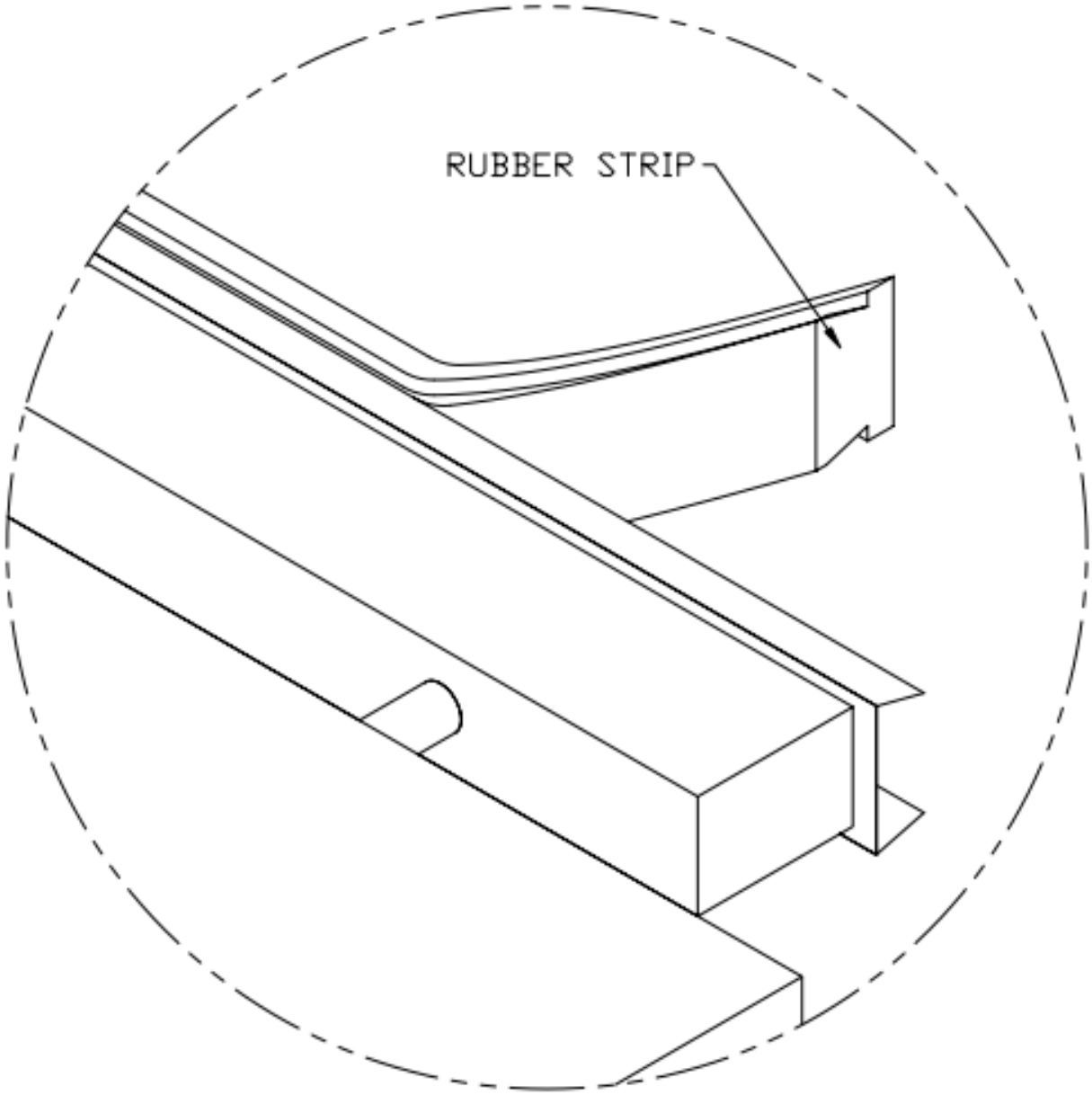
SEAL CYLINDER ADJUSTMENT

Figure 4-4



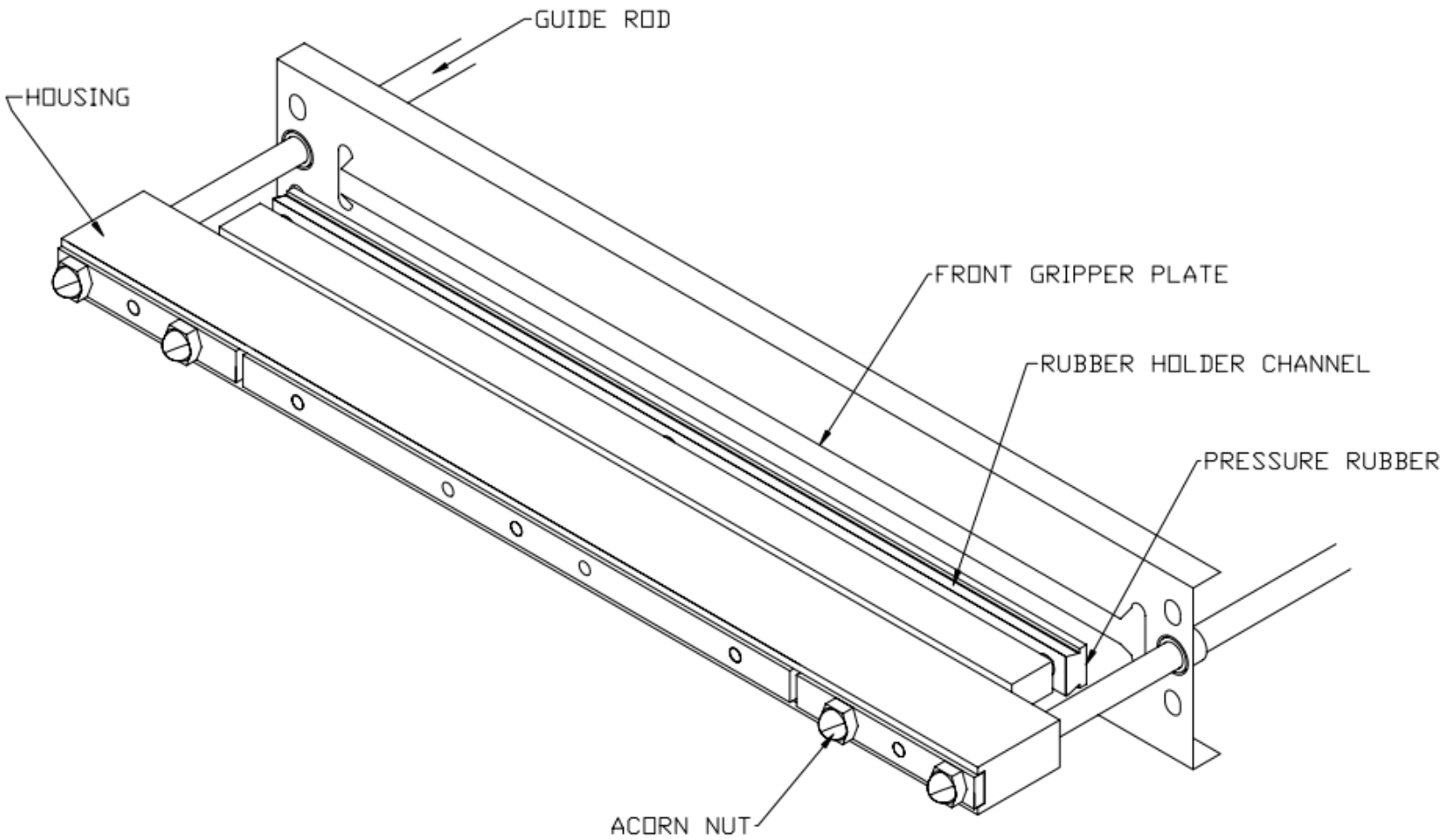
PRESSURE BAR REPLACEMENT

Figure 4-5



PRESSURE BAR REPLACEMENT

Figure 4-6



NOTE: There is a 1/8"gap between the pressure rubber and front gripper plate.

4.11 Anti-Jam Adjustment

The anti-jam device is designed to protect the T-1000-S14 Bagger from damage when an obstruction is encountered in the seal area, between the pressure bar and front gripper plate. If properly adjusted, the pressure bar will retract if an obstruction is encountered in the seal area. The pressure bar houses springs that cause the rubber and holder to compress. When the rubber holder compresses, a sensor is activated, causing the pressure bar to retract. The sensor is defeated when the pressure bar is approximately 1/8" from the gripper plate. See Figure 4-7. The anti-jam device can quickly be tested while the T-1000-S14 Bagger is operating using care, but it should be thoroughly tested by disconnecting air and power and removing covers.

To quickly test the anti-jam device, place a 3/8" diameter flexible poly tube against the front gripper plate perpendicular to the seal bar opening. Cycle the Bagger allowing the pressure bar to compress the poly tube against the front plate. If the pressure bar does not immediately retract and place the Bagger into STOP mode, the anti-jam device is not properly adjusted. Test the anti-jam device along the entire length of the pressure bar using the 3/8" poly tubing as a test device.

CAUTION: To avoid personal injury, do not place fingers or hands into the seal area of the bagger while power is ON or air is attached. Do not test the anti-jam device with hands or fingers. Ensure the poly tube that is used for testing is long enough to keep fingers or hands away from the seal area of the bagger.

Part 1: Anti-Jam Test

To thoroughly test and adjust the anti-jam device, you must first turn the power to the OFF position and disconnect the air line from the bagger. Remove Top Cover by unscrewing the two Button Head Screws, one on each side of the top- rear of the machine. Keep these screws in a safe place. Remove the top cover. With the covers removed and air disconnected, turn the power to the ON position.
With Power on, access the Main Menu on the Touch Screen, press Technical Assistance, and enter Level 1 Pass Code (1001). Press ENT.

On the Technical Assistance screen, press PLC Info to access the PLC I/O screen. You will be checking to see if the X7 LED illuminates when the Anti-Jam is tested.

From the front of the machine, move Pressure Bar in until the rubber is approximately 1/8 inch from touching the angle of the Gripper Plate.

Locate the Seal Rod and Magnetic Sensor Block on the left side of the T-1000-S14 Bagger.

With an Allen Wrench, loosen the Magnetic Sensor Block and slide Magnetic Sensor Block towards Magnetic Switch until X7 just illuminates.

At this point, tighten the Magnetic Sensor Block at the place where X7 illuminated. Be sure it is straight up and down and clears the Magnetic Switch.

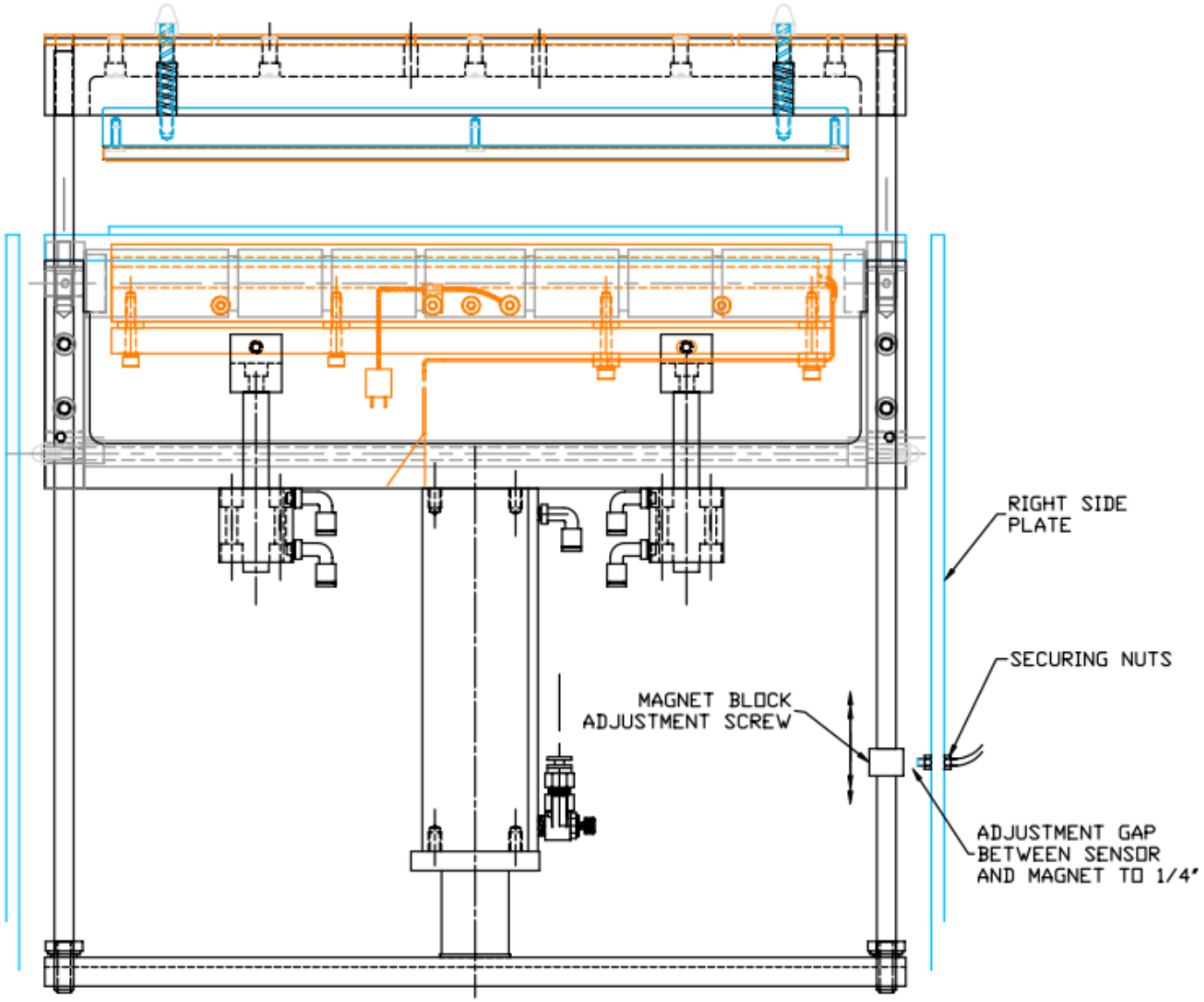
CAUTION: To avoid damaging the plastic override sensor, position the sensor so that it does not contact the magnetic block when the pressure bar is moving. To avoid "stripping" the threads of the sensor, do not over tighten the securing nuts.

Re-Attach Air Supply by attaching the female quick-coupler to the male quick-coupler on the filter regulator assembly.

Anti-Jam is working. Put the ST-1000 in Auto Run and let it cycle. While it is running perform the Anti-Jam test again by placing a piece of 3/8 tubing doubled over and place in between Pressure Bar and Heat Bar. The Pressure bar should jump back and the Touch Screen should give an Anti-Jam error screen.

ANTI-JAM OVERRIDE ADJUSTMENT

Figure 4-7



Part 2: Other Anti-Jam Testing

Next, locate the "X4" LED on the PLC Info Screen (under Technical Assist) and ensure the light is illuminated (ON). Then, compress the rubber and holder into the pressure bar (nylon holder). As soon as the rubber is pressed into the nylon holder, the "X4" LED should turn OFF. The LED should remain off while the rubber is held compressed into the nylon holder. If the "X4" LED shuts off while the rubber bar is pressed into the nylon holder, the pressure bar sensor is functioning properly.

NOTE: Acorn Nut base should be flat making full contact to the surface of the plate. If the Acorn Nut is worn, it will need replaced. Call APPI and refer to Replacement Part # TP-101131 (Nut, Acorn Brass Nickel Plate) when reordering.

NOTE: X3 is used on the T-1000 Clutch Brake and X4 is used on the T-1000-S14.

If the X4 LED is OFF when the rubber bar is not depressed into the nylon holder, the Coiled Cable, located inside the Main Frame of the T-1000-S14 Bagger, must be tested and the two Acorn Nuts must be checked for wear. Check the cable for any cuts or worn spots that could be going to ground. If there are signs of wear and tear it must be replaced. Refer to Part # TP - T1ME00209, Seal Bar Coiled Cable Harness when reordering from APPI Service.

If the coil is intact and it is still lighting when the Rubber Bar is depressed, unplug the Coiled Cable Harness located inside the Main Frame of the T-1000-S14. Using an electric meter set on Ohms, put the test leads on the coiled cable side and measure the resistance, it should be 0 or closed.

Squeeze the pressure bar. The meter should now show resistance or open. If it does, reconnect coiled cable, reattach Lexan Cover with Acorn nuts, and continue with production. If it does not, the coiled cable will need replaced. Call APPI Service and refer to PN: TP-T1ME00209, Seal Bar Coiled Cable Harness when reordering.

4.12 Heater Cartridge Replacement

A cylinder-shaped cartridge (element), located inside the heater bar, heats the bronze bars that contain it. This cartridge is considered a normal wear item and will infrequently fail, requiring replacement. Refer to Figure 4-8 while following these instructions.

To determine if the heater cartridge is bad, use the following troubleshooting steps:

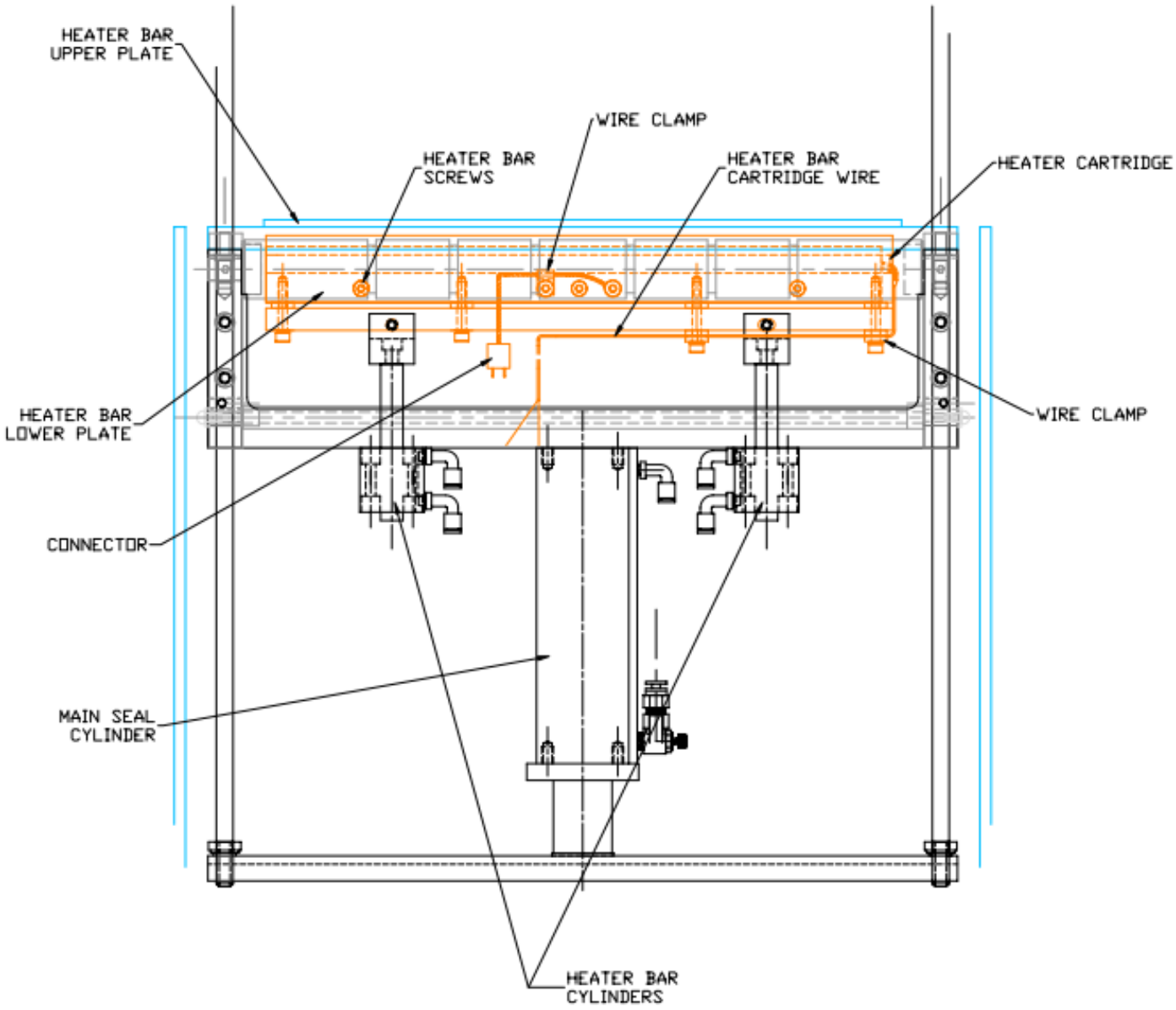
1. Check resistance value of heater cartridge. At room temperature, a 110V machine should read approximately 18 Ohms, and a 220V machine should read approximately 60 Ohms.
2. Locate the "Y3" indicator on the **PLC info** screen.
3. Press the **START** button if the ST-1000 is in the Stop mode. If "Y3" illuminates in long pulses without increasing the temperature on the Bagger Settings screen, the Heater Cartridge will need replaced.

NOTE: If you do not have an Ohms meter, start at step 2.

If the Heater Cartridge needs replaced, please call APPI Service.

HEATER BAR CARTRIDGE REPLACEMENT

Figure 4-8



VIEW FROM UNDERNEATH THE INNER FRAME

NOTE: Heater cartridge wires must make a sharp 90° bend at the end of heater bar. Wires should not extend past the end of the heater bar.

NOTE: If the wires rub on the bagger when the heater bar is in or out, the heater cartridge will fall prematurely.

4.13 Replace Thermocouple Wire

A thermocouple wire, brazed to a ring terminal and secured to the bottom of the heater bar, detects the amount of heat the heater bar is emitting. The thermocouple wire is considered a normal wear item and will infrequently fail, requiring replacement.

The thermocouple should be replaced when excessive fluctuations occur or incorrect temperature is displayed in the Bagger Settings menu. The thermocouple should also be replaced when a visual inspection reveals frayed insulation or broken wire. If the above conditions are met, the thermocouple is bad and the current to the heater bar has been turned OFF.

To replace the thermocouple wire, turn the main power to the OFF position, unplug the power cord and disconnect the air line. Let machine cool for at least an hour.

Remove the Gripper Plate and PTFE assembly, take note as to which side of the PTFE Sheet Bracket is up (the SHORT side of the groove on the bracket will be up for Drop Frame or the LONG side of the groove will be up for Standard Frame). Unplug the Heater Cartridge and Thermocouple wires, then remove the two shoulder bolts holding the Heater Bar in the yolks. Remove the Heater Bar. Remove the screws that hold the ring terminal and the jacketed wire clamp. Disconnect the connector and remove the wire. Reverse these steps to replace the wire and reattach Heater Bar.

NOTE: there is a top side and a bottom side to the thermocouple eye, the top side is flat and shiny, the bottom side has a slight groove in it. Attach the thermocouple wire so the top side is facing out.

CAUTION: To avoid stretching or breaking the wire during heater cylinder extension, ensure that the wire is looped and free to bend during heater bar movement.

Replace the PTFE assembly ensuring the correct side is up, then reattach Gripper Plate.

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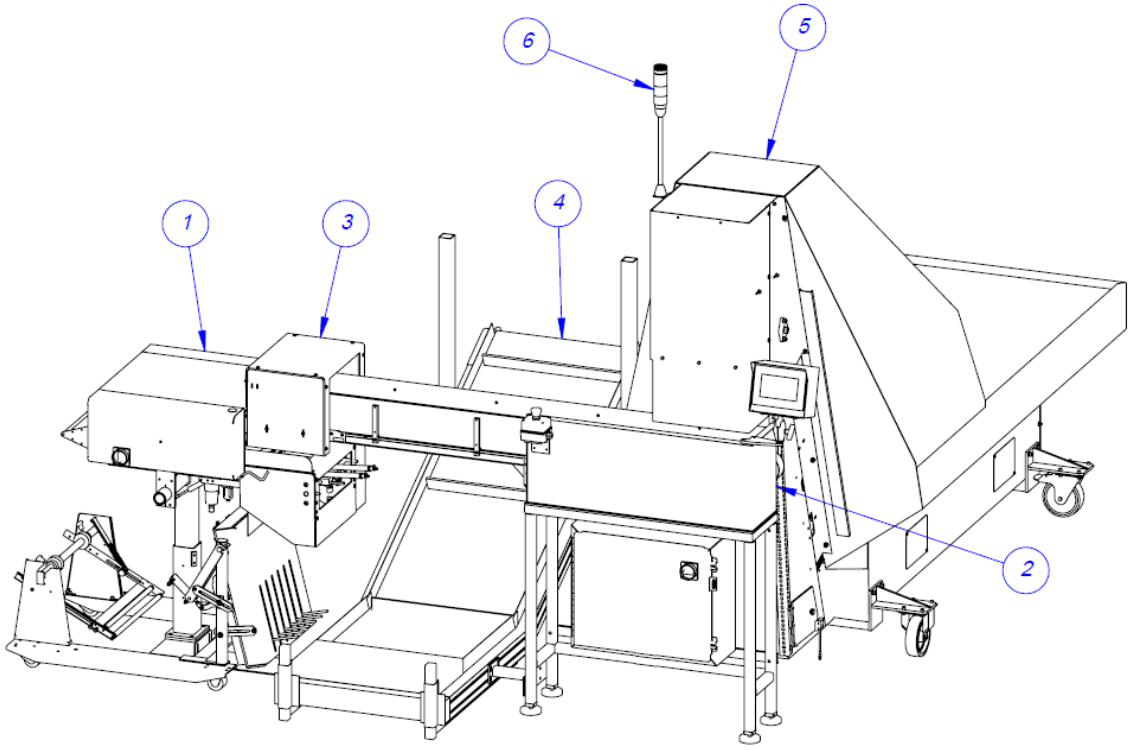
Chapter 5: Parts

Towel Bagger Assembly Layout
Towel Bagger Assembly Layout
ST-1000 Hopper Base Frame Assembly
Hopper Conveyor Assembly
Hopper Conveyor Direct Drive
ST-1000 Claw Conveyor Assembly
ST-1000 Claw Assembly
Claw Conveyor Direct Drive Assembly
Lexan Conveyor Cover
ST-1000 Accumulator Assembly Air Assist
ST-1000 Accumulator Gate Assembly
ST-1000 Scale Assembly Layout
ST-1000 Scale Conveyor Assembly
ST-1000 Scale Frame Assembly
ST-1000 Scale Guard Assembly
ST-1000 Electronics Assembly
ST-1000 Electrical Box Assembly
ST-1000 Electronic Panel Assembly
T-1000-S14 Advanced Poly-Bagger
T-1000-S14 Base Assembly
T-1000-S14 Upper Column Assembly
T-1000-S14 Covers and Guarding
T-1000-S14 Flat Load Shelf Assembly
T-1000-S14 Dancer Assembly
Seven Inch Touch Screen
T-1000-S14 Main Frame Assembly
T-1000-S14 Upper Roller Subassembly
T-1000-S14 Air Knife Assembly
T-1000-S14 Sealer Frame Assembly: Drop Frame
T-1000-S14 Pressure Bar Subassembly
T-1000-S14 Heater Bar Subassembly
T-1000-S14 PTFE Guide Subassembly
T-1000-S14 Grooved Roller Mounting Subassembly
T-1000-S14 Bag Finger Grounding Subassembly
T-1000-S14 Latch Subassembly
T-1000-S14 Manifold Assembly
T-1000-S14 Electrical Panel
T-1000-S14 Motorized Load Shelf Assembly
T-1000-S14 Bag Blow Off (Optional)
T-1000-S14 Bag Deflator (Optional)

5.1 Towel Bagger Assembly Layout

PN: ST-1000

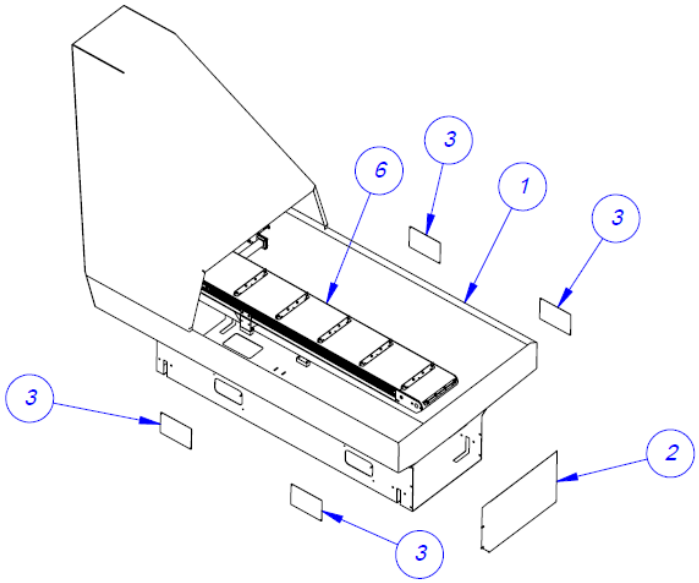
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	ST-1000-S14	TOWEL BAGGER
2	1	TA-T20-4000	SCALE ASSEMBLY
3	1	TA-T20-5000	SCALE GUARD ASSEMBLY
4	1	UF-2000	TAKE AWAY CONVEYOR
5	1	TA-T20-3000	HOPPER ASSEMBLY
6	1	TP-216609	3-LIGHT STACK WITH HORN

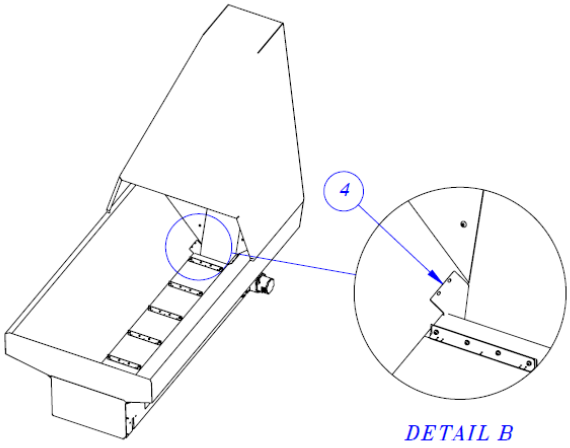


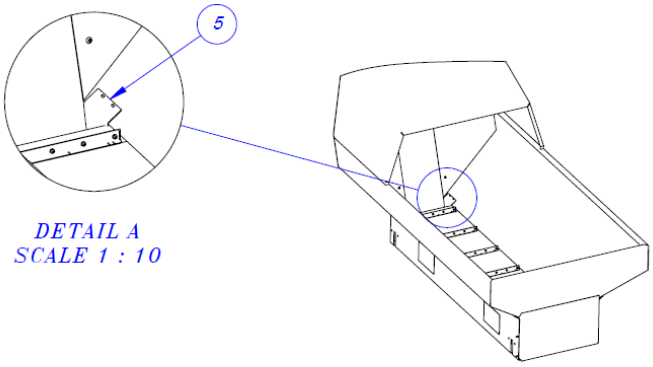
5.2 ST-1000 Hopper Assembly

PN: TA-T20-3200

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3201	HOPPER
2	1	TP-T20M3203	HOPPER CONVEYOR HOPPER GUARD
3	4	TP-T20M3212	ACCESS HOLE COVERS
4	1	TP-T20M3411	BRACKET COVER – RIGHT
5	1	TP-T20M3412	BRACKET COVER - LEFT
6	1	TA-T20-3200	DIRECT DRIVE CONVEYOR



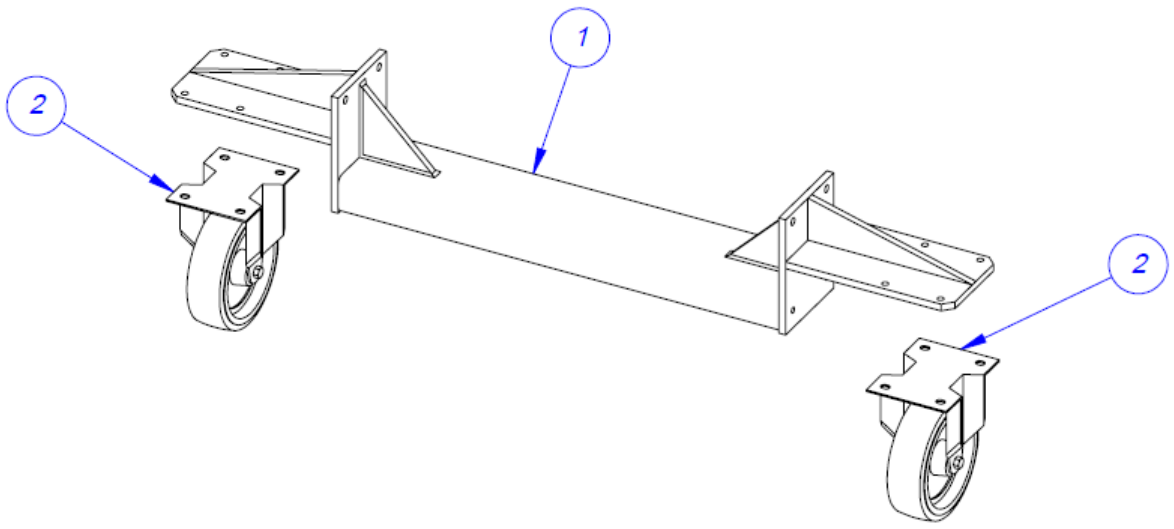




5.3 ST-1000 Hopper Base Frame Assembly

PN: TA-T20-3100

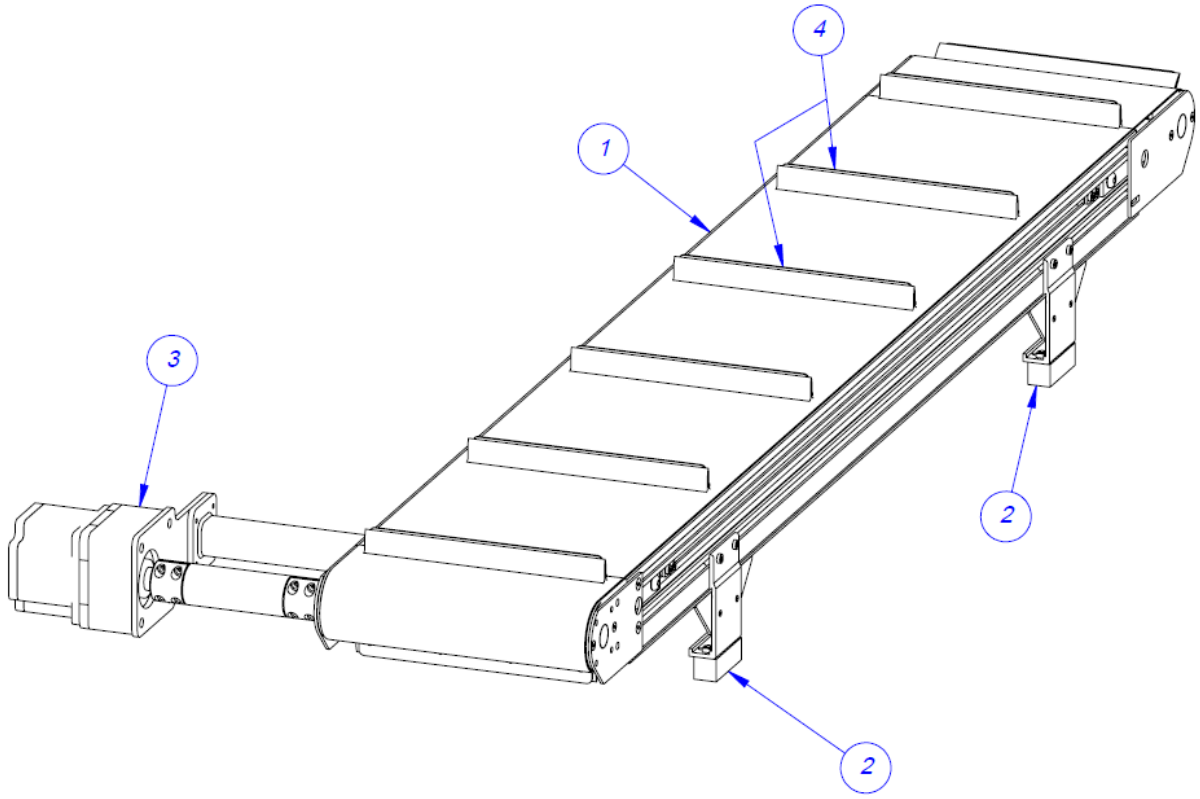
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3101	HOPPER BASE FRAME
2	2	TP-110762	RIGID CASTER. 770# CAP



5.4 Hopper Conveyor Assembly

PN: TA-T20-3200

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	V-DOR-3300	HOPPER CONVEYOR FOR DIRECT DRIVE
2	4	TP-T20M3312	HOPPER SPACER
3	1	TA-T20-3200-1	DIRECT DRIVE ASSEMBLY
4	1	TP-T20M3313	BACKUP PLATE

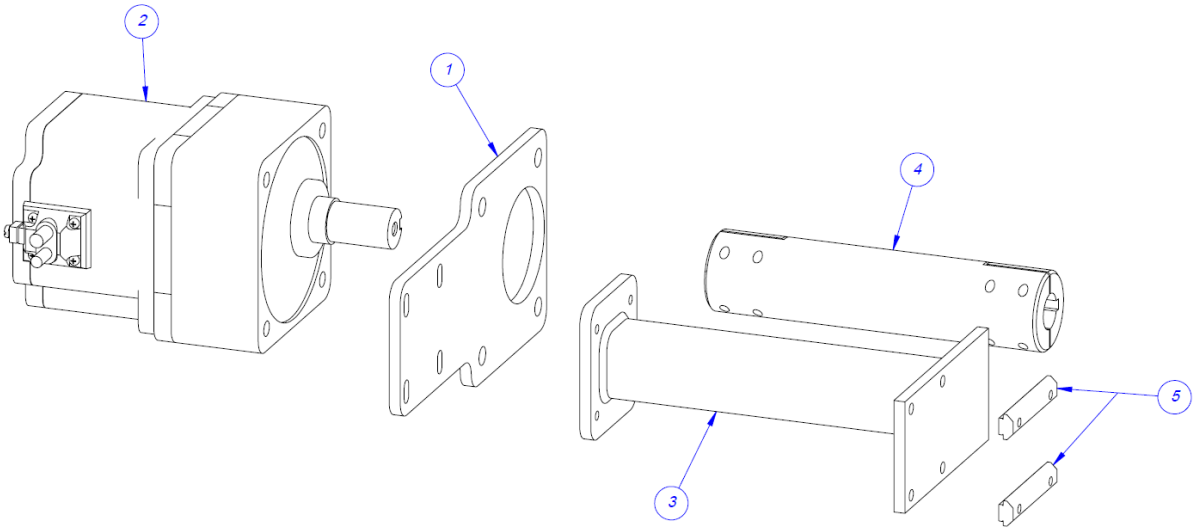


5.5 Hopper Conveyor Direct Drive

PN: TA-T20-3200

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3319	MOTOR MOUNT PICK CONVEYOR
2	1	TP-501125 / 501132	MOTOR DRIVER COMBO
3	1	TP-T20M3218	MOTOR STAND-OFF
4	1	TP-T20M3219	HOPPER CONVEYOR DRIVE SHAFT
5	2	VP-DOR-300150M	TWO-HOLE T-BAR

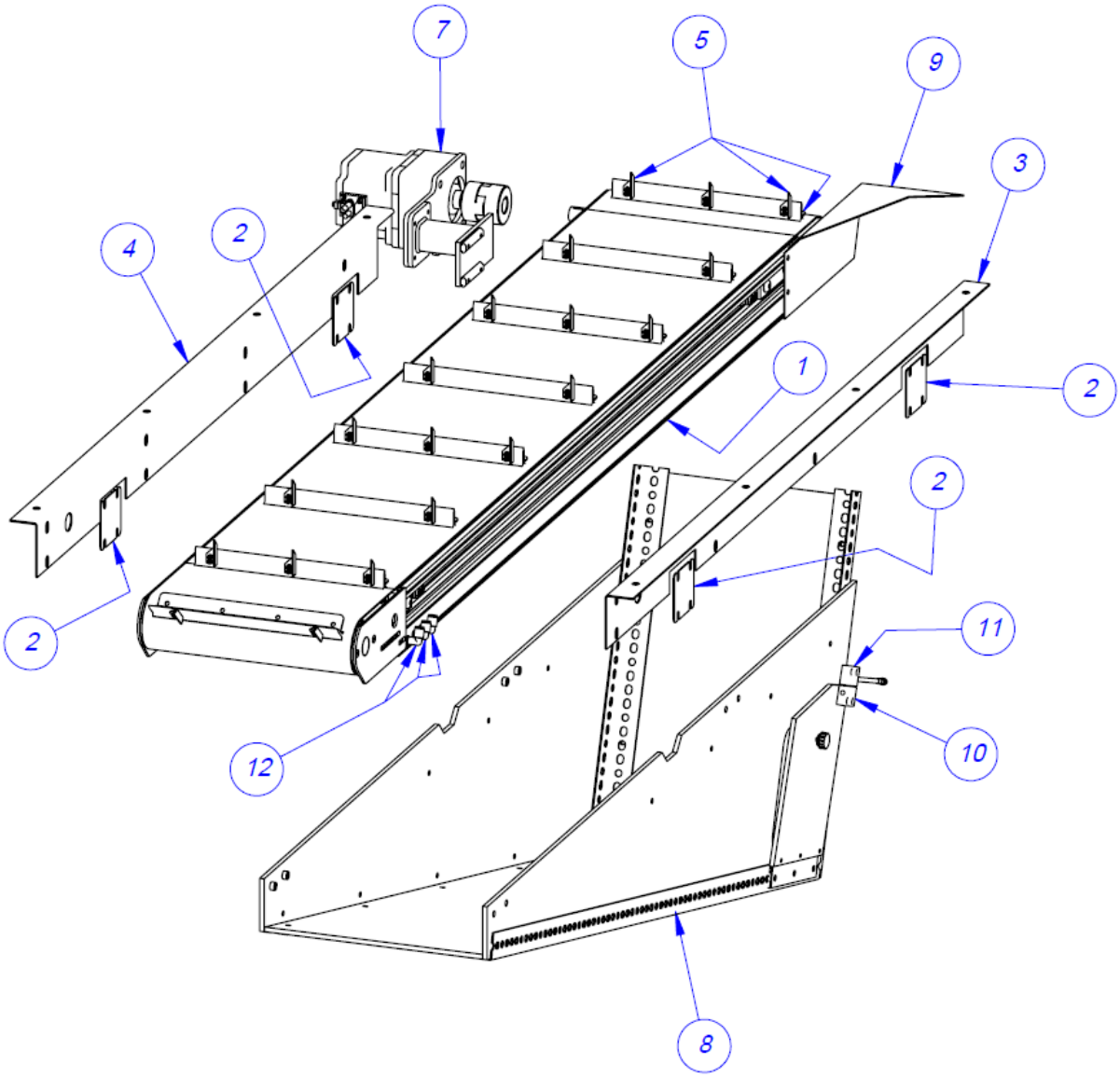
Note: Item 2 as TP-501128 is to be used on a 220V System. Item 2 as TP-501132 is to be used on a 110V System.



5.6 ST-1000 Claw Conveyor Assembly

PN: TA-T20-3300

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	V-DOR-3300	HOPPER CONVEYOR FOR DIRECT DRIVE
2	4	TP-T20M3302	GUARD PLATE
3	1	TP-T20M3310	CLAW CONVEYOR MOUNT RIGHT
4	1	TP-T20M3309	CLAW CONVEYOR MOUNT LEFT
5	6	TA-T20-3010	PICK ASSEMBLY (3) PICKS
6	6	TA-T20-3010	PICK ASSEMBLY (2) PICKS
7	1	TA-T20-3300-1	3300 DIRECT DRIVE ASSEMBLY
8	1	TA-T20-3300-2	LEXAN CONVEYOR COVER
9	1	TP-T20M3331	COVER
10	1	TP-215352	MAGNET
11	1	TP-215352	SWITCH
12	6	TP-401257	ELBOW, 1/4” TUBE x 1/8 NPT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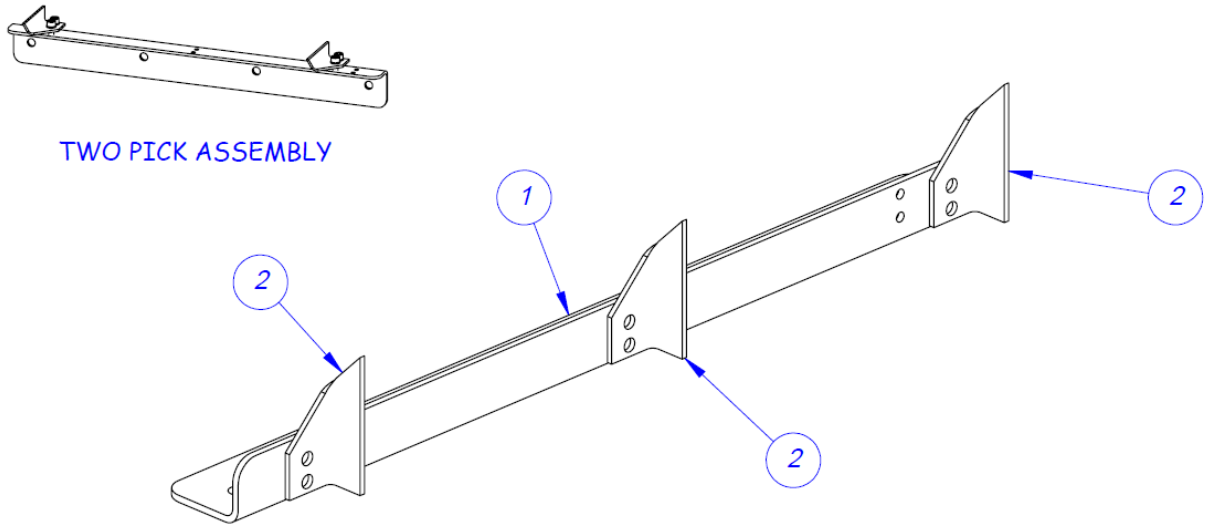
5.7 ST-1000 Claw Assembly

PN: TA-T20-3300

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3313	BACKUP PLATE
2	3	TP-T20M3303	CLAW

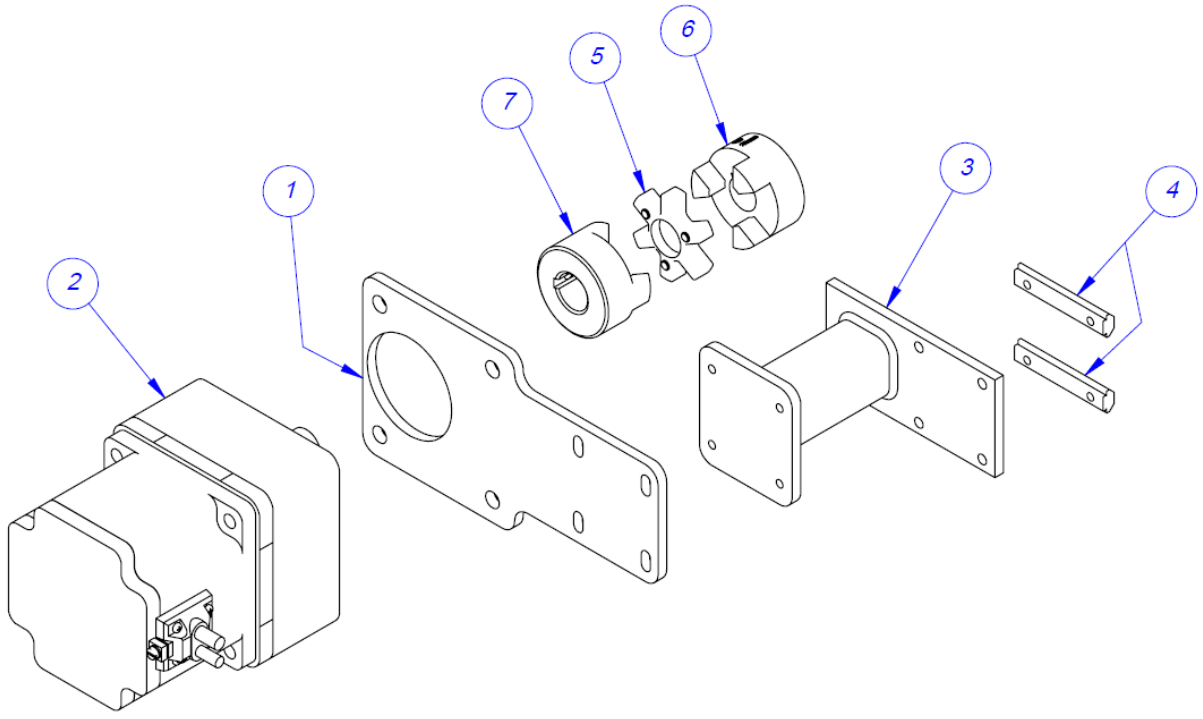


5.8 Claw Conveyor Direct Drive Assembly

PN: TA-T20-3300

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3319	MOTOR MOUNT PICK CONVEYOR
2	1	TP-501125 / 501132	MOTOR DRIVER COMBO
3	1	TP-T20M3218	MOTOR STAND-OFF
4	2	VP-DOR-300150M	TWO-HOLE T-BAR
5	1	TP-111161	BUNA-A-SPIDER 2-7/64” OD
6	1	TP-111162	FLEXIBLE SHAFT COUPLING, 20MM BORE
7	1	TP-111163	FLEXIBLE SHAFT COUPLING, 22MM BORE

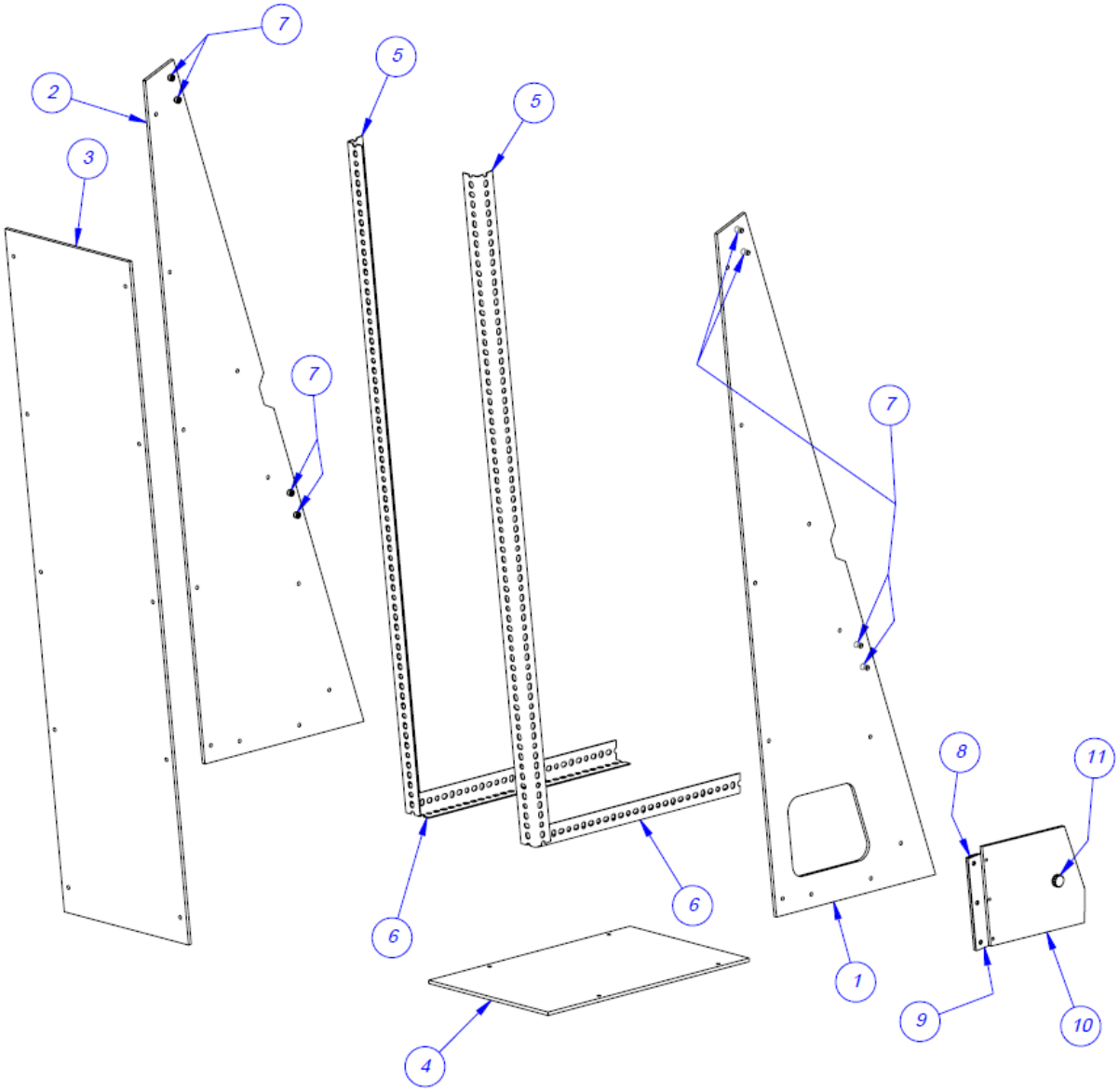
Note: Item 2 as TP-501128 is to be used on a 220V System. Item 2 as TP-501132 is to be used on a 110V System.



5.9 Lexan Conveyor Cover

PN: TA-T20-3300

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3321	ACCESS SIDE CONVEYOR GUARD
2	1	TP-T20M3322	MOTOR SIDE CONVEYOR GUARD
3	1	TP-T20M3320	FRONT CONVEYOR GUARD
4	1	TP-T20M3320	BASE GUARD
5	2	TP-T20M3324	FRONT ANGLE SUPPORT MODIFICATION
6	2	TP-T20M3325	BASE SUPPORT ANGLE MODIFICATION
7	8	PRESS-IN NUT	18-8 STAINLESS STEEL PRESS-FIT NUT
8	1	TP-T20M3329	HINGE SPACER
9	2	TP-T7M5028	DOOR HINGE
10	1	TP-T20M3328	ENCLOSURE DOOR
11	1	TP-109155	10-32 x 1/2" THREADED STEEL STUD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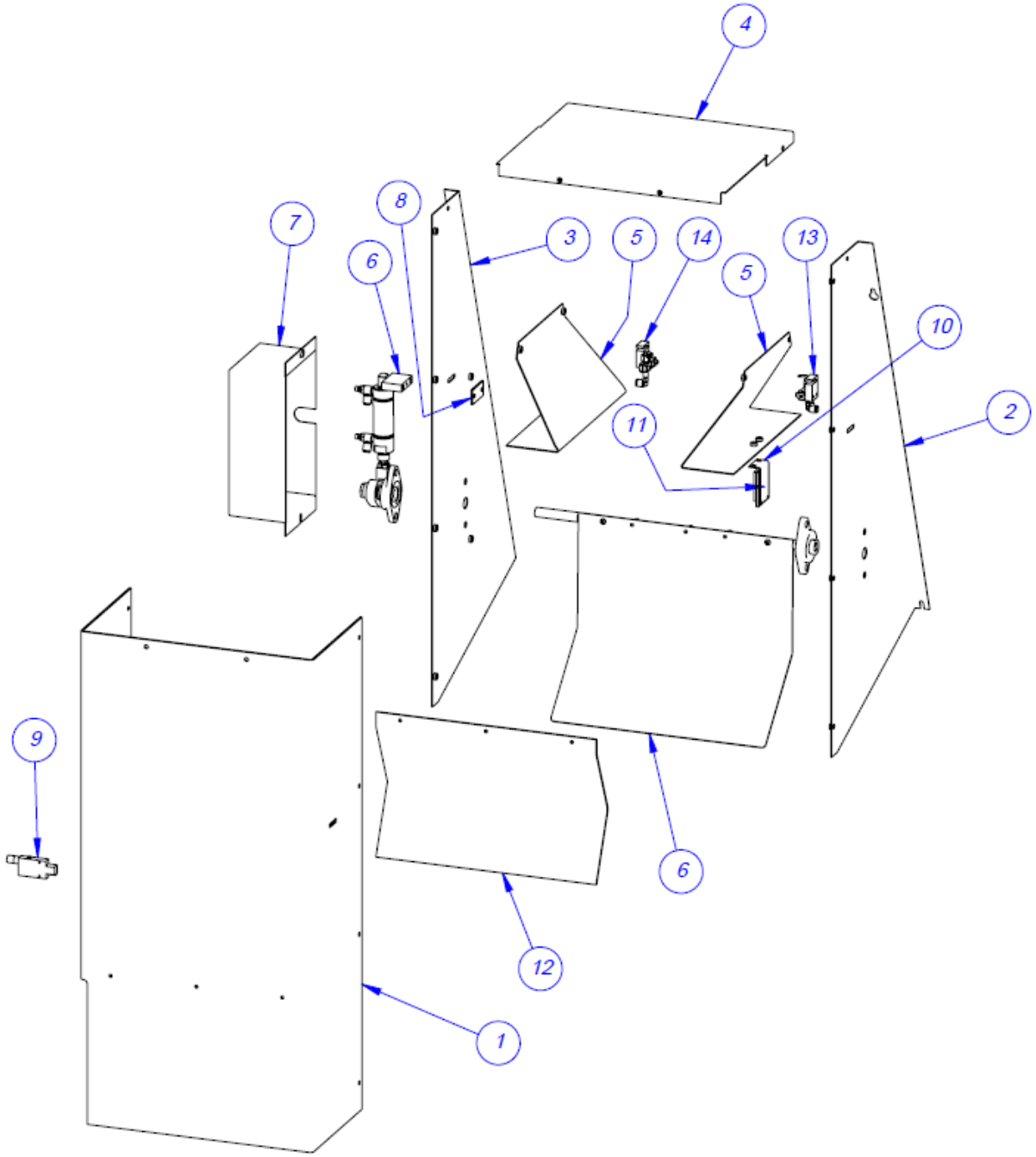
5.10 ST-1000 Accumulator Assembly

PN: TA-T20-3400

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3401	ACCUMULATOR LEXAN
2	1	TP-T20M3402	ACCUMULATOR SIDE (RIGHT)
3	1	TP-T20M3403	ACCUMULATOR SIDE (LEFT)
4	1	TP-T20M3406	ACCUMULATOR TOP
5	2	TP-T20M3408	ACCUMULATOR DIVERTER
6	1	ASSEMBLY	ACCUMULATOR GATE
7	1	TP-T20M3407	ACCUMULATOR. CYLINDER GUARD
8	1	TP-T1MBBO30-32	BACKING PLATE
9	1	TP-216116	PHOTO EYE
10	1	TP-T20M3410	ACCUMULATOR REFLECTOR MOUNT
11	1	TP-216101-1	REFLECTOR
12	1	TP-T20M3413	ACCUMULATOR PRODUCT STOP
13	1	ASSEMBLY	AIR ASSIST OPTION
14	1	ASSEMBLY	AIR ASSIST OPTION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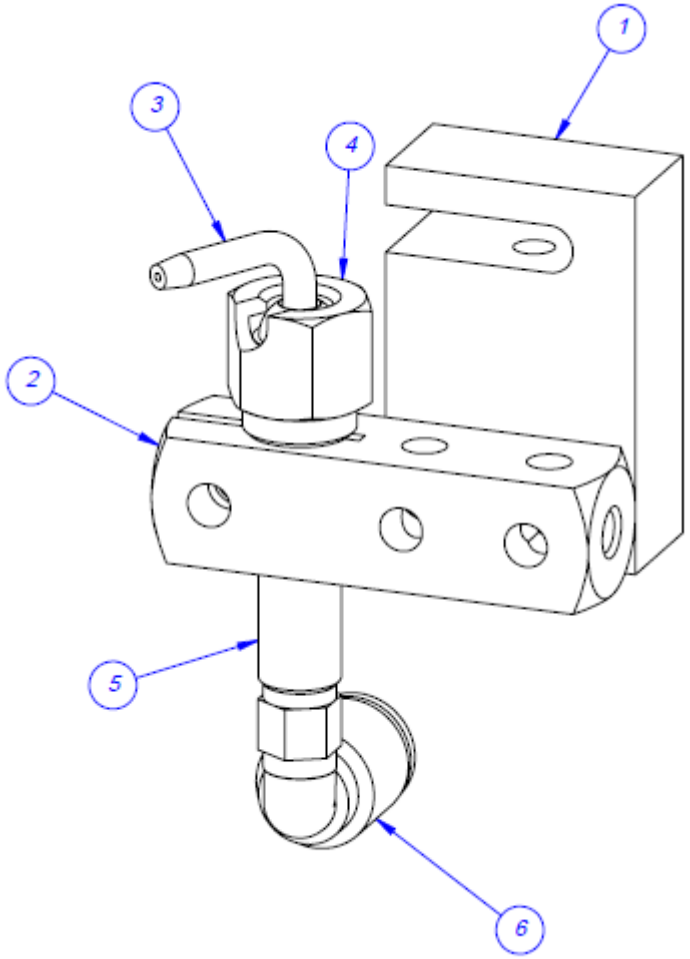
5.11 Air Assist

PN: TA-T20-3400

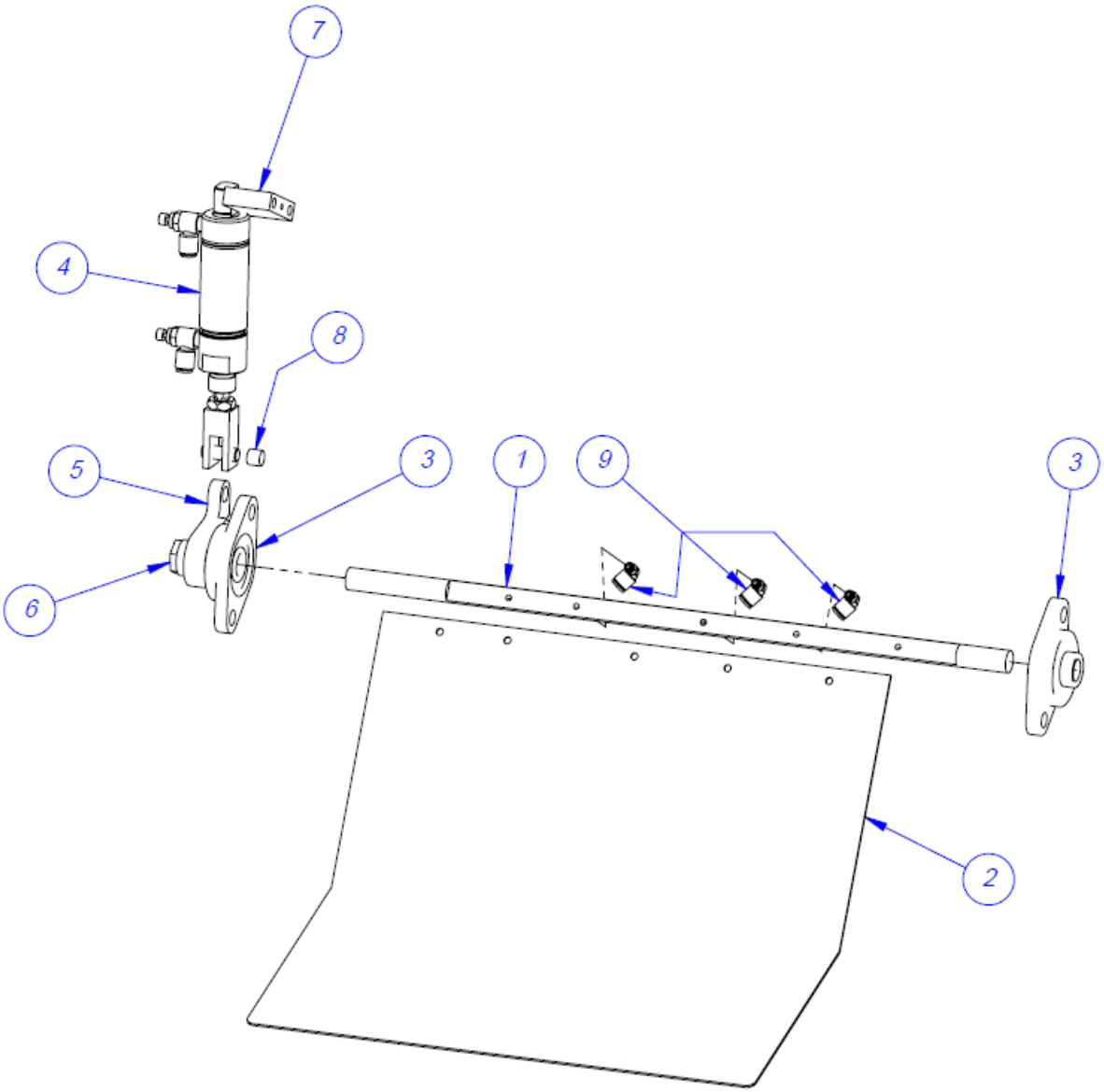
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP- T9MA8006	AIR ASSIST BLOCK
2	1	TP-401183	HOLDER, AIR JET
3	1	TP-401180	NOZZLE, 1/32" x 1", 90 DEG
4	1	TP-401184	NUT, ASSEMBLY, AIR JET BASE
5	1	TP-401182	BASE, 1" AIR JET
6	1	TP-401277	ELBOW, 1/4" TUBE x #10-32



5.12 ST-1000 Accumulator Gate Assembly

PN: TA-T20-3400

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M3404	ACCUMULATOR SHAFT
2	1	TP-T20M3405	ACCUMULATOR GATE
3	2	TP-107138	(2) BOLT FLANGE BEARING, 5/8" SHAFT
4	1	TP-403482	PNEUMATIC CYLINDER
5	1	TP-AF10130	LEVER ARM
6	1	TP-107400	5/8” BORE KEYLESS BUSHING
7	1	TP-T1MBO30-2	MOUNT BLOCK
8	1	TP-107136	SLEEVE BEARING
9	3	TP-401277	ELBOW, 1/4” TUBE X #10-32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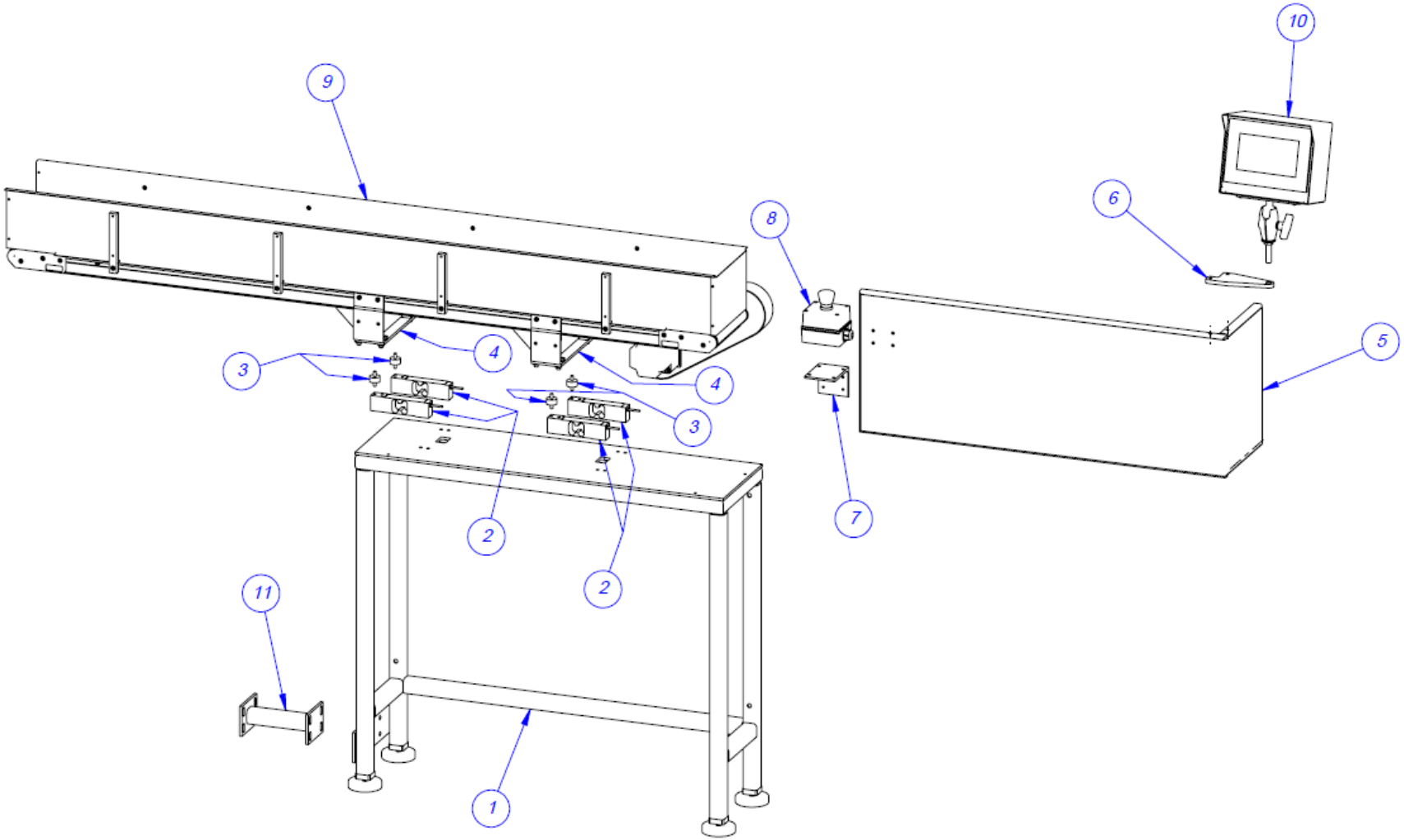
5.13 ST-1000 Scale Assembly Layout

PN: TA-T20-4000

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	ASSEMBLY	SCALE SUPPORT
2	4	TP-750006	LOAD CELL, 15kg
3	4	TP-110761-1	VIBRATION MOUNT, NEOPRENE
4	2	TP-T20M4004	CONVEYOR TIE PLATE
5	1	TP-T20M4003	SCALE GUARD
6	1	TP-T20M4002	TOUCH SCREEN MOUNT
7	1	TP-T20M4005	E-STOP MOUNT
8	1	TA-T1-ES10	E-STOP ASSEMBLY
9	1	EX-T20-4200	CONVEYOR ASSEMBLY
10	1	TA-T10240IOP	IOP TOUCH SCREEN
11	1	TP-T20M4007	TAKE-AWAY REGISTER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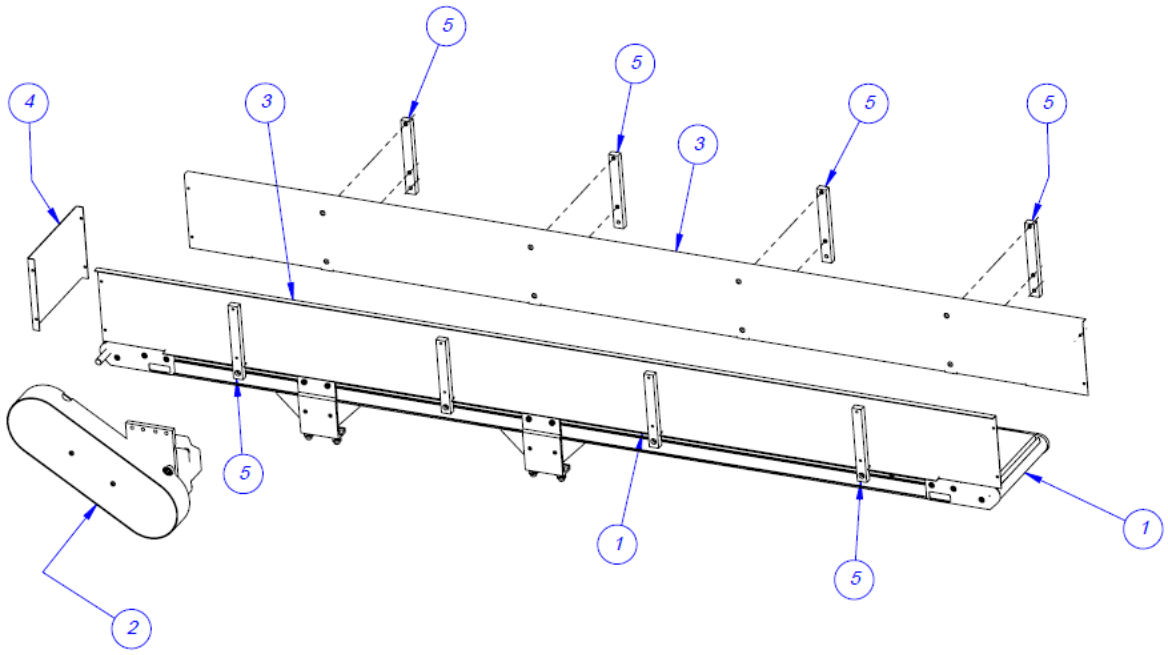
5.14 ST-1000 Scale Conveyor Assembly

PN: TA-T20-4000

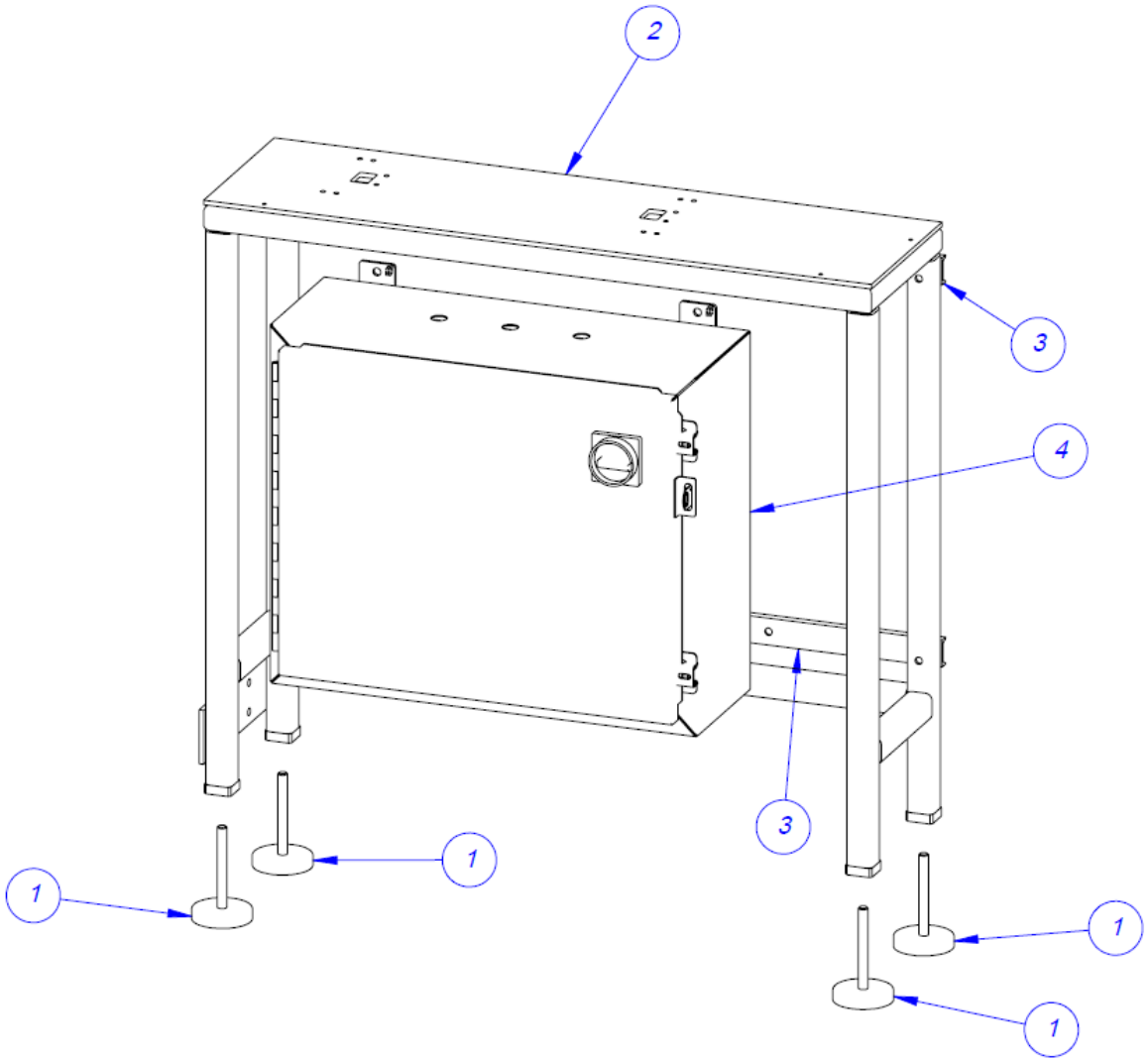
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	D2910951	6-FOOT CONVEYOR
2	1	TA-T3-2000	2200 SERIES DRIVE ASSEMBLY
3	2	TP-T20M4202	SIDE RAIL
4	1	TP-T20M4203	END RAIL
5	8	TP- T20M4201	SIDE RAIL MOUNT



5.15 ST-1000 Scale Frame Assembly

PN: TA-T20-4000

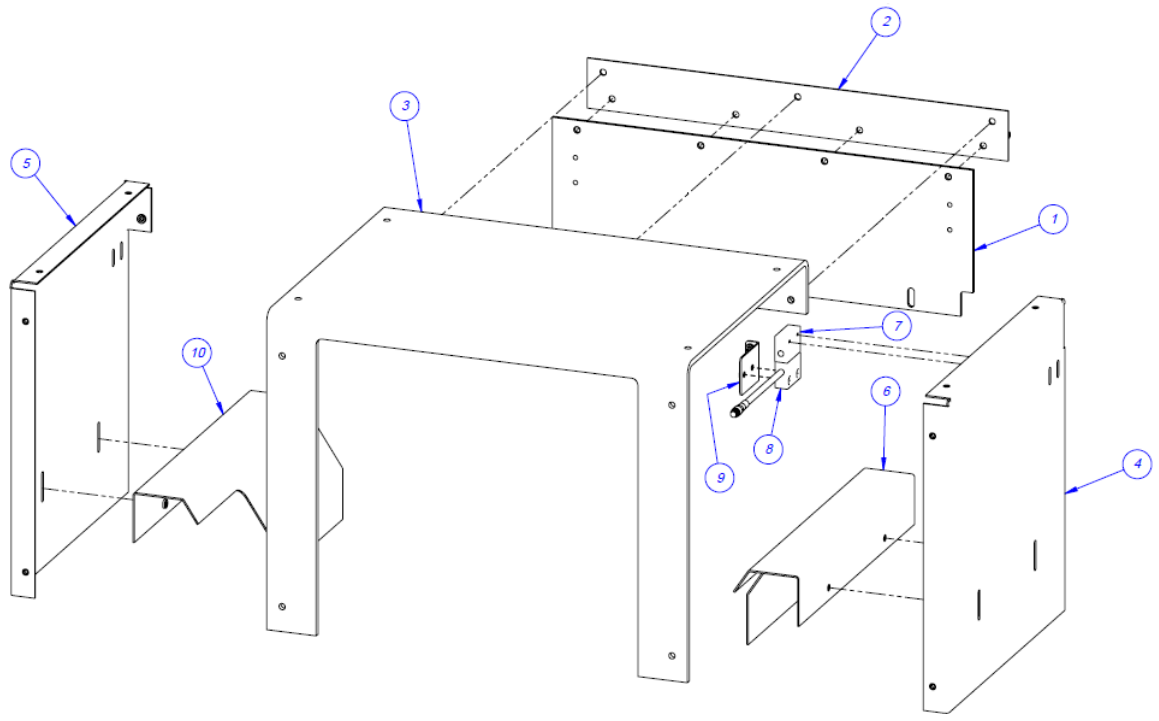
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	4	TP-110764	LEVELING MOUNT WITH POLYPRO
2	1	TP-T20M4101	SCALE FRAME WELDMENT
3	2	TP-T20M1101	DRIVE BOX MOUNT
4	1	TA-T20-1100	BOX ASSEMBLY



5.16 ST-1000 Scale Guard Assembly

PN: TA-T20-5000

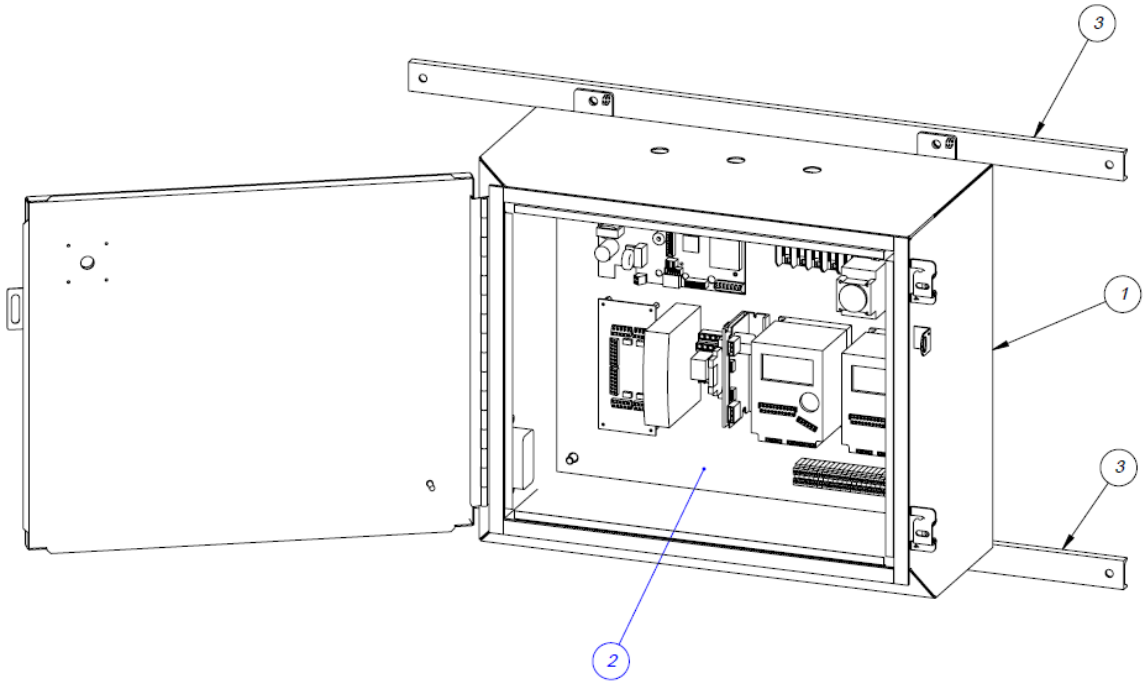
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T20M5001	GUARD MOUNT
2	1	TP-T20M5002	GUARD HINGE
3	1	TP-T20M5003	GUARD LEXAN
4	1	TP-T20M5004	GUARD SIDE (RIGHT)
5	1	TP-T20M5005	GUARD (LEFT)
6	1	TP-T20M5006	GUARD DIVERTER (RIGHT)
7	1	TP-215352	MAGNETIC SAFETY SWITCH
8	1	TP-215352	MAGNETIC SAFETY SWITCH
9	1	TP-T20M5007	SAFETY SWITCH MOUNT
10	1	TP-T20M5008	GUARD DIVERTER (LEFT)



5.17 ST-1000 Electronics Assembly

PN: TA-T20-1100

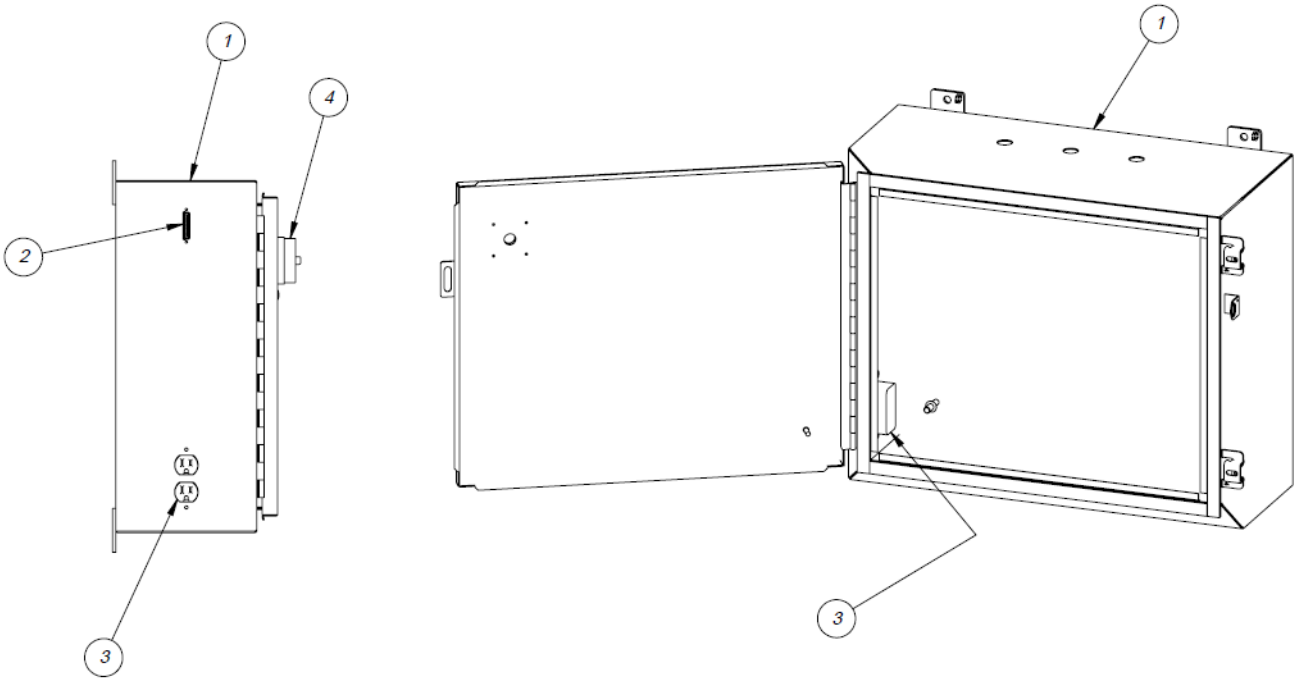
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1		BOX ASSEMBLY
2	1		PANEL ASSEMBLY
3	2	TP-T20M1101	DRIVE BOX MOUNT



5.18 ST-1000 Electrical Box Assembly

PN: TA-T20-1100

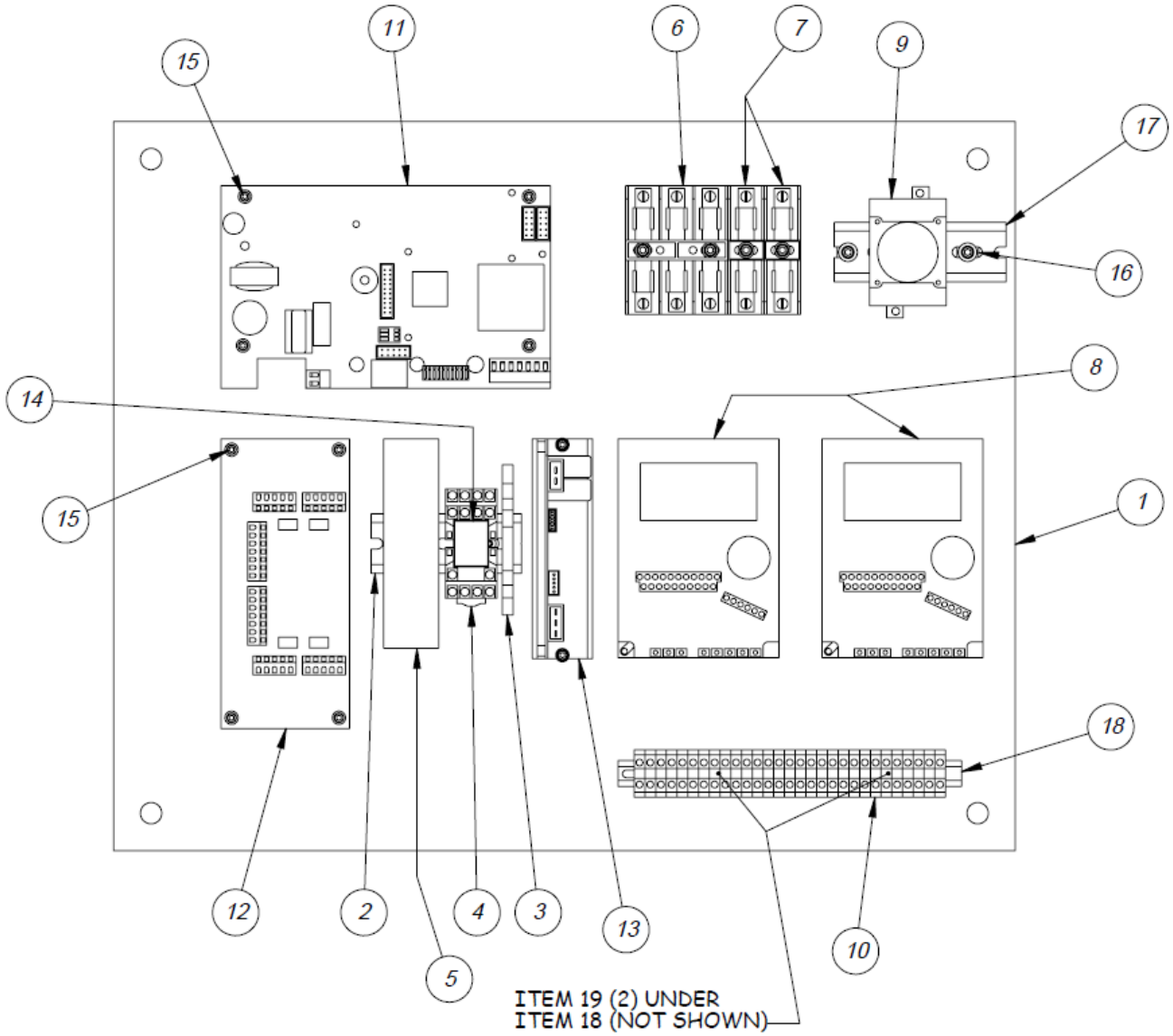
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-225150	ENCLOSURE MODIFICATION
2	1	TP-212248	CONNECTOR, MULTIPOLE RECTANGULAR
3	1	TP-212553	110 VAC OUTLET
4	1	TP-215004	ALLEN BRADLEY LOTO KNOB



5.19 ST-1000 Electronic Panel Assembly

PN: TA-T20-1100

ITEM NO.	QTY.	Part No	DESCRIPTION
1	1	TP-T20M1103	ST-1000 CONTROL PANEL
2	1	TP-218020	DIN RAIL
3	1	TP-215050	ALLEN BRADLEY 700-TBS24
4	1	TP-215020	RELAY SOCKET
5	1	TP-213427	POWER SUPPLY
6	1	TP-207061	FUSE HOLDER
7	2	TP-207060	FUSE HOLDER
8	2	TP-501128	VEXTA DRIVER
9	1	TP-215005	SWITCH
10	29	TP-208142	LARGE TERMINAL BLOCK
11	1	TP-750102	SCALE CONTROLLER
12	1	TP-750105	SUMMING BOARD
13	1	TP-501111	DRIVER BOARD
14	1	TP-215021	RELAY
15	8	TP-214277	NYLON #6-32 X 3/4”
16	2	TP-ST1000-1106	LOTO STAND-OFF
17	1	TP-218020	DIN RAIL
18	1	TP-218021	DIN RAIL
19	2	TP-214270	STAND-OFF #6-32 X 2”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ITEM 19 (2) UNDER
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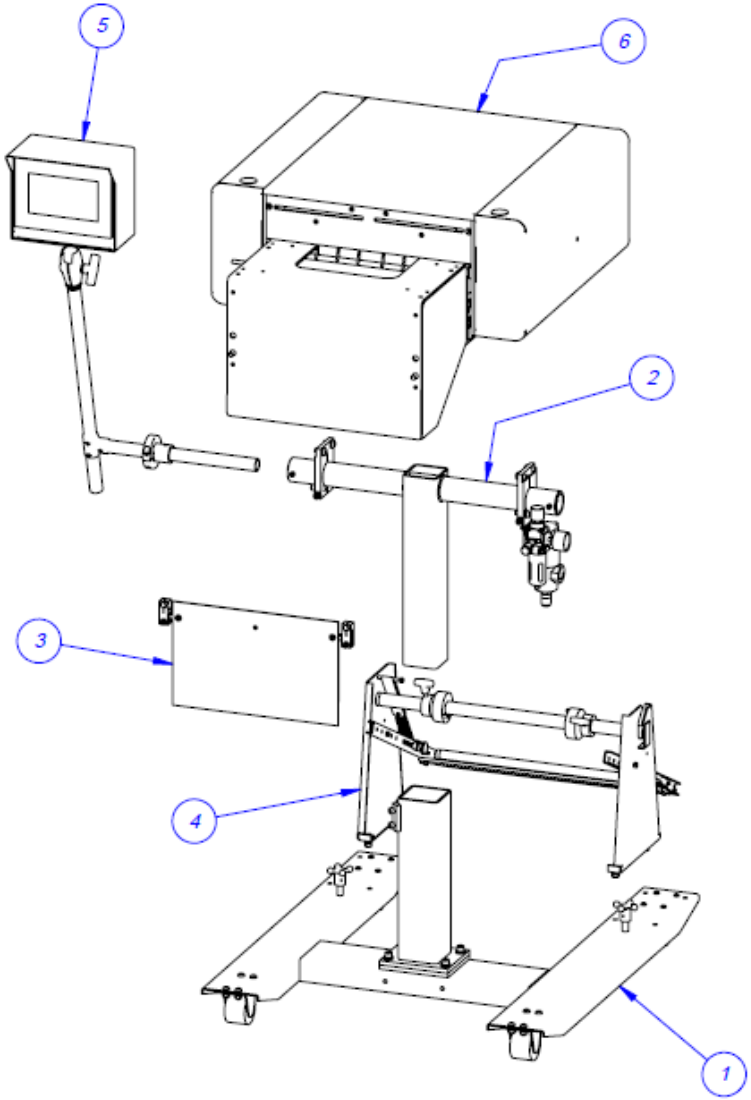
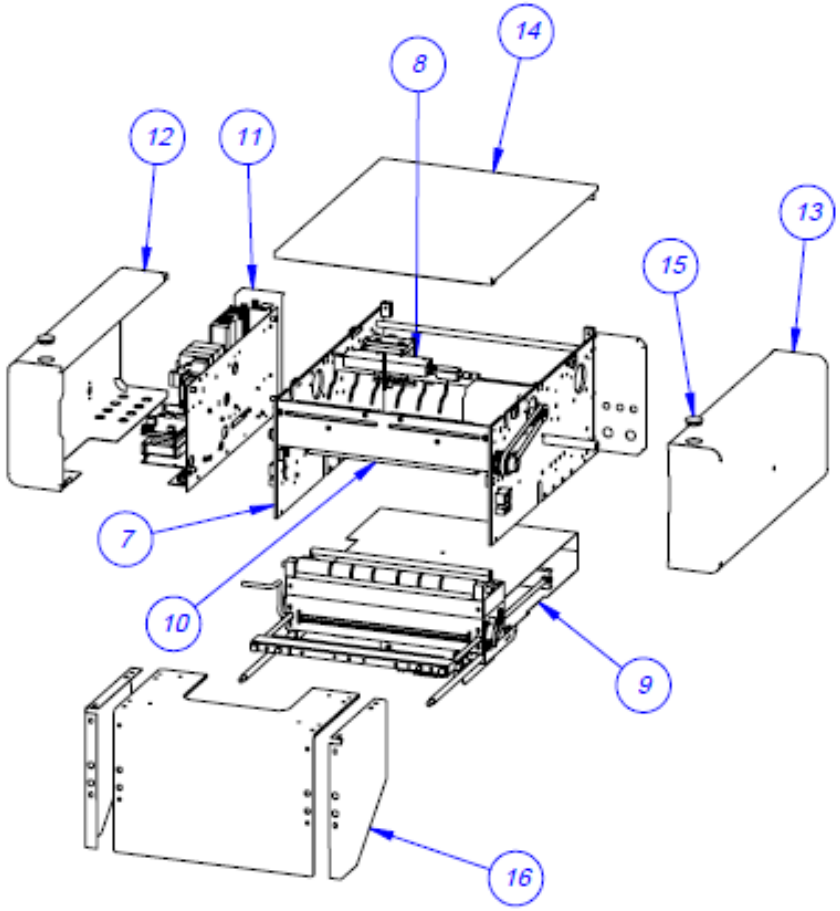
5.20 T-1000-S14 Advanced Poly-Bagger

T-T1000-S14

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TA-T10200	BASE ASSEMBLY
2	1	TA-T10210	UPPER COLUMN ASSEMBLY
3	1	TA-T10018	FLAT LOAD SHELF ASSEMBLY
4	1	TA-T10220	DANCER ASSEMBLY
5	1	TA-T10240	IOP (TOUCH SCREEN)
6	1	SEE ASSEMBLY	BAGGER W/OUT PRINTER
7	1	TA-T10250-S14	MAIN FRAME ASSEMBLY
8	1	TA-T10001-S14	AIR KNIFE ASSEMBLY
9	1	TA-T10280-S14	NBO SEAL DROP FRAME
10	1	TA-T10002-S14	UPPER ROLLER ASSEMBLY
11	1	TA-T10270-S14	ELECTRICAL PANEL
12	1	TP-T1MD00004-S14	ELECTRONICS COVER
13	1	TP-T1MD00005S14	RIGHT SIDE COVER
14	1	TP-T1MD00044	TOP COVER
15	2	TP-111241	SNAP BUTTON PLUG
16	1	SEE ASSEMBLY	LEXAN GUARD W/SIDE GUARDS



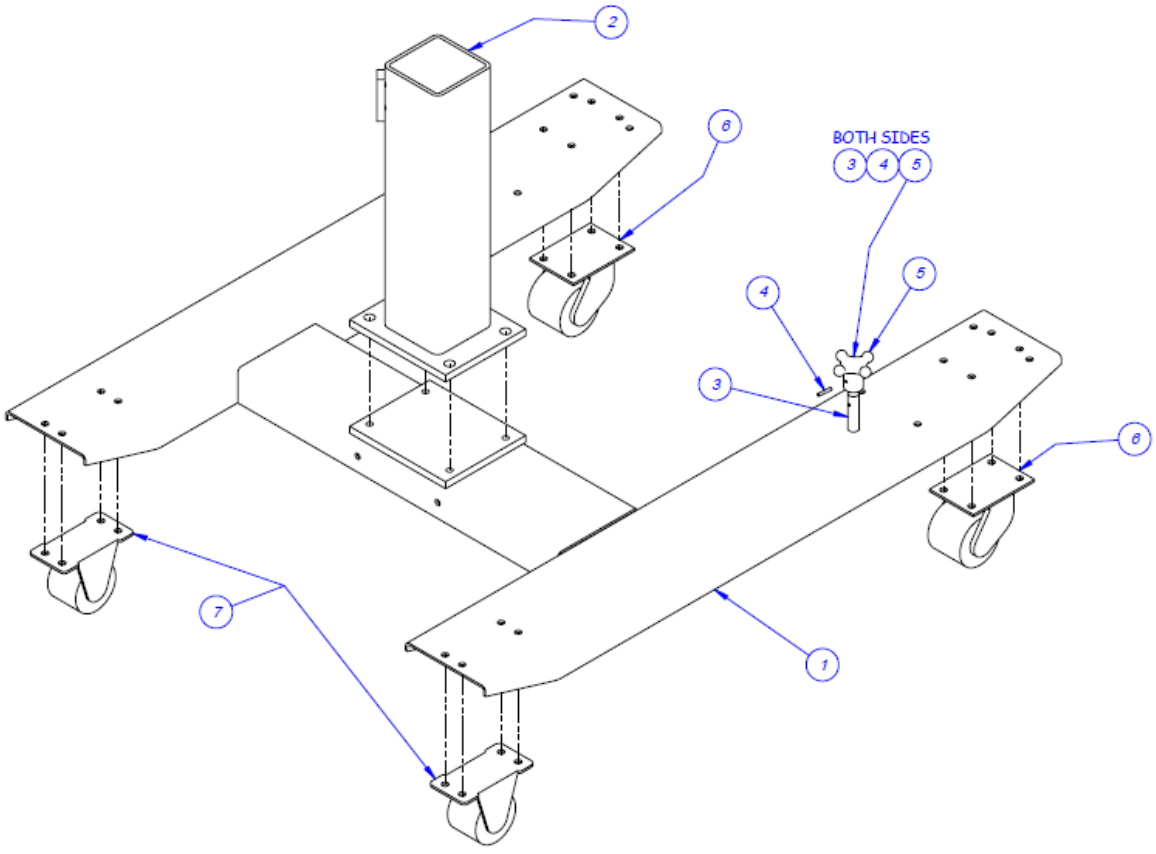


VIEW FROM INSIDE BAGGER

5.21 T-1000-S14 Base Assembly

PN: TA-T10200

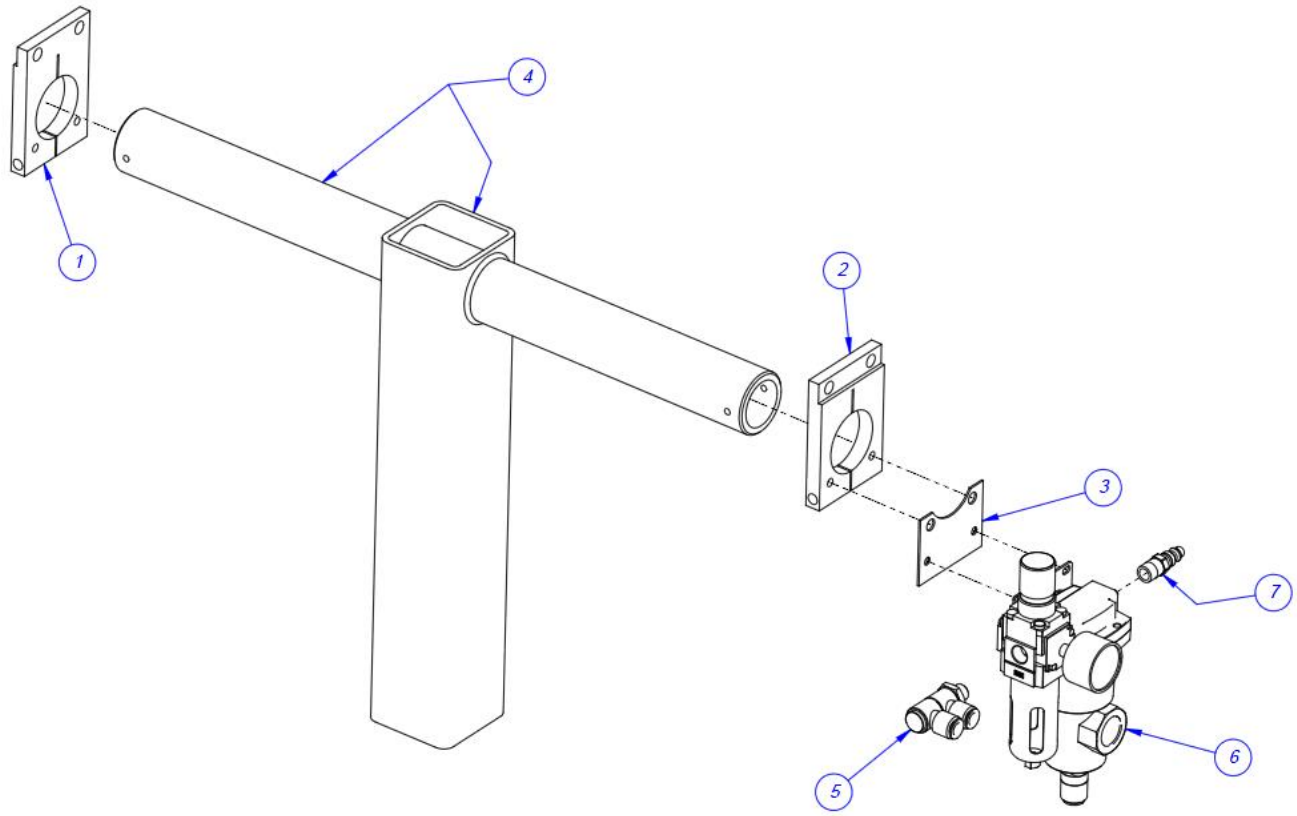
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T1MA00051	LOWER BASE WELDMENT
2	1	TP-T1MA00051-1	LOWER COLUMN
3	2	TP-106094	STUD, FLOOR LEVELER
4	2	TP-106119	SPRING PIN
5	2	TP-109148	HAND KNOB
6	2	TP-110756	CASTER, SWIVEL
7	2	TP-110763	CASTER, RIGID



5.22 T-1000-S14 Upper Column Assembly

PN: TA-T10210

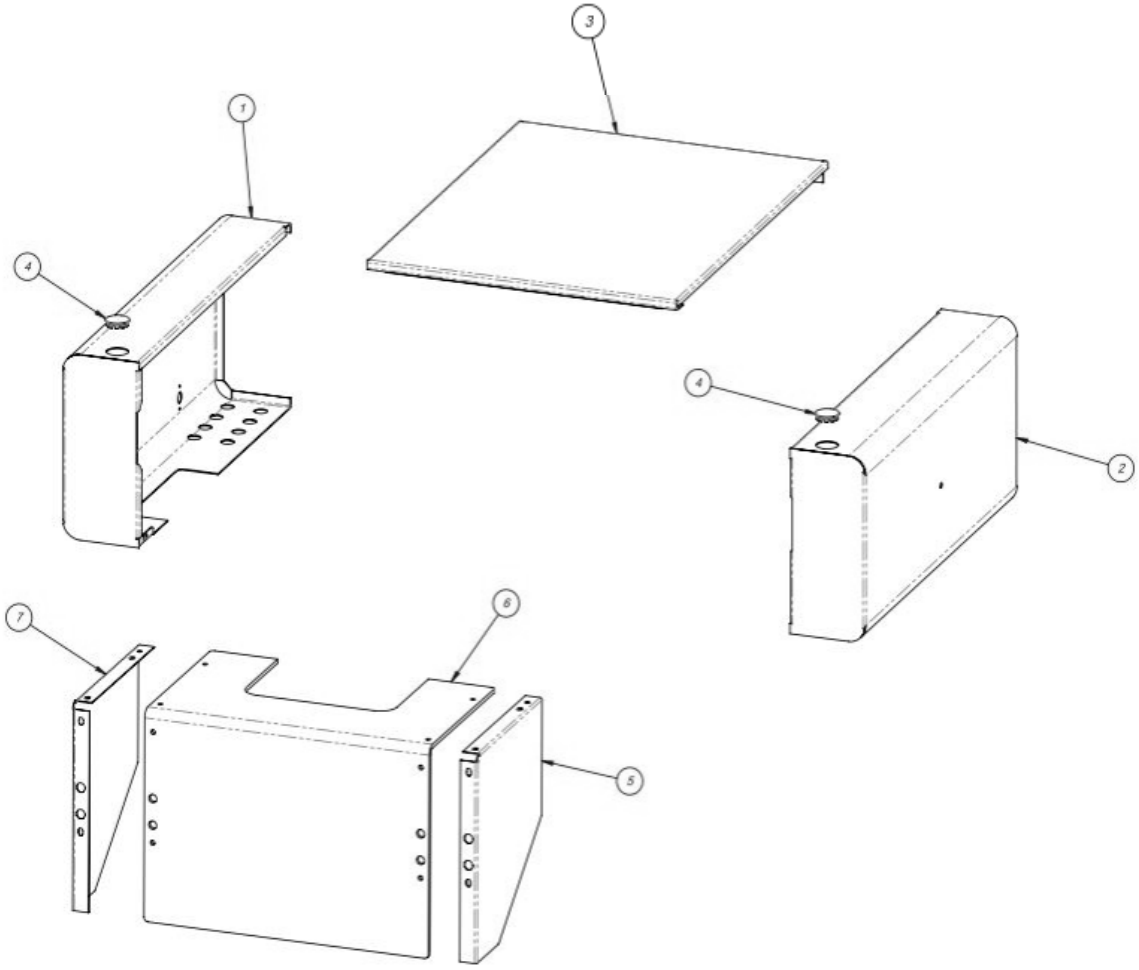
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T1MC00019-1	BASE CLAMP (L. H.)
2	1	TP-T1MC00019-2	BASE CLAMP (R. H.)
3	1	TP-T1MC00019-3	BRACKET, MOUNTING
4	1	TP-T1MA00087	CROSS PIPE
5	1	TP-401267	ELBOW, DOUBLE UNIVERSAL
6	1	TP-406260	FILTER/DRYER/REG. ASSEMBLY
7	1	TP-401222	HEX NIPPLE



5.23 T-1000-S14 Covers and Guarding

PN: TA-T1-S14NOPRINT

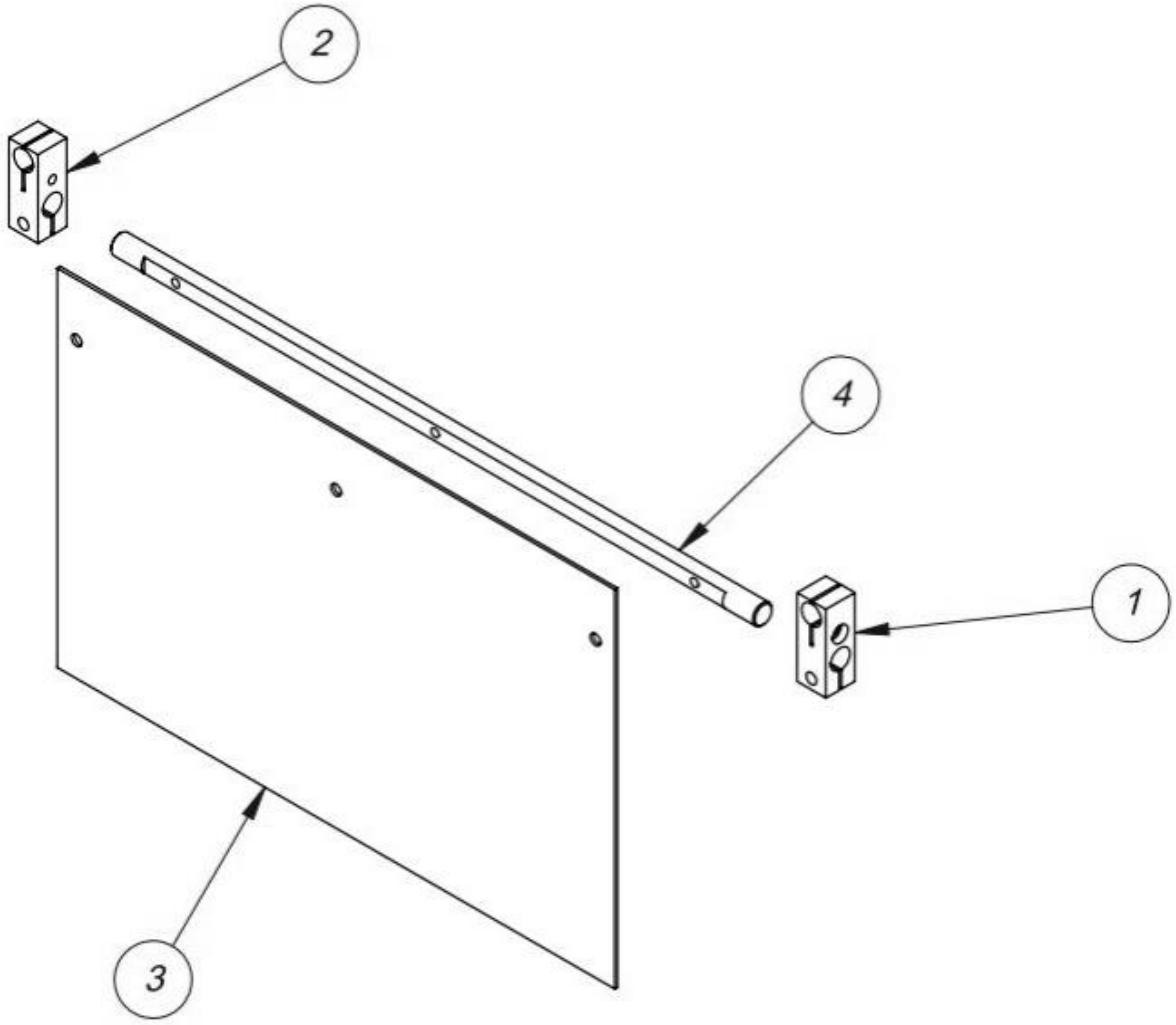
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MD00004-S14	ELECTRONICS COVER
2	1	TP-T1MD00005S14	RIGHT SIDE COVER
3	1	TP-T1MD00044	TOP COVER
4	2	TP-111241	SNAP BUTTON PLUG
5	1	TP-T1MO00226-4	LEXAN GUARD BRACKET (RIGHT)
6	1	TP-T1MD00116-2	LEXAN GUARD 5.25" PASS THROUGH
7	1	TP-T1MO00226-3	LEXAN GUARD BRACKET (LEFT)



5.24 T-1000-S14 Flat Load Shelf Assembly

PN: TA-T10018

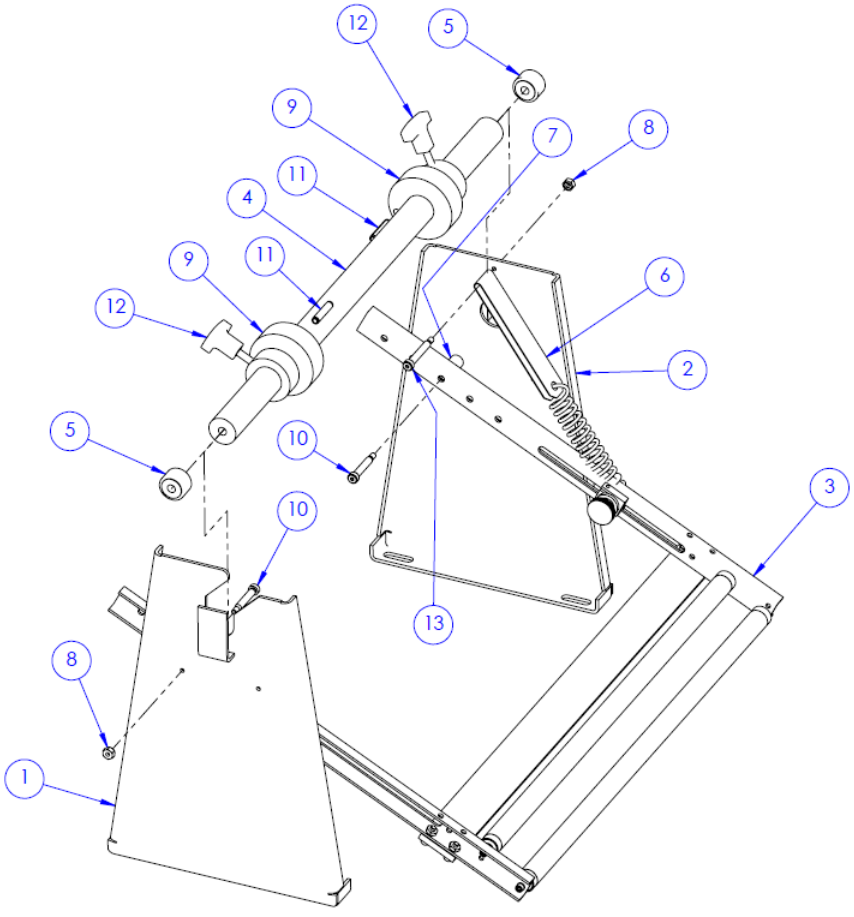
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MB00074-2	LOAD SHELF BRACKET (RIGHT)
2	1	TP-T1MB00074-1	LOAD SHELF BRACKET (LEFT)
3	1	TP-T1MB00075	9" FIXED LOAD SHELF
4	1	TP-T1MB00076	LOAD SHELF ROD



5.25 T-1000-S14 Dancer Assembly

PN: TA-T10220

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T1MA00069-1	DANCER SIDE PLATE
2	1	TP-C1MA00069-2	DANCER SIDE PLATE
3	1	TA-T10011	DANCER GUIDE SUB-ASSEMBLY
4	1	TP-T1MA00073	BAG ROLL SHAFT
5	2	TP-504132	CAM FOLLOWER
6	1	TP-T1MA00115	BELT TENSION STRAP & SPRING
7	2	TP-104148	SPACER
8	3	TP-101141	LOCKNUT, HEX #10-24
9	2	TP-T1MA00049	FILM TENSION HUB
10	2	TP-103307	SCREW, SHOULDER 1/4"D X 1-1/4"L X 10-24
11	2	TP-106106	SPRING PIN
12	2	TP-109212-1	"T" KNOB
13	1	TP-103583	SCREW, SHOULDER 1/4"D X 1-1/2"L X 10-24



Dancer Guide Subassembly

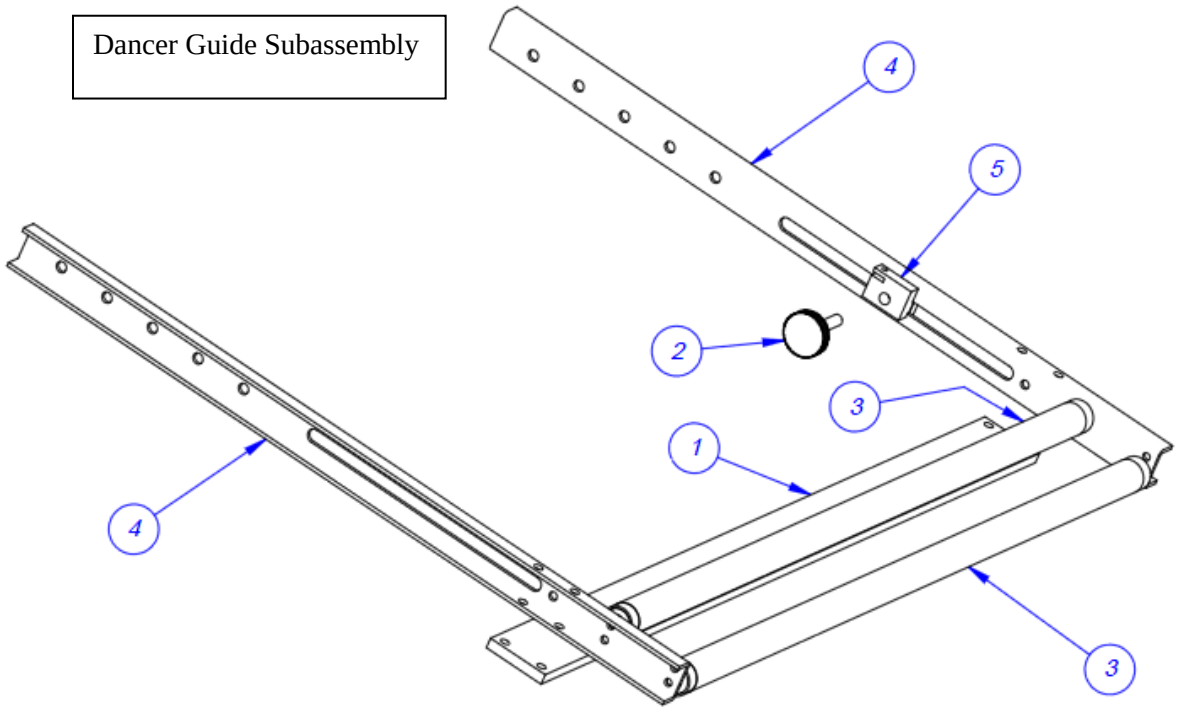
PN: TA-T10011

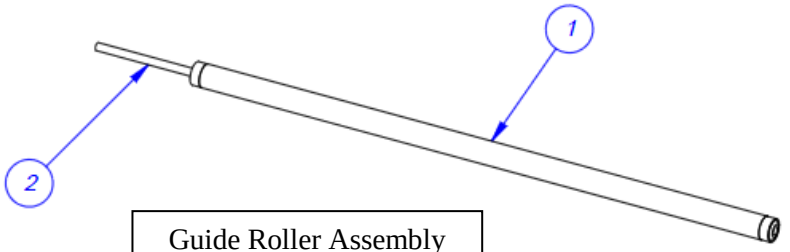
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T1MA00081	DANCER TENSION BAR CROSS BRACE
2	1	TP-109212	KNOB
3	2	TP- T1MA00072	DANCER TENSION BAR
4	1	TP-T1MA00186	TENSION ADJUSTER
5	2	ASSEMBLY	GUIDE ROLLER ASSEMBLY

Guide Roller Assembly

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T1MA00089	DANCER GUIDE ROLLER
2	1	TP-T1MA00090	DANCER GUIDE ROLLER SHAFT

Dancer Guide Subassembly



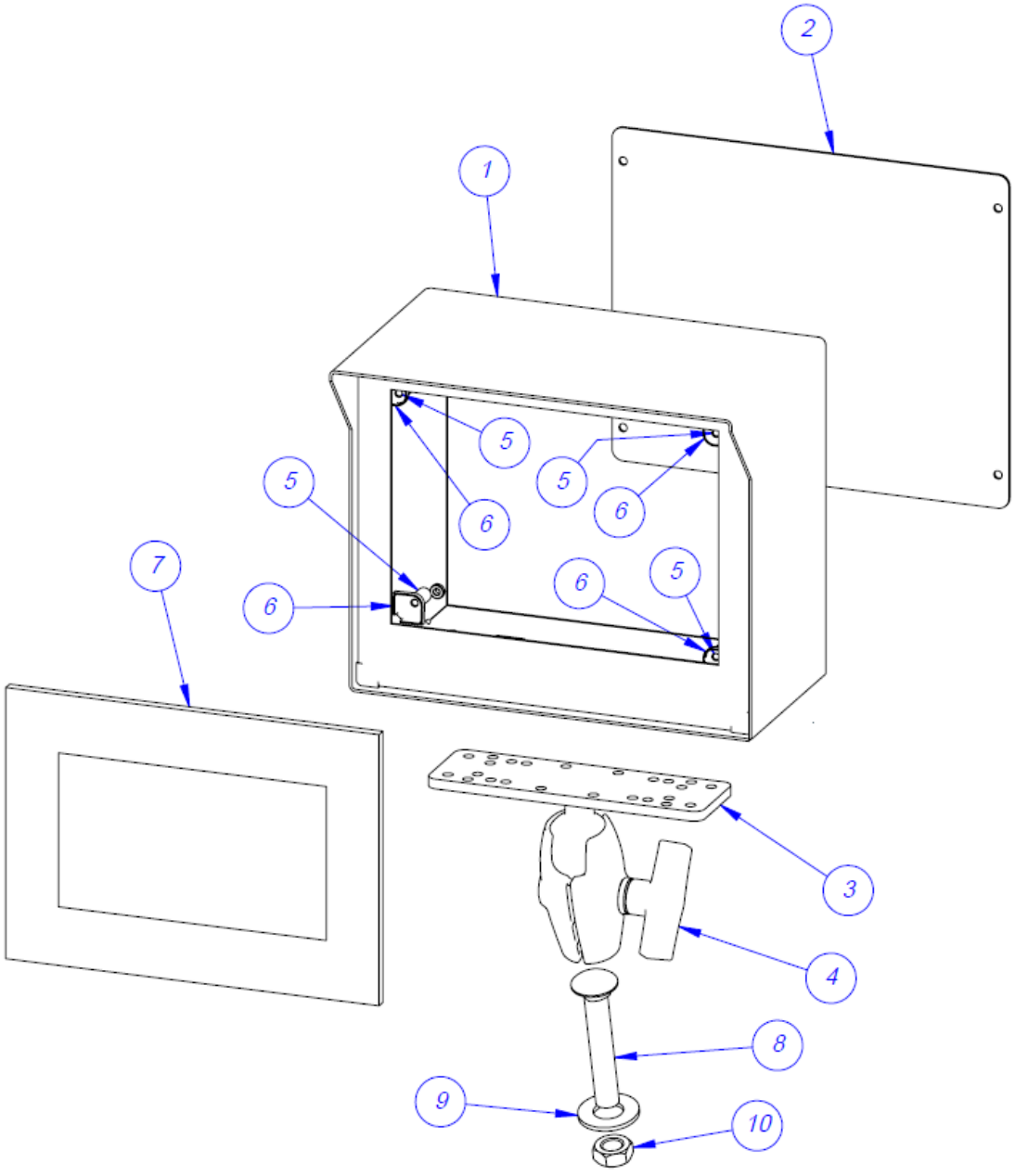


Guide Roller Assembly

5.26 Seven Inch Touch Screen

TA-T10240IOP

ITEM NO.	QTY.	PART No	DESCRIPTION
1	1	TP-T1MD00040	TOUCH SCREEN HOUSING
2	1	TP-T1MD00040-1	BACK COVER
3	1	TP-111131	BALL GRIP POSITIONING ARM
4	1	TP-111125-2	SOCKET ARM
5	4	PART OF TP-220363	SCREEN STUD
6	4	PART OF TP-220363	SCREEN CLIP
7	1	TP-220364	TOUCH SCREEN
8	1	TP-103474	MODIFIED BOLT
9	1	TP-102147	WASHER, 5/8” FLAT
10	1	TP-101125	NUT, 1/2-13 HEX JAM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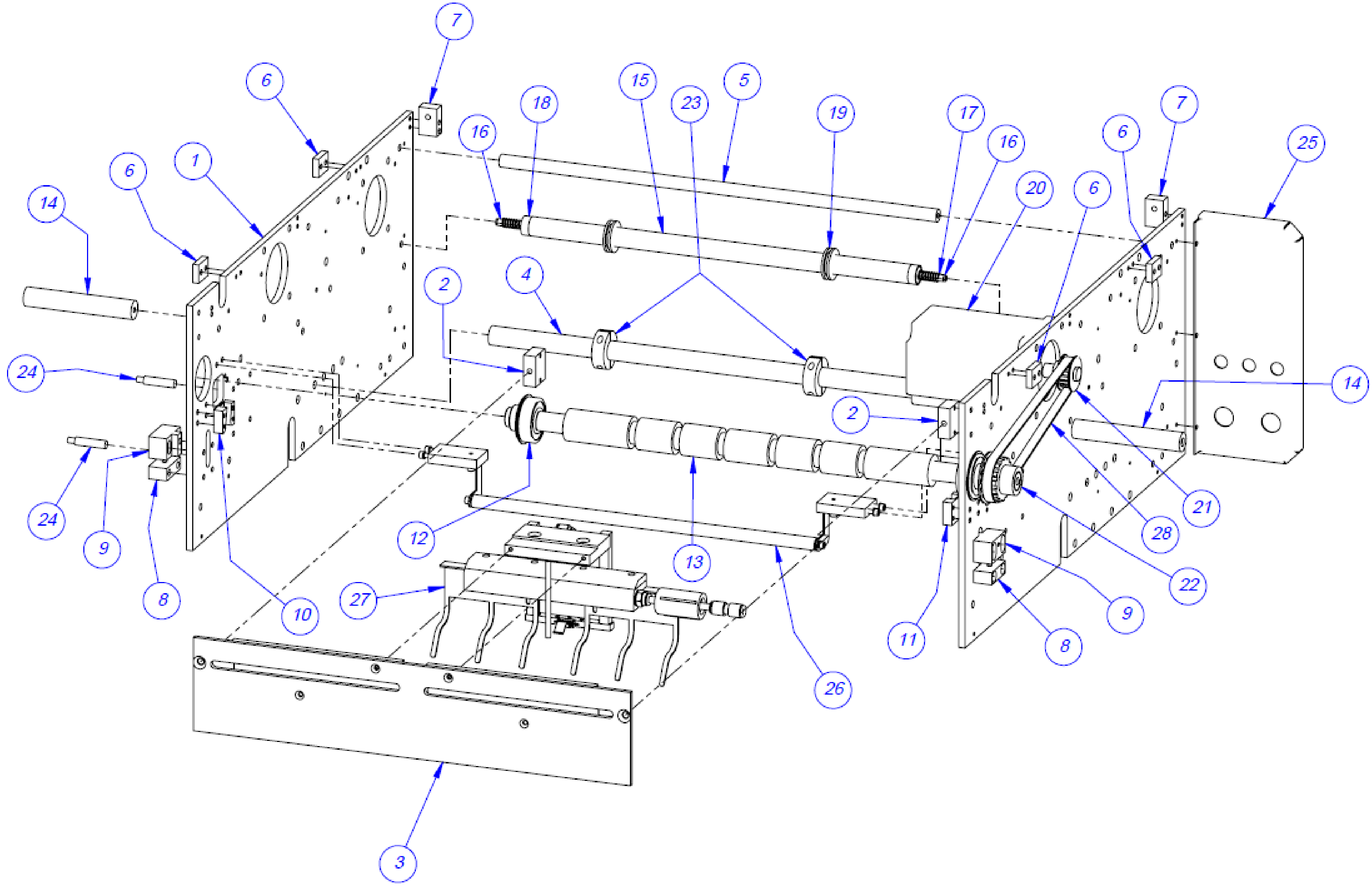
5.27 T-1000-S14 Main Frame Assembly

PN: TA-T10250-S14

ITEM NO.	QTY.	Part No	DESCRIPTION
1	2	TP-T1MC00001S14NB	SIDE FRAME
2	2	TP- T1MC00044	FACE PLATE BLOCK
3	1	TP- T1MC00042NB	FACE PLATE
4	1	TP-T1MC00079	CYLINDER PIVOT SHAFT
5	1	TP-T1MC00056	REAR CROSS SUPPORT SHAFT
6	4	TP-T100054	COVER SUPPORT CLAMP
7	2	TP-T1MC00099	REAR COVER SUPPORT
8	2	TP-T1MC00058	LATCH ADJUSTER BLOCK
9	2	TP-T1MC00059	LATCH LOCK BLOCK
10	1	TP-T1MC00163-2	GUIDE BLOCK - RH
11	1	TP-T1MC00163-1	GUIDE BLOCK - LH
12	2	TP-504113	BEARING
13	1	TP-T1MC00017	RUBBER ROLLER
14	2	TP-T1MC00082	COVER STAND-OFF
15	1	TP-T1MC00052	GUIDE ROLLER
16	2	TP-106106	SPRING PIN
17	2	TP- 108099	COMPRESSION SPRING
18	2	TP-504101	BEARING
19	2	TP-111010	SPRING CLOSURE COLLAR
20	1	TP-501170	S14 STEPPER MOTOR
21	1	TP-T14M1027	MOTOR PULLEY
22	1	TP- T1MC00161	DRIVEN PULLEY
23	2	TP-111142	CLAMP, COLLAR
24	2	TP-215200	MAGNETIC SWITCH
25	1	TP-T1MD00010-S14	PNEUMATICS BACK PANEL
26	1	TA-T10002-S14	UPPER ROLLER ASSEMBLY
27	1	TA-T1-10001-S14	AIR KNIFE ASSEMBLY
28	1	TP-502104	BELT 210XL037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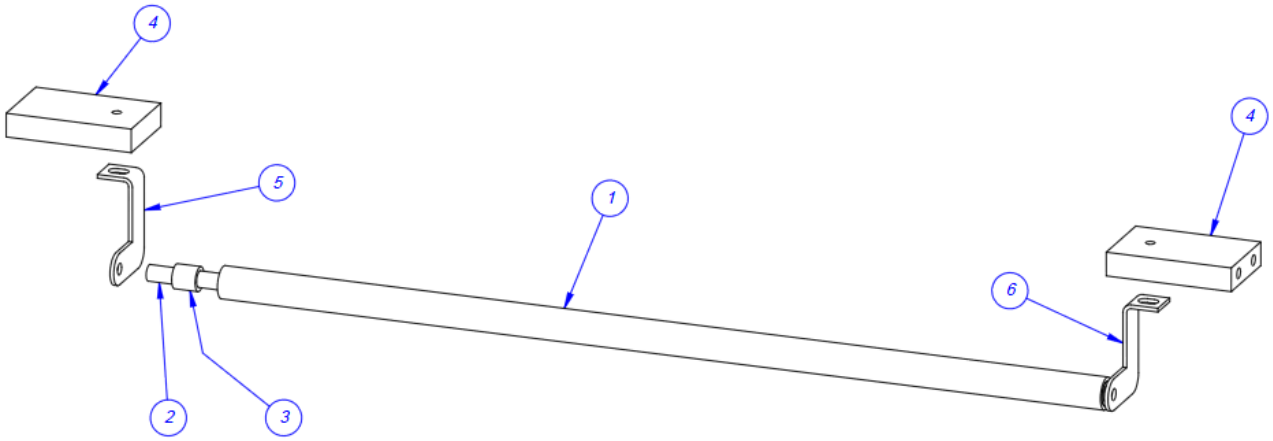
5.28 T-1000-S14 Upper Roller Subassembly

PN: TA-T10002-S14

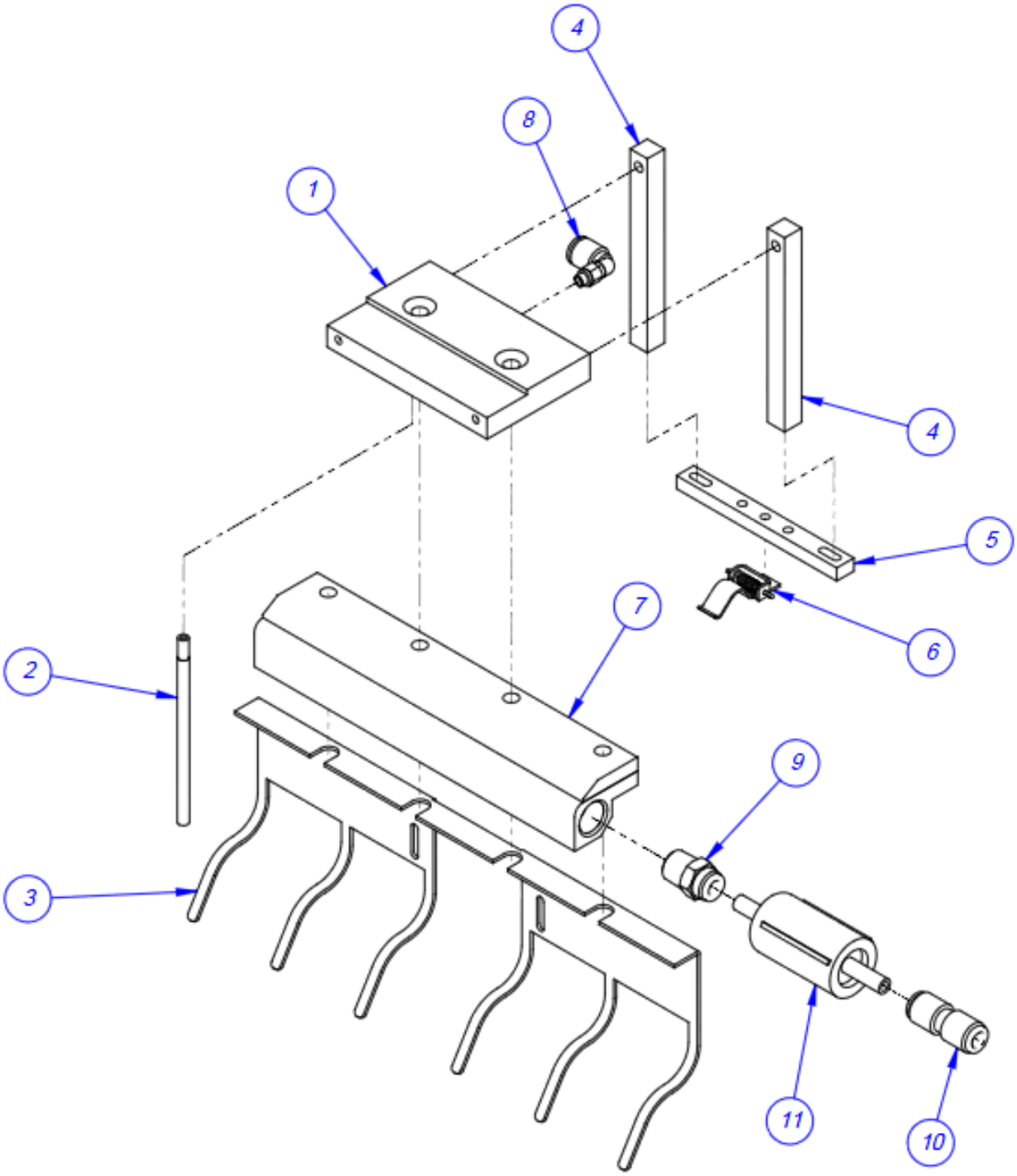
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MC00119	FILM WEB ROLLER
2	1	TP-T1MC00120	FILM WEB ROLLER SHAFT
3	2	TP-107177	BUSHING, 1/4” ID, 3/8 OD, 0.375 LONG
4	2	TP-T1MC00018-S14	ROLLER MOUNT
5	1	TP-T1MC00118-1	FILM WEB ROLLER BRACKET LEFT
6	1	TP-T1MC00118-2	FILM WEB ROLLER BRACKET RIGHT



5.29 T-1000-S14 Air Knife Assembly

PN: TA-T10001-S14

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-BP-1013-S14	MOUNTING BAR
2	1	TP-BP-1015-S14	AIR NOZZLE
3	1	TP-T1MC00020NB	FINGER PLATE
4	2	TP-T1MC00125S14	SENSOR MOUNTING BAR
5	1	TP-T1MC00083	HIGH VOLTAGE SENSOR INSULATOR
6	1	TA-T100124-1	HIGH VOLTAGE SENSOR
7	1	TP-405268	AIR KNIFE
8	1	TP-401277	ELBOW, 1/4” TUBE
9	1	TP-401292	STRAIGHT, 1/4” POLY x 1/4” NPT
10	1	TP-401262	UNION, STRAIGHT 1/4” TUBE
11	1	TP-406181	FILTER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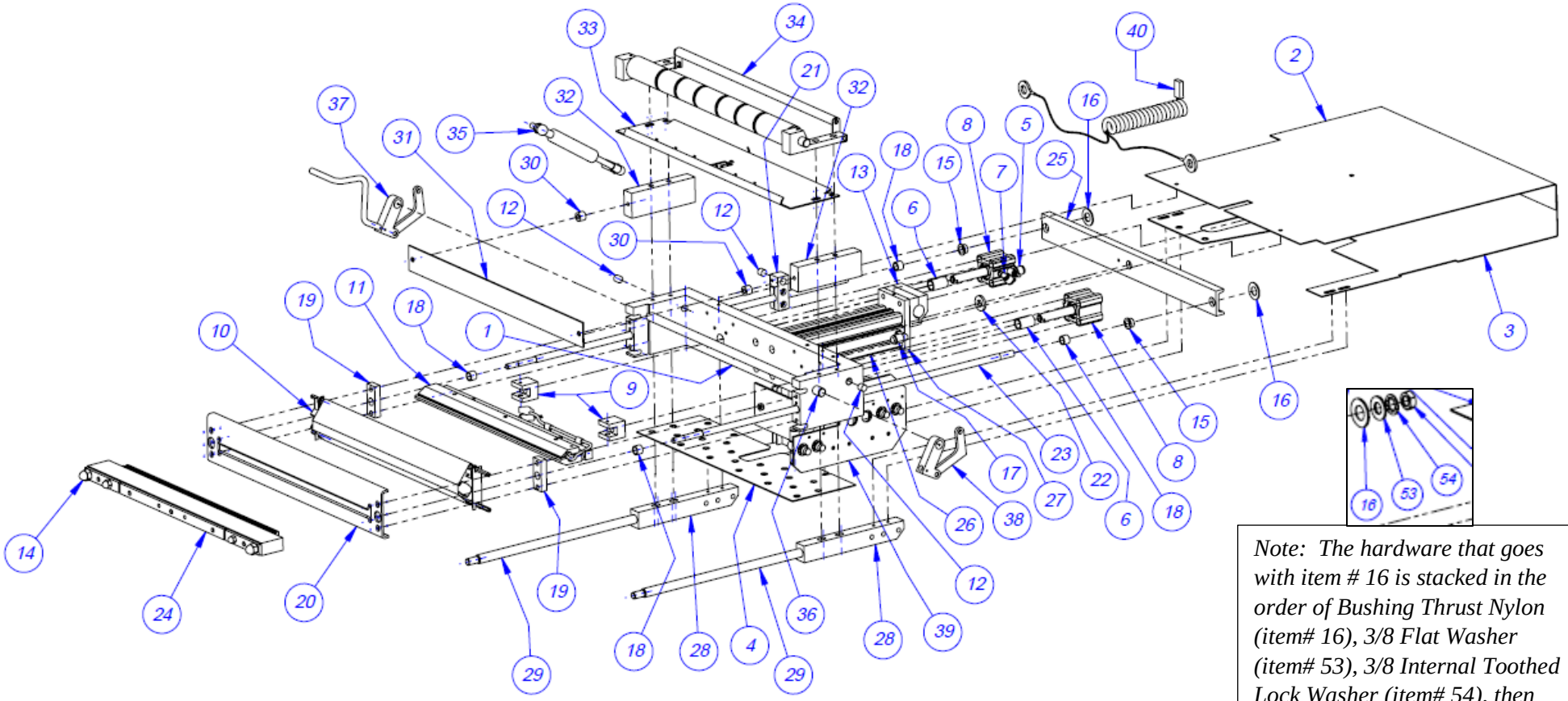
5.30 T-1000-S14 Sealer Frame Assembly: Drop Frame

PN: TA-T10280-S14

ITEM NO.	QTY.	Part No	DESCRIPTION
1	1	TP-T1MB00200	SEALER FRAME
2	1	TP-T1MD000276	NBO INTERNAL GUARD (4.25” PASS-THROUGH)
2	1	TP-T1MD00276NB-1	NBO INTERNAL GUARD (5.25” PASS-THROUGH)
2	1	TP-T1MD000276-2	NBO INTERNAL GUARD (6.25” PASS-THROUGH)
2	1	TP-T1MD000276-3	NBO INTERNAL GUARD (7.25” PASS-THROUGH)
3	1	TP-T1MD000275	BOTTOM INTERNAL GUARD (4.25” PASS-THROUGH)
3	1	TP-T1MD00275NB-1	BOTTOM INTERNAL GUARD (5.25” PASS-THROUGH)
3	1	TP-T1MD000275-2	BOTTOM INTERNAL GUARD (6.25” PASS-THROUGH)
3	1	TP-T1MD000275-3	BOTTOM INTERNAL GUARD (7.25” PASS-THROUGH)
4	1	TP-T1MD00277NB	SHORT INTERNAL GUARD
5	2	TP-402186	FLOW CONTROL, #10-32
6	2	TP-107127-1	BRONZE BUSHING
7	2	TP-401277	ELBOW, 1/4" TUBE
8	2	TP-403245	AIR CYLINDER
9	2	TP-T1MB00057	HEATER BAR YOKE
10	1	TA-T10009	PTFE GUIDE SUB-ASSEMBLY
11	1	TA-T10006	HEATER BAR SUB-ASSEMBLY
12	3	TP-211374	MAGNET, ROUND
13	1	TP-T1MB00164	PIVOT CLAMP
14	2	TP-101132	NUT, ACORN 5/16-18
15	2	TP-107228	BUSHING, NYLON FLANGE
16	2	TP-107227	BUSHING, THRUST NYLON
17	2	TP-401257	ELBOW, 1/4" TUBE x 1/8 NPT
18	4	TP-107160	PTFE COATED BUSHING
19	2	TP-T1MB00027	GRIPPER SPACER
20	1	TP-T1MB00005	FRONT GRIPPER PLATE
21	1	TP-T1MB00107	MAGNETIC SENSOR HOUSING
22	1	TP-102254	WASHER, FENDER
23	2	TP-T1MB00033	SEAL GUIDE ROD (4.25” PASS-THROUGH)
23	2	TP-T1MB00033-1	SEAL GUIDE ROD (5.25” PASS-THROUGH)
23	2	TP-T1MB00033-2	SEAL GUIDE ROD (6.25” PASS-THROUGH)
23	2	TP-T1MB00033-3	SEAL GUIDE ROD (7.25” PASS-THROUGH)
24	1	TA-T10005	PRESSURE BAR SUB ASSEMBLY
25	1	TP-T1MB00010	SEALER ROD TIE
26	1	TP-403244	CYLINDER (4.25” PASS-THROUGH)
26	1	TP-403146	CYLINDER (5.25” PASS-THROUGH)
26	1	TP-403242	CYLINDER (6.25” PASS-THROUGH)
26	1	TP-403241	CYLINDER (7.25” PASS-THROUGH)
27	1	TP-T1MB00016	SEAL CYLINDER MOUNTING BLOCK
28	2	TP-T1MB00022	GUARD ROD MOUNTING BLOCK
29	2	TP-T1MB00144	SHIELD MOUNTING ROD (4.25” PASS-THROUGH)
29	2	TP-T1MB00144-1	SHIELD MOUNTING ROD (5.25” PASS-THROUGH)
29	2	TP-T1MB00144-1	SHIELD MOUNTING ROD (6.25” PASS-THROUGH)
29	2	TP-T1MB00144-1	SHIELD MOUNTING ROD (7.25” PASS-THROUGH)
30	2	TP-104210	SPACER, 3/8LG,1/2 DIA.,.252 HOLE
31	1	TP-T1MO00129	DROP FRAME FACE PLATE

32	2	TP-T1MO00023	DROP FRAME SPACER
33	1	TA-T10017	BAG FINGER GROUNDING ASSEMBLY
34	1	TA-T10012NB	GROOVED ROLLER MOUNTING SUB-ASSEMBLY.
35	1	TP-403507 (OR 8)	SEAL FRAME STRUT
36	1	TP-T1MB00063	LATCH SHAFT
37	1	TA-T10019LH	LEFT HAND LATCH ASSEMBLY
38	1	TA-T10019	NO HANDLE LATCH ASSEMBLY
39	1	TA-T10020-S14	MANIFOLD ASSEMBLY
40	1	TP-T1ME00209	SEAL BAR COIL CABLE



Note: The hardware that goes with item # 16 is stacked in the order of Bushing Thrust Nylon (item# 16), 3/8 Flat Washer (item# 53), 3/8 Internal Toothed Lock Washer (item# 54), then 3/8-16 Hex Jam Nut.

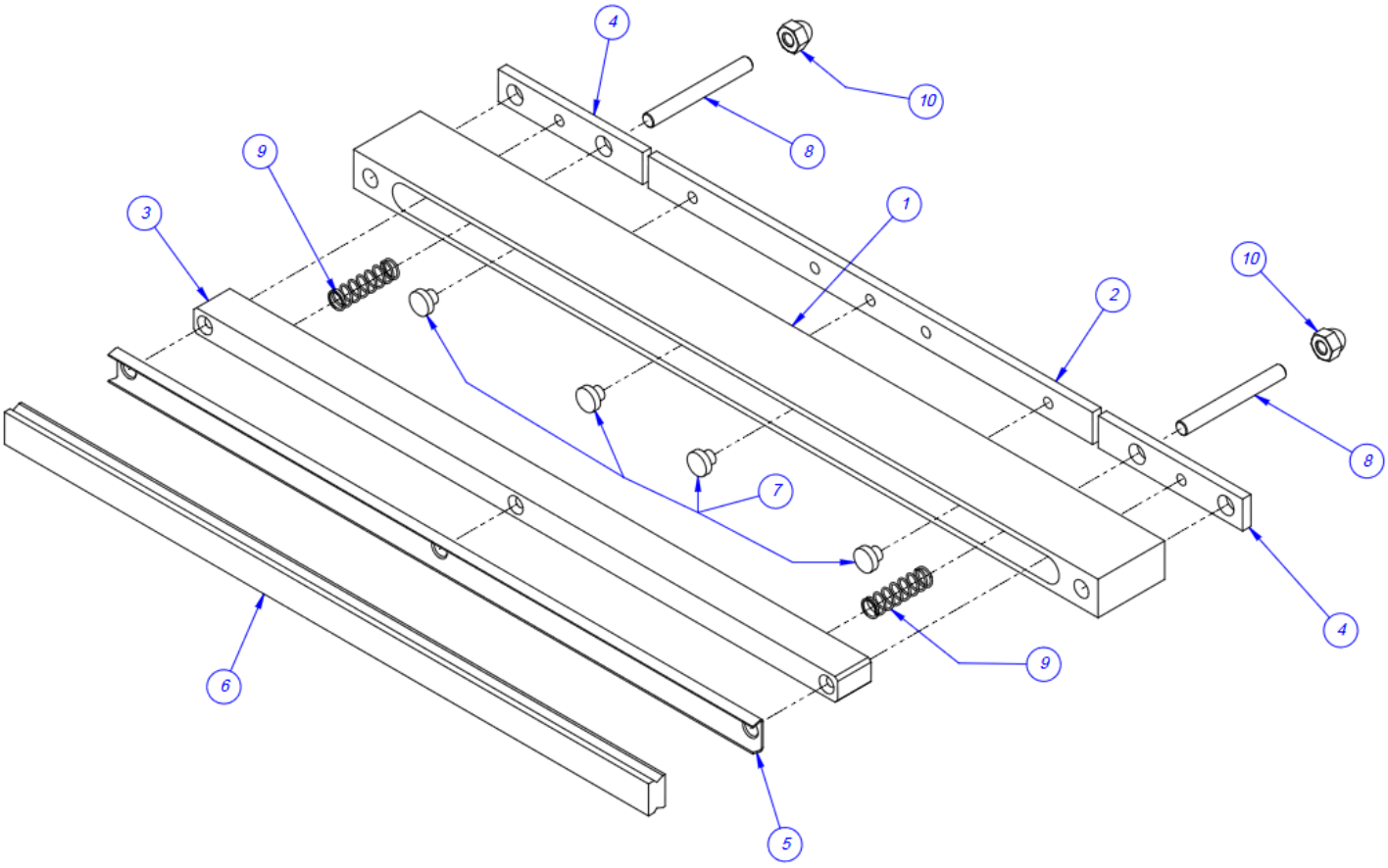
Note: If you purchased the T-1000-S14 with a Standard Frame instead of a Drop Frame, your part numbers for the Standard Sealer Frame Assembly are the same as those listed above with the exception of Item 30 TP-104210 Spacer, Item 31 TP-T1MO00129 Drop Frame Face Plate and Item 32 TP-T1MB00023 Drop Frame Spacer. Those three parts are not included in the Standard Frame Sealer Frame Assembly.

Note: Items 2, 3, 23, 26, and 29 will vary depending upon the Pass-Through size of the Bagger. Please note this when ordering parts from the Bill of Materials shown above. For example, a Bagger with a 6.25" Pass-Through will use NBO Internal Guard TP-T1MD000276-2, Bottom Internal Guard TP-T1MD000275-2, Seal Guide Rod TP-T1MB00033-2, Cylinder TP-403242, and Shield Mounting Rod TP-T1MB00144-2.

5.31 T-1000-S14 Pressure Bar Subassembly

PN: TA-T10005

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T1MB00029	ANTI-JAM PRESSURE HOUSING
2	1	TP-T1MB00030	ANTI-JAM CONTACT STRIP
3	1	TP-T1MB00031	ANTI-JAM PRESSURE PAD
4	2	TP-T1MB00068	ANTI-JAM CONTACT STRIP
5	1	TP-T1MB00111	RUBBER STRIP HOLDER
6	1	TP-306002	RUBBER SEAL
7	4	TP-300001	RUBBER BUMPER
8	2	TP-106093	1/4-20 x 2" STUD
9	4	TP-108155	COMPRESSION SPRING
10	2	TP-101130	Nut, 1/4-20 ACORN HEX

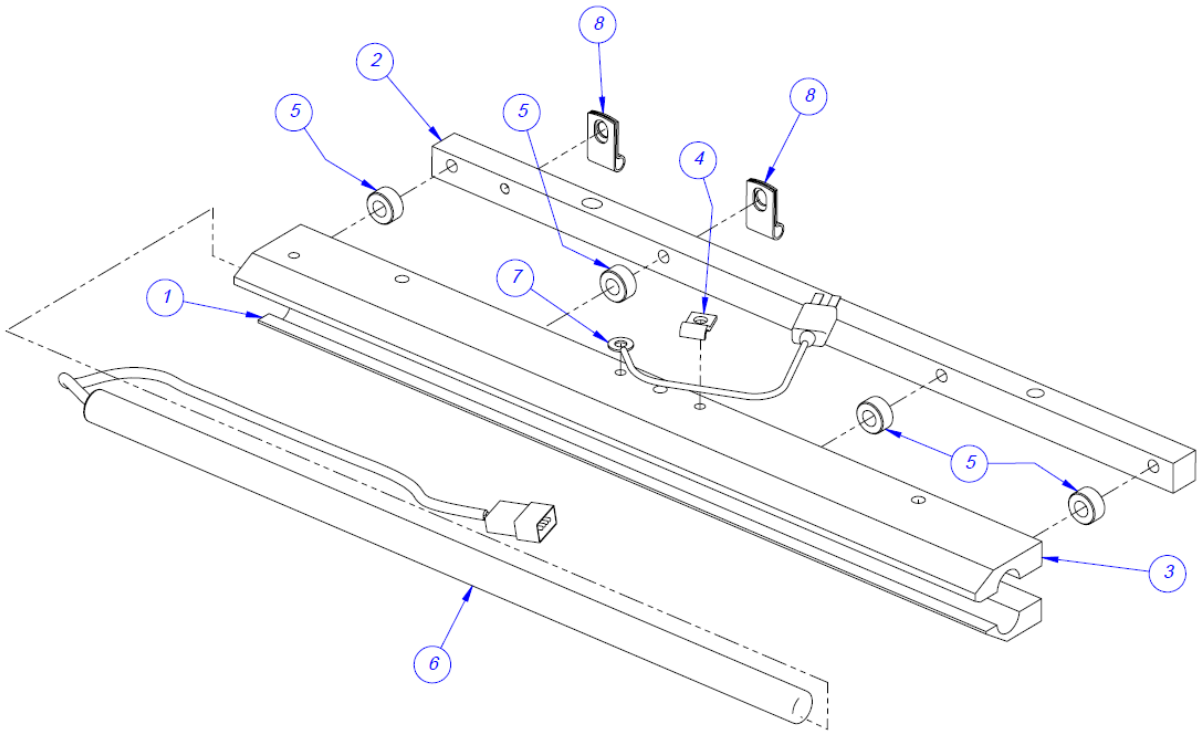


5.32 T-1000-S14 Heater Bar Subassembly

PN: TA-T10006

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MB00006	HEATER BAR CLAMP
2	1	TP-T1MB00008	HEATER BAR MOUNTING PLATE
3	1	TP-T1MB00009-1	1/8" SEAL BAR*
4	1	TP-T1MB00145	WIRE TIE DOWN
5	4	TP-104124	SPACER
6	1	TP-217116	CARTRIDGE, HEATER
7	1	TP-221416	THERMOCOUPLE WIRE
8	2	TP-109096	LOOP CLAMP

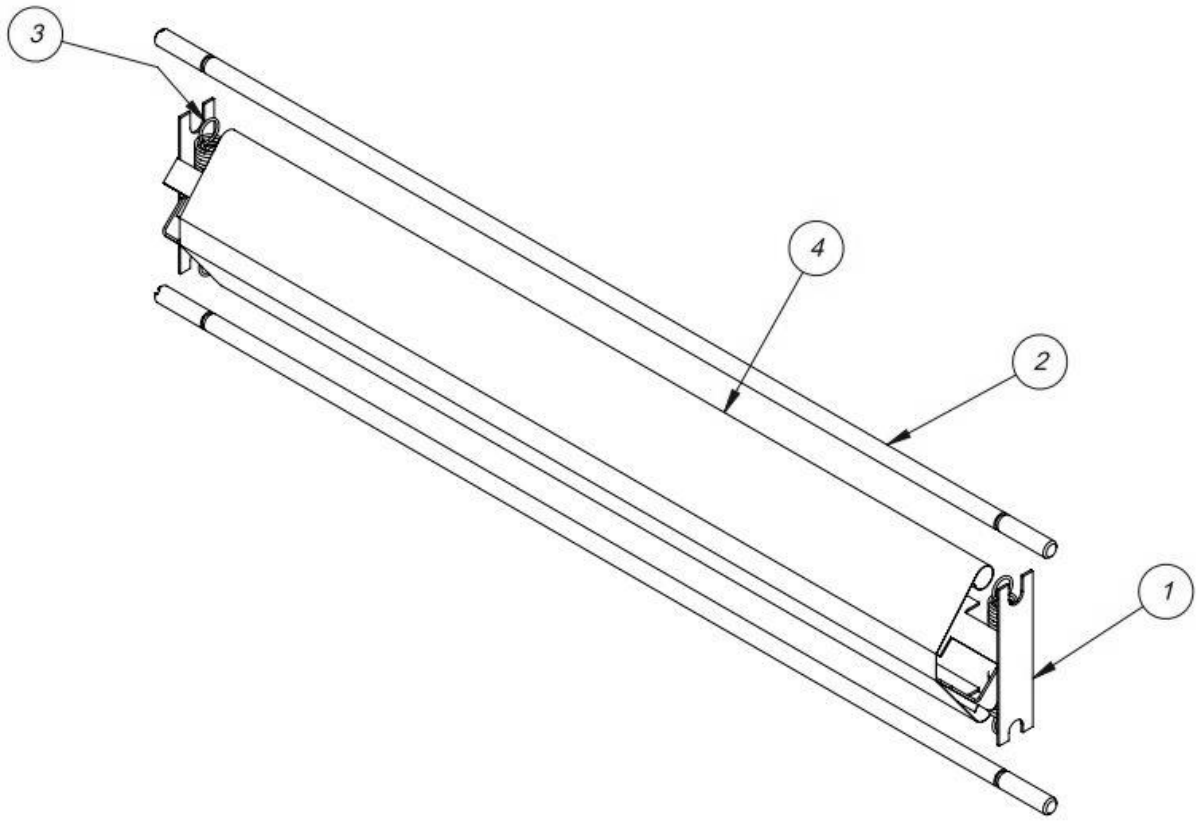
**NOTE: Depending on your order, Item 3 could also be TP-T1MB00009 Heater Seal Bar, TP-T1MB00009-2 1/4" Seal Bar, TP-T1MB00009-3 Three Point Seal or TP-T1MB00009-5 3/8" Seal Bar.*



5.33 T-1000-S14 PTFE Guide Subassembly

PN: TA-T10009

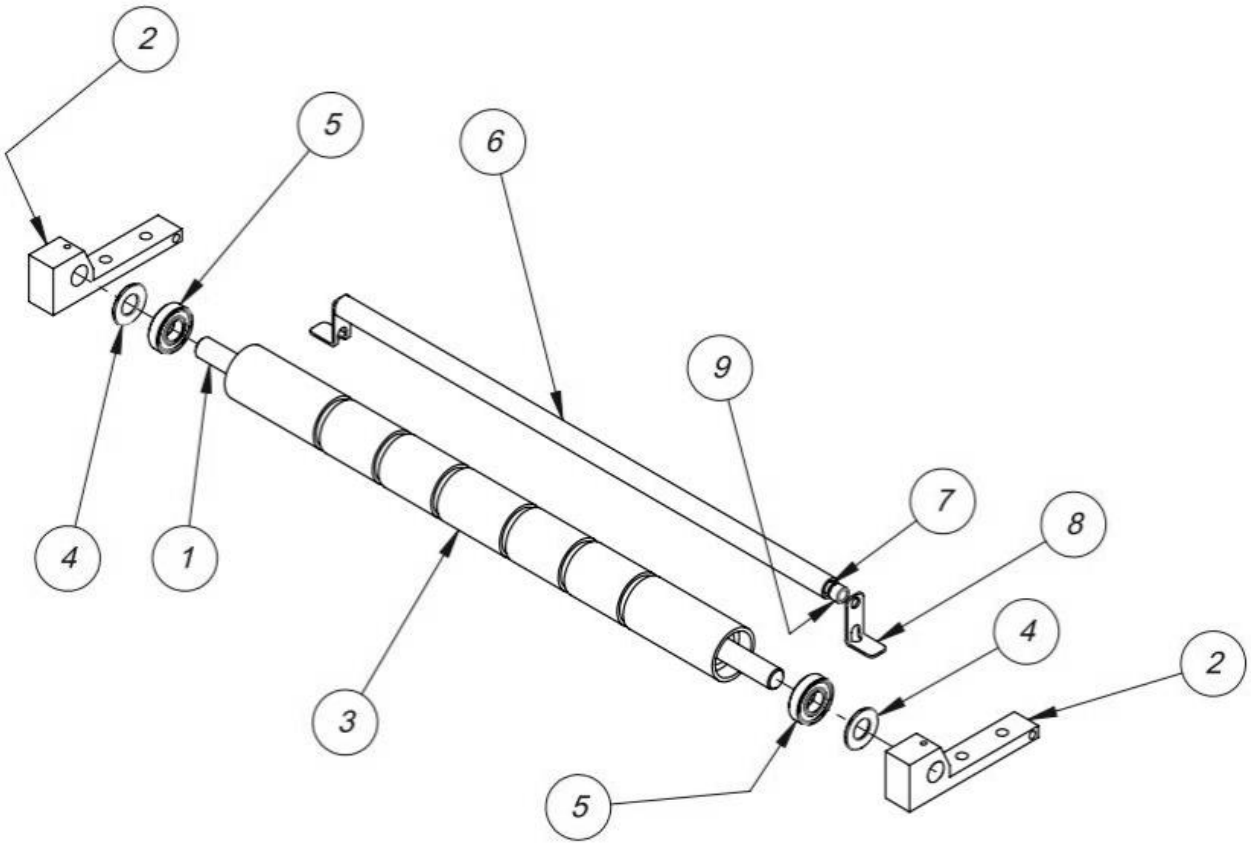
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MB00034	PTFE FINGER
2	2	TP-T1MB00040	PTFE ROD
3	2	TP-108089	EXTENSION SPRING
4	1	TP-300500	PTFE SHEET



5.34 T-1000-S14 Grooved Roller Mounting Subassembly

PN: TA-T10012

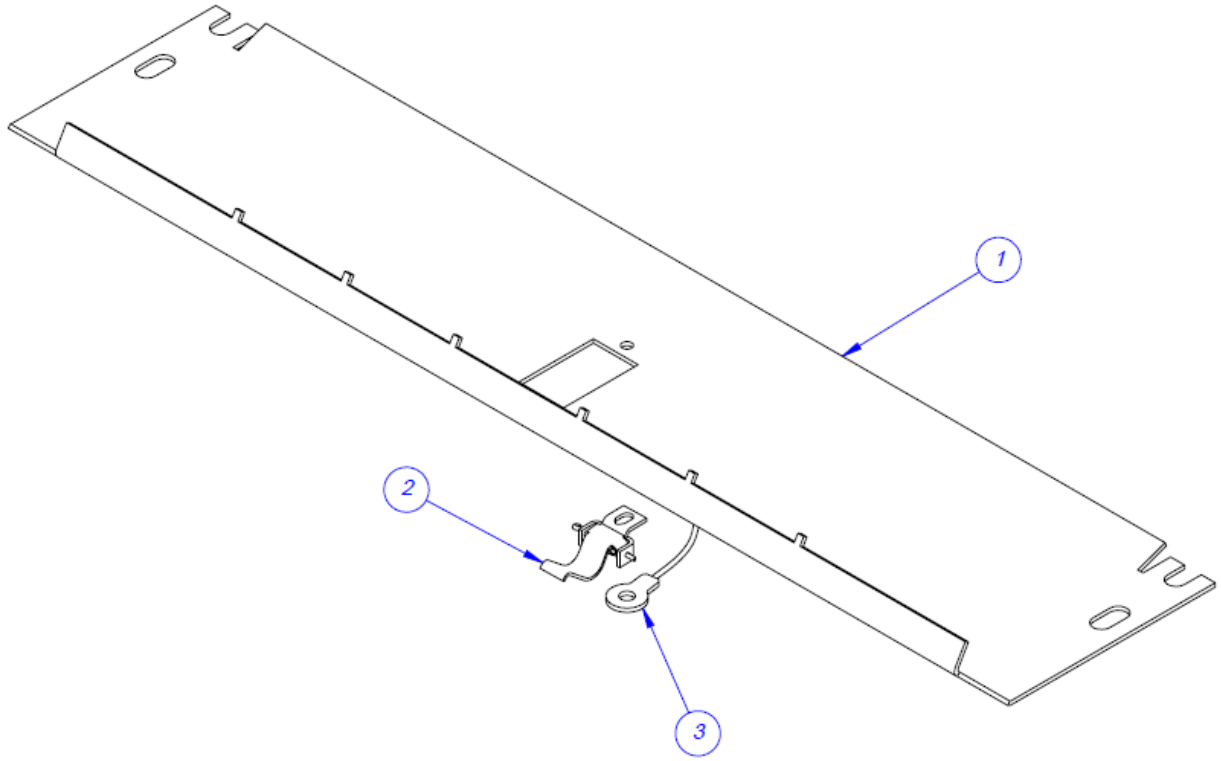
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MB00013	ALUMINUM ROLLER SHAFT
2	2	TP-T1MB00004NB	ROLLER MOUNTING BLOCK
3	1	TP-T1MB00012	ROLLER
4	2	TP-107227	BUSHING, THRUST NYLON
5	2	TP-504107	BEARING, 0.500 BORE, 1.125 0D, 9/32 WIDE
6	1	TP-T1MB00155	FILM WEB TENSION ROLL
7	1	TP-T1MB00156	FILM WEB TENSION SHAFT
8	2	TP-T1MC00121	REAR ROLLER CLIP
9	2	TP-107163	BUSHING 1/4” ID x 3/8 x 0.250



5.35 T-1000-S14 Bag Finger Grounding Subassembly

PN: TA-T10017

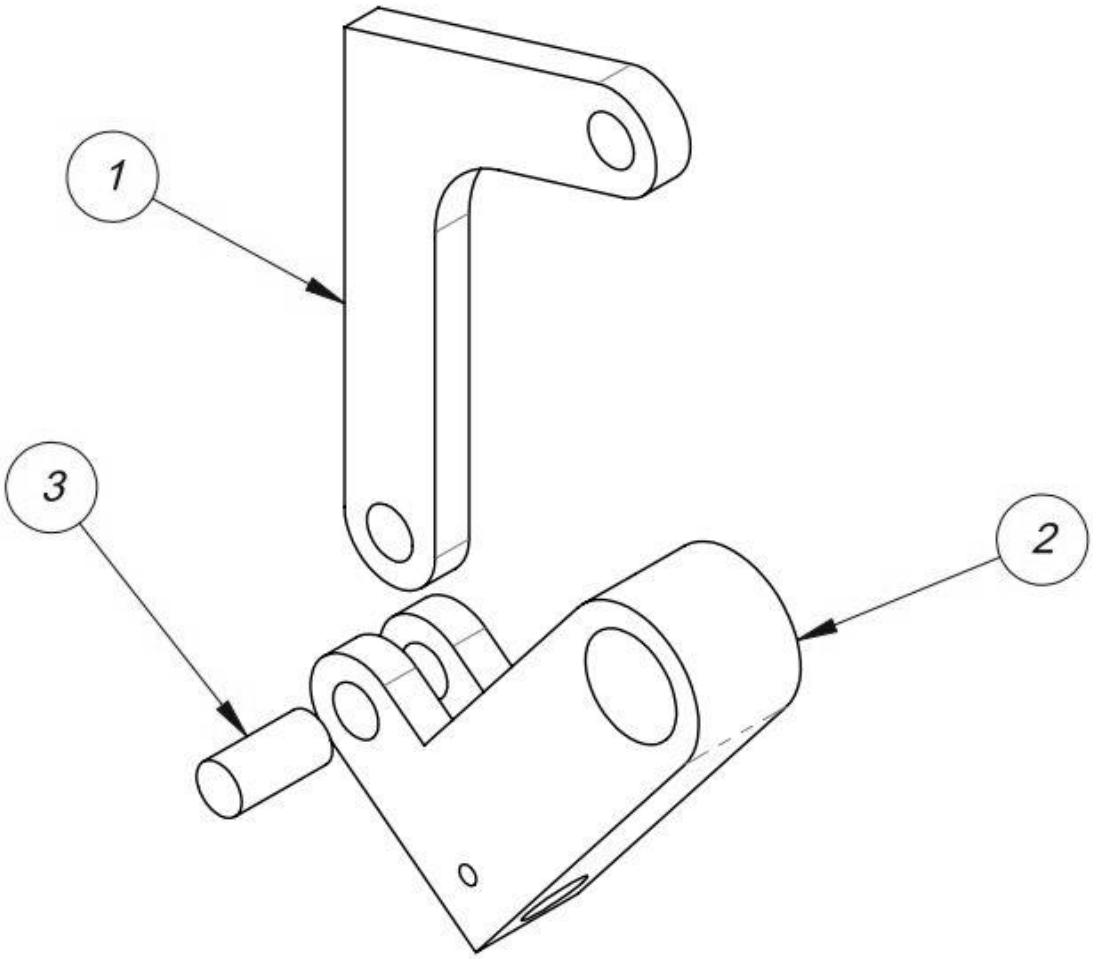
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MB00028	GROOVED METAL ROLLER FINGER
2	1	TP-T100124-1	GROUNDING SENSOR
3	1	TP-T1ME00325-1	GROUNDING SENSOR WIRE



5.36 T-1000-S14 Latch Subassembly

PN: TA-T10019

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MB00060	LATCH LOCK
2	1	TP-T1MB00061	LATCH CAM
3	1	TP-106135	DOWEL PIN

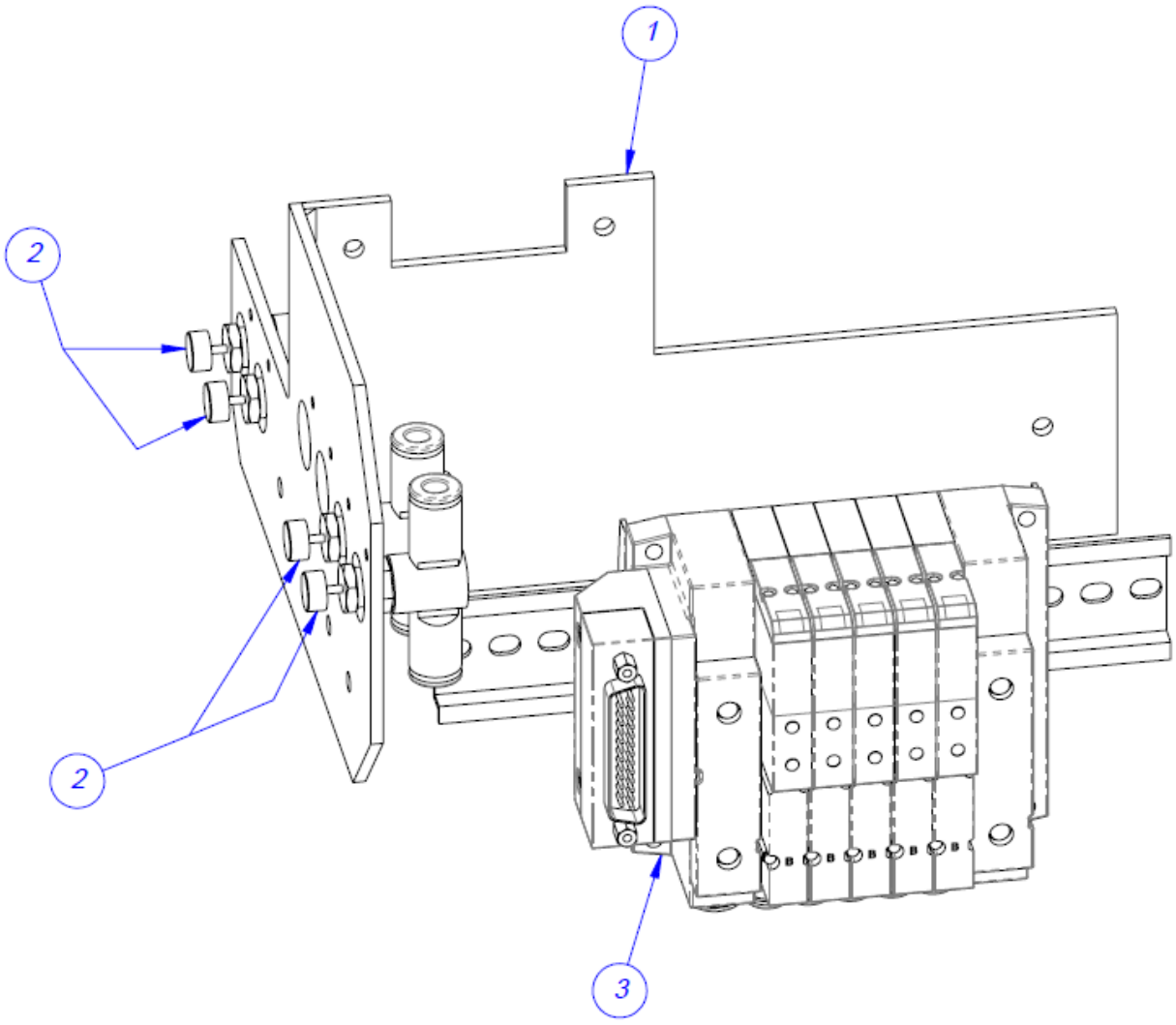


5.37 T-1000-S14 Manifold Assembly

PN: TA-T10020-S14

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	TP-T1MC00015S14	MANIFOLD BRACKET
2	4	TP-402104	IN-LINE FLOW CONTROL
3	1	TA-T10025-S14	PNEUMATIC VALVE ASSEMBLY

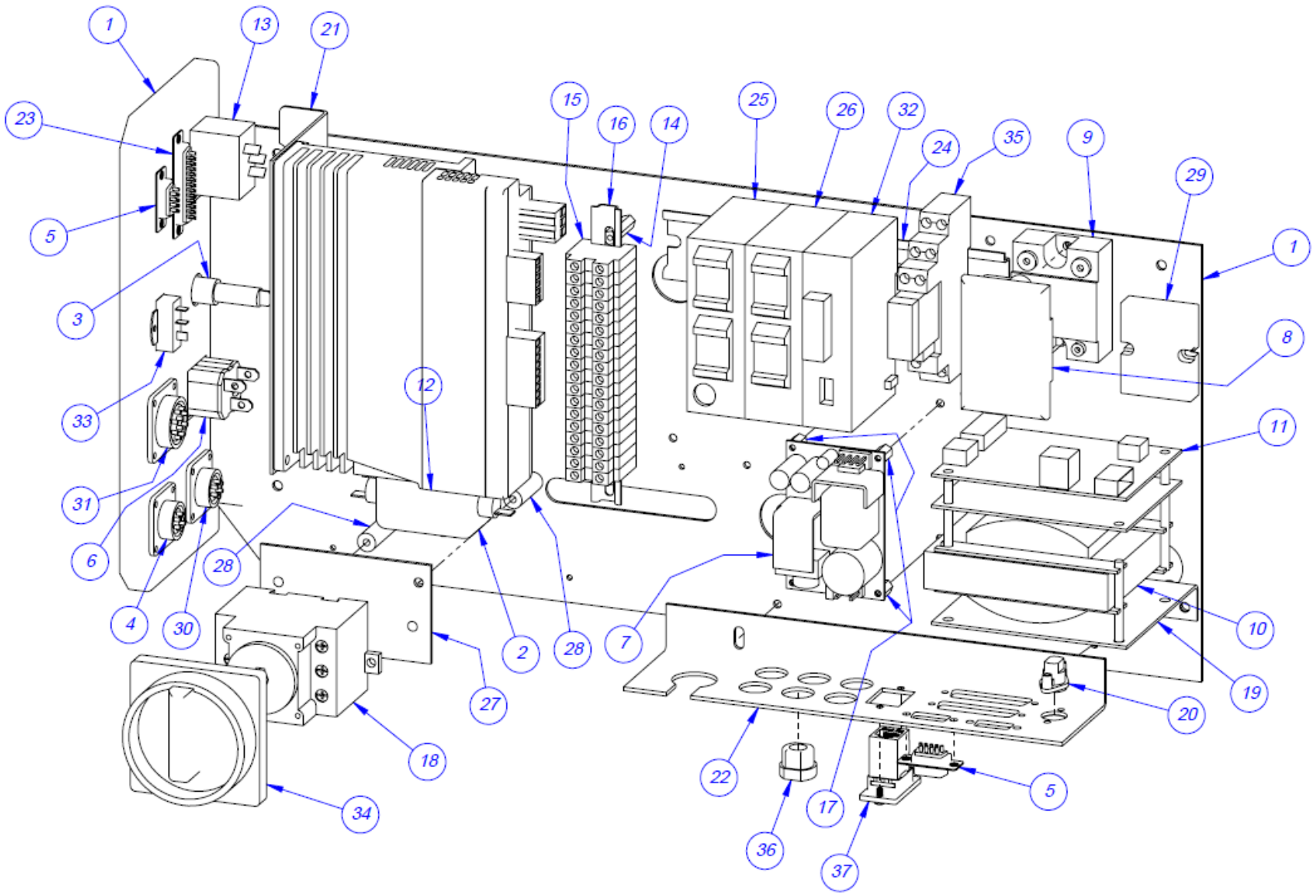
NOTE: Valves with one button (Single Valves) are part # TP-402266. Valves with two buttons (Dual Valves) are part # TP-402267.



5.38 T-1000-S14 Electrical Panel

PN: TA-T10270-S14

ITEM	QTY	PART NO	DESCRIPTION
1	1	TP-T1MC00006-S14	ELECTRONICS MOUNTING PANEL
2	1	TP-205108	EMI FILTER, CORCOM
3	1	TP-207216, TP-207344	FUSE HOLDER & FUSE
4	1	TP-212167	6-PIN CIRCULAR FEMALE
5	2	TP-212247	9-PIN D-SUB FEMALE
6	1	TP-212410	AC OUTLET
7	1	TP- 213361	24VDC, 3AMP POWER SUPPLY
8	1	TP-215000A	COVER
9	1	TP-215000	SOLID STATE RELAY
10	1	TP-211386	HIGH VOLTAGE TRANSFORMER
11	1	TP-T1ME00301	HIGH VOLTAGE BOARD
12	1	TP-501175-1	MOTOR DRIVE
13	1	TP-215384	POWER SWITCH
14	2	TP-214279	STAND-OFF 1"
15	18	TP- 208142	LARGE TERMINAL BLOCK
16	1	TP-218021	DIN RAIL
17	4	TP-214268	STAND-OFF .38"
18	1	TP-215005	SWITCH
19	1	TP-T1MC00021	TRANS MOUNTING PLATE
20	1	TP-212160	5 POS MINI DIM
21	1	TP-T1MC00002S14	ANGLE MOUNT (5) PHASE DRIVER
22	1	TP- T1MC00016S14	ELECTRONICS MOUNTING BRACKET
23	1	TP-212248	25-PIN D-SUB FEMALE
24	1	TP-218020	DIN RAIL
25	1	TP-220510	PLC, FP0R-F32MT
26	1	TP-220514	PLC, FPO-E32T-A- EXPANSION I/O
27	1	TP-T1MO00228	T-1000 EURO DISCONNECT SWITCH
28	2	TP-T1MO00229	STANDOFF
29	1	TP-215530	SOLID STATE REPLAY
30	1	TP-212166	6-PIN MALE
31	1	TP-212338	10-PIN FEMALE
32	1	TP-220508	PLC ANALOG MODULE
33	1	TP-TP-212242	3-PIN SOCKET W/ANGLE BRACKET
34	1	TP-215004	SWITCH KNOB
35	1	TP-215115 & 215116	AUX RELAY & SOCKET
36	1	TP-112240	POWER CORD STRAIN RELIEF
37	1	TP-215400	ETHERNET COUPLER
33	1	TP-215115 & 215116	AUX RELAY & SOCKET
34	1	TP- 112240	POWER CORD STRAIN RELIEF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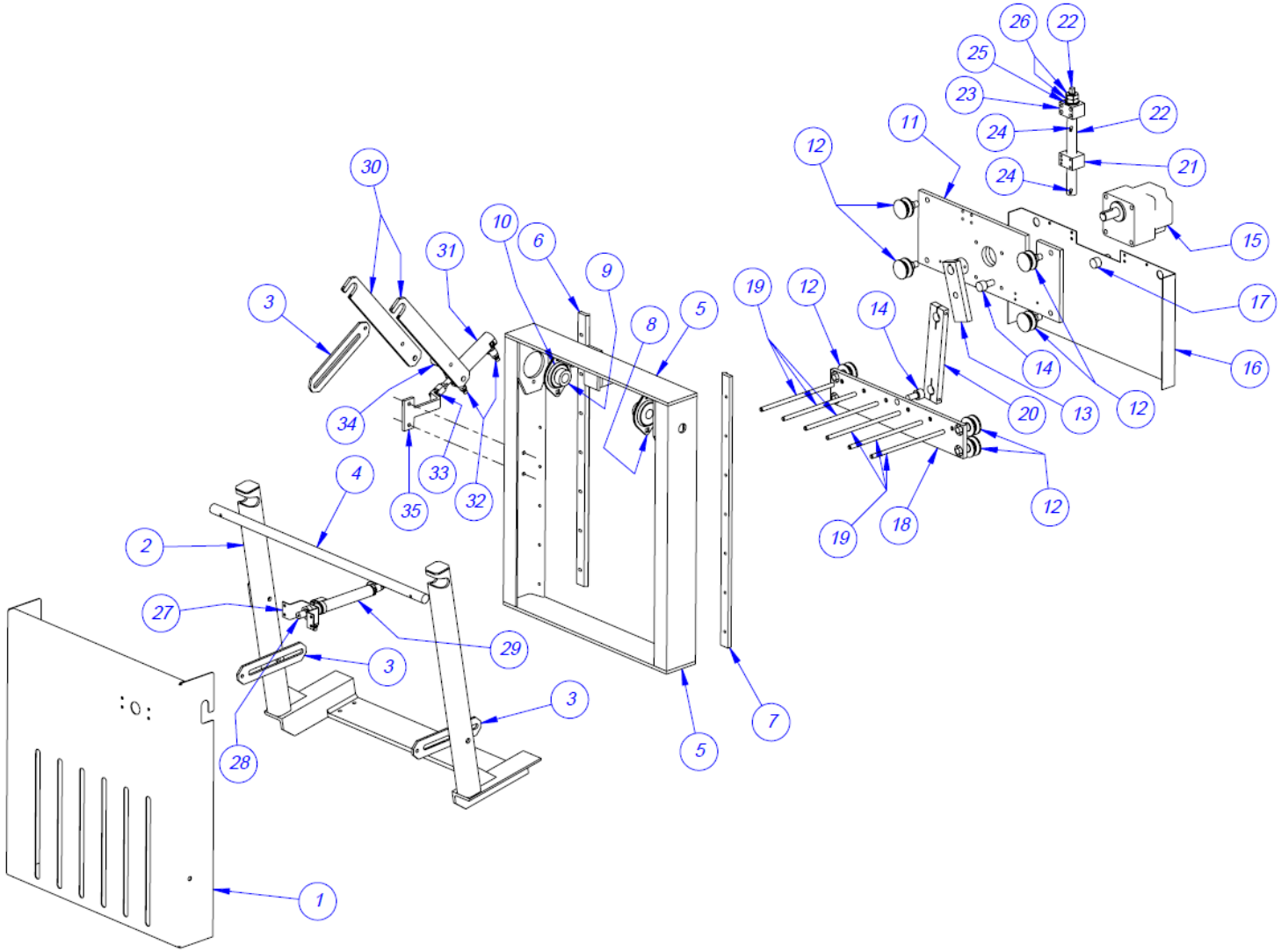
5.39 T-1000-S14 Motorized Load Shelf Assembly

PN: TO-T1-LSV30

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T1LSV30-026	HEAVY DUTY BACKING PLATE
2	1	TP-T1LSV30-24	HD FRAME
3	3	TP-T1LSV30-025	HEAVY DUTY ADJ. BAR
4	1	TP-T1LSV30-038	SHAFT
5	1	TP-T1LSV30-39	FRAME WELDMENT
6	1	TP-T1LSV30-41	LEFT RAIL
7	1	TP-T1LSV30-042	RAIL RIGHT
8	2	TP-107385-1	FLANGE BEARING
9	2	TP-107385	BEARING
10	2	TP-107385-2	FLANGE BEARING
11	1	TP-T1LSV30-043	MOTOR PLATE
12	8	TP-504137	V-GROVE TRACK ROLLER
13	1	TP-T1LSV30-044	ARM
14	2	TP-504136-1	CAM FOLLOWER
15	1	TP-501109	UF-5000 DORNER MOTOR
16	1	TP-T1LSV30-057	SENSOR BRACE
17	1	TP-216148	MAGNETIC SWITCH, T-1000 MACHINE OPEN
18	1	TP-T1LSV30-045	RAKE PLATE
19	6	TP-T1LSV30-006	RAKE PRONG
20	1	TP-T1LSV30-046	LINK
21	1	TP-T1LSV30-047	THREADED CLAMP
22	1	TP-T1LSV30-048	THREADED ADJUST ROD
23	1	TP-T1LSV30-049	ADJUST BLOCK
24	2	TP-106152	COTTER PIN
25	1	TP-102146	WASHER, 1/2 FLAT
26	2	TP-101117	NUT, HEX 1/2-13
27	1	TP-T1LSV30-056	PUSH ROD MOUNT
28	1	TP- T1-LSV30-033	ROD CAP
29	1	TP-403256	AIR CYLINDER
30	2	TP-T1LSV30-062	ARM BRACKET
31	1	TP-403202	CYLINDER
32	2	TP-402187	AIR FLOW CONTROL
33	2	TP-108091	SNAP RING
34	1	TP-T1LSV30-063	SPACER
35	1	TP-T1LSV30-064	BRACKET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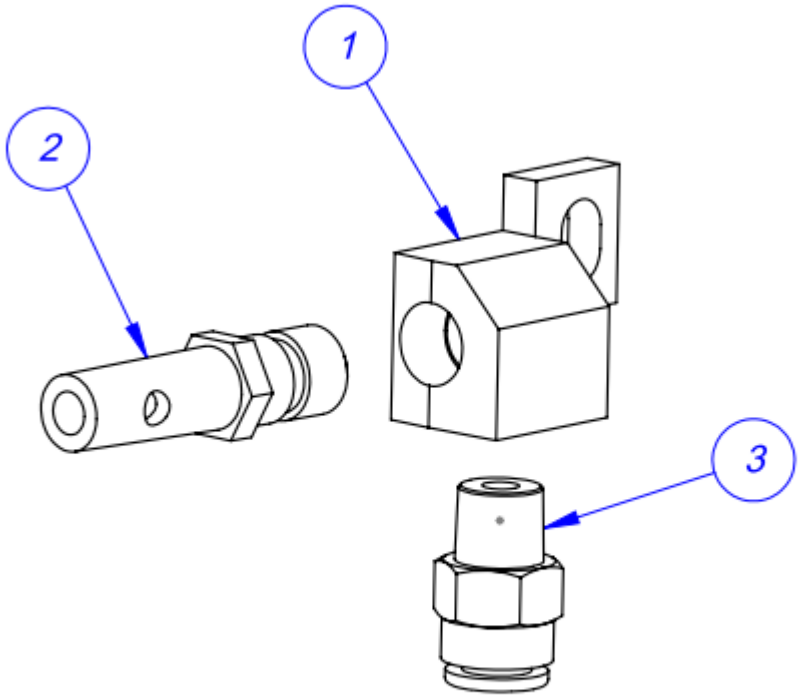
5.40 T-1000-S14 Bag Blow Off (Optional)

TO-T1-BB10

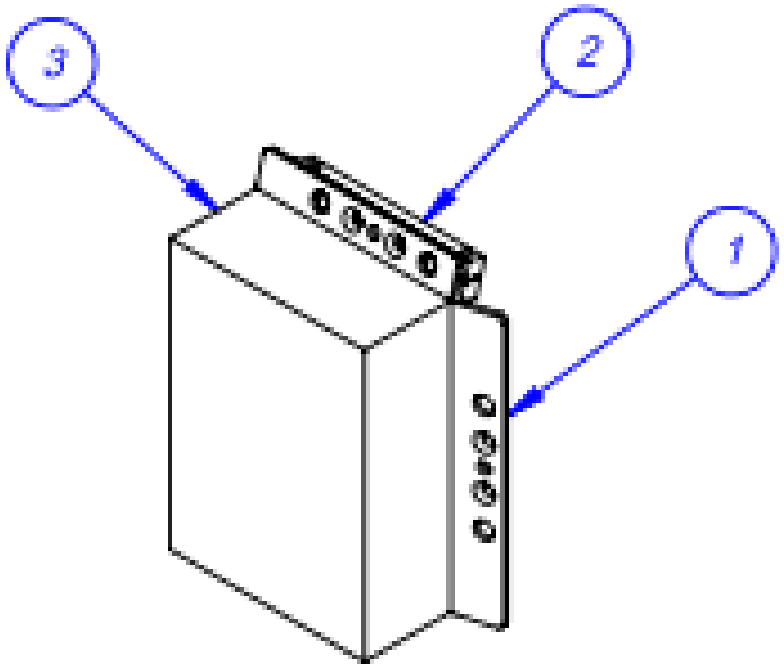
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-TS10-106	TRIM SEAL BLOW-OFF
2	1	TP- 404002	NOZZLE, SAFETY BLOW GUN
3	1	TP-401258	MALE CONNECTOR



5.41 T-1000-S14 Bag Deflator (Optional)

TO-T1-BF10-2

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-BF10-160	BACK PLATE
2	1	TP-BF10-157	PLATE CLAMP
3	1	HP-35027A1	SPONGE REPLACEMENT



Chapter 6: Preventative Maintenance & Scheduled Maintenance

6.1 Preventative Maintenance & Scheduled Maintenance

To extend the life of the ST-1000, qualified maintenance personnel must perform all required maintenance tasks. Failure to perform scheduled and preventative maintenance may cause excessive wear to components and will void the warranty. For the purpose of this manual, preventative maintenance (PM) tasks are considered periodic tasks which should be performed on a daily, weekly, or monthly basis.

Scheduled maintenance tasks are performed when the ST-1000 Maintenance Chart Number changes to a higher number. Scheduled maintenance tasks (CHART items) are performed dependent upon the number of machine cycles and therefore are not considered "periodic" tasks.

Legend for Preventative Maintenance Checklist

D	Daily
W	Weekly
M	Monthly

6.2 Preventative Maintenance Checklist

Filter / Air regulator	Drain water from filter	D
Air regulator	Adjust pressure to 80 PSI	D
Anti-jam device	Check operation, adjust as needed (Chapter 4.10)	D
Pressure bar (rubber)	Clean with alcohol	D
Perforation sensor	Clean sensor assembly with alcohol	W
Upper (rubber) roller	Inspect for nicks or cuts, clean with alcohol	W
Lower (alum.) roller	Clean with alcohol	W
Micron filter / Venturi	Inspect for contamination of filter, replace as needed Inspect for blockage / air restriction	M
Wiring / Connectors	Inspect for loose wiring / connectors, tighten as needed	M
Air lines / Valves / Cylinders	Inspect for loose air lines, listen for leaks, tighten, or replace poly tubing as needed	M
Compartments / Covers	Remove all covers, clean, and blow out compartments with compressed air to remove dust and dirt	M
Side-plates	Clean and wipe down with lightweight oil (based upon environmental - humidity conditions)	M
Drive belt	Inspect for wear / fraying, replace if needed	M
Drive belt (right panel)	Inspect for looseness, tighten as required	M
Touch Screen cabinet / arms	Tighten set screws	M
Height adjustments screws	Tighten bolts	M

6.3 Scheduled Maintenance Chart

Drive belt (right panel)	Adjust/Inspect for wear replace when necessary	O	O	O	O	O	O	O	O	O	O
Heater element & wiring	Inspect for fraying, cuts, loose connections	O	O	O	O	O	O	O	O	O	O
Pressure bar assembly	Disassemble, clean, inspect springs for wear, breakage (frequency dependent on environment and product)	O		O		O		O		O	
Guide rollers	Inspect for free movement	O	O	O	O	O	O	O	O	O	O
Roller bearings	Inspect for free movement	O	O	O	O	O	O	O	O	O	O
Perf sensor & spring	Inspect for wear, replace when necessary		O		O		O		O		O
Upper rubber roll	Inspect for cuts, unevenness	O		O	O	O	O	O	O	O	O
Lower aluminum roller	Clean w/ alcohol, inspect for burs	O	O	O	O	O	O	O	O	O	O
Printed circuit boards	Blow off with clean, dry air, inspect for loose wires, connectors	O	O	O	O	O	O	O	O	O	O
Main Seal Cylinder	Listen for air leakage, replace or repair as required	O	O	O	O	O	O	O	O	O	O
Air (blower) filter	Inspect for contamination, replace as necessary	O	O	O	O	O	O	O	O	O	O
Air lines & connectors	Inspect for wear, cuts, leaking, replace as required	O	O	O	O	O	O	O	O	O	O
	INITIALS										

(NOTE: Each chart change represents 1MM cycles)

6.4 Preventative Maintenance (PM) Chart, Continued...

(Options / Auxiliary Equipment)

CHART

ITEM	DESCRIPTION	1	2	3	4	5	6	7	8	9	10
	Inspected by: (Initials)										

(*NOTE: Each chart change represents 1MM cycles*)

Chapter 7: Troubleshooting

Trouble Shooting Guide
Troubleshooting Checklist
110V Circuit
Thermocouple Expansion Card, Heater Circuit
Analog Output Card
Stepper Motor Circuit
Perforation Sensor PCB
Aux Interface
Solenoid Valve Circuit Diagram
PLC I/O
PLC Expansion
Pick Conveyor Circuit
ESTOP Circuit
Scale AXH Circuit
Scale GSE Circuit
COM2 Circuit
DB25 Circuit
LS-10 Circuit
Bagger Pneumatic Diagrams
PLC IO Listing
Notes

7.1 Trouble Shooting Guide

The items included in this section cover the common causes of trouble which an operator might encounter during the operation of the ST-1000. When operating difficulties occur, the best procedure is to observe what is happening; then search out the causes; and effect the correction. Make only one adjustment at a time, checking the results of each adjustment. If an adjustment does not help or escalates the problems, return the settings back to the former position.

CAUTION: These tests and repairs should be performed only by qualified mechanics or electricians and at their own risk.

NOTE: When troubleshooting a T-1000-S14 functioning within a system (i.e.: with conveyors, scales, feeders, counters, etc.), always isolate the equipment and operate each machine individually.

7.2 Troubleshooting Checklist

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
60 Day Trial Expired screen appears	60 Day Trial expired	Call APPI Service
Bags not tearing off	1. Continuous Strip is ON 2. Reverse Distance is too low 3. Reverse Speed too low	1. Turn Continuous Strip OFF 2. Increase Reverse Distance 3. Increase Reverse Speed
Low Battery screen appears	It is recommended to replace battery once every three years.	If the Low Battery Screen displays on the touch screen, DO NOT turn off the machine, it will erase the operating program and any stored settings. Call APPI Service to reorder battery and for replacement instructions.
Touch screen does not display	1. Power off 2. Loose connection 3. Fuse blown 4. Contrast out of adjustment	1. Plug in power cord / turn on 2. Tighten connections 3. Replace fuse(s) 4. Adjust screen contrast
No main power light	1. Blown fuse 2. Bulb out	1. Replace fuse 2. Replace bulb
Pressure bar does not move when foot switch is operated	1. Disconnected air line/foot switch 2. Power off	1. Hookup air line 2. Turn on power
Pressure bar moves inward but does not reach the front plate (retracts immediately)	1. Anti-jam improperly adjusted 2. Misalignment of guide rods 3. Insufficient air pressure 4. Loose / broken ground wire on guide rods	1. Adjust anti-jam (section 4.12) 2. Align guide rods (section 4.6) 3. Increase air pressure 4. Connect / tighten ground wires

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Pressure bar presses against front plate but does not seal bag	1. Seal time too low 2. Heat (temperature) too low 3. Heater cartridge bad 4. Insufficient air pressure 5. Misalignment of guide rods 6. PTFE folded over 7. Heater bar not extending 8. Seal cylinder bad 9. Heater bar cylinder(s) bad	1. Increase in Settings screen 2. Increase in Settings screen 3. Replace heater cartridge 4. Increase air pressure 5. Align guide rods 6. Turn PTFE 7. Check heater bar cylinders / valve 8. Replace cylinder / valve 9. Replace cylinder / valve
Bag sticks to PTFE or pressure (rubber) bar	1. Seal temperature too high	1. Decrease temp in Settings screen
	2. Seal time too high 3. PTFE in poor condition 4. Rubber is dirty / contaminated	2. Decrease seal time in Settings screen 3. Turn / replace PTFE 4. Clean / replace pressure bar rubber
Bag does not tear off completely	1. Bag slipping through rollers 2. Compression pressure insufficient 3. Drive roller not reversing 4. Bag did not index properly 5. Seal rubber dirty / worn	1. Clean upper and lower rollers with alcohol to remove slip and dirt build-up 2. Adjust roller compression 3. Check Reverse setting 4. Index another bag for test 5. Clean / replace rubber
Two bags index from rollers	1. Bag is folded over 2. Perf sensor dirty / damaged 3. Perf sensitivity out of adjustment 4. Ungrounded outlet causing electrical noise 5. Auxiliary equipment: noise 6. Seal point value too high	1. Lower inner frame and straighten bag 2. Clean / replace perf sensor 3. Contact APPI for perf adjustment 4. Plug into "clean" power source 5. Contact APPI for solution 6. Set value lower
Bag does not completely index	1. Perf is sensing hole in bag (vent) 2. Seal position setting too low	1. Reposition bag 2. Increase seal position in Settings screen
Bag web indexing to floor level without stopping on bag	1. Perf sensor not sensing bag 2. Dirty / damaged sensor 3. Perf sensor out of adjustment	1. Contact APPI for adjustment 2. Clean / replace sensor 3. Contact APPI for adjustment
Bags web breaking prematurely in machine	1. Improper web tension 2. Web dragging foreign objects 3. Bag roll side plates bent inward	1. Adjust tension 2. Remove obstructions 3. Repair / remove side-plates

7.3 110V Circuit

Circuit drawings are provided to assist in troubleshooting the functionality of the T-1000 and the interface signaling with auxiliary infeed equipment. A circuit diagram of the 110V circuit is comprised of main power to the T-1000, through the fuse, Corcom filter, motor controller, solid state relay, heater element, line out, and into the power supply printed circuit board. See Dwg T1kST-E1-110VAC.

7.4 Thermocouple Expansion Card, Heater Circuit

A circuit diagram of the Thermocouple Expansion controller TC4 with correct Dip switch settings is provided. See Dwg T1kST-E56_TC4.

7.5 Analog Output Card

A circuit diagram of the new Analog Card for Conveyor Speed Control. See Dwg ST1k-E14.

7.6 Stepper Motor Circuit

A circuit diagram of the stepper motor controller is provided with correct Dip switch and Pot settings. See Dwg T1kST-E4,

7.7 Perforation Sensor PCB

APPI manufactures the printed circuit board for accurate and consistent perforation detection, for accurate bag positioning and registration. A circuit diagram is provided for this PCB. See Dwg T1kSTNB-E5.

7.8 Aux Interface

APPI provides for a closed loop signal with auxiliary infeed equipment. The circuit diagram references the pinouts on Aux 2 connector, located on the T-1000 rear electrical panel (military connector). See Dwg T1kST-E7.

7.9 Solenoid Valve Circuit Diagram

The ST-1000 is equipped with an expandable Valve manifold, pre-wired for up to 7 options solenoid valves. Valve stations 1 through 4 are standard, and valve station 5-11 are options. PLC output information, DB25 pin outs, voltages and valve descriptions are provided on this circuit diagram. See Dwg T1kST-E8.

7.10 PLC I/O

A drawing is provided which illustrates the PLC wire colors / pin-outs. See Dwg ST1k-E4

7.11 PLC Expansion

The T-1000 comes equipped with a PLC Expansion, where standard options are wired into the bagger. See Dwg ST1k-E5

7.12 Pick Conveyor Circuit

Controls the Hopper and Pick Conveyor BLDC Motors. See Dwg ST1k-E2

7.13 ESTOP Circuit

The ESTOP stops all bagger functions when pressed. See Dwg ST1k-E10

7.14 Scale AXH Circuit

Brushless DC Motor Speed Control. See Dwg ST1k-E12

7.15 Scale GSE Circuit

Scale Controller and Summing Board. See Dwg ST1k-E13

7.16 COM2 Circuit

See Dwg ST1k-E16

7.17 DB25 Circuit

See Dwg ST1k-E15

7.18 LS-10 Circuit

Brushless DC Motor Speed Control. See Dwg ST1k-E11

7.19 Bagger Pneumatic Diagrams

APPI offers pneumatic diagrams to assist in troubleshooting the ST-1000 Bagger. Piping from Solenoid Valve Stations 5 through 11 will change based on the configuration of the ST-1000 and the options ordered by the customer. Included are diagrams for the Bagger, BO-30 Bag Opener, Accumulator Chute, and Shaker Load Shelf.

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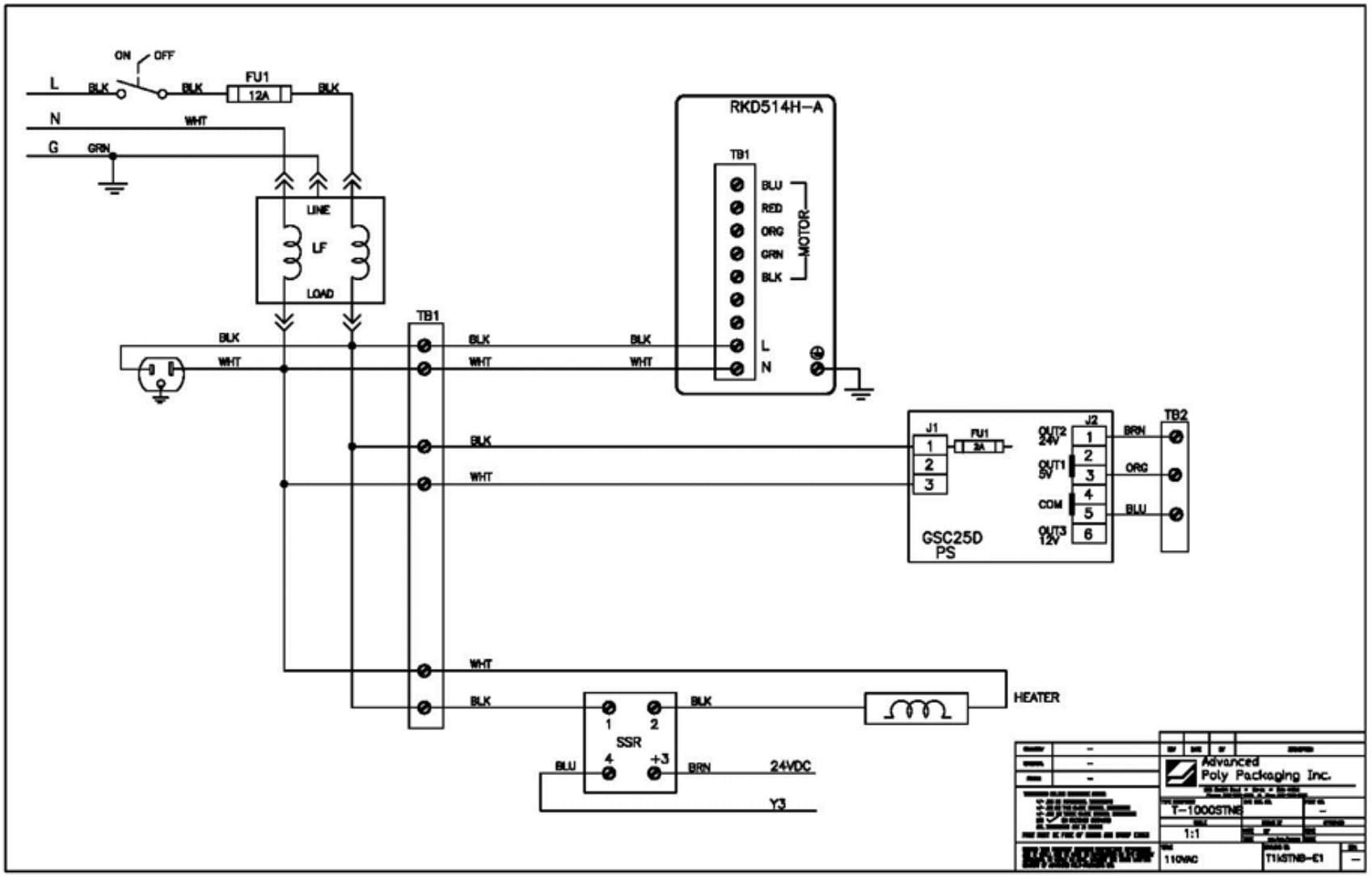
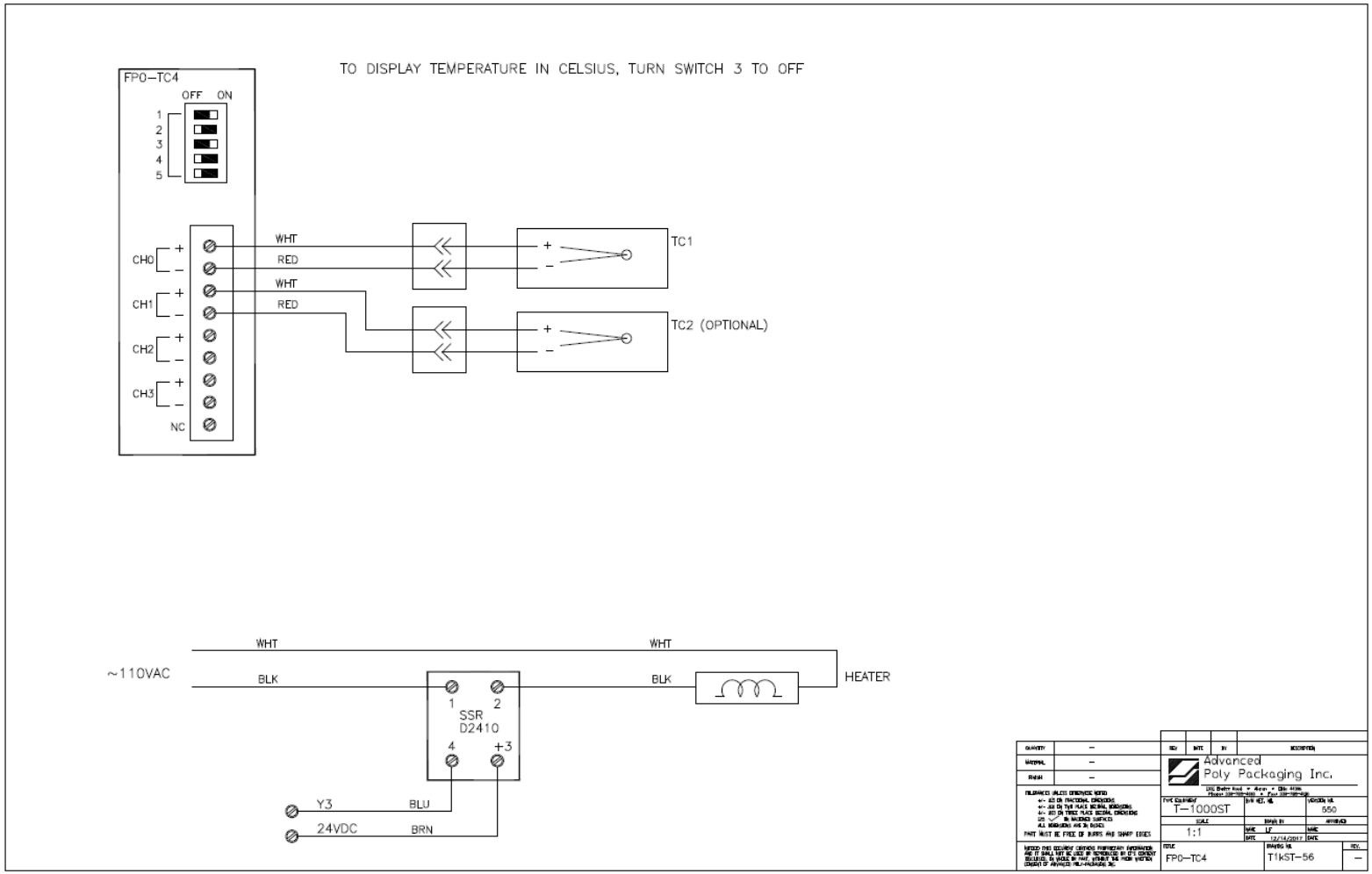
7.3 110V Circuit

T1kST-E1-110VAC



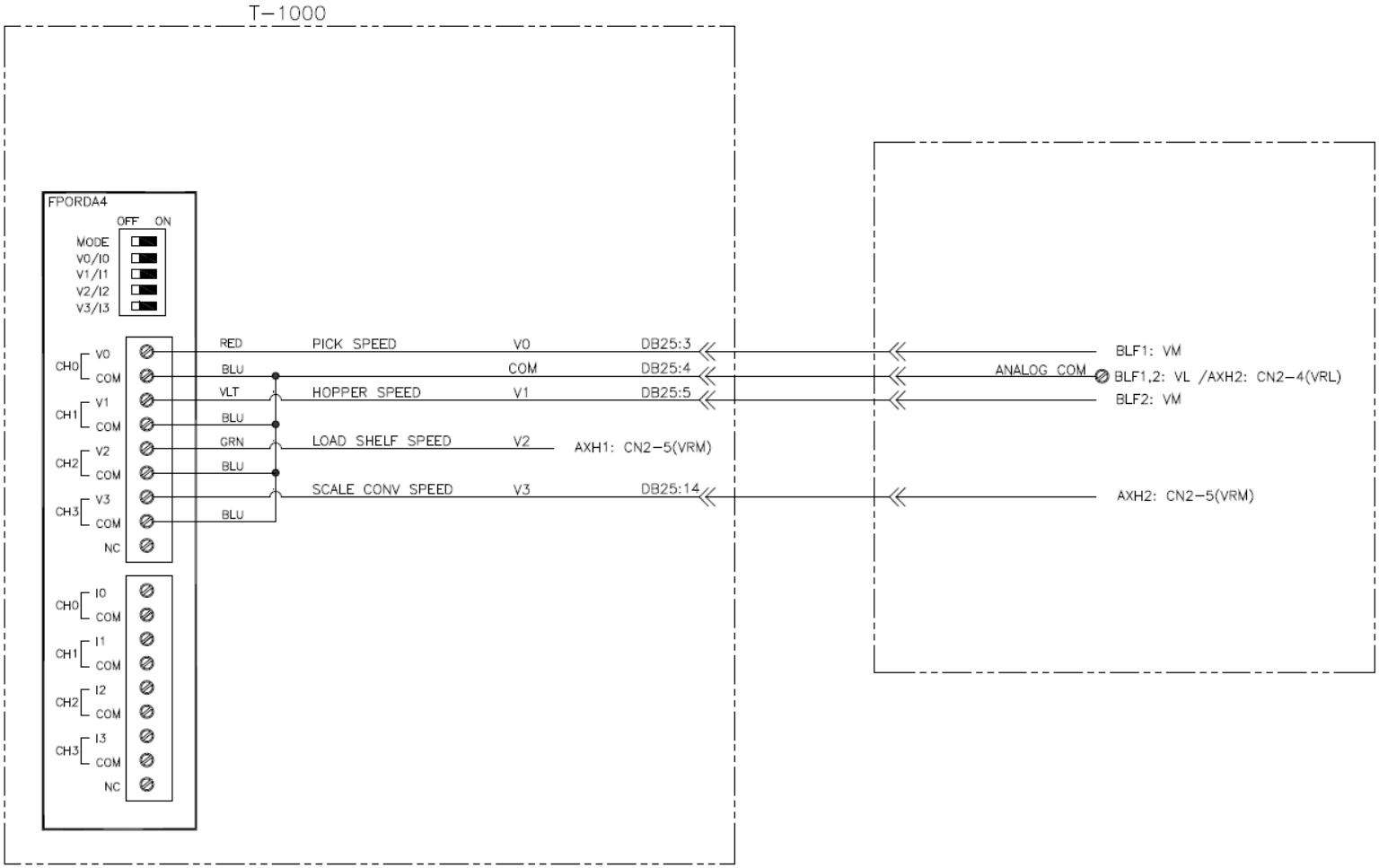
7.4 Analog Card, Temperature Controller, Heater Circuit

T1kST-E56_TC4



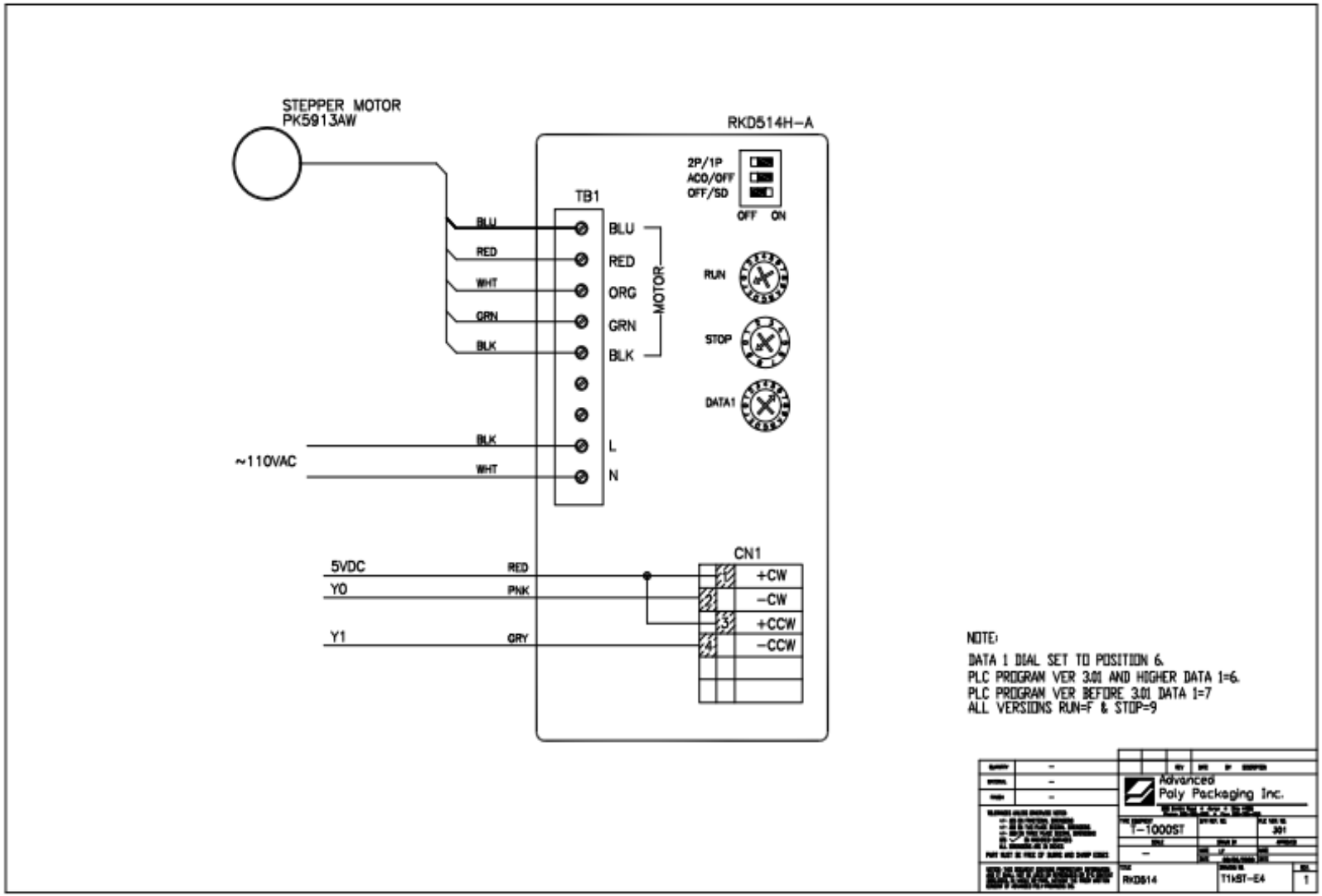
7.5 Analog Output Card

ST1k-E14

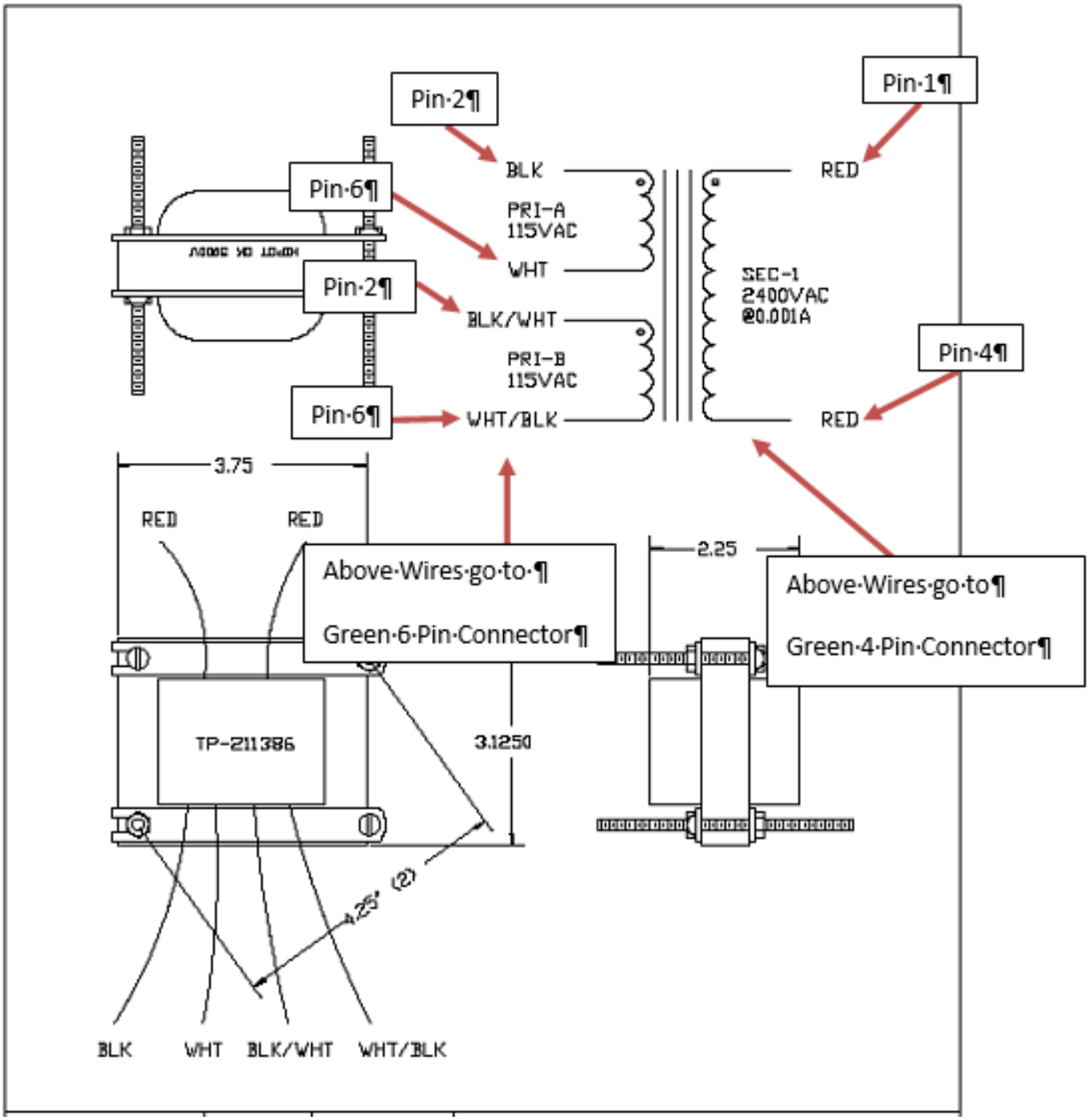


7.6 Stepper Motor Circuit

T1kST-E4

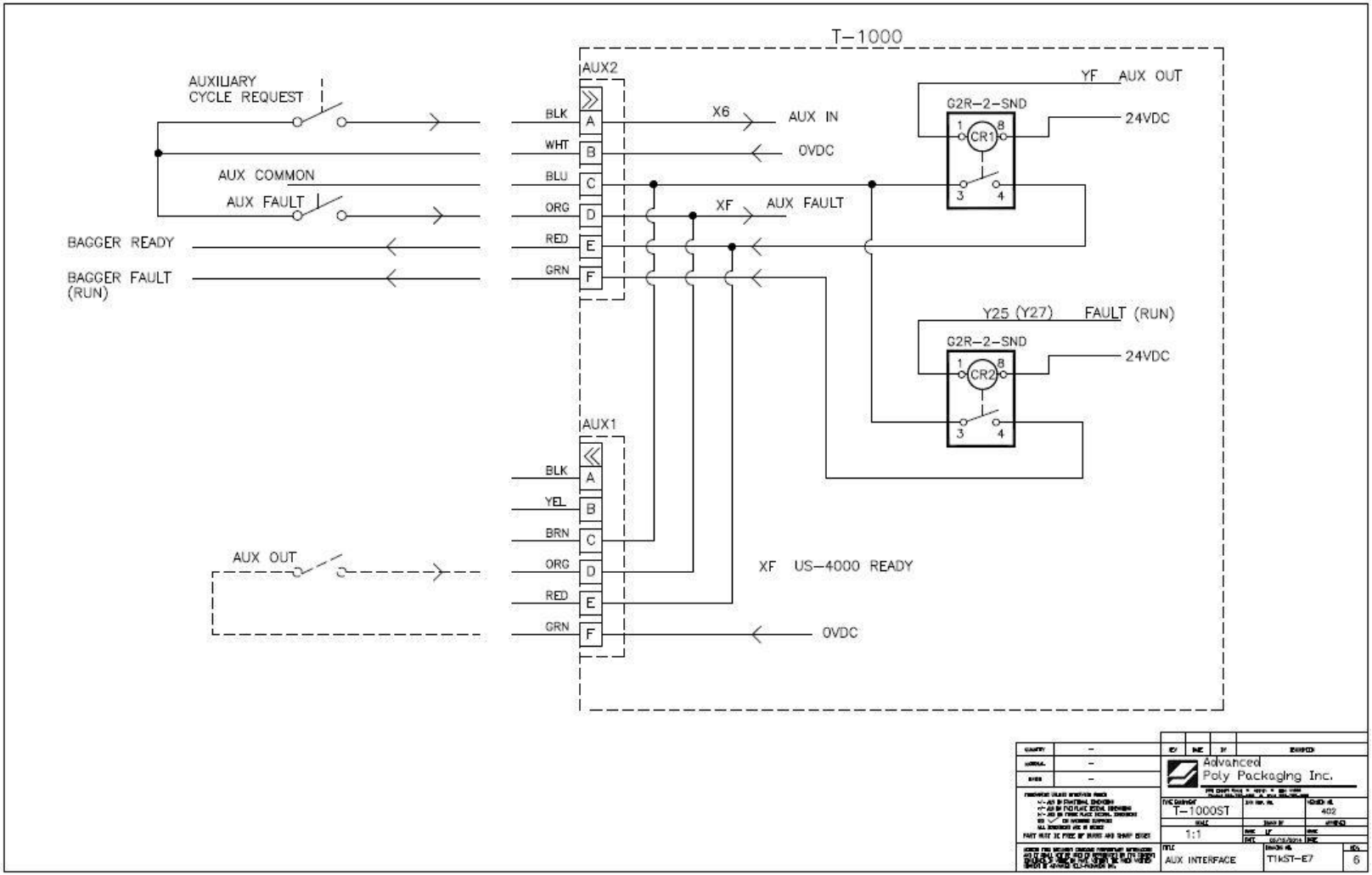


7.7 Perforation Sensor PCB



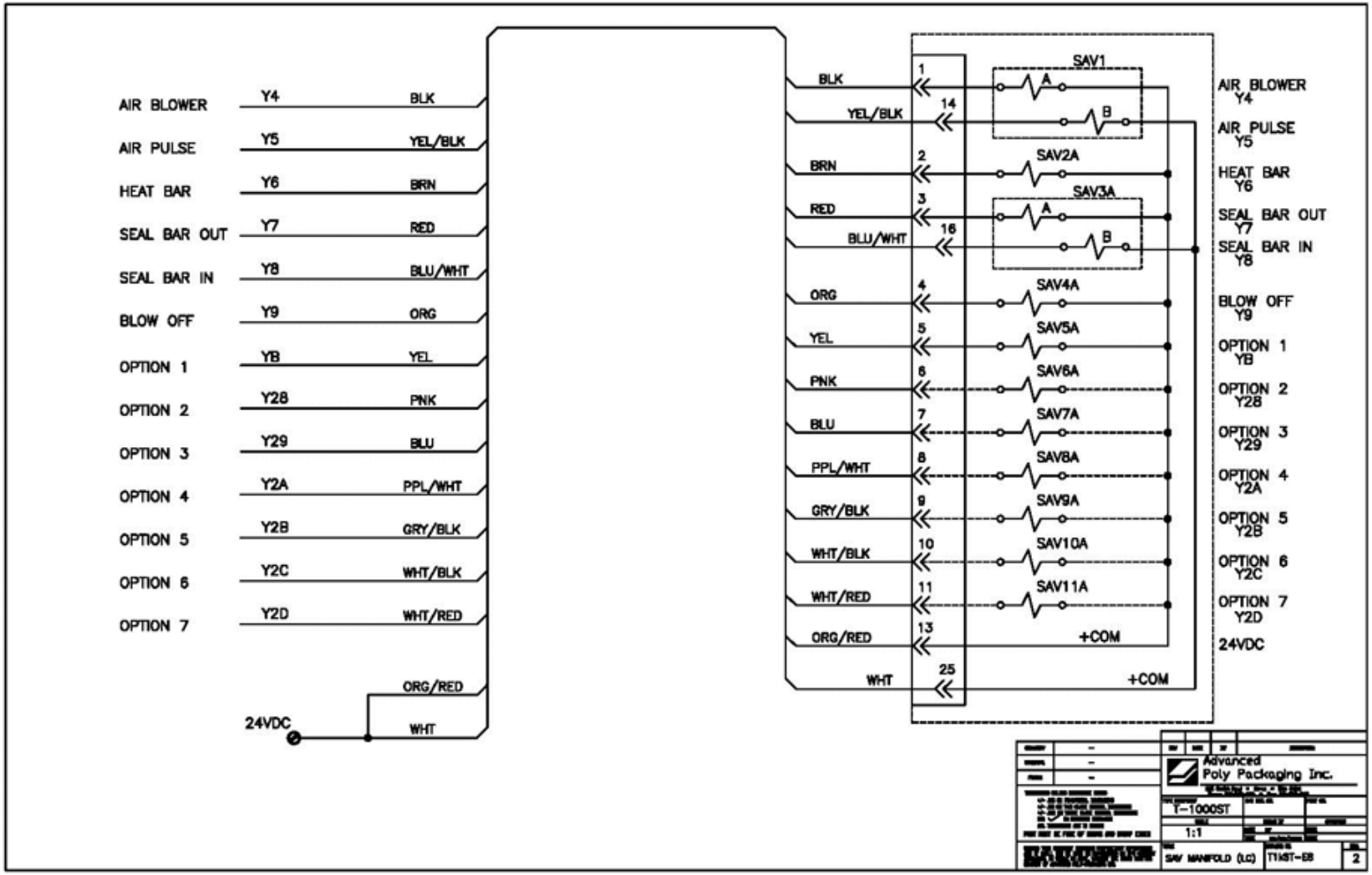
7.8 Auxiliary Interface

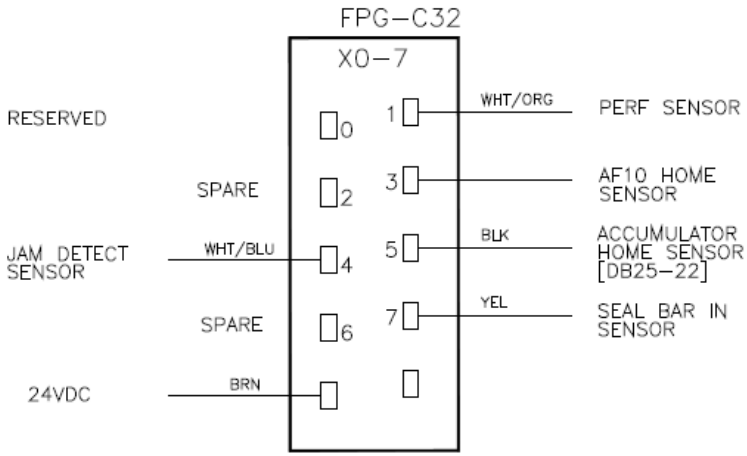
T1kST-E7



7.9 Solenoid Valve Circuit Diagram

T1kST-E8

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X0-7
RESERVED
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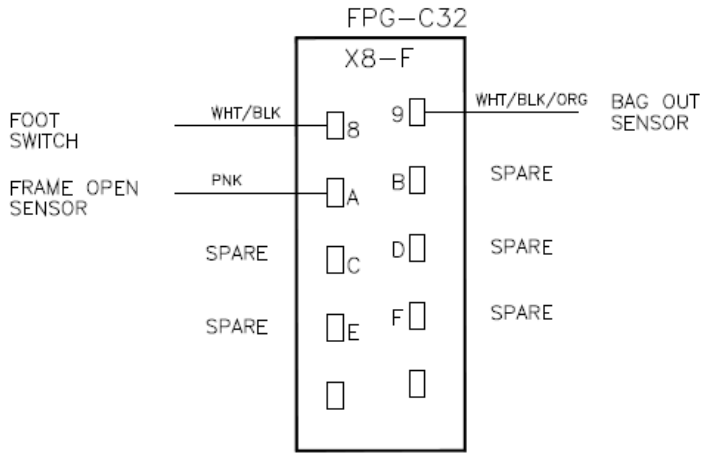
WHT/ORG
PERF SENSOR
SPARE
2
3
AF10 HOME SENSOR
JAM DETECT SENSOR
WHT/BLU
4
5
BLK
ACCUMULATOR HOME SENSOR [DB25-22]
SPARE
6
7
YEL
SEAL BAR IN SENSOR
24VDC
BRN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X8-F
FOOT SWITCH
WHT/BLK
8
9
WHT/BLK/ORG
BAG OUT SENSOR
FRAME OPEN SENSOR
PNK
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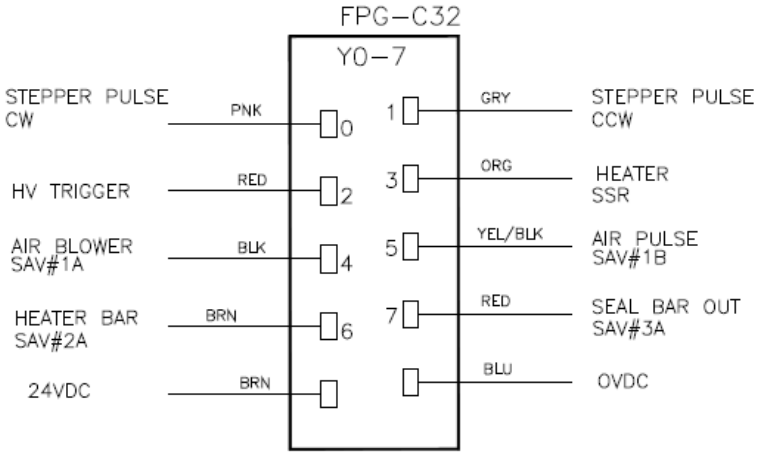
B
SPARE
SPARE
C
D
SPARE
SPARE
E
F
SPARE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PNK
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GRY
STEPPER PULSE CCW
HV TRIGGER
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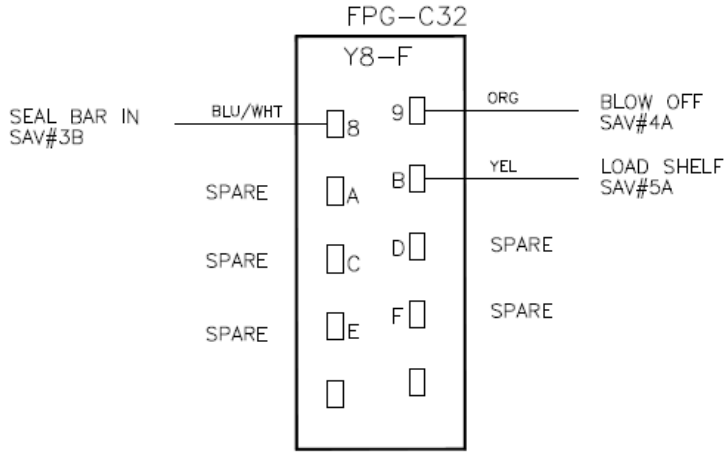
3
ORG
HEATER SSR
AIR BLOWER SAV#1A
BLK
4
5
YEL/BLK
AIR PULSE SAV#1B
HEATER BAR SAV#2A
BRN
6
7
RED
SEAL BAR OUT SAV#3A
24VDC
BRN
BLU
OVDC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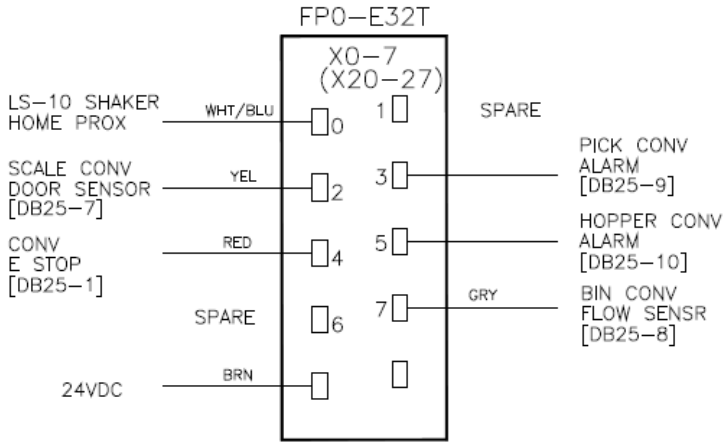
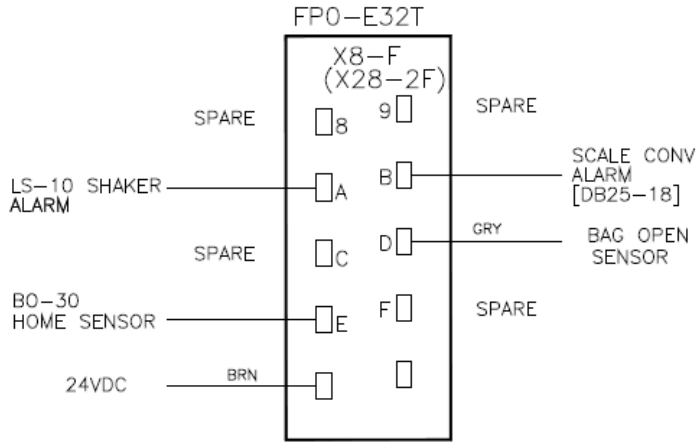
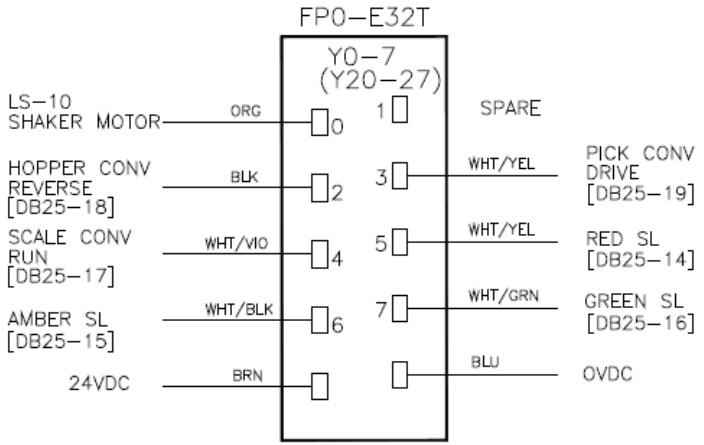
Y8-F
SEAL BAR IN SAV#3B
BLU/WHT
8
9
ORG
BLOW OFF SAV#4A
SPARE
A
B
YEL
LOAD SHELF SAV#5A
SPARE
C
D
SPARE
SPARE
E
F
SPARE

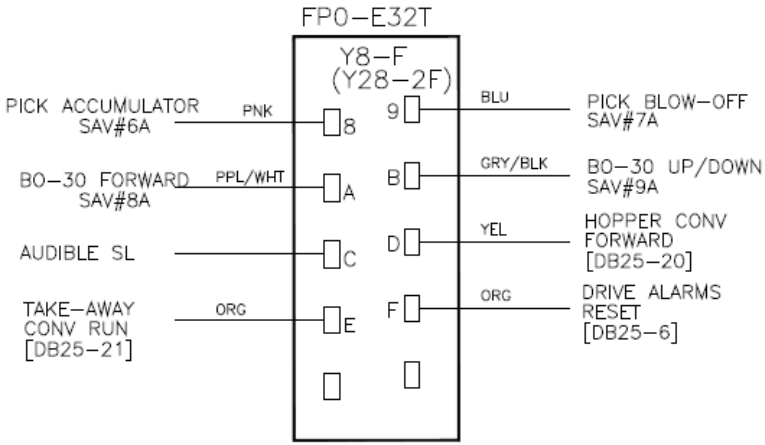
7.11 PLC I/O Expansion

ST1k-E5



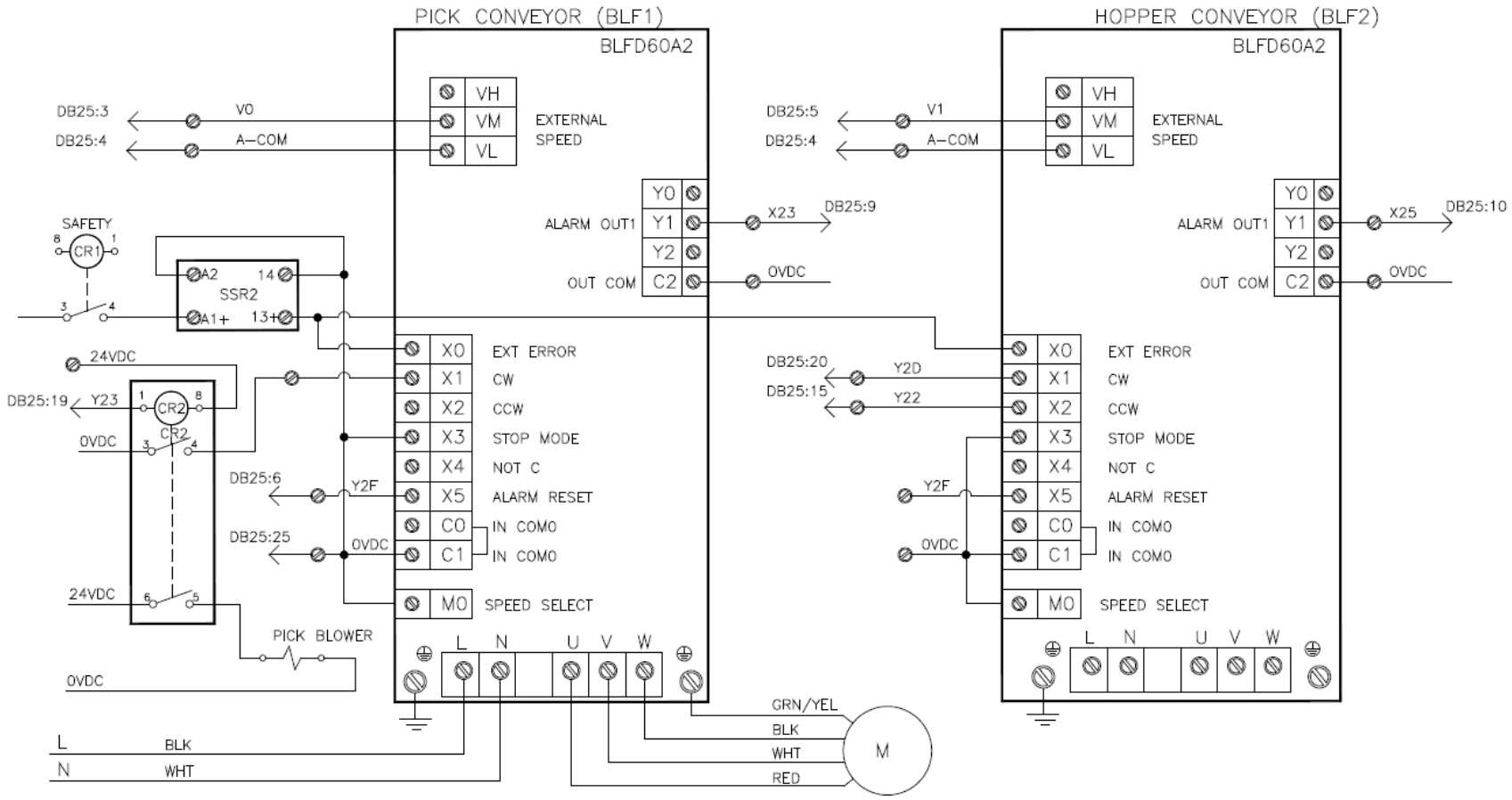






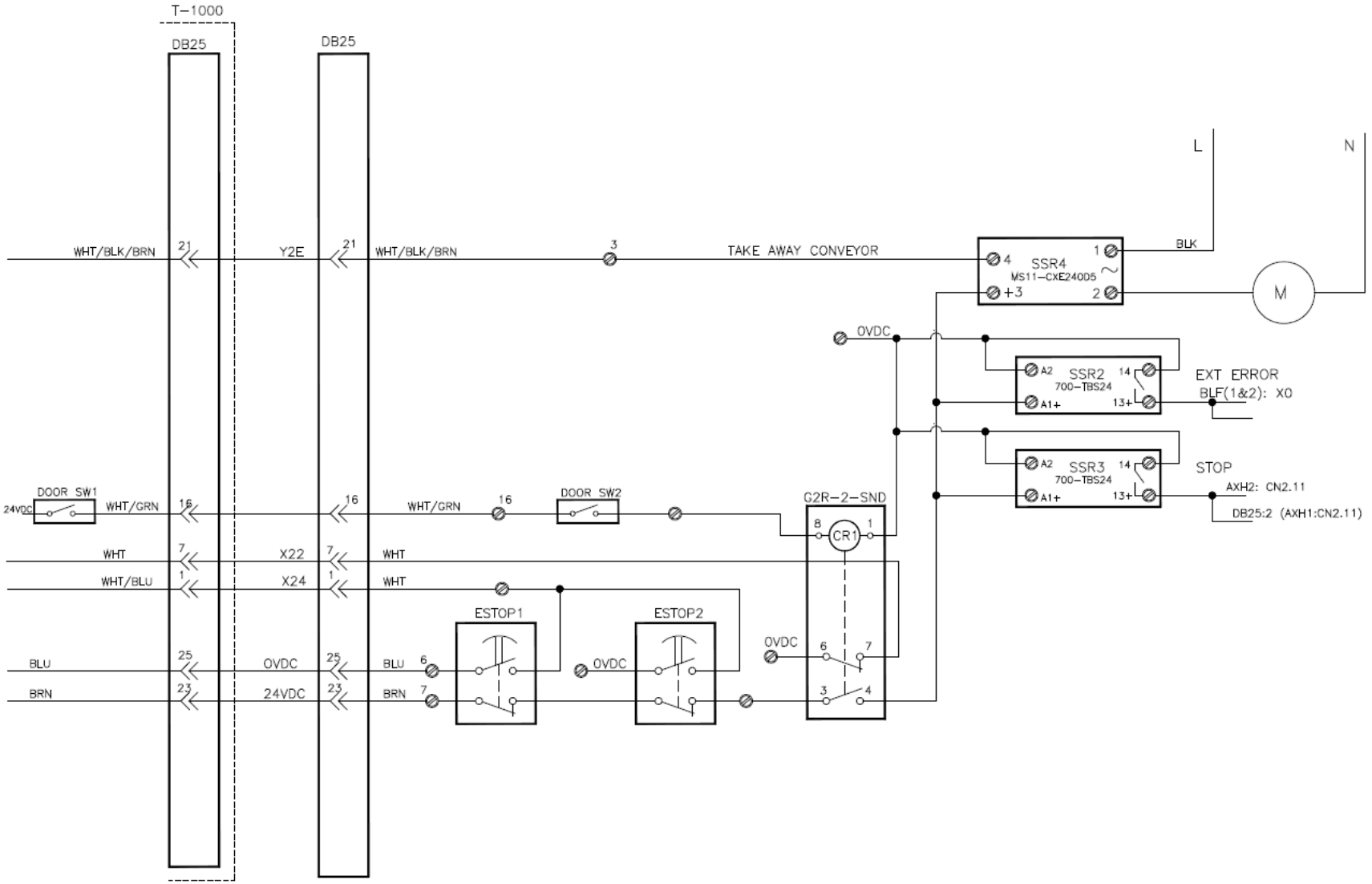
7.12 Pick Conveyor Circuit

ST1k-E2_BLF_rev3



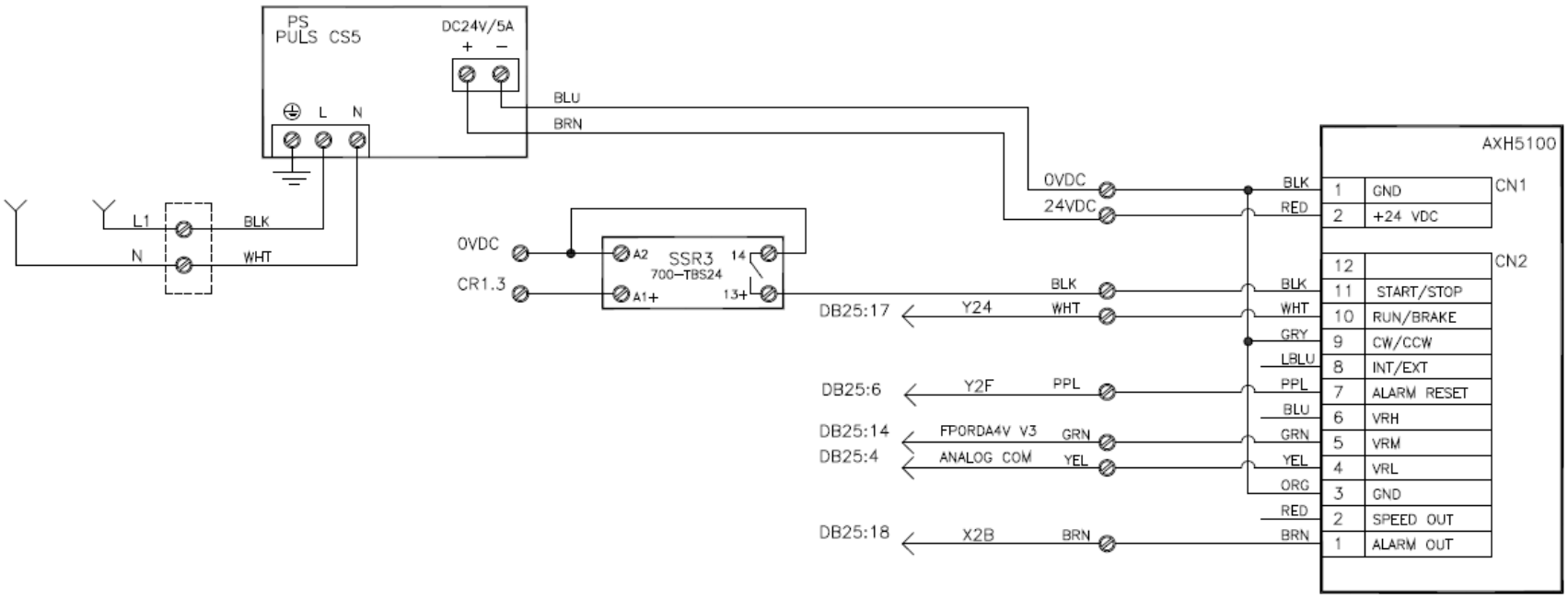
7.13 ESTOP Circuit

ST1k-E10



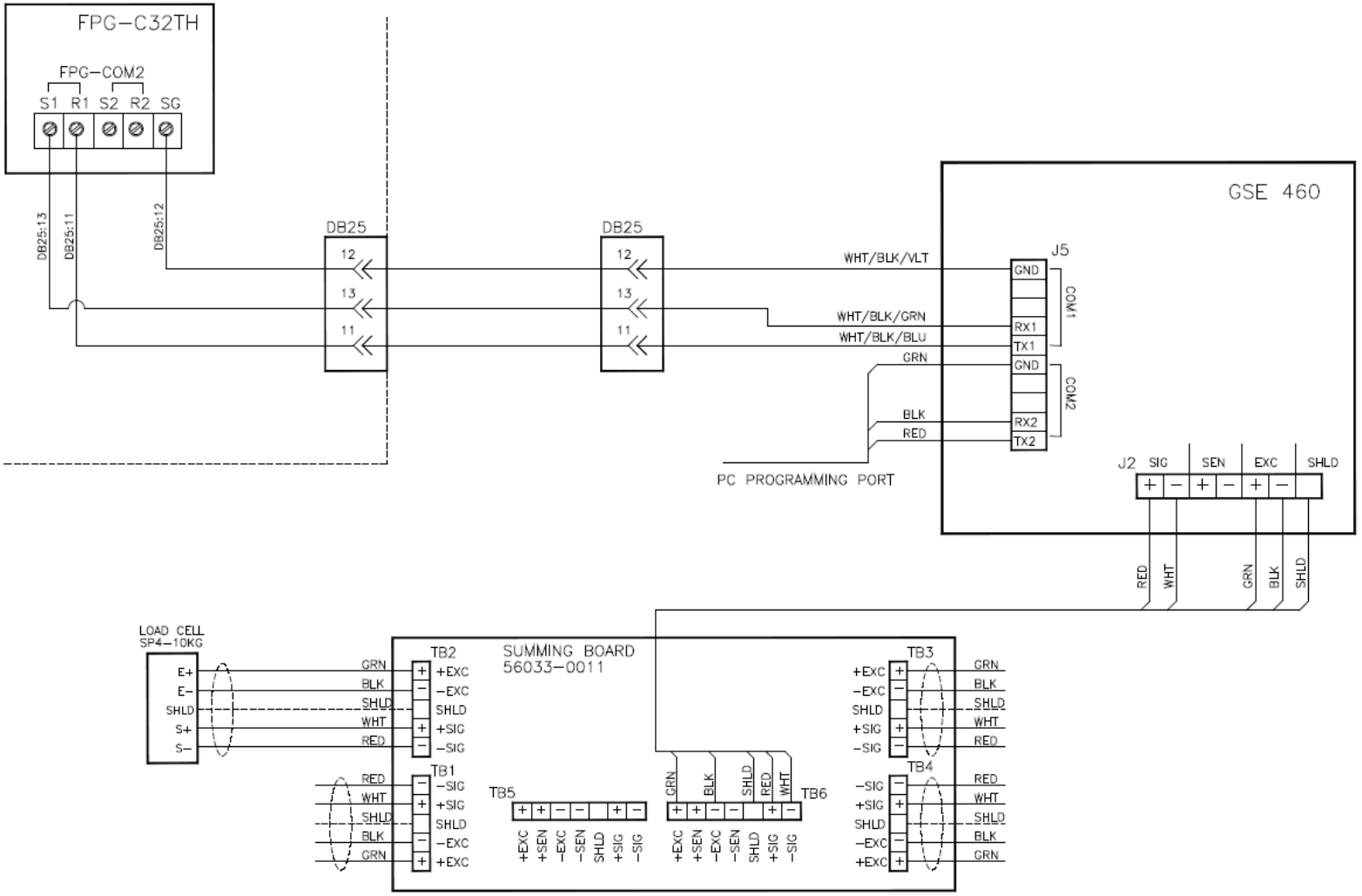
7.14 Scale AXH Circuit

ST1k-E12



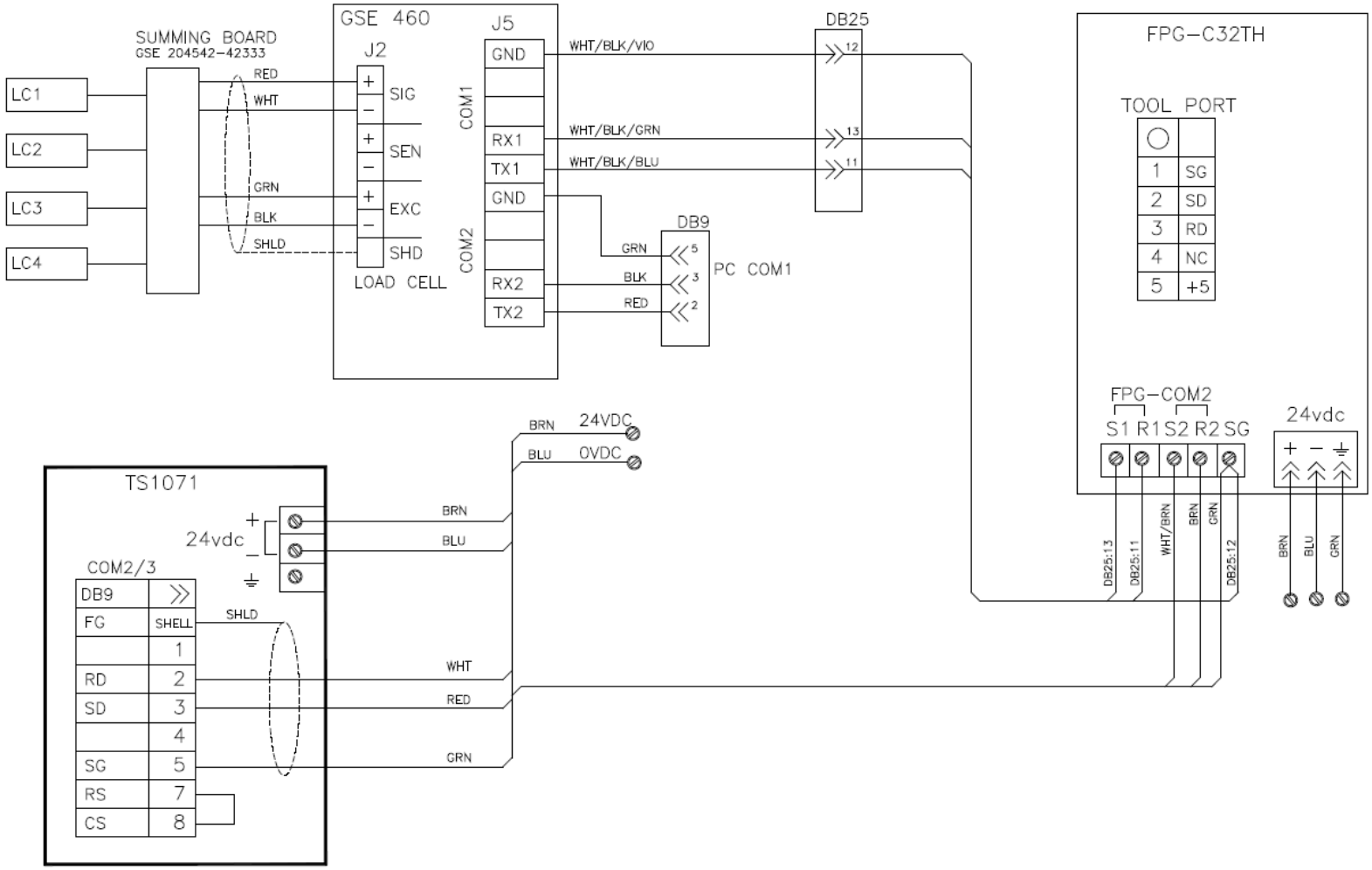
7.15 Scale GSE Circuit

ST1k-E13



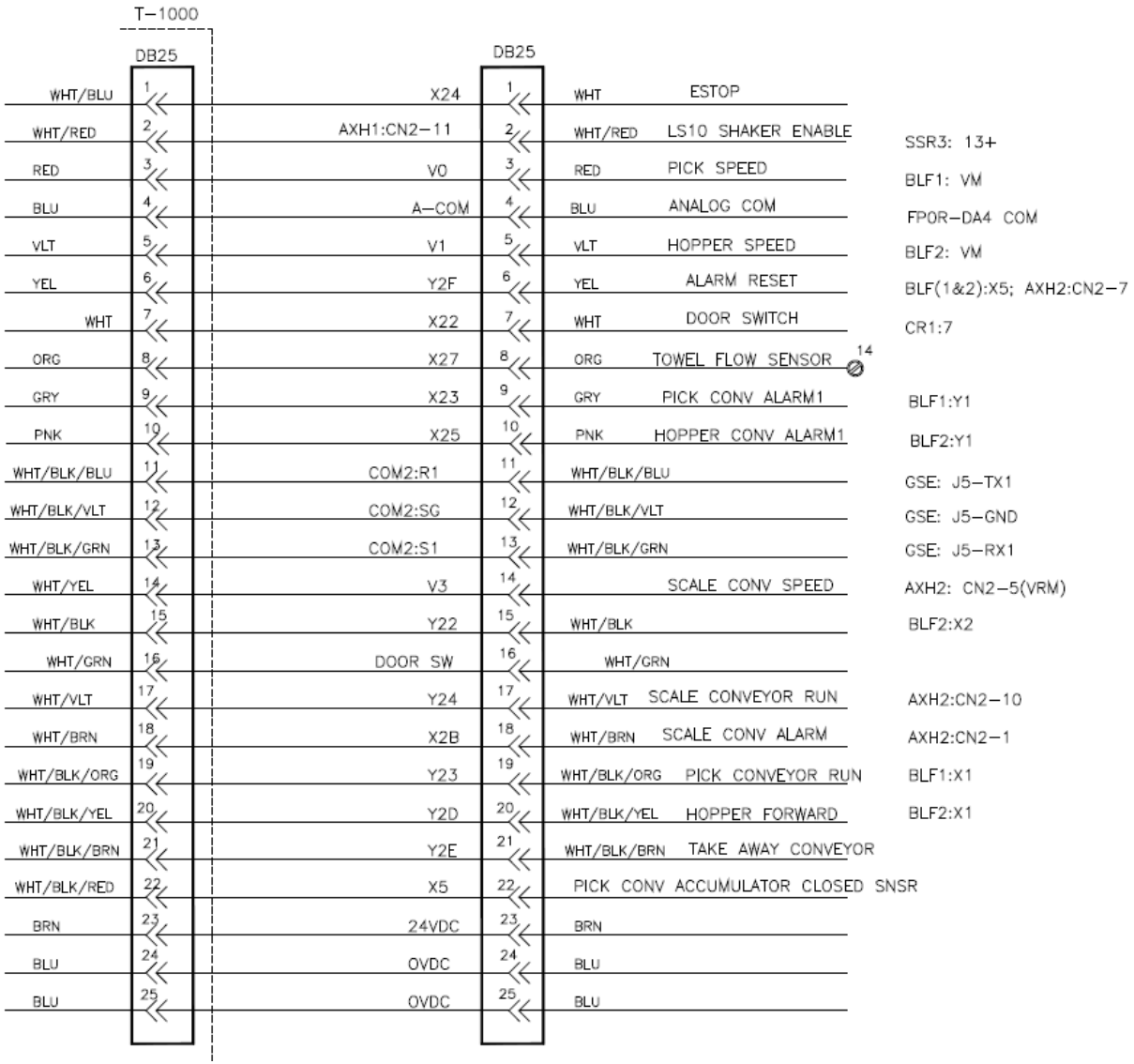
7.16 COM2 Circuit

ST1k-E16



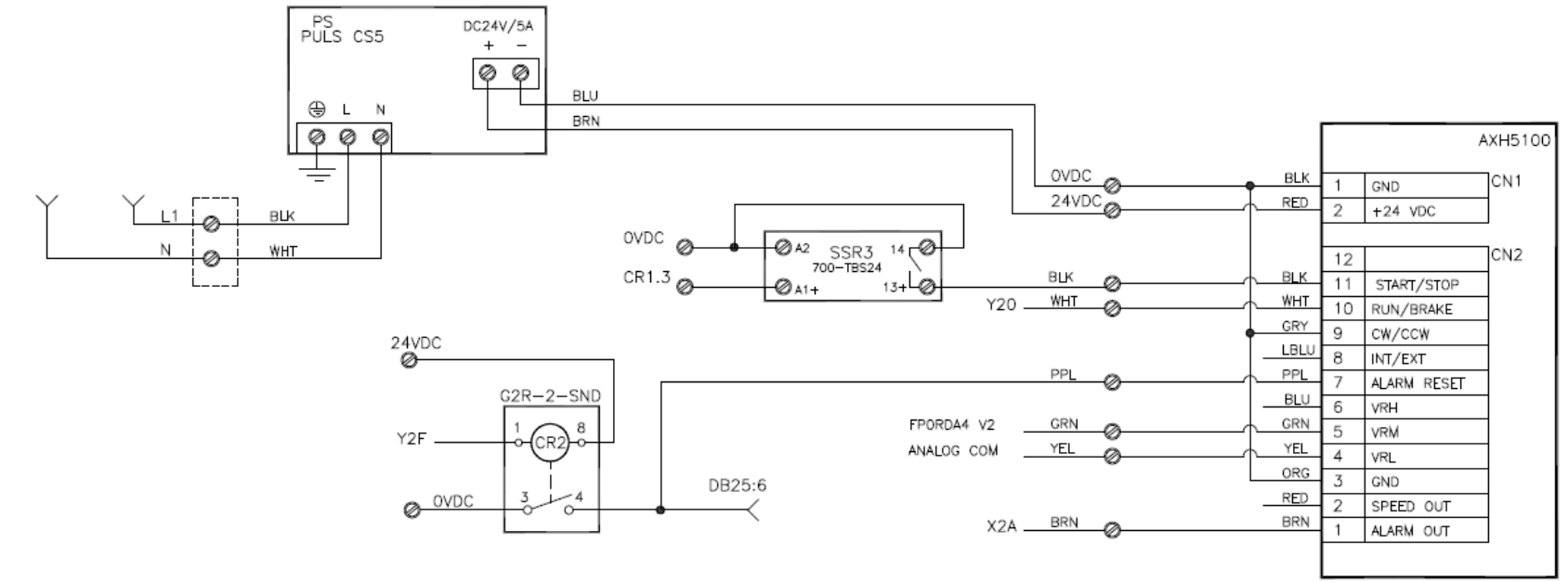
7.17 DB25 Circuit

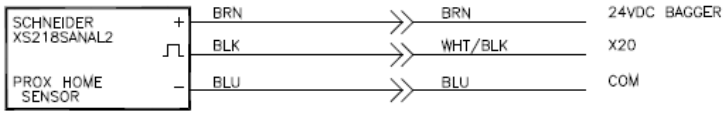
ST1k-E15



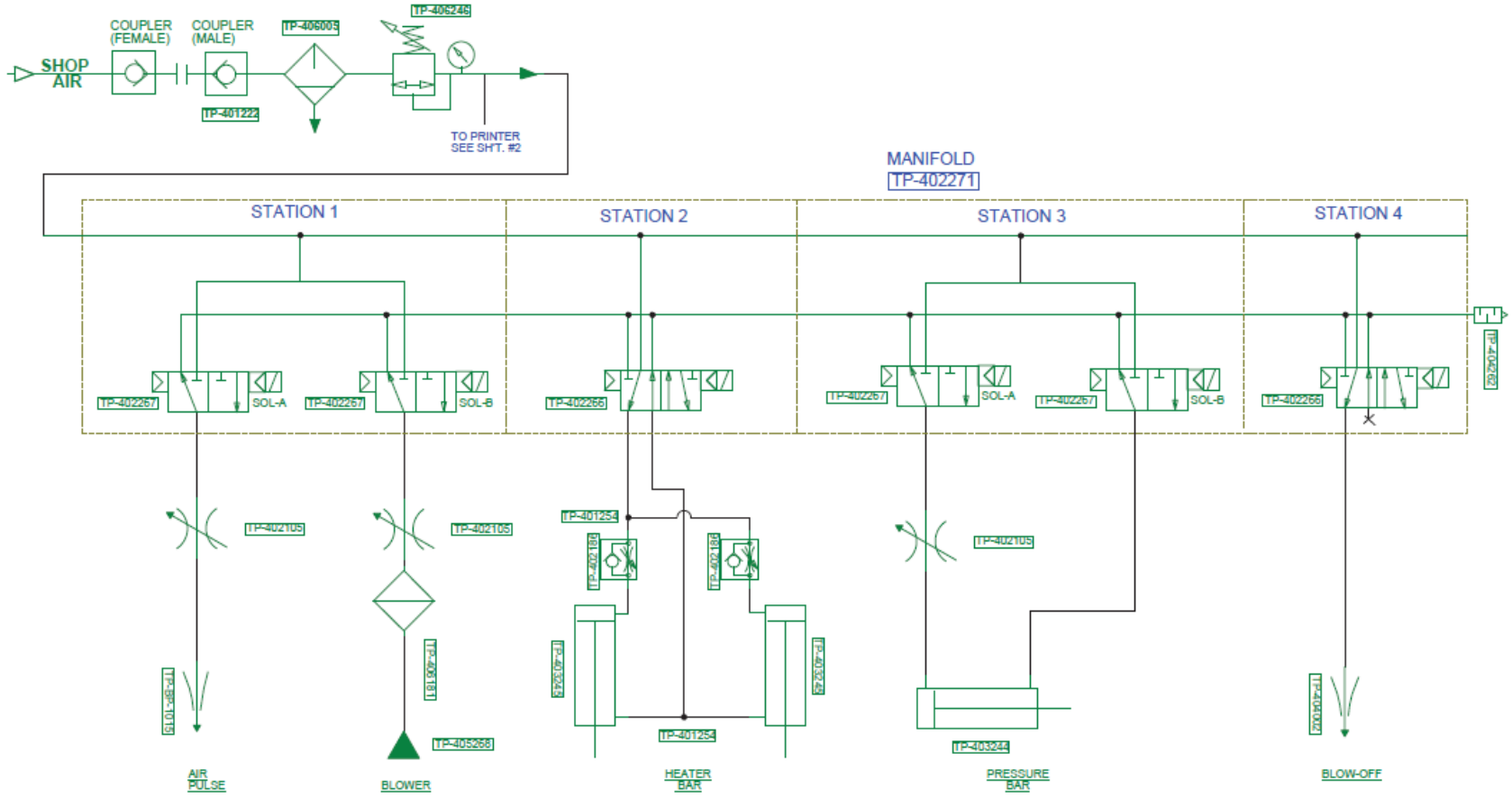
7.18 LS-10 Circuit

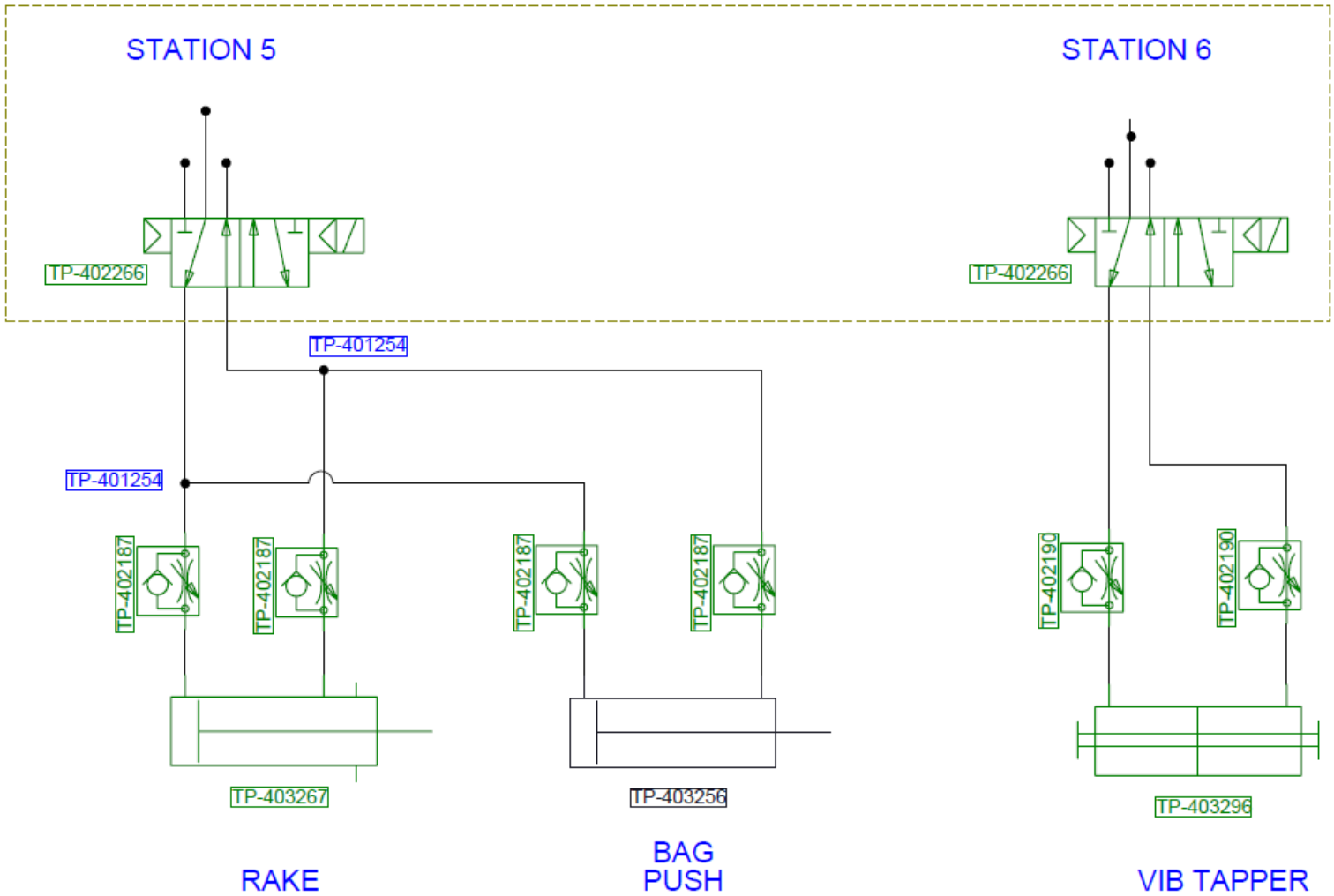
ST1k-E11



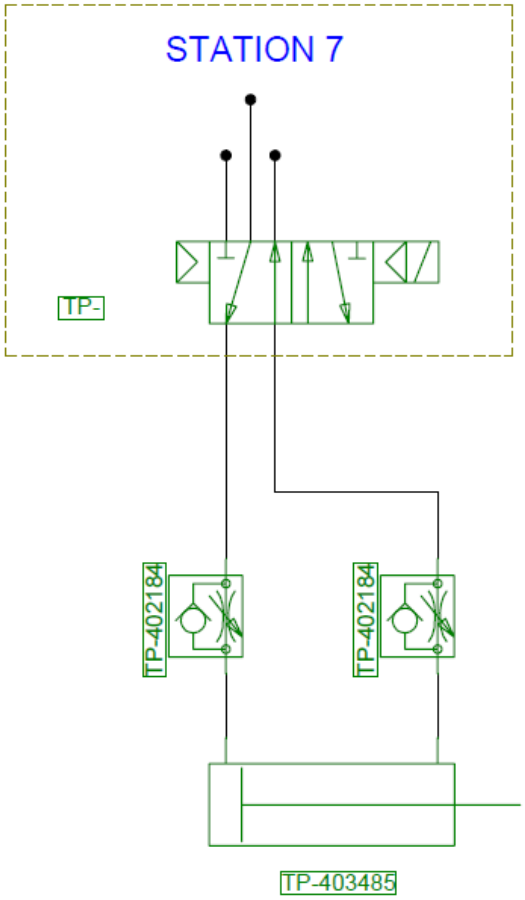


7.19 Bagger Pneumatics

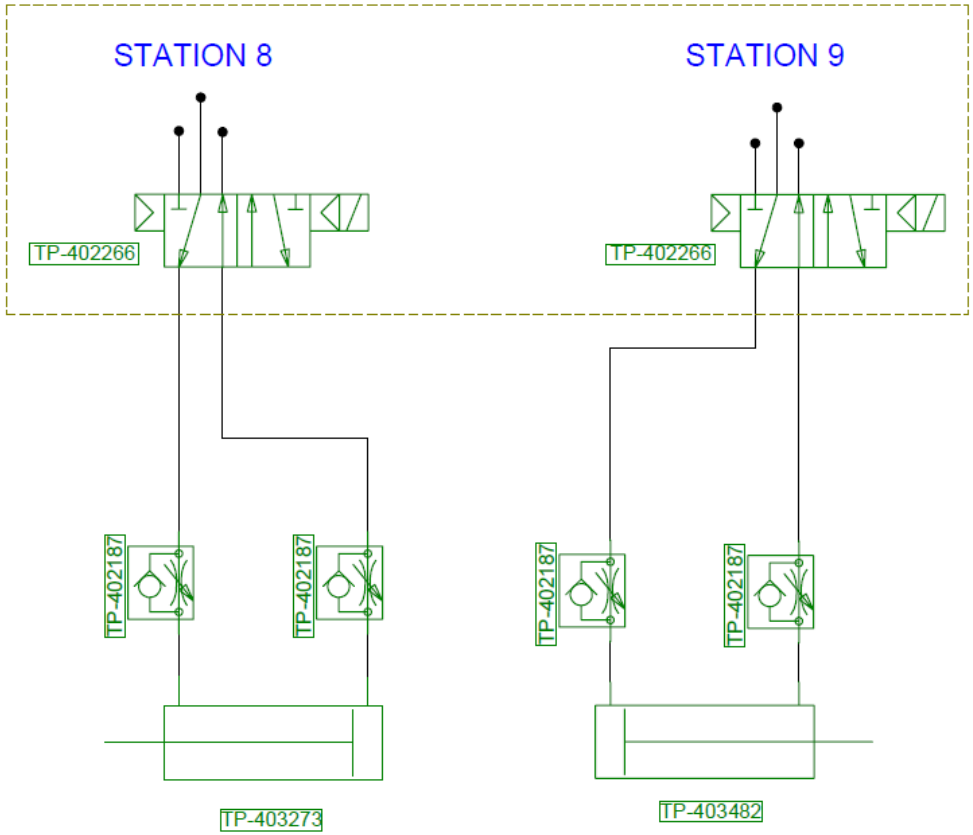



STATION 5
STATION 6
TP-402266
TP-402266
TP-401254
TP-401254
TP-402187
TP-402187
TP-402187
TP-402187
TP-402190
TP-402190
TP-403267
TP-403256
TP-403296
RAKE
BAG
PUSH
VIB TAPPER

LSV30



ACCUMULATOR CHUTE



BO-30
BAG OPENER

7.20 PLC IO Listing

Main PLC and Expansion PLC IO (Inputs and Outputs) Listing is provided to assist in troubleshooting the T-1000.

Card:	Address	Description	Normal State
	Inputs		
Main PLC	X 0	Reserved for Stepper Control	N/A
Main PLC	X 1	Perf Sensor	off
Main PLC	X 2	*Not Used - Available*	
Main PLC	X 3	AF10 Home Sensor	off
Main PLC	X 4	Jam Detect Sensor	on
Main PLC	X 5	Pick Conv: Accumulator Closed Sensor	off
Main PLC	X 6	*Not Used - Available*	
Main PLC	X 7	Seal Bar In Sensor	off
Main PLC	X 8	Foot Switch (Pick-to-Light Touch)	off
Main PLC	X 9	Out of Bags Sensor	off
Main PLC	X A	Frame Open Sensor	on
Main PLC	X B	*Not Used - Available*	
Main PLC	X C	*Not Used - Available*	
Main PLC	X D	*Not Used - Available*	
Main PLC	X E	*Not Used - Available*	
Main PLC	X F	*Not Used - Available*	
Main PLC	X 10	*Not Used - Not Available*	
Main PLC	X 11	*Not Used - Not Available*	
Main PLC	X 12	*Not Used - Not Available*	
Main PLC	X 13	*Not Used - Not Available*	
Main PLC	X 14	*Not Used - Not Available*	
Main PLC	X 15	*Not Used - Not Available*	
Main PLC	X 16	*Not Used - Not Available*	
Main PLC	X 17	*Not Used - Not Available*	
Main PLC	X 18	*Not Used - Not Available*	
Main PLC	X 19	*Not Used - Not Available*	
Main PLC	X 1A	*Not Used - Not Available*	
Main PLC	X 1B	*Not Used - Not Available*	
Main PLC	X 1C	*Not Used - Not Available*	
Main PLC	X 1D	*Not Used - Not Available*	
Main PLC	X 1E	*Not Used - Not Available*	
Main PLC	X 1F	*Not Used - Not Available*	

PLC Exp1	X	20	LS-10 Shaker Home Sensor	off
PLC Exp1	X	21	*Not Used - Available*	
PLC Exp1	X	22	Scale Conv Safety Door Sensor	off
PLC Exp1	X	23	Pick Conv Alarm	on
PLC Exp1	X	24	ESTOP	off
PLC Exp1	X	25	Hopper Conv Alarm	on
PLC Exp1	X	26	*Not Used - Available*	
PLC Exp1	X	27	Pick Conv Flow Sensor	on
PLC Exp1	X	28	*Not Used - Available*	
PLC Exp1	X	29	*Not Used - Available*	
PLC Exp1	X	2A	*Scale Conv Alarm*	on
PLC Exp1	X	2B	*LS-10 Shaker Alarm*	on
PLC Exp1	X	2C	*Not Used - Available*	
PLC Exp1	X	2D	*BO-30 Bag Open Sensor*	off
PLC Exp1	X	2E	*BO30: Home Sensor*	on
PLC Exp1	X	2F	*Not Used - Available*	
PLC Exp1	X	30	*Not Used - Not Available*	
PLC Exp1	X	31	*Not Used - Not Available*	
PLC Exp1	X	32	*Not Used - Not Available*	
PLC Exp1	X	33	*Not Used - Not Available*	
PLC Exp1	X	34	*Not Used - Not Available*	
PLC Exp1	X	35	*Not Used - Not Available*	
PLC Exp1	X	36	*Not Used - Not Available*	
PLC Exp1	X	37	*Not Used - Not Available*	
PLC Exp1	X	38	*Not Used - Not Available*	
PLC Exp1	X	39	*Not Used - Not Available*	
PLC Exp1	X	3A	*Not Used - Not Available*	
PLC Exp1	X	3B	*Not Used - Not Available*	
PLC Exp1	X	3C	*Not Used - Not Available*	
PLC Exp1	X	3D	*Not Used - Not Available*	
PLC Exp1	X	3E	*Not Used - Not Available*	
PLC Exp1	X	3F	*Not Used - Not Available*	

PLC Exp2	WX	4	*Analog Input (Thermocouple J)*	
PLC Exp2	WX	5	*Not Used - Available (Thermocouple J)*	

Outputs

Main PLC	Y 0	*Stepper Pulse Train CW*	
Main PLC	Y 1	*Stepper Pulse Train CCW*	
Main PLC	Y 2	*H/V Trigger*	
Main PLC	Y 3	*Heater Control*	
Main PLC	Y 4	*Air Blower Solenoid*	
Main PLC	Y 5	*Air Pulse Solenoid*	
Main PLC	Y 6	*Heater Bar Solenoid*	
Main PLC	Y 7	*Seal Bar Solenoid*	
Main PLC	Y 8	*Seal Bar In Solenoid*	
Main PLC	Y 9	*Blow Off Solenoid*	
Main PLC	Y A	*Not Used - Available*	
Main PLC	Y B	*Load Shelf (station#5) Solenoid*	
Main PLC	Y C	*Not Used - Available*	
Main PLC	Y D	*Not Used - Available*	
Main PLC	Y E	*Not Used - Available*	
Main PLC	Y F	*Not Used - Available*	
Main PLC	Y 10	*Not Used - Not Available*	
Main PLC	Y 11	*Not Used - Not Available*	
Main PLC	Y 12	*Not Used - Not Available*	
Main PLC	Y 13	*Not Used - Not Available*	
Main PLC	Y 14	*Not Used - Not Available*	
Main PLC	Y 15	*Not Used - Not Available*	
Main PLC	Y 16	*Not Used - Not Available*	
Main PLC	Y 17	*Not Used - Not Available*	
Main PLC	Y 18	*Not Used - Not Available*	
Main PLC	Y 19	*Not Used - Not Available*	
Main PLC	Y 1A	*Not Used - Not Available*	
Main PLC	Y 1B	*Not Used - Not Available*	
Main PLC	Y 1C	*Not Used - Not Available*	
Main PLC	Y 1D	*Not Used - Not Available*	
Main PLC	Y 1E	*Not Used - Not Available*	
Main PLC	Y 1F	*Not Used - Not Available*	

PLC Exp1	Y 20	LS-10 Shaker Run	
PLC Exp1	Y 21	*Not Used - Available*	
PLC Exp1	Y 22	Hopper Conv Reverse	
PLC Exp1	Y 23	Pick Conv/Pick Blow-Off	
PLC Exp1	Y 24	Scale Conv Run	

PLC Exp1	Y 25	Stack Light Red	
PLC Exp1	Y 26	Stack Light Yellow	
PLC Exp1	Y 27	Stack Light Green	
PLC Exp1	Y 28	Pick Accumulator (station#6) Solenoid	
PLC Exp1	Y 29	Not Used (Pick Conv Blow-Off)	
PLC Exp1	Y 2A	BO-30 Forward (station#8) Solenoid	
PLC Exp1	Y 2B	BO-30 Up/Down (station#9) Solenoid	
PLC Exp1	Y 2C	Stack Light Audible	
PLC Exp1	Y 2D	Hopper Conv Forward	
PLC Exp1	Y 2E	Take-Away Conv Run	
PLC Exp1	Y 2F	Conveyor Drive Alarms Reset	
PLC Exp1	Y 30	*Not Used - Not Available*	
PLC Exp1	Y 31	*Not Used - Not Available*	
PLC Exp1	Y 32	*Not Used - Not Available*	
PLC Exp1	Y 33	*Not Used - Not Available*	
PLC Exp1	Y 34	*Not Used - Not Available*	
PLC Exp1	Y 35	*Not Used - Not Available*	
PLC Exp1	Y 36	*Not Used - Not Available*	
PLC Exp1	Y 37	*Not Used - Not Available*	
PLC Exp1	Y 38	*Not Used - Not Available*	
PLC Exp1	Y 39	*Not Used - Not Available*	
PLC Exp1	Y 3A	*Not Used - Not Available*	
PLC Exp1	Y 3B	*Not Used - Not Available*	
PLC Exp1	Y 3C	*Not Used - Not Available*	
PLC Exp1	Y 3D	*Not Used - Not Available*	
PLC Exp1	Y 3E	*Not Used - Not Available*	
PLC Exp1	Y 3F	*Not Used - Not Available*	

PLC Exp2	WY 4	*Not Used - Analog Output Available*	
PLC Exp3	WY 6	Analog Output: Pick Conv (V0) LS-10 Shaker (V2)	
PLC Exp4	WY 7	Analog Output: Hopper Conv (V1) Scale Conv (V3)	

7.21 Notes

Date	Note