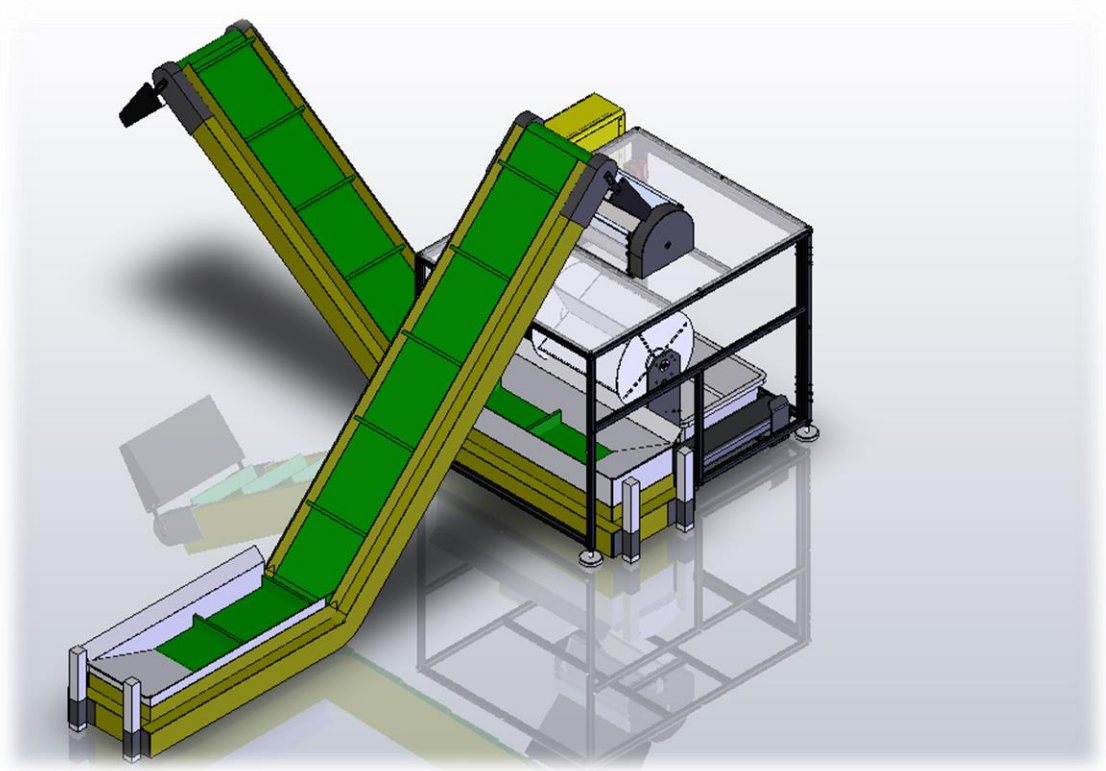
US-4000 Rotary Check-Weigh Scale

Operation Guide, Version 2A

Setup, Operation and Parts Manual



Advanced Poly-Packaging, Inc.

1331 Emmitt Road • Akron, OH 44306 • 1-800-754-4403 • fax 330-785-4010 • www.advancedpoly.com

Acknowledgments

Written By: Jen Sprandel and Annie Braddock
Edited By: Annie Braddock
Reviewed By: Stuart Baker

Copyright

Trademarks

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.

TABLE OF CONTENTS

Chapter 1: Introduction

Welcome
Overview
Specifications
Air and Power Requirements
Available Options
Using This Manual
Vishay Load Cell Specification Sheet
Warranty Registration

1.1 Welcome

Now that you have decided to upgrade your packaging facilities with the Ultra-Scale 4000 Rotary Check-Weigh Scale, we thank you for selecting our equipment, materials and service. Designed to accurately weigh packages and sort acceptable product from product that is under or over weight, the US-4000 will lower your packaging costs with automatic operation, increased speeds, versatility, reliability and simplicity.

1.2 Overview

The Ultra-Scale 4000 is designed to cut setup time and allow for quick and easy download of setting changes without losing production time. A user-friendly, menu-driven touch screen program allows operators to set up the scale, save the settings in memory and recall those settings for repeat runs.

1.3 Specifications

MACHINE SPECIFICATIONS		TOUCH SCREEN SPECIFICATIONS	
Machine Dimensions	32" Width x 54" Height x 23.5" Depth	Power	24VDC (+/- 10%)
Load Height	Adjustable, 42" to 60" (depends on accumulator position)	Operating Environment	0-50°C, 85% RH or less
Rotary Drum Motor	Stepper Driven	Display	Color LCD
Drum Positioning Optical Sensor	Photoelectric with Distance Adjustment	Display Area	174 x 131mm (5.7")
Product Sensor	Photoelectric with Teach Function	Resolution (W x H)	320 x 240 pixels
Load Cell	25 lbs Active Load	Backlight	CCFL,
Weight	250lbs	Backlight Hours	Approx. 75,000
Air, Electric	40 PSI, 115V/60Hz	PLC Connection	RS232C

1.4 Air and Power Requirements

The US-4000 is equipped with an external regulator and the air supply should feed to the US-4000 with ¼" O.D. poly tubing. Make the connection at the rear of the unit. Set the air pressure on the US-4000 between 35 and 45 PSI or a lower pressure, sufficient to actuate the opening and closing of the doors.

NOTE: Air should be dry and oil free to avoid damage to components.

The US-4000 requires an 115V/60 Hz power source and will draw approximately 3 Amps total per unit.

1.5 Available Options

Incline Feed Conveyors: APPI offers a variety of infeed conveyors, including flat to incline, horizontal and incline configurations in lengths up to 100 feet.

Exit Conveyors: To remove product from the scale to further packing stations, APPI offers exit conveyors.

Wind Enclosure: In areas with air flow from the environment or fans, scale reading may be affected. APPI offers enclosures to shield the scale from these factors.

1.6 Using This Manual

The following manual conventions are frequently used to assist in understanding important information, to alert the operator of potentially dangerous or damaging practices and to describe the normal functions of the US-4000.

- Text Normal text.
- *Italics* Used for emphasis.
- **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.
- *NOTE:* Identifies important information.

1.7 Vishay Load Cell Specification Sheet Placeholder

Specification Sheet for the Load Cell, if not included with the manual, can be obtained by calling APPI Service.
You will need this specification sheet if ordering a replacement load cell.

1.8 Warranty Registration

This section must be completed and returned to Advanced Poly-Packaging, Inc. to register the US-4000 Rotary Scale for Warranty Protection.

Serial Number:

_____

(Serial Number located on the back panel)

Company Name and 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: sales@advancedpoly.com

This page intentionally left blank.

Chapter 2: Getting Started

Chapter Summary
Safety and Risks
Installation Procedures
Machine Setup
Hookups and Connections
Main Power

2.1 Chapter Summary

This chapter describes procedures to receive and set up the US-4000, including uncrating instructions, environmental, air and power requirements, assembly instructions and height adjustments. Additionally, this chapter describes safety precautions and how to power on the US-4000.

2.2 Safety and 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 any 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 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 the equipment, assemble the equipment (if required), test and connect power sources, test the equipment for proper operation and otherwise set up the equipment for use.

- ***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*:** To avoid injury, do not operate the equipment if funnels, guards, 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 temperatures that can cause crush, cut or burn injuries to hands or fingers.

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

- ***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*:** Be careful when opening the seal frame 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*:** 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 Installation Procedures

The US-4000 is shipped with the scale drum assembly removed from the unit in a custom crate designed to protect the machine during shipment. The load cell will be secured with breather screw closed. The breather screw must be opened before use by turning the screw counterclockwise. Do this last to ensure no damage is done to the scale or load cell. Directions are provided below and a check list is provided in Section 2.7 for proper installation procedures.

NOTE: The load cell and scale are very sensitive and require precise attention to how components are handled to ensure there is no damage done during the installation process. It is imperative that screws directly touching the load cell are not over tightened; if they are it may cause misreading in the scale weight.

Step 1: Remove components from crating. Locate the Upper Drum Assembly and the Load Cell Assembly. Remove a side panel from the Upper Drum Assembly so that it can be lowered onto the Load Cell Assembly. Keep screws that were removed in a safe place to reattach at the end of the installation procedure.

NOTE: This is a critical operation and must be done very carefully to avoid damage to the scale. The installer must be able to see where the upper holes align with the load cell holes; thus the reason for the panel to be removed.

NOTE: Lift the drum with two people, one on each side, ensuring the Upper Drum Assembly is not lifted by the Servo-Motor.

Step 2: Fasten the Upper Drum Assembly to the load cell with four ¼ x 20 x ¾ SHCS and washers. When attached, these should not be over tightened, which could cause damage to the load cell threaded holes.

Step 3: Locate the DB9 Cable (Eye Cable) from the top and the bottom assemblies, connect the cables from each assembly to each other. Locate the 6 Pin Military Cable (Motor Cable) on both assemblies and connect, see Figure 2-1. Ensure each of the cables are fastened above the load cell and looped down into the plate, careful not to touch the load cell and module wire. Ensure that the DB9 and 6 Pin Military Cables are not pinched. The cables must be fastened to both the top and bottom plate with a large loop, between the weight (upper side) and stand (lower side).

NOTE: The inspector must ensure that there are not any cables that are pinched between the upper drum assembly and the lower stand assembly. The position and securing of the cables are critical to ensure the proper performance of the load cell. If the cables are not "looped" properly, with a large loop to reduce stress on the load cell, the accuracy of the scale will be affected. . If wires are loose or are pinched, the accuracy of the scale will be diminished and the scale will not operate correctly. .

NOTE: After the Drum Assembly is attached, DO NOT LIFT at the Servo-Motor to move the US-4000 into position. The Servo-Motor is attached to the load cell and lifting the Drum Assembly by the Servo-Motor will severely damage the load cell. To prevent damage, lift from the bottom of the assembly.

Step 4: Reattach the side plate that was removed during installation using the original screws.

Operating Environment: When choosing a location for installation, make sure the area is free of air movement, which could cause the scale to act erratically, or inaccurately. The area should also be free of excess dust, dirt and moisture which would affect the accuracy of the scale. The scale also should be stable, with no heavy moving equipment, or ground vibration. To ensure the highest production possible, consider product flow from baggers or counters and ensure that finished (packaged) product can easily flow from the system.

NOTE: For suggested system layouts, please contact an APPI technical sales person.

2.4 Machine Setup

Position the US-4000 in an environment free from vibrations, air flow or other conditions that may affect the stability of the scale or cause incorrect readings from the load cell.

When the scale is in its operating location, level the scale by adjusting the leveling pads. Place a level across the stand and along the stand legs to level the scale.

After mounting the rotary drum assembly and choosing an adequate operating location, the load cell breather screw can then be opened. Turn the breather screw (located on the back of the load cell assembly) counterclockwise 3-4 turns by reaching a screw driver through the hole in the side plate. See Figure 2-2. Once the breather screw is opened, the scale should not be moved.

2.5 Hookups and Connections

On the back of the US-4000 electrical panel is a port which allows for a conveyor to be plugged into the 115V power outlet. This outlet is switched based on the status of the Scale, to stop the conveyor from over-feeding the scale if the scale is in a fault or stop mode. Connection to this port is optional. If not connected, the scale can operate in a stand-alone operation mode. A 12-foot power cord is supplied to connect to a standard 115V/60Hz grounded outlet (US voltage).

There is also an optional T-1000 Connection, which allows the bagger to stop and signal a fault if the cable is connected. This is an optional feature; if the machine is not equipped with the cable, please call APPI for pricing.

NOTE: Power outlets should be checked by qualified electricians to ensure the proper voltages are supplied.

Connect a 1/4" airline to the regulator to operate the accumulator gates and set the air pressure between 35 and 45 PSI or lower to allow the gates to open and close quickly and freely.

Connect the product sensor photo eye cable to the photo eye mounted above the accumulator assembly.

When the upper assembly has been installed and all connections have been made the cover plate can be reinstalled.

2.6 Main Power

The main power switch for the US-4000 is located on the side of the control module. To turn the scale on, turn the switch from its horizontal OFF position to its vertical ON position. When the machine is turned on, 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 Operation screen or Main Menu.

After the machine is set up so it can be operated, the scale must then be calibrated. See Chapter 3.26 Scale Calibration for full Scale Calibration procedures.

2.7 Inspection / Action Checklist:

NOTE: This operation requires multiple people to aid in the installation.

CAUTION: The load cell is very sensitive and requires great attention when being assembled.

CAUTION: DO NOT tilt the load cell on its side, it will drain out.

1. Remove components from crating.
2. Ensure you have 2 people to hold the drum.
3. Remove side panel.
4. Locate DB9 Cable and the 6 Pin Military Cable.
5. Lower drum assembly onto the scale head. ***CAUTION:*** **Do Not hold Upper Drum Assembly by the Servo-Motor, it will cause damage to the scale.**
6. Attach drum to scale head via the 4 outer screws. Be mindful not to over tighten. ***CAUTION:*** **Over tightening screws will cause the scale to misread.**
7. Attach and Adjust cables, ensure they are looped and not pinching and that they are not touching the load cell, module wire or each other. ***CAUTION:*** **Pinched or touching wires will cause a misread in the scale.**
8. Reattach side panel.
9. Move Scale to desired operating location, ensure the scale is level.
10. Locate small hole on reverse side plate. Use a screw driver to open the breather Screw 3 to 4 turns counterclockwise. *NOTE: Once the Breather Screw is opened, the scale should not be moved.*
11. Hookup Air and Power connections.
12. Turn on the Main Power.
13. Calibrate the Machine.

Wire Placement

Figure 2-1

Breather Screw

Figure 2-2

Chapter 3: Operation

Summary
Panel LEDs
System and Function Keys
Screen Contrast Settings
Auto Screen Off / Manual Screen Off
Parameter and Communication Settings
Touch Screen Program
Quick Startup Checklist

3.1 Chapter Summary

The touch screen is comprised of LEDs, System and Function keys and the screen operation itself. This chapter describes the identification, operation and adjustments of the touch screen program.

3.2 Panel LEDs / Connectors

Front - Power: Green LED is lit when machine is turned on.
Back - MJ1: Connector used for serial communication with an external device and screen data transfer
Back - MJ2: Connector used for serial communication with an external device
Back - USB-A Port: Provides connection to a USB printer
Back - USB-B Port: Provides connection to a computer for screen data transfer
Back - LAN Connector (Optional): Provides Ethernet communication.

3.3 System and Function Keys

There are three levels of access to the system settings:

1) Press Function keys (**F1** to **F5**) directly.
2) Press the **System** key. Then press one of the **Function** keys.
3) Press the **System** key. Then hold down the **F1** and **F5** keys for parameter settings.

Function keys are programmed as "hot" keys and may be changed depending upon the program version. However, F1 key will always display a HELP screen.

3.4 Screen Contrast Settings

To access the Screen Contrast settings, press the **System** key first, then press the **Function** keys. Pressing the **System** key followed by **F2** through **F5** allows for screen contract adjustments, as follows:

F1 - Function key 1: Displays Help screen.
F2 - Function key 2: Reduces the screen contrast.
F3 - Function key 3: Sets the screen contrast to mid-scale.
F4 - Function key 4: Increases the screen contrast.
F5 - Function key 5: Backlight ON/OFF (locked in ON position).

To enable the function keys, press the lavender **System** key. Hold down the **F2** key or depress it repeatedly to decrease the contrast and darken the touch screen display. Hold down the **F4** key or depress it repeatedly to increase the contrast and brighten the touch screen display. Press the **F3** key to set the contrast to the mid-scale position. Press the **System** key again to disable the function keys.

NOTE: The function keys will only remain active for 5 seconds after the last key is pressed.

3.5 Auto Screen Off / Manual Screen Off

The backlight will automatically turn off after 30 minutes of nonuse of the touch screen to protect the longevity of the screen components. If the backlight is off, simply touch the screen or press the **System** or **Function** key to illuminate the screen. To turn off the backlight manually, press the **System** key, followed by the **F5** function key.

3.6 Parameter and Communication Settings

System settings can only be accessed by pressing the **System** key and then holding the **F1** and **F5** function keys simultaneously.

NOTE: Parameter settings are set at the factory and should not be altered. Any changes may cause the touch screen to become inoperative.

System settings provide access to the COMM parameters, I/O test and memory card information. COMM parameters are set at the factory as follows:

- **SIG LEVEL**: RS232C
- **CONNECT**: 1:1
- **PC Stat**: No: 1
- **Baud Rate**: 19,200
- **Data**: 8
- **Stop Bit**: 1
- **Parity**: ODD

The I/O test provides for touch / contact switch tests. Each button can be tested to ensure proper operation of the screen. Press the right corner of screen to return to the Main Menu. From the Main Menu, press **System / Mode** button to return to normal operation.

3.7 Touch Screen Program Overview

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 is used for operation consistency and to identify functions:

- **Blue:** Background color used for text information. No "buttons" or functions are blue.
- **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.
- **Red**: Indicates that a function is off or stopped. For example, pressing a red button may turn a function on.
- **Yellow**: Used for menu buttons. Pressing a menu button displays another screen and allows for movement throughout the entire program.

Figure 3-1

3.8 Calibrating Screen

When the US-4000 is turned on, a Calibrating screen is displayed on the touch screen for approximately 30 seconds while the program initiates and automatically calibrates the load cell. See Figure 3-1.

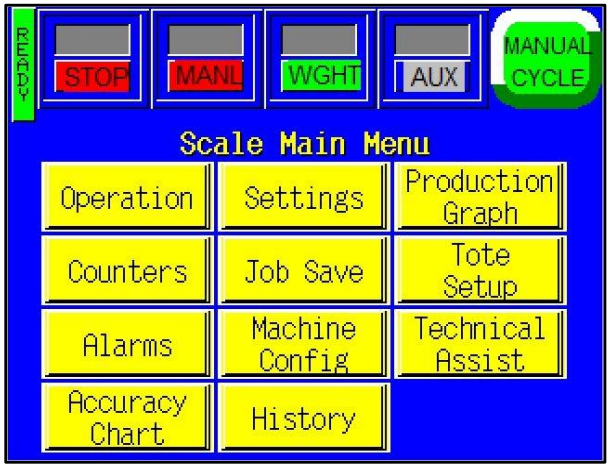


Figure 3-2

3.9 Main Menu

The Main Menu screen is provided to allow the operator to quickly navigate to other areas in the touch screen program. See Figure 3-2.

Mode toggle buttons are located at the top of most screens:

- **START / STOP**: This toggle button changes the current state of the scale's operation. To start the scale, toggle the button to START. To stop the scale, toggle the button to STOP. If an error condition exists, the scale will automatically switch to STOP.

- **AUTO / MANL**: This toggle button is provided to operate the system in an Automatic or a Manual operation. In Automatic mode, product is automatically fed to the scale and the scale automatically cycles when product is received. In Manual mode, cycle operation begins when the **Manual Cycle** button is pressed.

- **EYE / WGHT**: This toggle button is provided to switch operation between the photo Eye mode and the Weight mode. In Eye mode, a product must pass through the photo sensor located in the accumulator. When the product passes through the eye and the scale is empty, the accumulator door will open, dropping product onto the scale and initiating operation. In Weight mode, the accumulator door will be open unless the scale is cycling, awaiting product. Product is detected when the product weighs greater than the UNDER set point.

- **AUX ON/OFF**: To set up communication with a bagger, conveyor or other piece of auxiliary equipment, the **AUX** toggle button must be in the green ON position. If you wish to operate the unit as a stand-alone machine, then the **AUX** button must be in the grey OFF position. For setup, place the **AUX** button in the OFF position.

Ready / Waiting LED: The vertical LED to the left of the **START / STOP** toggle button indicates the operation status of the US-4000. When this LED displays "Waiting," the US-4000 rejects all products dropped onto the scale or does not cycle at all, depending on the cause of the Waiting condition. If this LED displays "Ready," the scale will accept product and operate normally.

The **Manual Cycle** button is provided to manually cycle the scale for testing and setup.

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. 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.

3.10 Scale Operation Screen

The Scale Operation screen allows the operator to monitor the operation of the scale, begin operation and stop the system. See Figure 3-3.

The US-4000 is designed to operate within a system and as a stand-alone unit. A system is comprised of several units, including baggers, counters and/or conveyors. The auxiliary function of the scale is flexible, depending on the equipment operating in the system. When the auxiliary cable is connected to the scale, a "pause" signal is provided that can be interpreted by other equipment in the system to pause automatic operations. If not connected, the scale can run automatically.

Before running automatically, the scale should be cycled several times as a stand-alone unit to test for accuracy.

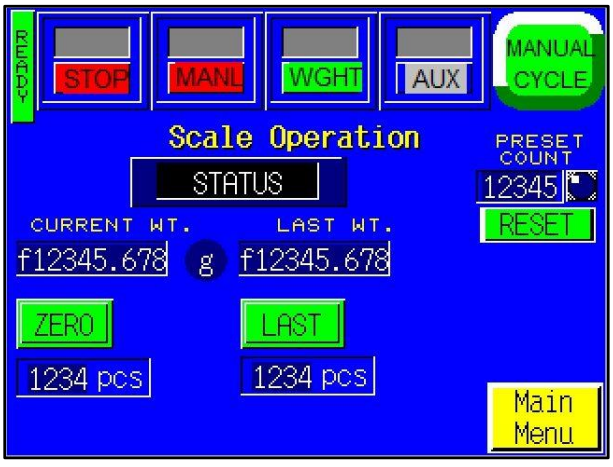


Figure 3-3

Status Display: When the scale is within the zero range, the Status display will display "STATUS," which indicates that the scale is idle. If the scale is over the zero range but under the acceptable weight range, "UNDER" will be displayed. If the scale is in the acceptable weight range, then "ACCEPT" will be displayed. If the scale has exceeded the acceptable weight range, then "OVER" will be displayed.

Current Weight: Displays the weight of the product on the scale. If there is no product on the scale and the weight is not zero, press the **Zero** button to zero the scale. The current count is also displayed on the Operation screen.

Last Weight: Displays the weight of the previous batch of product. The last count is also displayed on the Operation screen.

The **ZERO** button is provided to reset the scale to zero when the scale is empty. This button prevents the operator from having to constantly clean debris from the scale.

Last Button: Press the **Last** button to manually move the current weight into the Last Weight display.

Preset Count: The Preset Count can be set to stop production after a preset number of cycle operations. To adjust the Preset Count on the Operation screen, press the blue box below Preset Count. A numeric keypad will be displayed. Enter a value and press the **ENT** button. To reset this counter, press the **Reset** button. To disable the option, set the value to zero. This counter can also be adjusted on the Scale Counters screen. The LED to the left of the Preset Count will illuminate when the Preset Count is reached.

3.11 Scale Settings Screen

The Scale Settings screen contains the weight value settings, timer settings, units or count settings used to control the operation of the scale. See Figure 3-4.

*NOTE: Before changing any values on this screen, toggle the **START / STOP** button to STOP to prevent personal injury.*

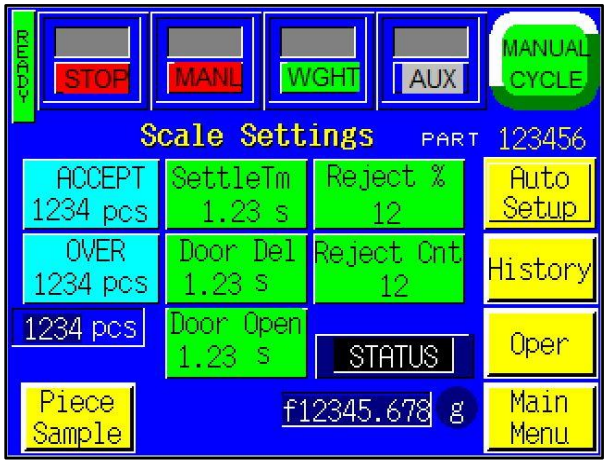


Figure 3-4

There are two different settings screens in the touch screen program: one for the scale when it is in Count mode (See Figure 3-4) and one for the scale when it is in Weight mode (See Figure 3-5). In Count mode, the Settings screen displays the quantity of product. In Weight mode, the Settings screen displays the weight of the product. A toggle button on the Factory Settings screen allows for switching between these two modes.

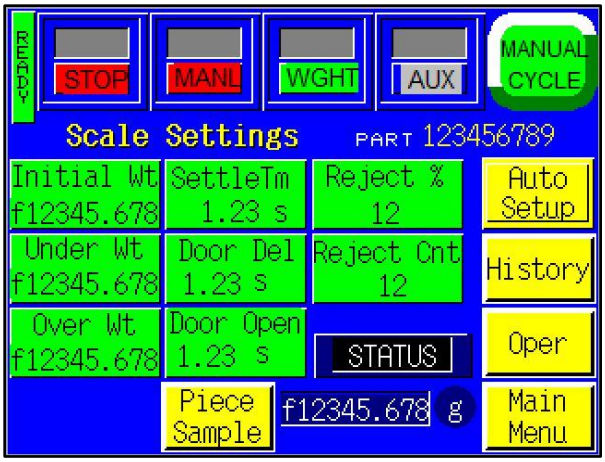


Figure 3-5

Accept / Initial Weight: The minimum count or weight needed to cycle the scale; the desired count or weight of product. To set this value, press the **Accept** or **Initial Wt** button, enter a value in the numeric keypad and press the **ENT** button.

Under Weight (only in weight mode): The weight of product that is considered under the acceptable weight and will be rejected when the US-4000 is in Weight mode. Product with a weight equal to or less

than this value will be rejected. To adjust this setting, press the **Under Wt** button, enter a value in the numeric keypad and press the **ENT** button.

*NOTE: Values below the minimum value or above the maximum value will not be accepted when the **ENT** button is pressed. Press the **CLR** button and enter a new value that is within the indicated acceptable range.*

Over / Over Weight: This setting is a value that, if exceeded, would cause the product to be rejected. Product with a count or weight equal to or greater than this value will be rejected. This value is discretionary since some product that is overweight or contains too many parts could be considered acceptable. To adjust this setting, press the **Over** or **Over Wt** button, enter a value into the numeric keypad and press the **ENT** button.

NOTE: The difference between the UNDER and ACCEPT values and the OVER and ACCEPT values must be greater than 0.005 lbs. If the difference is less than or equal to 0.005 lbs., the scale may accept product that is considered a reject and vice versa.

Settle Time: This setting is provided to allow product on the scale to settle in the bag and become motionless before the scale locks the weight and cycles the rotary drum. By increasing the settle time, the accuracy of the scale increases, but the production/output decreases.

Door Delay: The amount of time, in seconds, before the accumulator door opens. If the product is falling from a great height, the doors should remain closed until the product hits the accumulator doors in order to prevent damage to the scale.

Door Open: The amount of time that the accumulator doors will remain open, allowing product to completely exit the scale before the doors close.

Reject %: The percentage of product that, if rejected, will stop operation and cause an error message to be displayed. For example, if the Reject % is set to 25 and 25 out of 100 products are rejected, operation will stop. To adjust this setting, press the **Reject %** button, enter a value into the numeric keypad and press the **ENT** button.

Reject Count: The consecutive number of rejected products that will cause operation to stop and an error message is displayed. For example, if the Reject Count is set to 5 and 5 consecutive cycles produce 5 consecutive rejects, operation will stop. If a product is accepted, the Reject Count resets back to zero. For example, if the Reject Count is set to 10 and 9 consecutive boxes are rejected but the tenth box is accepted, the Reject Count will reset to zero. To adjust this setting, press the **Reject Count** button, enter a value into the numeric keypad and press the **ENT** button.

3.12 Piece Sample Screen

The average piece weight must be established for the scale to count accurately. The scale should be in STOP, MANL, SETUP mode prior to performing this step. Press the **Piece Sample** button from the Settings screen to access the Piece Sample screen. See Figure 3-6.

NOTE: Before performing this test, the scale tray should be empty and clean and the scale should be at zero before proceeding.

To run the test, first press the **Manual Cycle** button to clear the scale. Clean the scale tray, then press the **Zero** button. Manually count a quantity sufficient to

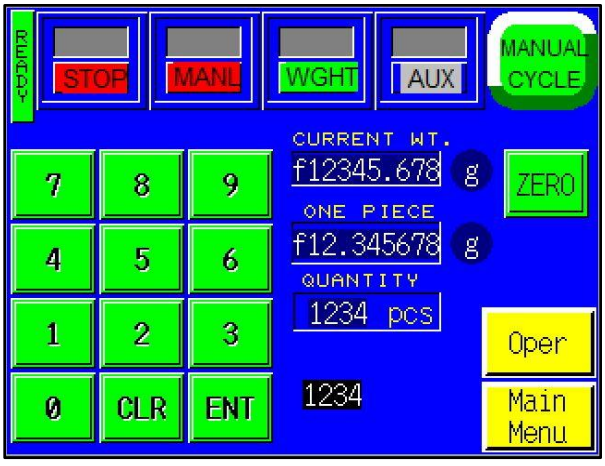


Figure 3-6

accurately determine the average piece weight. For smaller or lighter products, we recommend a higher quantity for the sample count. Drop product into the tray, enter the quantity of product using the numeric keypad and press the **ENT** button. Notice the One Piece weight value on the screen. Then press the **ENT** button again. If the One Piece value did not change, the One Piece weight or "Average Piece Weight" has been established. As a final test, remove and add one piece at a time, ensuring the quantity changes accordingly.

NOTE: A higher batch count will establish a more accurate average (one) piece weight.

Due to "lot" weight variance, this count setup procedure should be conducted on a regular basis. We recommend performing the sampling procedure during the setup of every new part. If the piece quantity does not accurately display the number of pieces in the tray when one piece is removed, it may be due to varying piece weight. For very light pieces, the Quantity display may be constantly changing. If this occurs, the range may need to be increased to allow for the scale accuracy increments.

Additionally, some parts may weigh less than the scale minimal increment. For example, you may need to remove five parts for the scale to decrement by a quantity of five. In this case, removing one part from a batch of 100 will still show 100 pieces in the scale until five pieces have been removed. Then the scale will display 95 pieces. When satisfied with your testing, press the **Operation** button.

3.13 Auto Setup Feature

An Auto Setup feature has been incorporated into the settings screen to assist in determining the Under Weight, Over/ Over Weight and Settle Time. See Figure 3-7. The Auto Setup Screen is accessed by pressing the **Auto Setup** button on the Settings screen.

This function uses a sampling method of determining the values. Before beginning the Auto Setup Procedure, create two bags of parts as follows:

Bag 1 - UNDER Kit: This kit is considered a reject because it is missing a component. The missing component is typically the lightest component in the kit.

Bag 2 - OVER Kit: This kit is considered a reject because it contains too many components. In determining this kit, consider the costs of reworking the kit versus the cost of components. For instance, many decide to “give away” an extra washer instead of taking the time to open the bag, separate the like components, counting them individually and resealing the bags. The greater the weight range between Bag 1 and Bag 2, the greater the packaging speed.

When the bags are made, access the Auto Setup screen and follow all instructions. Once complete, you will have the opportunity to accept the new settings. Test the new settings carefully to ensure that the system is functioning properly. Setting changes may be required to fine tune the operation. Press the **Help** button to display an information screen. See Figure 3-8.

Figure 3-7

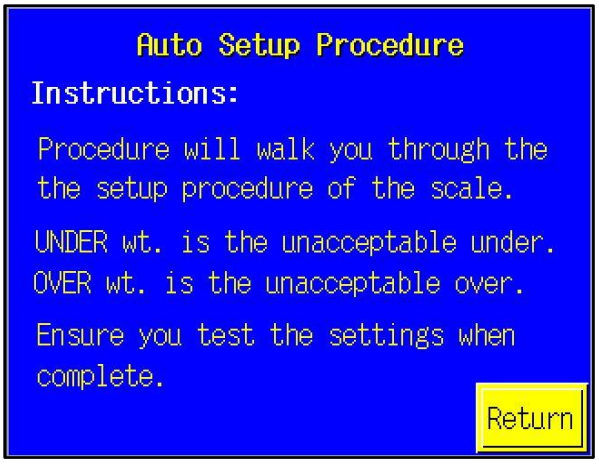


Figure 3-8

3.14 Weight History Screen

The US-4000 maintains a history of the last 50 weights. See Figure 3-9. This screen allows the operator to keep an accurate account of all weights and counts. To access the Weight or Count History screen, press the **Wght/Cnt Log** button. Pressing the **Reset** button will set all stored weighments to zero. Press the **Last** button to move the current weight to history.

Figure 3-9

3.15 Production Graph

APPI provides a simple graph to chart production throughout the day. See Figure 3-10.

Press the left arrow key to scroll back one hour at a time and review past production. Press the right arrow key to check more recent production information.

Press the **Reset** button once to reset the production time and twice to reset the graph. Press the **Return** button to return to the previous screen.

The Production Chart screen also displays the boxes per minute produced and the production time.

Figure 3-10

3.16 Counters Screen

The Counters screen allows the operator to count accepted product in preset batch quantities and then stop the automatic infeed of product. See Figure 3-11.

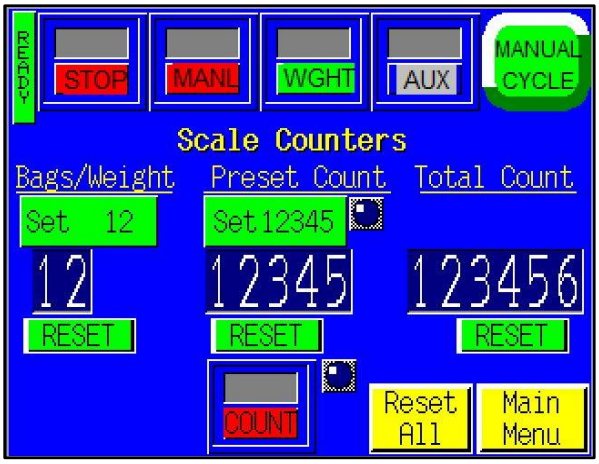


Figure 3-11

Bags / Weight: The Bags / Weight counter provides for the weighing of more than one bag at a time. For example, if the scale is not able to keep up with the infeed systems, two products could be weighed and if the measurement is over the acceptable weight range for both, both products would be rejected.

Preset Count: This counter can be adjusted to stop production after a preset number of cycle operations. When this preset count has been reached, a message screen will be displayed and operation will stop. To enter a value for this counter, press the green **Set** button under Preset Count and enter a value using the numeric keypad. Then press the **ENT** button. To reset this counter, press the **Reset** button. To disable the option, set the value to zero.

Total Count: This counter is used to track production and count the total cycle operations of the machine. To reset this counter, press the **Reset** button.

Each time a product is weighed and is within an acceptable weight range, the remaining preset counter value decreases until it reaches zero. When it reaches zero, it will display a message and pause any infeed

equipment. While the message is displayed on the screen, all following product will be rejected until the screen is pressed, resetting the remaining count value to the preset count. The **Reset** button will reset the remaining value to the preset value.

3.17 Accuracy Chart Screen

The Accuracy Chart screen provides the operator with information regarding accepted and rejected product. A pie chart displays the percentage of rejected and accepted product as the machine operates. Accepted product is displayed in green. Rejected product is displayed in red. See Figure 3-12.

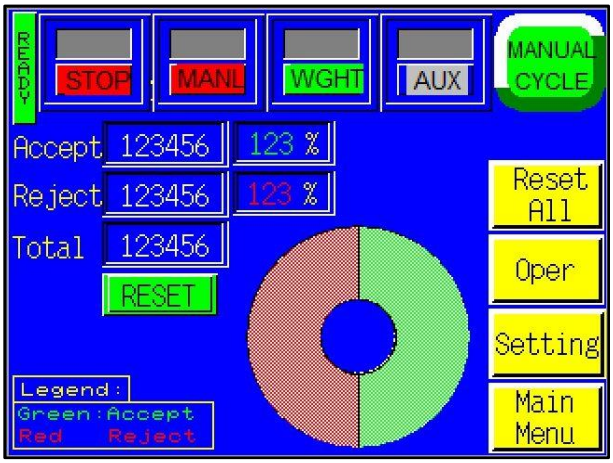


Figure 3-12

The amount and percentage of accepted product, the amount and percentage of rejected product and the total amount of product cycled through the system are also listed on this screen. Press the **Reset** button to reset all values to zero.

3.18 Reset All

The Reset All screen allows the operator to quickly reset the counters, production graph, weight history and accuracy chart. See Figure 3-13. Press the **Reset** button to the right of the counter to set that item to zero. The Reset All screen can be accessed through the Accuracy Chart and the Weight History screen by pressing the **Reset All** button.

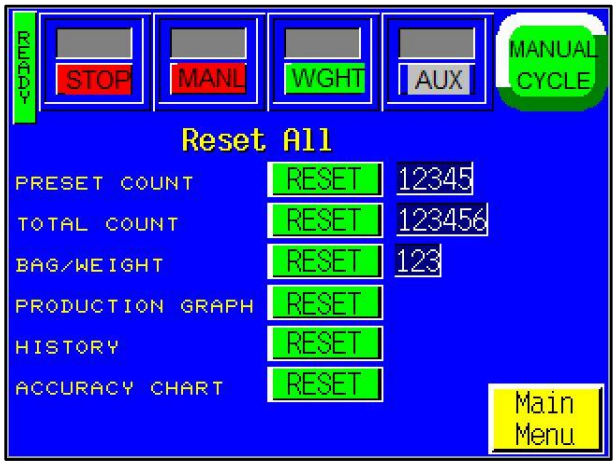


Figure 3-13

3.19 Job Save Screen

The programming allows the operator to save up to 96 different settings for later recall. These include bag settings, options settings and factory settings. See Figure 3-14.

When all settings have been created and tested, press the **Job Save** button, located on the Main Menu. The Scale Job Save/Recall screen will be displayed. The No. columns on the screen describe a memory address/order. The PN columns on the screen allow the operator to enter a part number (up to six numbers) for future reference.

To save a job to a memory address that has no settings saved, press an empty field in the **PN**. column. A keypad will be displayed. See Figure 3-15. Enter a part number that you will reference in the future and press the **Save** button.

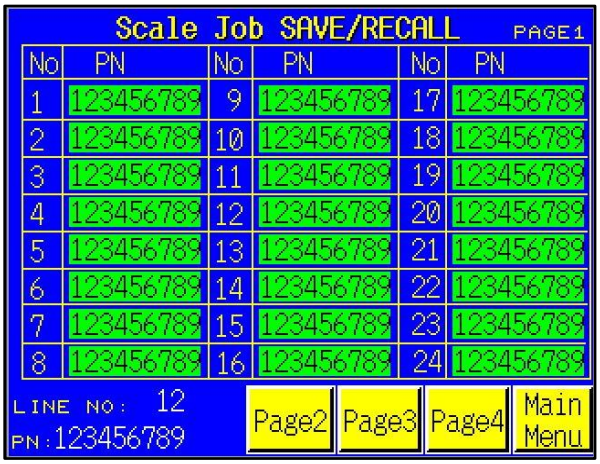


Figure 3-14

NOTE: Settings can be saved over a previously saved job, but this will cause the previous settings to be lost.

To recall a job that has been saved, access the Scale Job Save/Recall screen and press the corresponding part number. Press the **View** button on the displayed screen. See Figure 3-15. The Scale Recall Settings screen will be displayed. See Figure 3-16. On this screen, the operator can view the settings for that specific job and then press the **Load** button to load the previous settings.

If you attempt to load a job that does not exist, a message will be displayed.

3.20 Tote Setup Screen

The system is programmed to allow for a high level flow sensor to shut down the system. See Figure 3-17. For example, if a tote is full (level sensor turns ON), the scale system will pause and wait for the sensor to turn off. A message will be displayed alerting the operator to empty the tote.

Prox Delay: The length of time the scale is paused after the tote is full before the system shuts down.

NOTE: Additional components / wiring are required to enable operation of this feature.

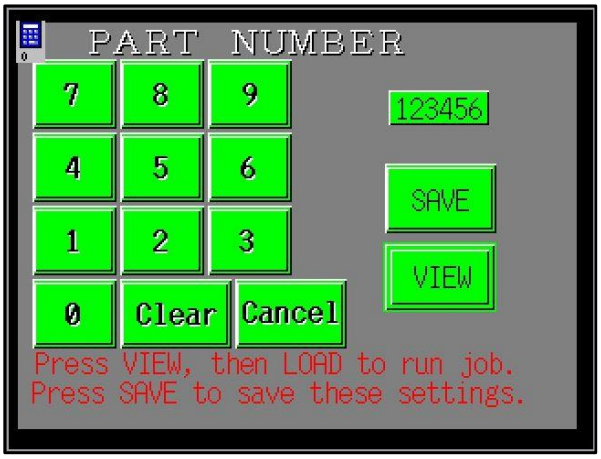


Figure 3-15

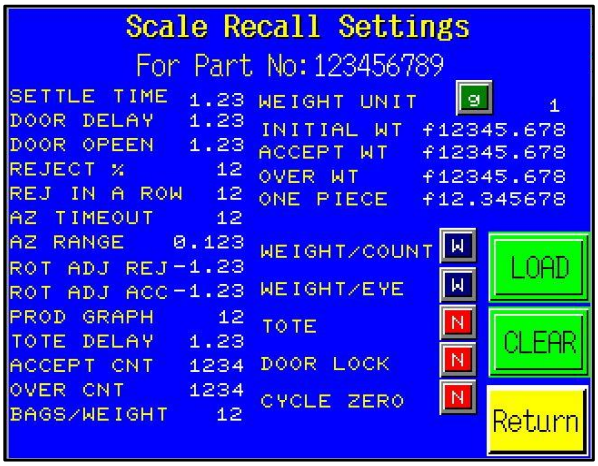


Figure 3-16

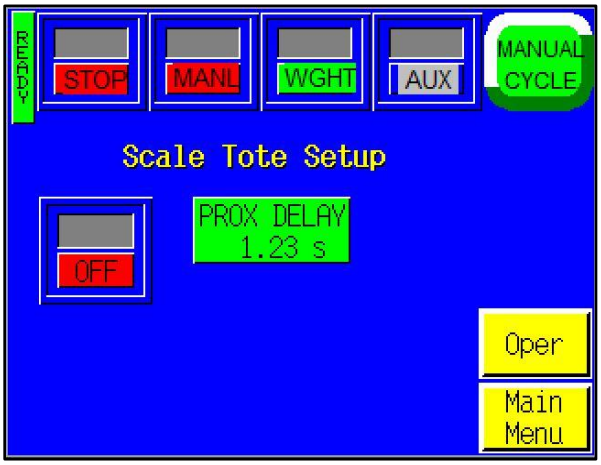


Figure 3-17

3.21 Scale Operation Mode

The Scale Operation Mode screen displays the time and frequency of a particular operation. See Figure 3-18. It also provides access to the Alarm Status and Alarm Data screens.

The colored bar at the bottom of the Operation Mode screen is color-coded to reflect the percentage of time the machine has been in the following modes: Start, Automatic Operation, Manual Operation and Stop.

Press the Alarm Status button to view the Alarm Status screen. The Alarm Status screen provides the start and reset time of a particular warning signal. See Figure 3-19.

Press the **Alarm Data** button to view the Alarm Data screens. These screens keep track of how long a particular warning message (i.e. Tote Full, Preset Count, etc) has been signaled. See Figure 3-20.

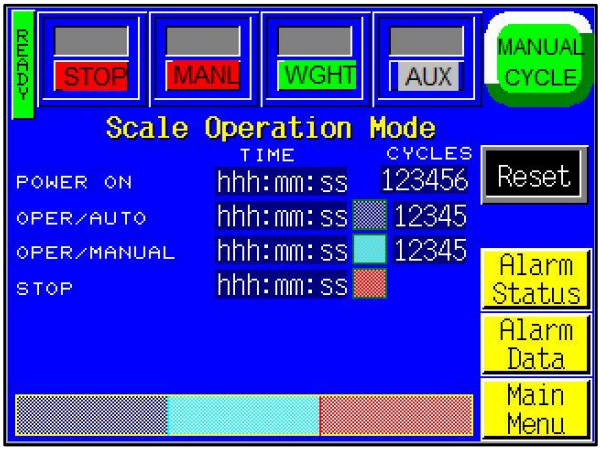


Figure 3-18

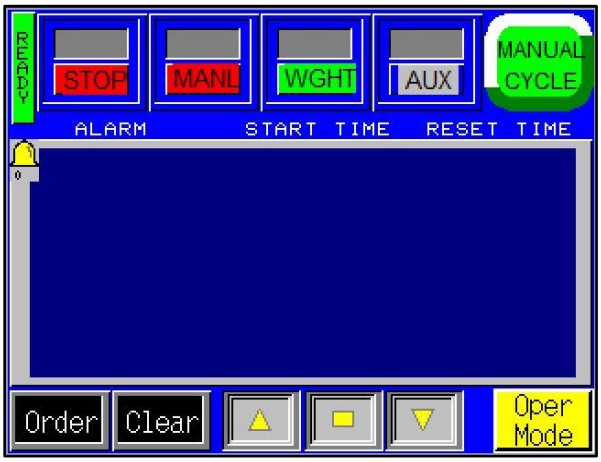


Figure 3-19

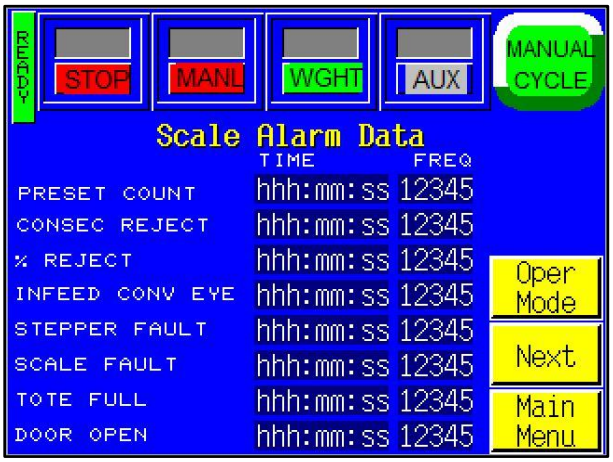


Figure 3-20

3.22 Technical Assistance Screen

The Technical Assistance screen is used by maintenance personnel to provide contact information for APPI, assist in troubleshooting the machine, cycle the drum and adjust settings that affect the auto zeroing function. See Figure 3-21.

Figure 3-21

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 also 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.

3.23 Password Setup Screen

Advanced Poly-Packaging, Inc. (APPI) has included a pass code function in all touch screen equipment to prevent unauthorized operators from changing settings. See Figure 3-22.

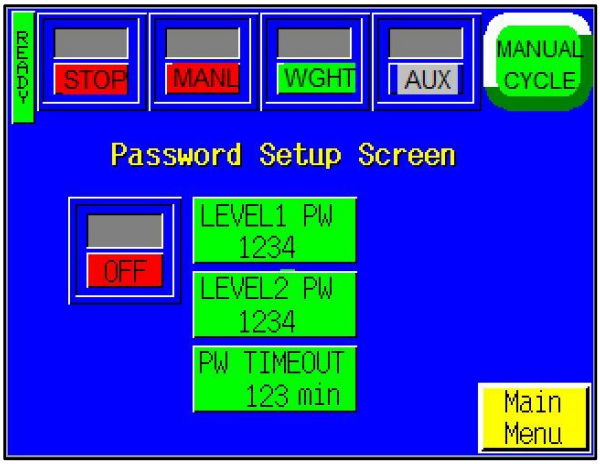


Figure 3-22

There are two pass code levels described as follows:

1. **Level 1**: This is the highest level pass code. It prevents operators from accessing the Technical Assistance functions of the machine. Additionally, the pass codes are maintained in this area. The default Level 1 pass code, when shipped from the factory, is 1001. To change this code, press the **Level1 PW** button on the Password Setup Screen, enter a new code on the numeric keypad, and press the **ENT** button. See Figure 3-23.

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. If the touch screen defaults back to the Operation screen after a preset amount of time elapses, the operator must enter this code to access settings screens. To change this code, press the **Level2 PW** button on the Password Setup Screen, enter a new code on the numeric keypad, and press the **ENT** button. See Figure 3-24.

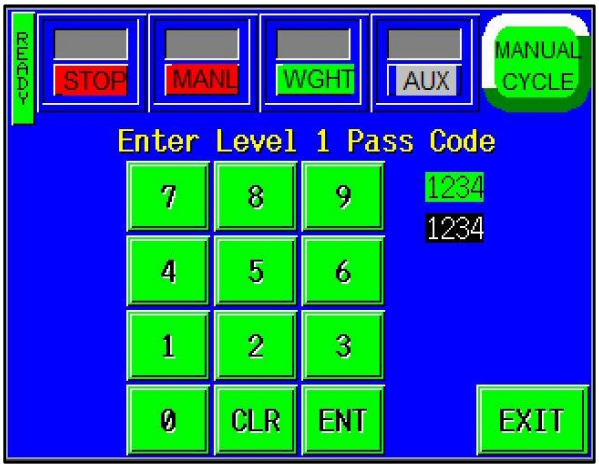


Figure 3-23

Pass codes prevent unauthorized individuals from tampering with settings. When equipment is shipped, APPI uses the following codes that can be changed by the customer at any time:

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). Then press the **ON / OFF** toggle button 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 Password Setup screen. By default, the time is set to five minutes.

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

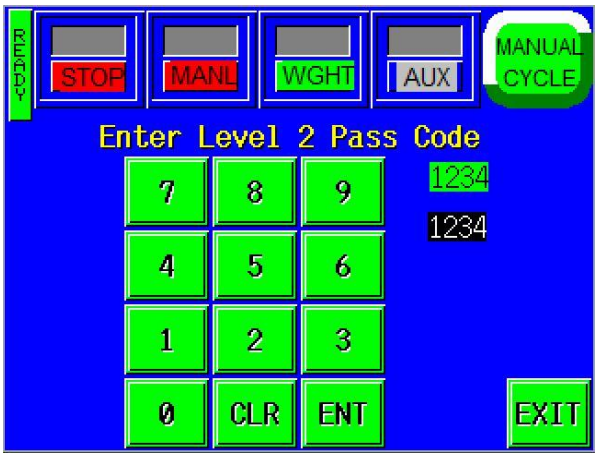


Figure 3-24

3.24 Scale Factory Settings

This screen contains additional scale settings that should only be set by qualified technicians or by the factory. See Figure 3-25.

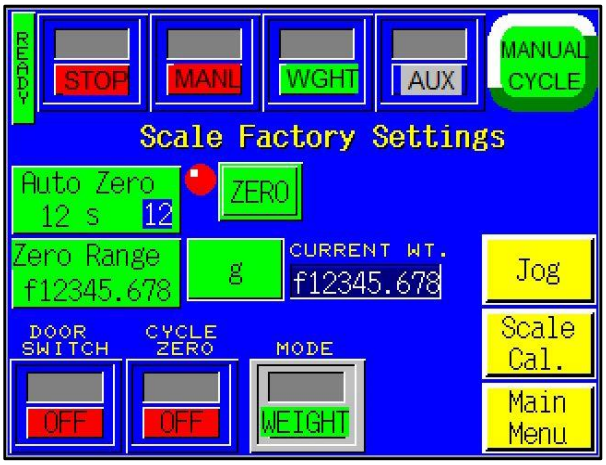


Figure 3-25

Auto Zero: The amount of time, in seconds, before the scale automatically zeros. 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 manually zero the scale. To adjust this setting, press the **Auto Zero** button, enter a value on the numeric keypad and press the **ENT** button.

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.

Press the **Units** button to toggle between different units of measurement, including grams, pounds and ounces.

3.25 Jog Screen

Press the **Jog** button to display the Jog screen and manually adjust the position of the drum. This screen allows the operator to determine if the stepper motor is functioning properly, the photo eye that registers the drum location is functioning properly and the weight is not fluctuating too much during the

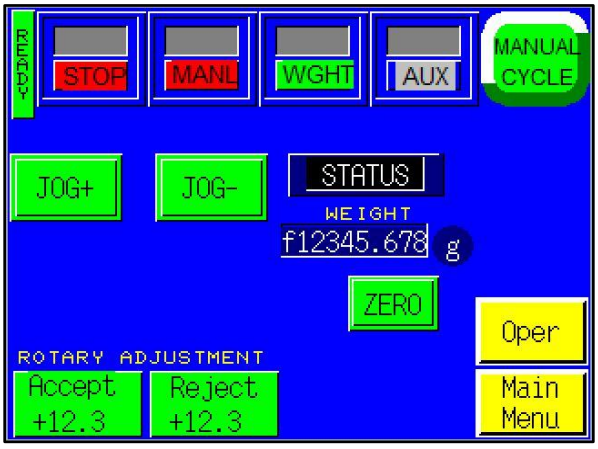


Figure 3-26

operation of the drum. See Figure 3-26.

Rotary Adjustment: The Jog Screen allows the operator to adjust the final position of the rotary. Press the **Accept** button to turn the rotary in the Accept direction. Press the **Reject** button to turn the rotary in the Reject direction.

The Scale Factory Settings screen also allows the operator to calibrate the scale. Press the **Scale Cal**. button to access the Calibration screen.

3.26 Scale Calibration

To calibrate the scale, a Calibration screen is provided. See Figure 3-27. The following step-by-step procedure must be followed closely to properly calibrate the scale. A known metric calibration weight (in grams) must be used to properly calibrate the scale. The calibration weight should be 1000 grams. Contact APPI Tech Support to discuss the calibration weight used during this procedure. This weight may also be purchased from APPI.

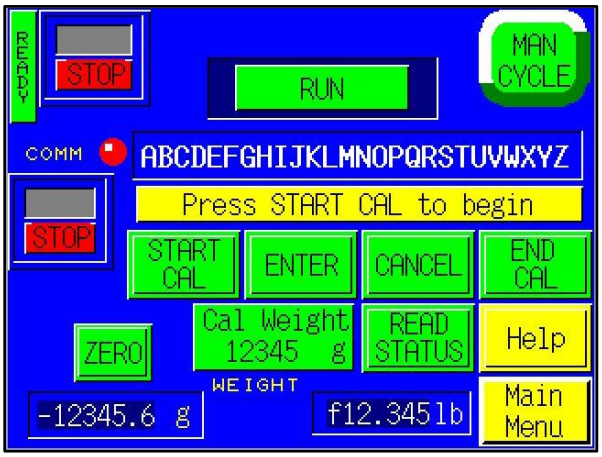


Figure 3-27

1. From the Main Menu, press the Technical Assistance button.
2. On the Technical Assistance screen, press the Factory Settings button.
3. On the Factory Settings screen, press the **Scale Calibration** button.
4. Follow the instructions displayed in the yellow prompt bar.
5. Press the **START CAL** button.
6. Wait for the prompt message New Zero.
7. When the New Zero message appears, press the **ENTER** button.
8. Wait for the Cal Weight prompt.
9. Place the sample weight on the scale. The weight must be 1000 grams and must weigh exactly what will be entered in the next step.
10. Press the CAL WEIGHT button located under the **ENTER** button.
11. Enter the exact Cal Weight that was placed on the scale in the previous step and press the **ENTER** button.
12. When the prompt message Cal OK appears, press the **ENTER** button.
13. When the prompt message “Save?” Appears, press the **ENTER** button.
14. When prompt message Exit Setup? Appears, press the **ENTER** button.
15. Once the weight displays the same as the sample weight, press the **END CAL** button located on the right center of the screen.

This ends the calibration procedure. RUN should now be displayed in the top center of the screen. The scale can now be run with a known weight for testing in operation mode.

NOTE: COMM / STOP is only located on the Calibration Screen. The COMM / STOP button must be toggle to COMM for the Operation Screen to change weights. In STOP mode, the Operation Screen will display only ZEROS. LOW BATTERY will display as a full screen warning.

3.27 PLC I/O Screen

The PLC I/O screens are provided for maintenance personnel to determine the status of the PLC and to review the mode of outputs and inputs. PLC I/O screens are also used to assist APPI service technicians as they work with your maintenance personnel to troubleshoot the US-4000 in the field. See Figure 3-28.

To determine the function of each input and output, press the row of LEDs to display a brief description. The PLC I/O screen also provides the run Hours and Cycles counters. These counters cannot be reset by the operator.

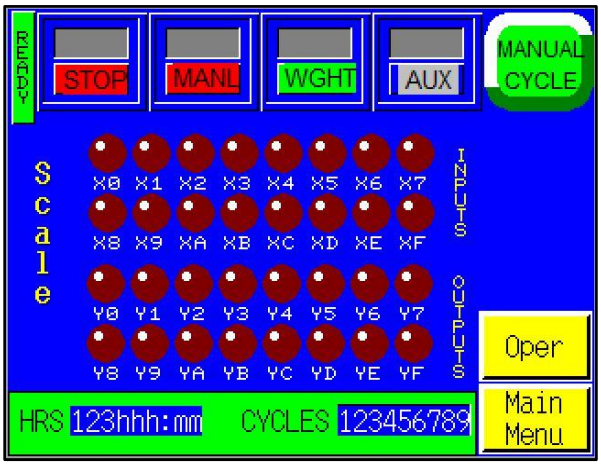


Figure 3-28

3.28 APPI Factory

This screen displays additional settings that should only be set by qualified technicians or by the factory. See Figure 3-29. To access this screen, a pass code must be entered.

Default Settings: Press the **Accept** button under Default Settings to return all the settings back to the original factory settings.

EEPROM: Pressing the **Write** button allows the operator to write machine data to the PLC EEPROM. Pressing the **Read** button to retrieve all written data.

Service Center: Displays the service center that should be contacted if a problem arises.

The **Load Cell** toggle button allows for switching the load cell capacity to greater than or less than 10kg.

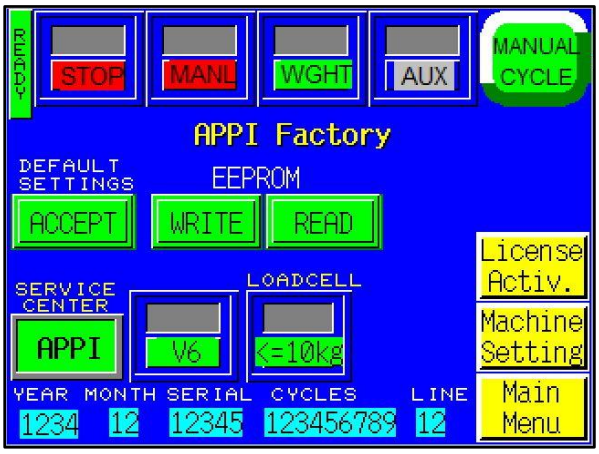


Figure 3-29

3.29 Scale Machine Info

This screen will provide information about the machine, such as the model number, serial number, part number and line number. See Figure 3-30.

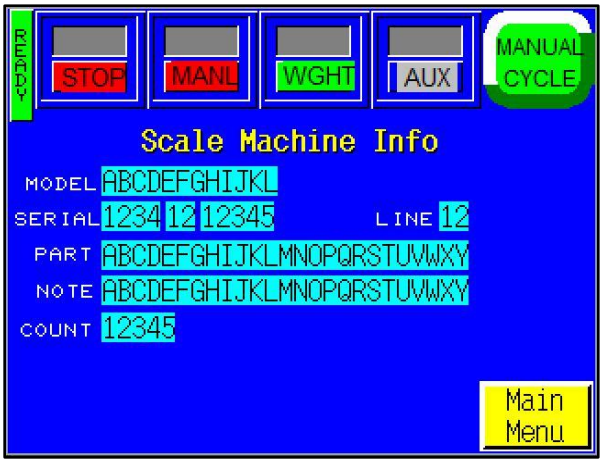


Figure 3-30

3.30 Message / Fault Screens

Message and fault screens automatically “pop up” on the screen during certain conditions that warrant informing the operator of errors or information. See Figure 3-31 through Figure 3-39 for examples of message screens.

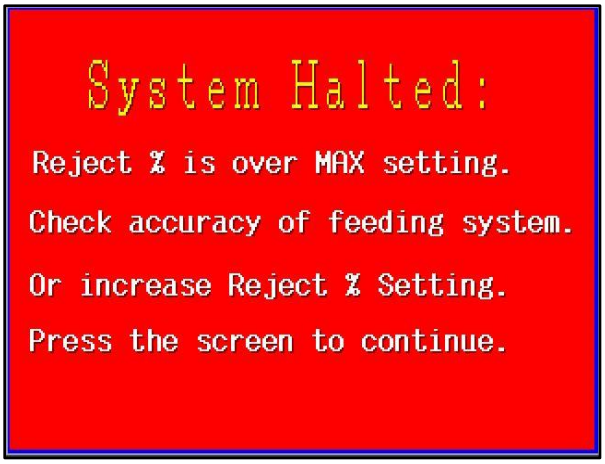


Figure 3-31

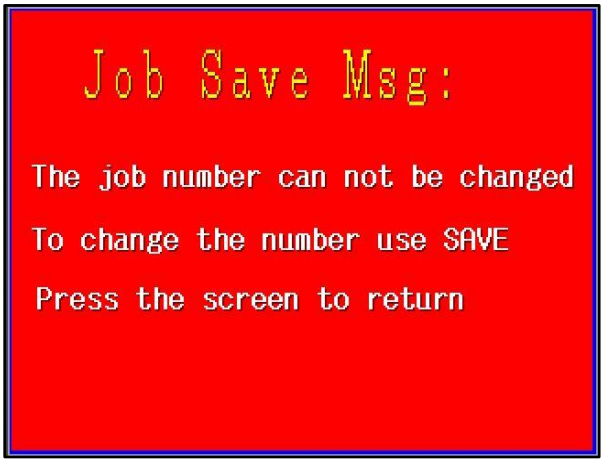


Figure 3-32

Figure 3-33

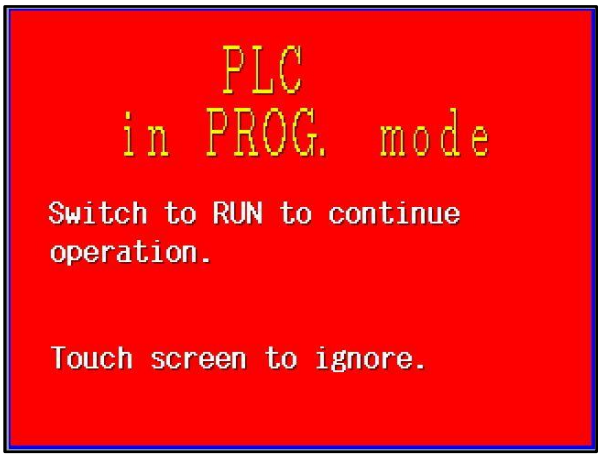


Figure 3-34

Figure 3-35

Figure 3-37

Figure 3-36

Figure 3-39

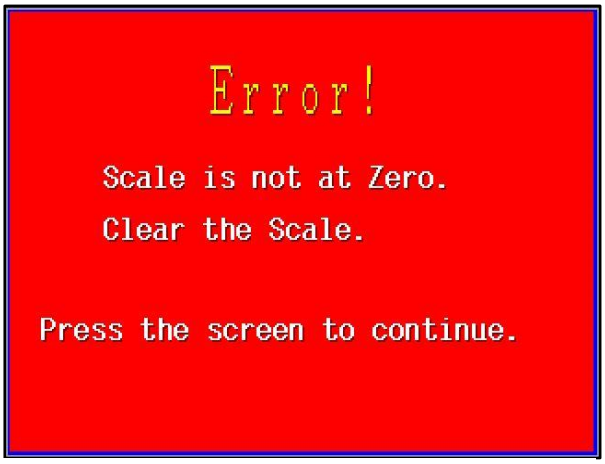


Figure 3-38

3.31 Quick Startup Procedures

The checklist below is provided to setup a new "job" on the scale. This checklist could be incorporated into your work instructions.

QUICK STARTUP CHECKLIST

US-4000 Check Weigh Scale

For Item No.: _____

Perform the following tasks when you have completed a job. These procedures will decrease setup time for product not run or saved in the job save function or for setting up jobs that change in weight due to lot variations. Follow these steps:

1. From the Operation screen, toggle the **START / STOP** button to the **STOP** position. Toggle the **AUTO / MANL** button to the **MANL** position. Toggle the **WGHT / EYE** button to the **WGHT** position.

2. Clean the scale rotary drum and the plate located below the drum to ensure that no debris is on the scale. Press the **Zero** button and the **Last** button.

3. Place an Under product in the drum of the scale and write the weight in 3a. Place an Over product in the drum and write the weight in 3b. Use these setting for the Under and Over setpoints on the Settings screen:
    a. Under Product Value: _____
    b. Over Product Value: _____

NOTE: You can also use the Auto Setup button to automatically perform the settings function.

4. Remove the product from the scale. Place the scale in **START** mode and drop the good product onto the scale. The scale should rotate, dropping the product in the Accept feed direction. If it rejected the product, repeat steps 3 through 4 or increase the Settle Time. Repeat until the product is consistently Accepted. Follow this same procedure for the Under and Over bags to ensure that the Under and Over bags are being rejected.

5. Access the Operation screen and toggle the mode buttons to **AUTO** and **EYE** and place the product on the infeed conveyor, checking that the same acceptable results are obtained as in Step 5. If you don't obtain the same results, change the timers on the Setting screen. Increase or decrease the Settle Time, Eye Delay or Accum Funnel delay timers.

6. Scroll to the Job Save screen and save the settings according to the product number.

Chapter 4: Maintenance and Troubleshooting

Rotary Drum Positioning
Accumulating Funnel Adjustments
Troubleshooting Checklist
IO Listing

4.1 Rotary Drum Positioning/Sensor Settings

A photo sensor maintains the registration of the drum. The drum can be repositioned by either moving the photo eye or the sensor gap plate. Refer to Figure 4-1 to reposition the drum via the sensor gap plate. Refer to Figure 4-2 to reposition the drum via the photo sensor.

4.2 Accumulating Funnel Adjustments

The accumulator funnel holds the product above the drum so that product is not dropping onto the drum while previous product is being weighed or the drum is in motion. The doors of the drum should close at the same time without "banging." Refer to drawings 4.3 for door speed adjustments and door position adjustments. Refer to drawing 4.4 for door position setting.

Air Pressure: Air pressure and speed controls must be set so that the air is sufficient to close and open the doors and also sufficient to keep the doors closed when product is resting on the doors.

4.3 Troubleshooting Checklist

This section covers the common problems an operator may encounter during operation of the US-4000. If an operating difficulty occurs, observe the situation, look for the cause and make a correction. Make only one adjustment at a time and check the results of each adjustment. If an adjustment does not help or escalates the problem, return the settings back to their former position.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
The machine is rejecting good kits	1. Incorrect settings	1. Double check Settings and Kit Setup
	2. Under / Over tolerance range too small.	2. Increase tolerance range
	3. Scale is not at Zero	3. Clear scale of debris and re-zero.
	4. Something is leaning against or touching the scale.	4. Clear area around sides of scale.
	5. Draught or wind gusts affect scale reading	5. Reduce / avoid wind or fan interference, close doors, etc.
	6. Settle Time too low	6. Increase settle time. The Factory Setting is 1.5 seconds. *Note: The more time the product has to settle, the greater the accuracy of the readout.*
Scale will not zero.	1. Something is touching the load cell.	1. Clear area around load cell and drum.
	2. Parts are wedged under housing	2. Clear parts under load cell gap or frame.
	3. Scale minimum start setting is too low.	3. Go to Scale Factory Settings located in Tech Assist and increase scale start minimum. Ex: if the scale start minimum is set to 0.002 increase it to 0.05.
Inaccurate Readings	1. Wire on load cell is touching something	1. Ensure internal wires are not touching load cell cover.
Display weight stays at a positive or negative number.	1. Damaged / blown load cell	1. Replace load cell
	2. Settle time too low	2. Increase Settle Time to Factory Setting or above. Factory Setting is 1.5 sec.

Display Weight stays at positive or negative number, continued…	3. Zero start time set too low.	3. Increase Zero Start Time to above what it frequently seen. Ex: If constant wind gusts tip scale to 0.05 0.08 make scale start at 0.09 or 0.1.
Touch screen does not display	1. Power off 2. Main fuse blown 3. Breaker tripped 4. IOP cables loose / damaged 5. Contrast out of adjustment	1. Check main / individual power switch. Plug in power cord. 2. Replace fuse #1 on the module. 3. Check breaker in main power box. 4. Check cables behind IOP cover. 5. Adjust screen contrast.
No Main Power LED	1. Power off 2. Main fuse blown 3. Breaker tripped 4. IOP cables loose / damaged 5. LED burned out	1. Check main / individual power switch. Plug in power cord. 2. Replace fuse #1 on the module 3. Check breaker in main power box. 4. Check cables behind IOP cover. 5. Replacement not possible.
Accumulating funnel not functioning correctly or not at all	1. No/low air pressure 2. Leaking hoses or air cylinders 3. Product sensor not sensing product 4. Incorrect mode of operation	1. Check main and individual regulators. Check for kinked air hoses. 2. Check all air hoses and cylinders. 3. Check output from photo sensor, check setting (use teach option). 4. Check mode on Operation screen and set to MANL mode. In this mode, the Accumulating funnel should be open.
Part sensor (eye) not functioning	1. Dust / dirt in eye 2. Eye cables loose / damaged 3. Product not being detected	1. Wipe inside of eye. 2. Check eye cables. 3. Check setting: teach button available on some models.
Weight not displayed properly	1. Cell communication problem 2. Overloaded cell 3. Damaged cell	1. Check communication cables 2. Remove weight, look for parts jammed between cell and covers. 3. Replace cell.

Figure 4.1

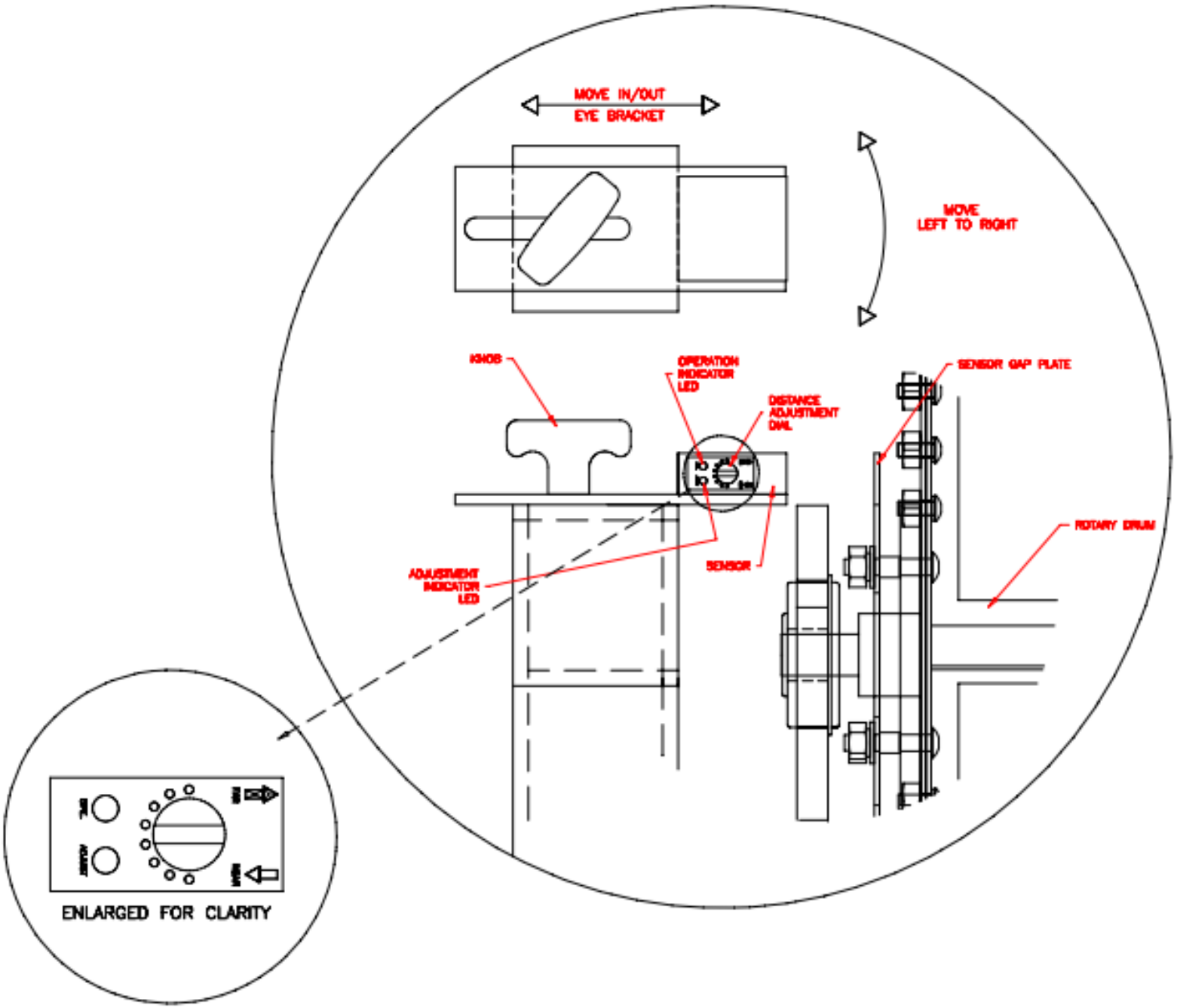

MOVE IN/OUT
EYE BRACKET
MOVE
LEFT TO RIGHT
KNOB
OPERATION
INDICATOR
LED
DISTANCE
ADJUSTMENT
DIAL
SENSOR GAP PLATE
ROTARY DRUM
ADJUSTMENT
INDICATOR
LED
SENSOR
ENLARGED FOR CLARITY

Figure 4.2

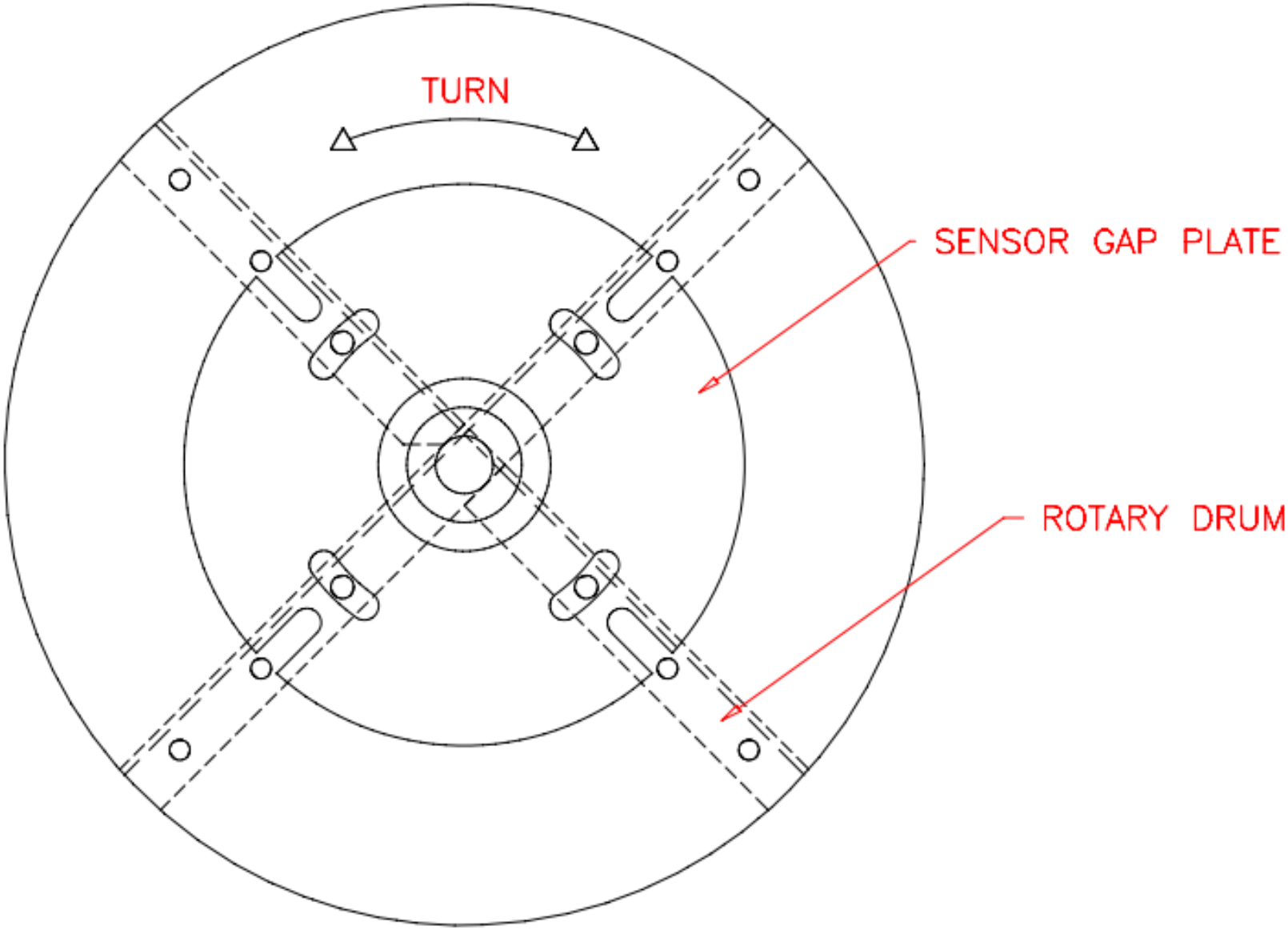


Figure 4.3

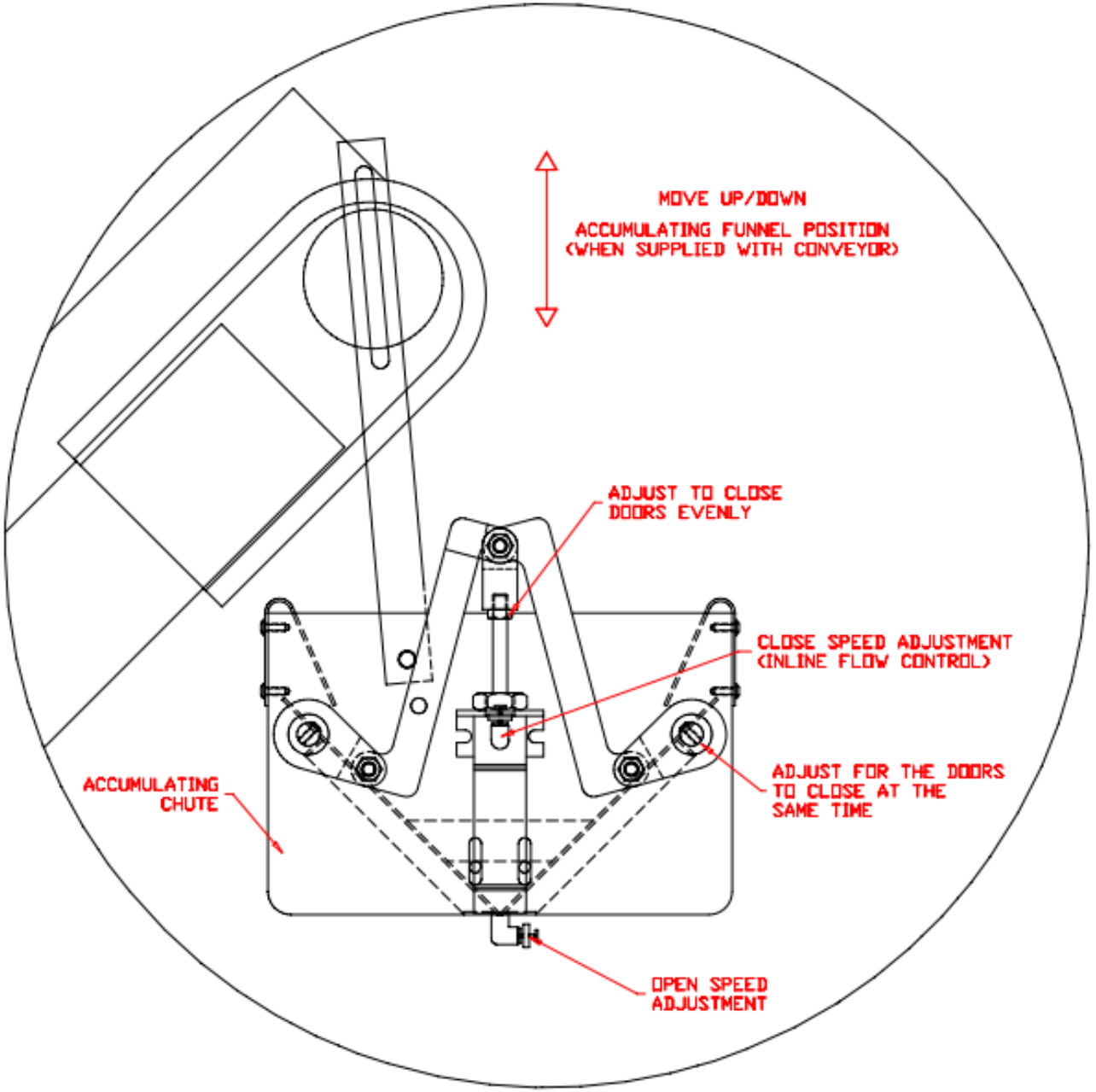
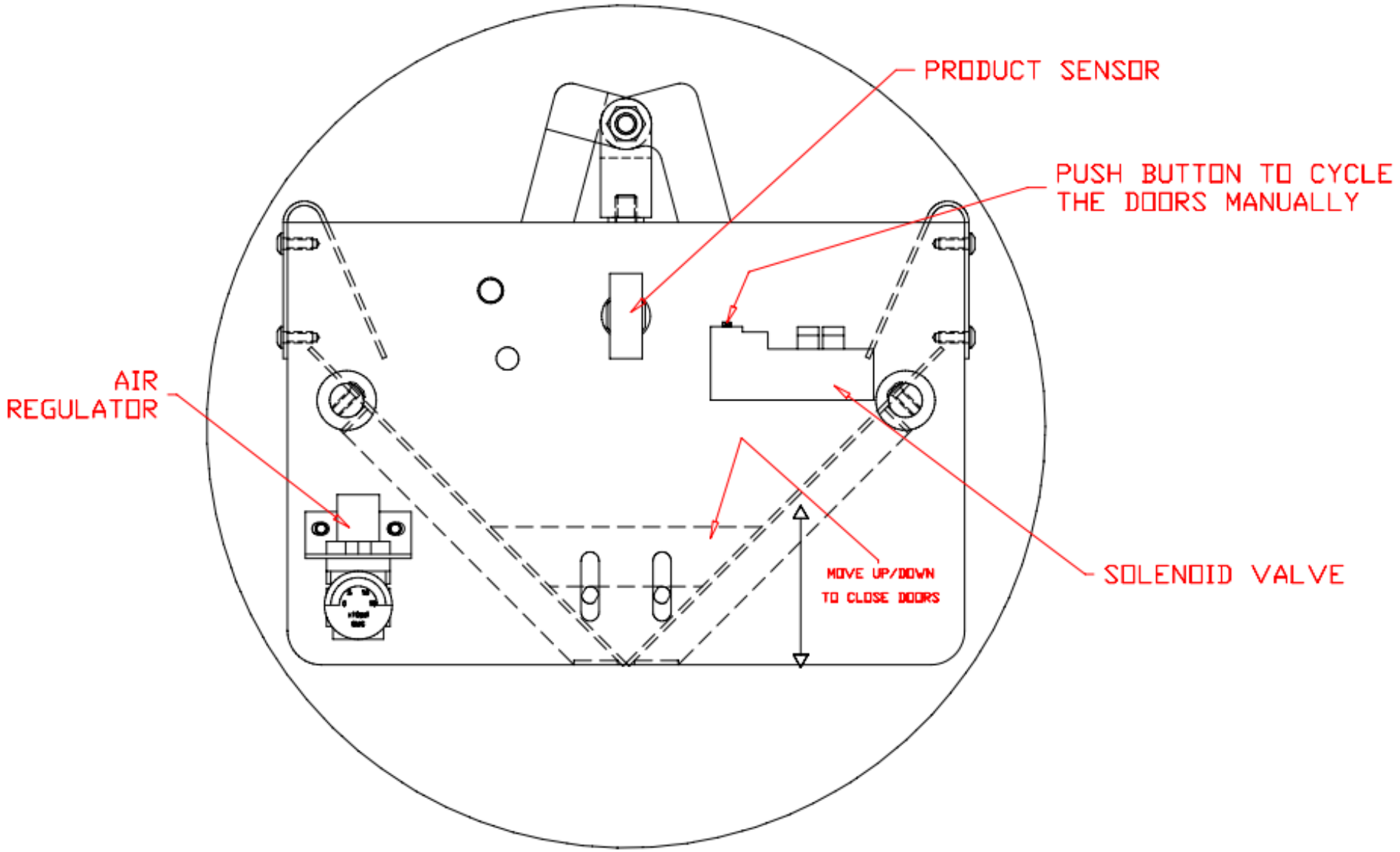

MOVE UP/DOWN
ACCUMULATING FUNNEL POSITION
(WHEN SUPPLIED WITH CONVEYOR)
ADJUST TO CLOSE
DOORS EVENLY
CLOSE SPEED ADJUSTMENT
(INLINE FLOW CONTROL)
ADJUST FOR THE DOORS
TO CLOSE AT THE
SAME TIME
ACCUMULATING
CHUTE
OPEN SPEED
ADJUSTMENT

Figure 4.4


PRODUCT SENSOR
PUSH BUTTON TO CYCLE
THE DOORS MANUALLY
AIR
REGULATOR
MOVE UP/DOWN
TO CLOSE DOORS
SOLENOID VALVE

4.4 PLC IO Listing

The Main PLC Listing is provided to assist in troubleshooting the US-4000 Scale.

MAIN PLC			
Input	**Description**	**Output**	**Description**
X0	Spare	Y0	Stepper CW
X1	Spare	Y1	Stepper CW
X2	Spare	Y2	Aux Out
X3	Infeed Conv Eye	Y3	Fault Out
X4	Stepper Home Sensor	Y4	Conveyor Run
X5	Right Door LS	Y5	Chute Sol.
X6	Tote Full Eye	Y6	Spare
X7	Left Door LS	Y7	Spare
X8	Take Away Eye	Y8	Spare
X9	Spare	Y9	Spare
XA	Spare	YA	Spare
XB	Spare	YB	Spare
XC	Spare	YC	Spare
XD	Spare	YD	Spare
XE	ESTOP	YE	Spare
XF	Spare	YF	Spare

4.5 Spare Parts Kits

Level 1 Spare Parts Kit: TO-T7-SP10

PART #	DESCRIPTION	QUANTITY
TP-207026	Fuse, 8 Amps / 250V	2
TP-305510	UHMW W/TSA 12"Wide x 1/16"Thk	15
TP-216151	Sensor, Proximity: 8mm, Shielded, NPN (FO)-Threaded Cylindrical, Stainless Steel, 10-30v DC-1 Normally Open	1
TP-402255	Valve w/Connector SY3120-5MNZ-N7	1
TP-403490	Cylinder, NCMB106-0150C	1
TP-216116	Banner Photo Eye,Minibeam Expert	1

Level 2 Spare Parts Kit: TO-T7-SP20

PART #	DESCRIPTION	QUANTITY
TP-207026	Fuse 8 Amps / 250V	2
TP-305510	UHMW W/TSA 12" Wide x 1/16" Thk	15
TP-216151	Sensor, Proximity:8mm, Shield	1
TP-402255	Valve w/Connector SY3120-5MNZ	1
TP-403490	Cylinder, NCMB106-0150C	1
TP-216116	Banner Photo Eye, Minibeam Expe	1
TP-213358	Power Supply, 25W 4.00"x2.50"x0	1
TP-501169-1	Driver, Vexa 5-Phase	1
TP-750102	PCB, Scale Controller, M460 Ma	1
TP-750017	Load Cell, Analog 10kg Live w	1
TP-750019	Load Cell, Analog 20kg Mech.	1
TP-501169-2	Motor, 5 Phase Stepper	1

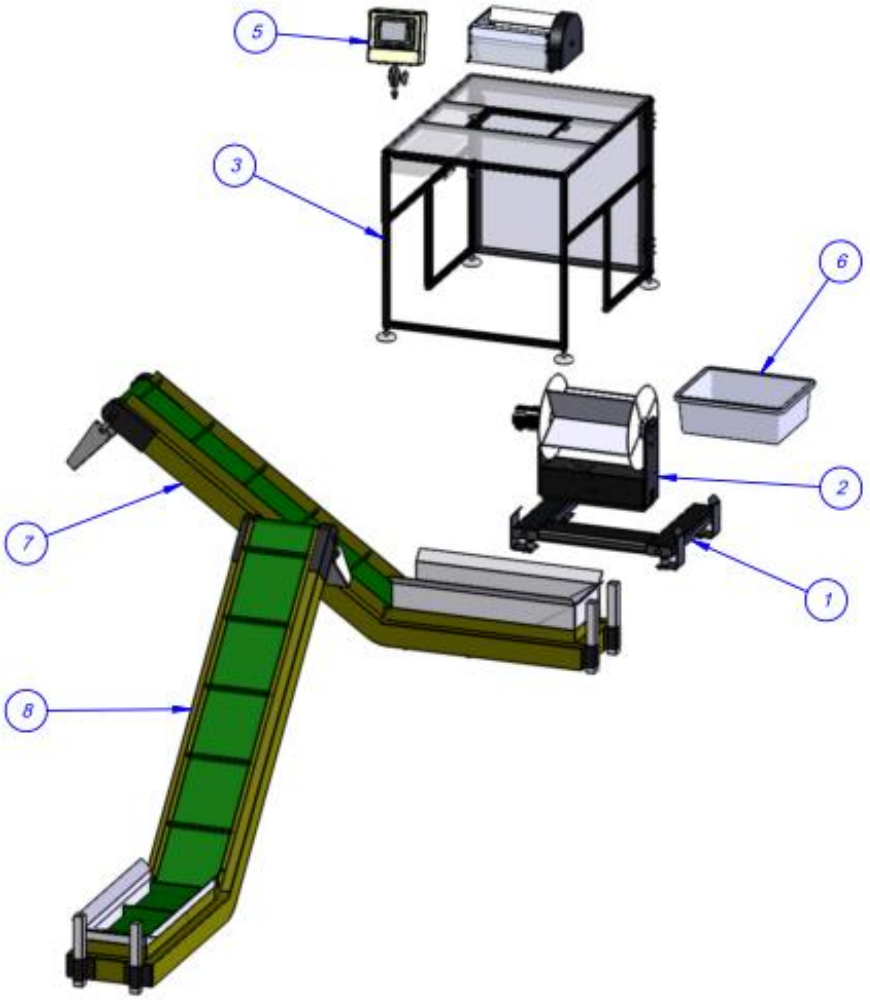
Chapter 5: Parts and Drawings

Ultra-Scale 4000 Drawings and BOM
Ultra-Scale 4000 Schematics
Notes

5.1 ULTRA-SCALE 4000

PN: T-US4000

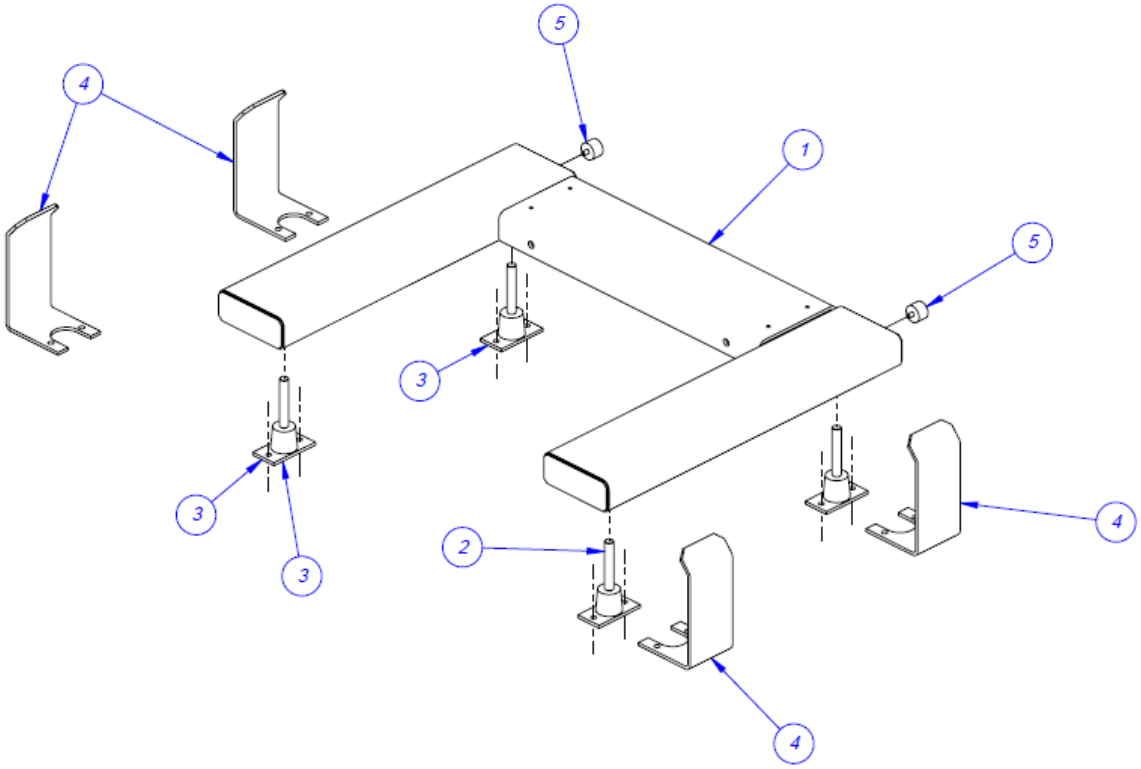
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	CWR-1000	STAND ASSEMBLY	1
2	CWR-3000	DRUM ASSEMBLY	1
3	CWR-5000	WIND ENCLOSURE	1
4	CWR-8000	SCALE ACCUMULATOR	1
5	CWR-4000	IOP ASSEMBLY	1
6	TP-305524	PLASTIC TOTE BIN	1
7	T-UF2-120205	TAKE AWAY CONVEYOR (Optional)	1
8	T-UF2-120206	INFEED CONVEYOR (Optional)	1



5.2 STAND ASSEMBLY

PN: TA-CWR1000

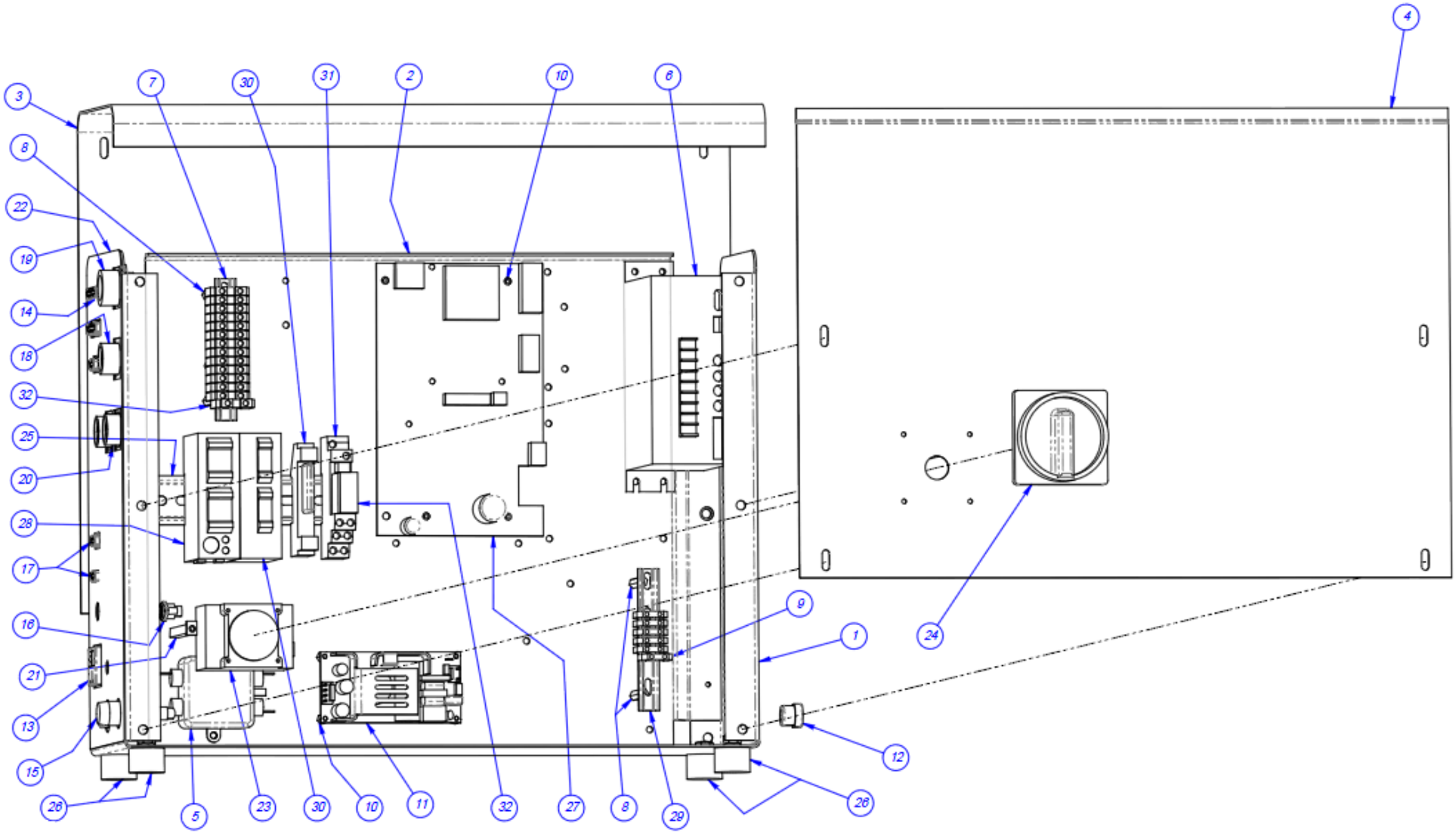
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T7M1001	BASE ASSEMBLY
2	4	TP-T7M1006	FOOT MOUNT STUD
3	4	TP- 110750	FLOOR MOUNT
4	4	TP-T7M5010	ENCLOSURE BRACKET
5	2	TP-110766	1 INCH DIA. x 11/16 RUBBER FOOT, 1/4-20 x .375 STUD



5.3 ELECTRONIC MODULE ASSEMBLY

PN: TA-CWR2000

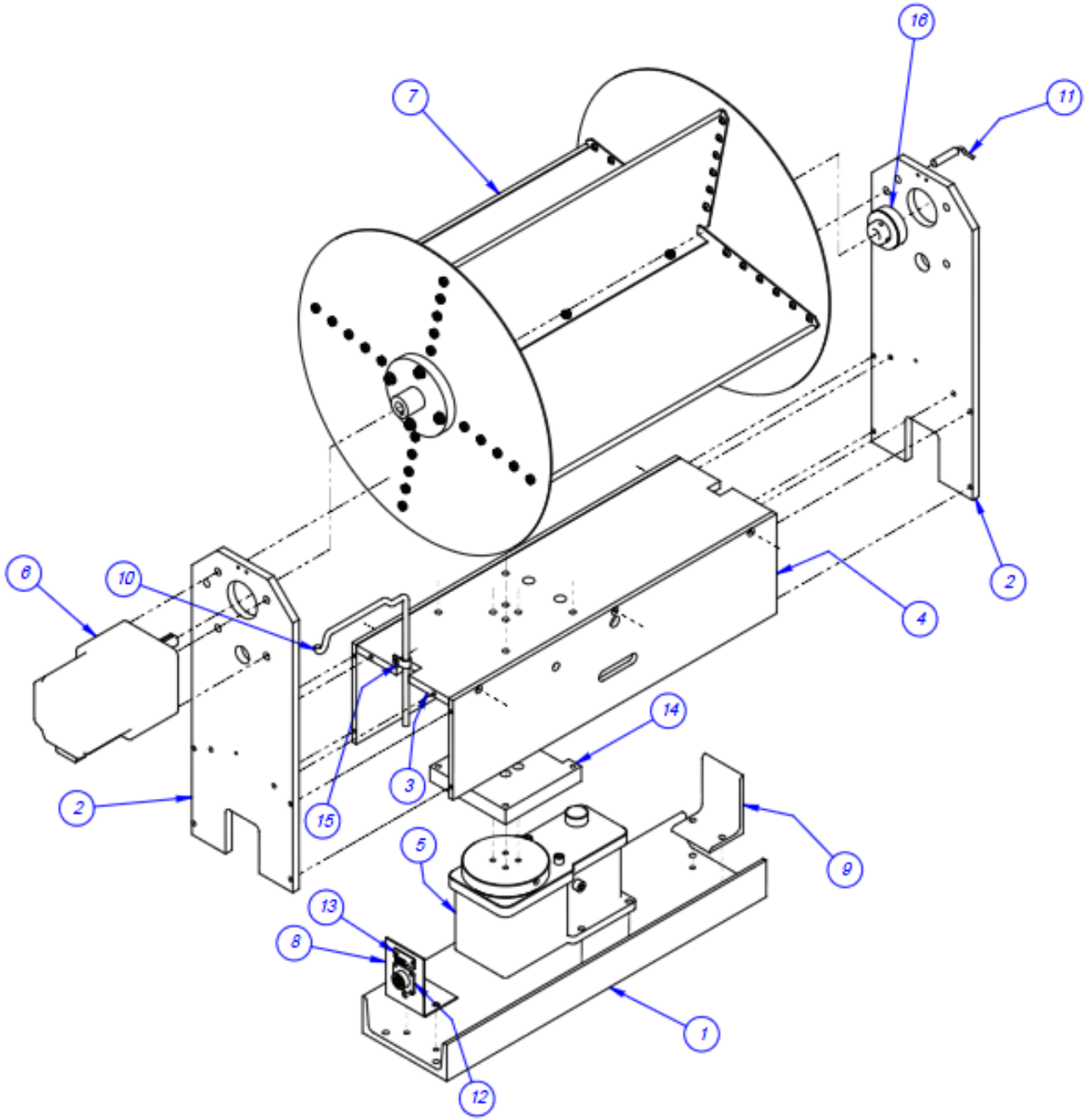
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-MM1-0002	ELECTRONICS PANEL
2	1	TP-MM1-0001	ELECTRONICS BACK PANEL
3	1	TP-MM1-0003	BACK COVER
4	1	TP-MM1-0004	FRONT COVER
5	1	TP-205108	EMI FILTER, CORCOM
6	1	TP-501169-1	5 PAHSE DRIVER
7	- 2	TP-218021	DIN RAIL
8	- 4	TP- 214285	STAND-OFF 1-1/2" LONG 6-32
9	- 6	TP-208141	SMALL TERMINAL BLOCK
10	8	TP-214275	STAND-OFF
11	1	TP- 213361	24VDC, 3AMP POWER SUPPLY
12	2	TP-112240	POWER CORD STRAIN RELIEF
13	1	TP-212410	AC OUTLET
14	2	TP-212248	CONNECTOR, MULTIPOLE RECTANGULAR
15	1	TP-207216 , TP-207344	FUSE HOLDER & FUSE
16	1	TP-212160	5 POS MINI DIM
17	3	TP-212247	CONNECTOR, MULTIPOLE RECTANGULAR
18	1	TP-212167	6 PIN FEMALE
19	1	TP-TP-212229	7 PIN AMPHENOL MALE
20	2	TP-212333	3 PIN FEMALE AMPHENOL
21	2	TP-MM1-0005	STAND-OFF
22	1	TP-T10MM1006	US-9000 OVERLAY
23	1	TP-215005	SWITCH
24	1	TP-215004	SWITCH KNOB
25	1	TP-218020	DIN RAIL
26	4	TP-110766	1 INCH DIA. RUBBER FOOT - 1/4-20 x .375 STUD
27	1	TP- 750102	SCALE CONTROLLER MO 460
28	1	TP- 220511 (TP-214111 & TP-220513)	PLC, FPG-C32T2H GREY
29	1	TP-215044	SOLID STATE RELAY
30	1	TP-220514	PLC, FPO-E32T-A Expansion I/O
31	1	TP-215116	RELAY SOCKET
32	1	TP-215115	AUX RELAY


3
7
30
31
2
10
6
4
8
22
19
14
18
32
25
20
28
17
16
21
13
15
26
5
23
30
10
11
32
27
8
29
26
12
1
9
24

5.4 SCALE HEAD ASSEMBLY

PN: TA-CWR3000

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T7M2003	BASE PLATE
2	2	TP-T7M3008	SIDE PLATE
3	1	TP-T7M3009	TOP PLATE
4	2	TP-T7M3010	FILLER PLATE
5	1	TP-750017	US-4000 LOAD CELL
6	1	TP-501169-2	MOTOR
7	1	TA-CWR3001	DRUM ASSEMBLY
8	1	TP-T7M3013	CONNECTOR BASE
9	1	TP-T7M3014	CONNECTOR BASE (BLANK)
10	1	TP-501169-2	MOTOR CABLE
11	1	TP-216151	ALLEN BRADLEY B72C
12	1	TP-212167	6 PIN FEMALE
13	1	TP-212247	CONNECTOR, MULTIPOLE RECTANGULAR
14	1	TP-T7M3016	LOAD CELL BLOCK
15	1	TP-214373	WIRE TIE
16	1	TP-504114	NICE 7608 DLG



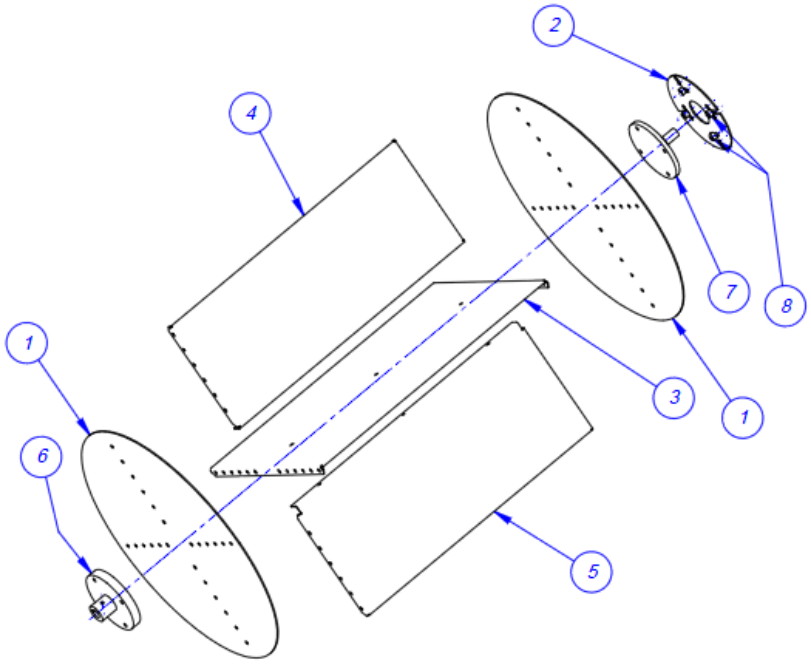
SCALE HEAD ASSEMBLY

PN: TP-CWR3000

5.5 DRUM ASSEMBLY

PN: TA-CWR3001

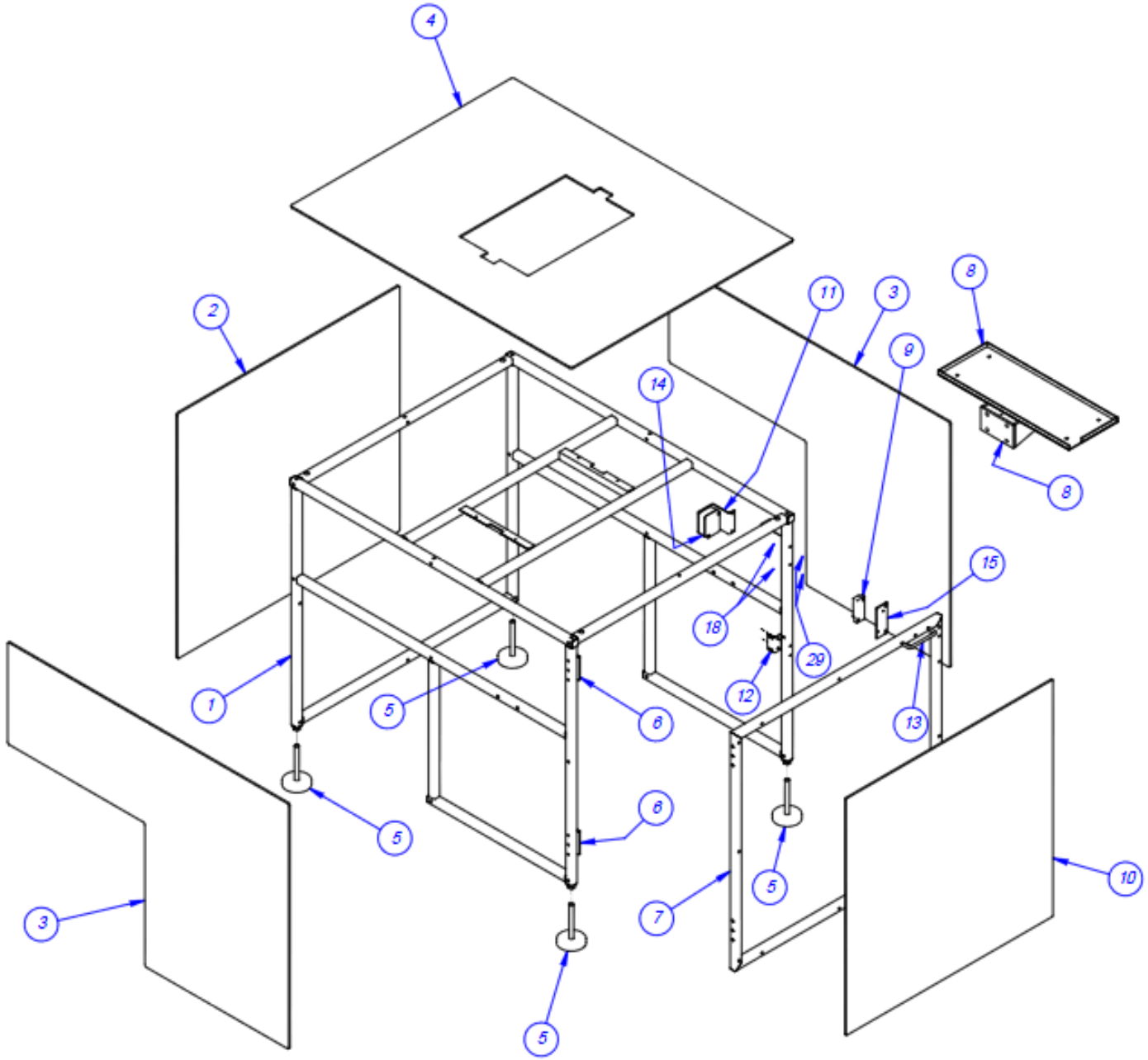
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	2	TP-T7M3002	ROTARY SIDE PLATE
2	1	TP-T7M3003	SENSOR REFLECTOR
3	1	TP-T7M3004	ROTARY LONG SHELF
4	1	TP-T7M3005-1	ROTARY SHORT SHELVES (1)
5	1	TP-T7M3005-2	ROTARY SHORT SHELVES
6	1	TP-T7M3006	MOTOR DRUM PLATE
7	1	TP-T7M3007	SUPPORT DRUM PLATE
8	4	TP-107163	1/4 ID x 3/8 x 0.250



5.6 WIND ENCLOSURE ASSEMBLY

PN: TA-CWR5000

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TP-T7M5001	WIND ENCLOSURE
2	1	TP- T7M5020	ENCLOSURE FRONT
3	2	TP-T7M5021	ENCLOSURE SIDE
4	1	TP-T7M5022	TOP
5	4	TP-110764	LEVELING MOUNT
6	4	TP- 313010	McMASTER-CARR # 1582A343
7	1	TP-T7M5026	ENCLOSURE DOOR
8	1	TP-T7M5025	MODULE SUPPORT SHELF
9	1	TP- 215351	Ferrogard, Actuator
10	1	TP-T7M5027	ACCESS DOOR LEXAN
11	1	TP-T7M5029	INTERLOCK SWITCH MOUNT
12	1	TP-T7M5031	DOOR LATCH MOUNT
13	1	TP-109158	PULL HANDLE US-4000 ENCLOSURE
14	1	TP- 215350	FERROGARD, FRS-5
15	1	TP-T7M5030	ACTUATOR MOUNT



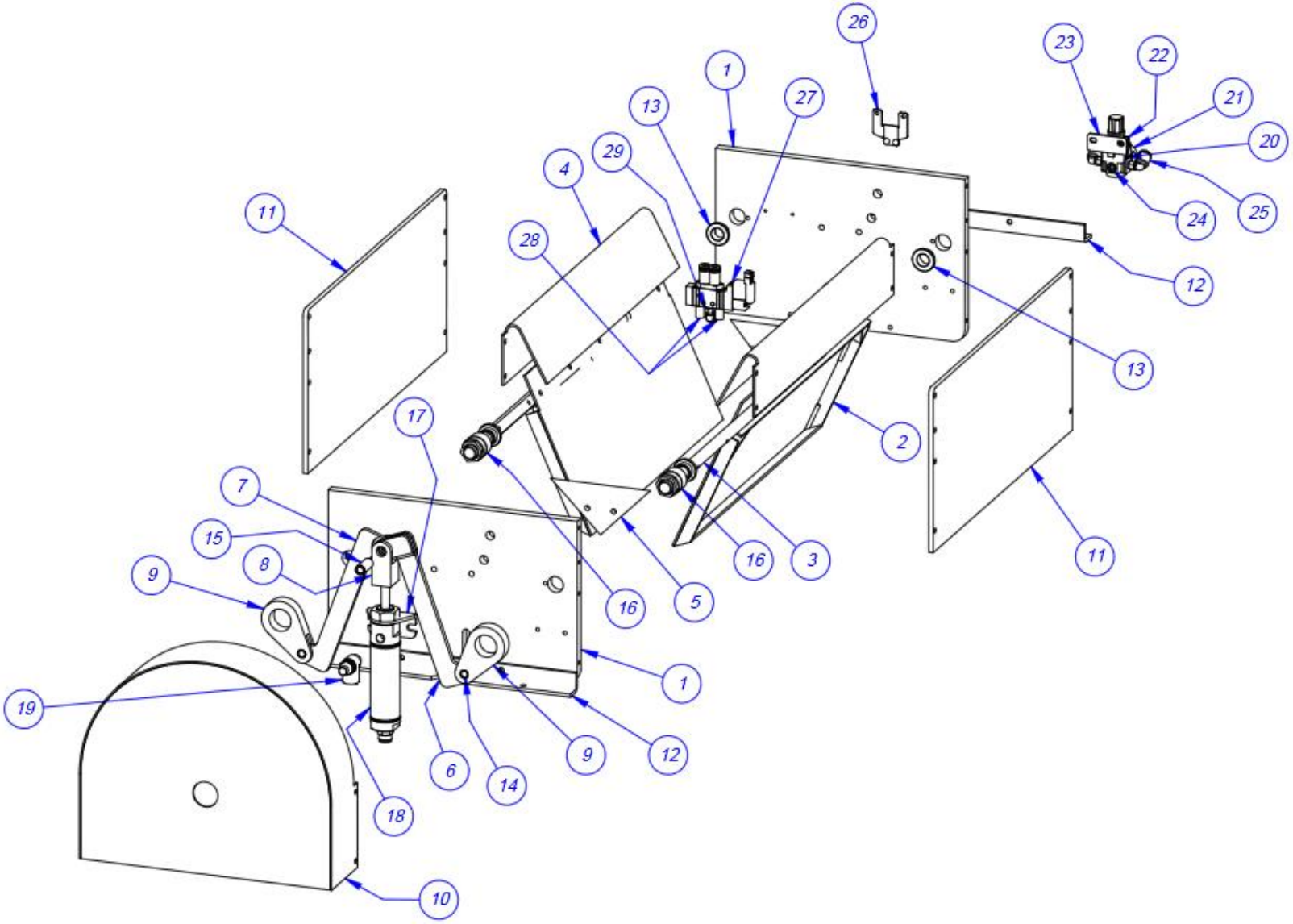
WIND ENCLOSURE ASSEMBLY

PN: TA-CWR5000

5.7 SCALE ACCUMULATOR ASSEMBLY

PN: TA-CWR8000

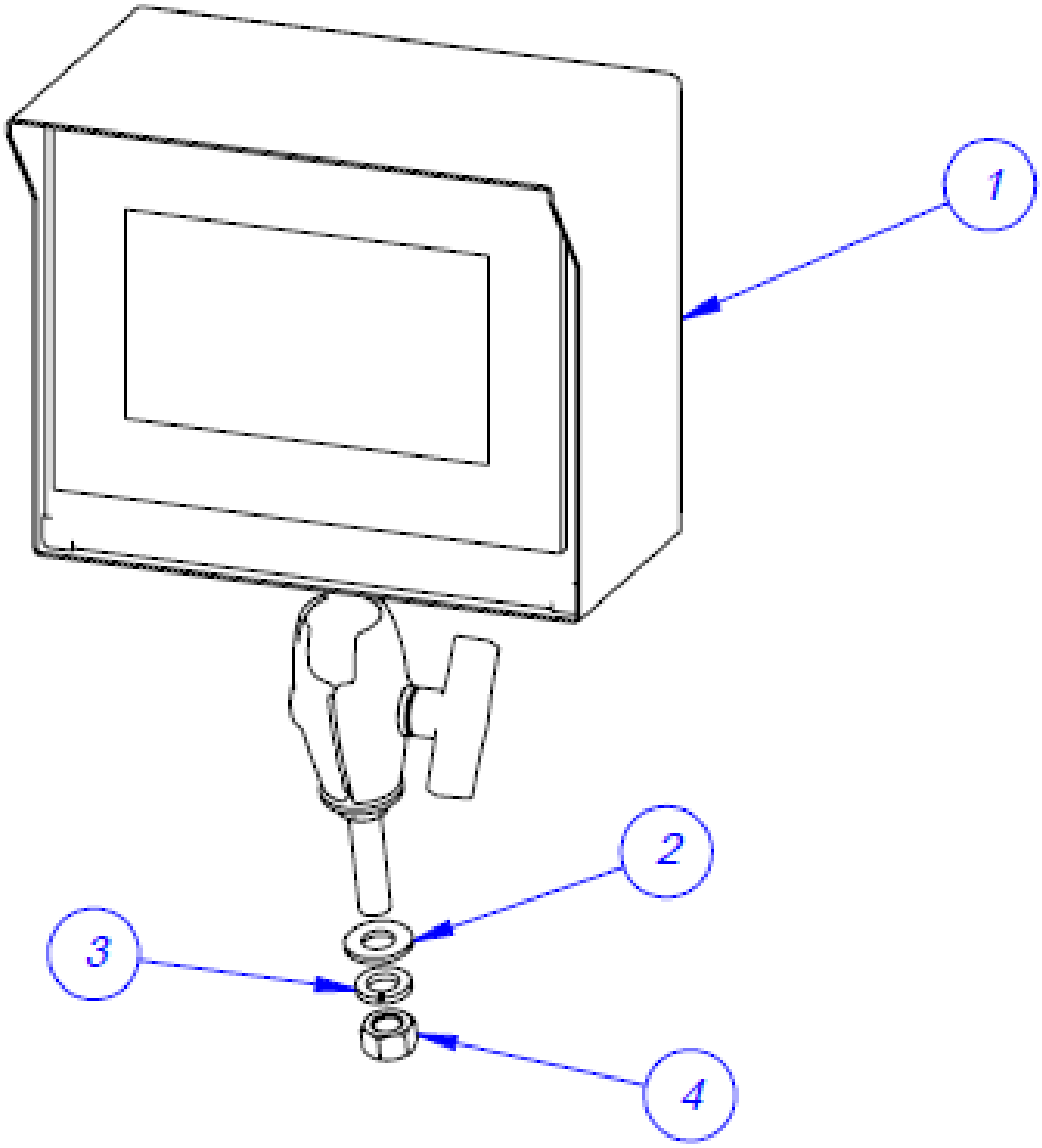
ITEM NO.	QTY.	PART NO	DESCRIPTION
1	2	TP-T7M8001	END PLATE
2	2	TP-T7M8003	GATE
3	2	TP-T7M8004	GATE SHAFT
4	2	TP-T7M8005	SUPPORT GUIDE
5	2	TP-T7M8006	GATE STOP
6	1	TP-T7M8007	CYLINDER ARM L.H.
7	1	TP-T7M8008	CYLINDER ARM R.H.
8	1	TP-T7M8009	CYLINDER CLEVIS
9	2	TP-T7M8010	GATE LEVER
10	1	TP-T7M8012	END GUARD
11	2	TP-T7M8015	SIDE GUARD
12	2	TP-T7M5008	ACCUMULATOR MOUNT
13	4	TP-107115	FLANGE BEARING 1/2 ID x 5/8 OD x 7/8 FLANGE
14	2	TP-107321	1/4 ID x 5/16 OD x 1/2 LONG
15	1	TP-107348	1/4 ID x 3/8 OD x 7/8 LONG
16	2	TP-107401	TRANSTORQUE KEYLESS BUSHING
17	1	TP-403491	CYLINDER MOUNT
18	1	TP-403490	CYLINDER
19	1	TP-402184	FLOW CONTROL
20	1	TP-406259	REGULATOR
21	1	TP-406259	GAUGE
22	1	TP-406259	NUT
23	1	TP-406259	BRACKET
24	1	TP-406259	PLUG
25	2	TP-401277	ELBOW
26	1	TP-402175	BRACKET
27	1	TP-402255	VALVE
28	2	TP-404263	MUFFLER
29	1	TP-401277	ELBOW, 1/4" TUBE x #10-32


26
23
22
1
21
13
27
20
29
4
25
24
11
28
12
13
17
2
7
15
16
3
8
5
9
16
11
1
19
9
12
6
14
18
10

5.8 TOUCH SCREEN ASSEMBLY

PN: TA-CWR4000

ITEM NO.	QTY.	PART NO	DESCRIPTION
1	1	TA-T10240-IOP	SEVEN INCH TOUCH SCREEN
2	1	TP-102146	Washer, 1/2 FLAT
3	1	TP-102159	Washer, 1/2 LOCK
4	1	TP-101117	Nut, 1/2-13 HEX


1
2
3
4

5.9 SCHEMATICS

This section is provided to show the electrical drawings for different components in the US-4000.

A. 110 VAC
See drawing US4k_GSE-E1

B. FPG-IO
See drawing US4k_GSE-E2_ Rev 1

C. SCALE
See drawing US4K_GSE-E3

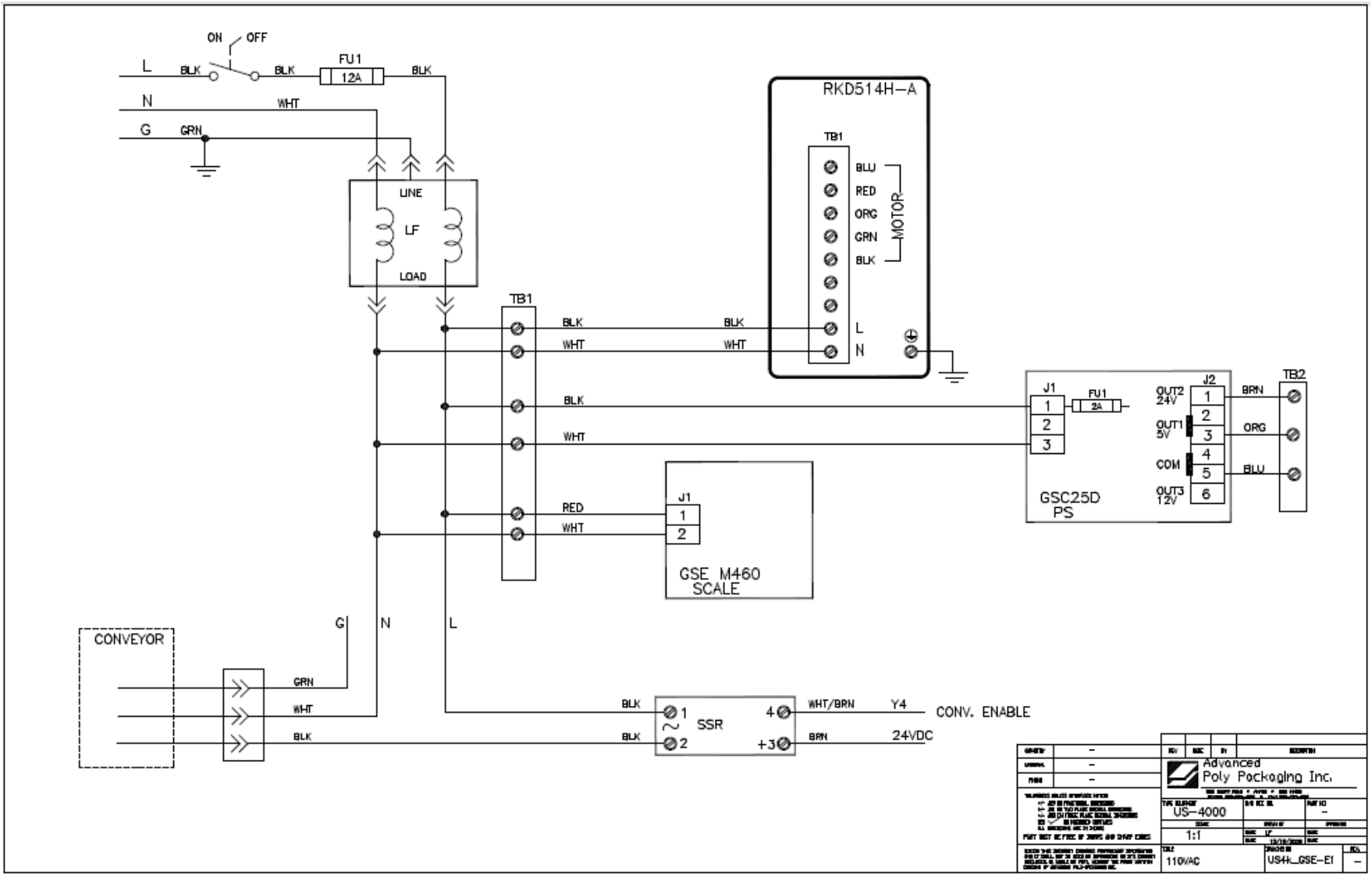
D. RKD
See drawing US4k_GSE-E4

E. Com2
US4k_GSE-E5_ Rev 1

F. Aux-IF
US4k_GSE-E6_ Rev 2

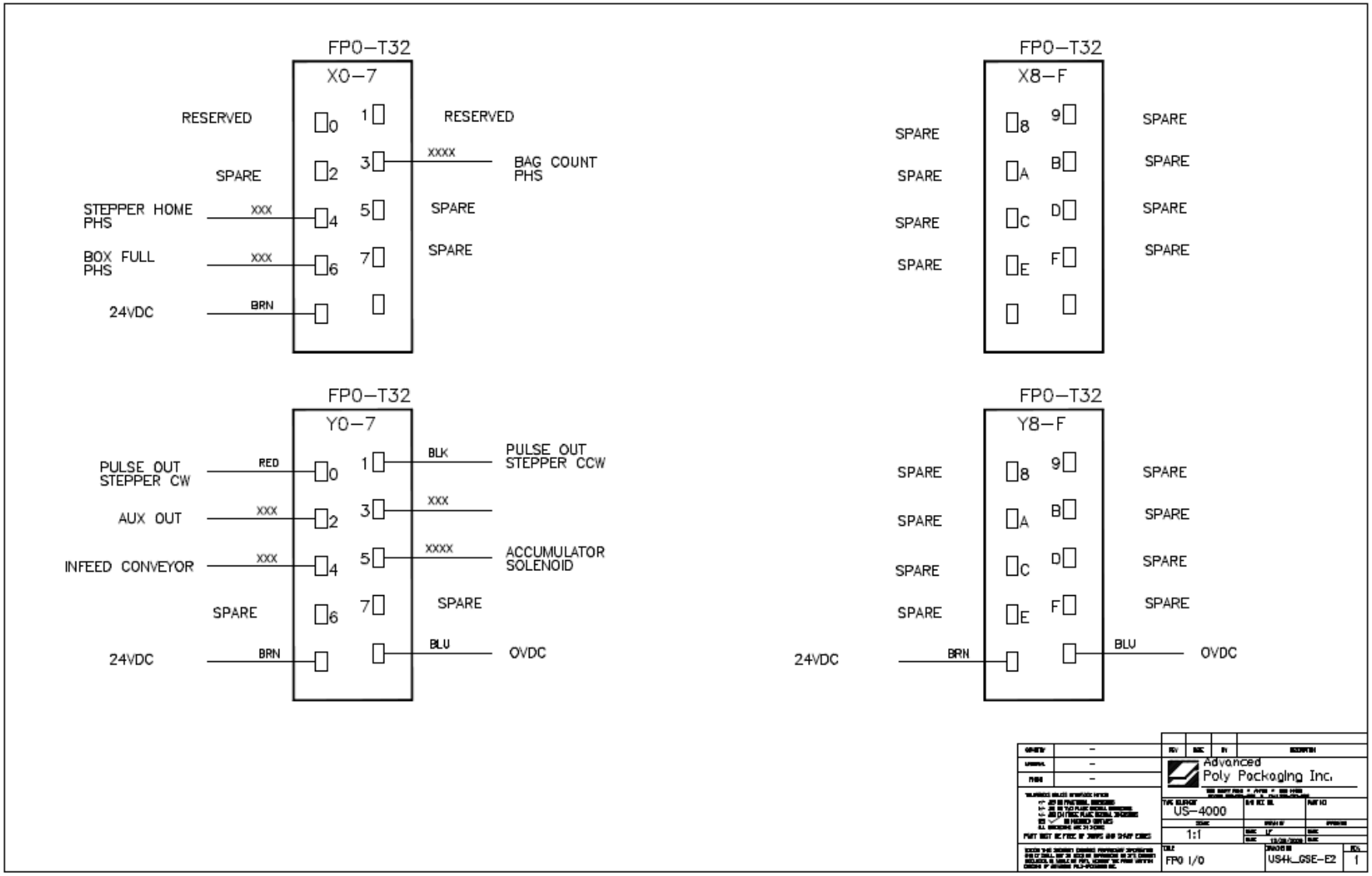
A. 110 VAC

US4k_GSE-E1

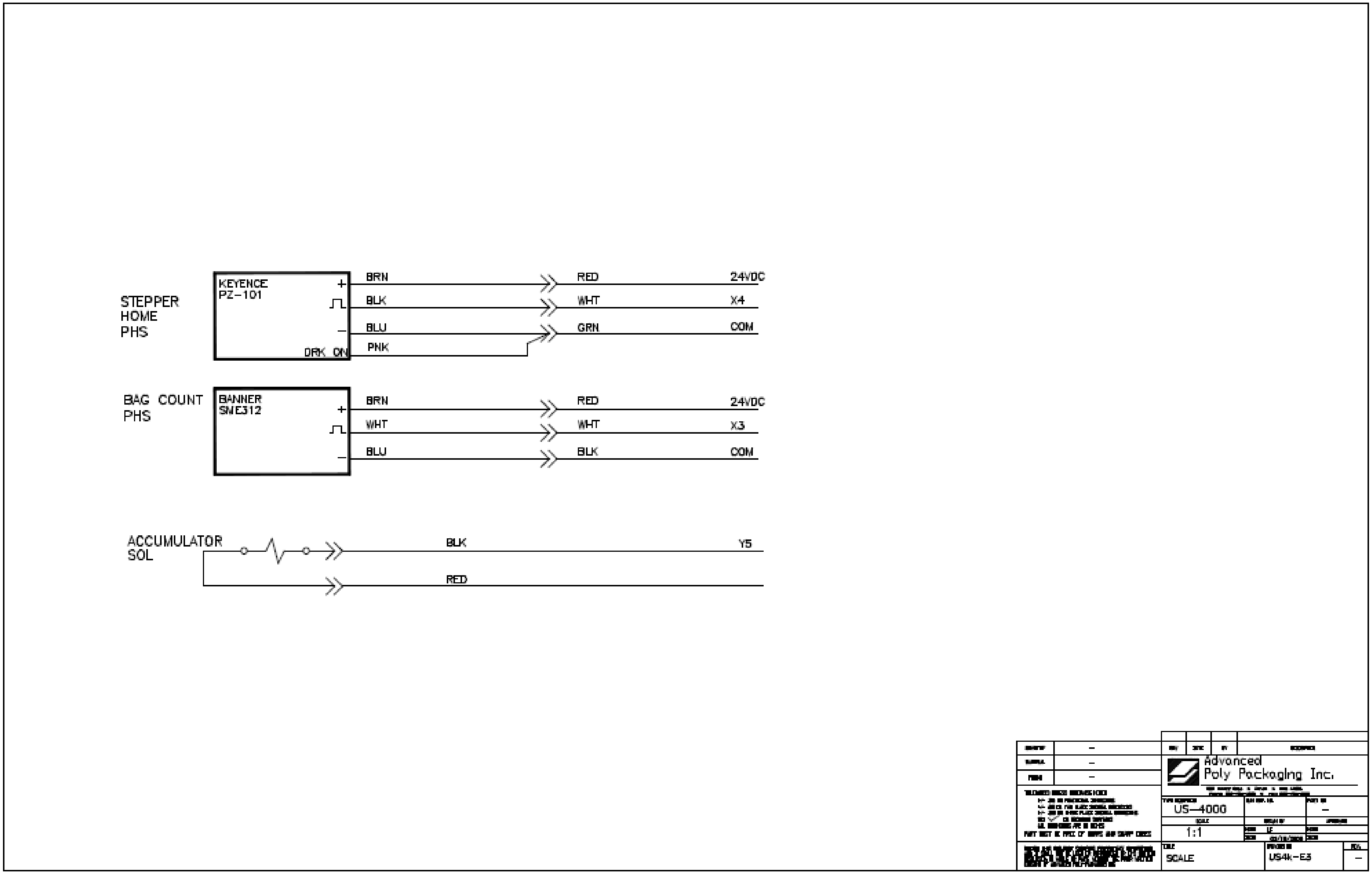


B. FPG-IO

US4k_GSE-E2_ Rev 1

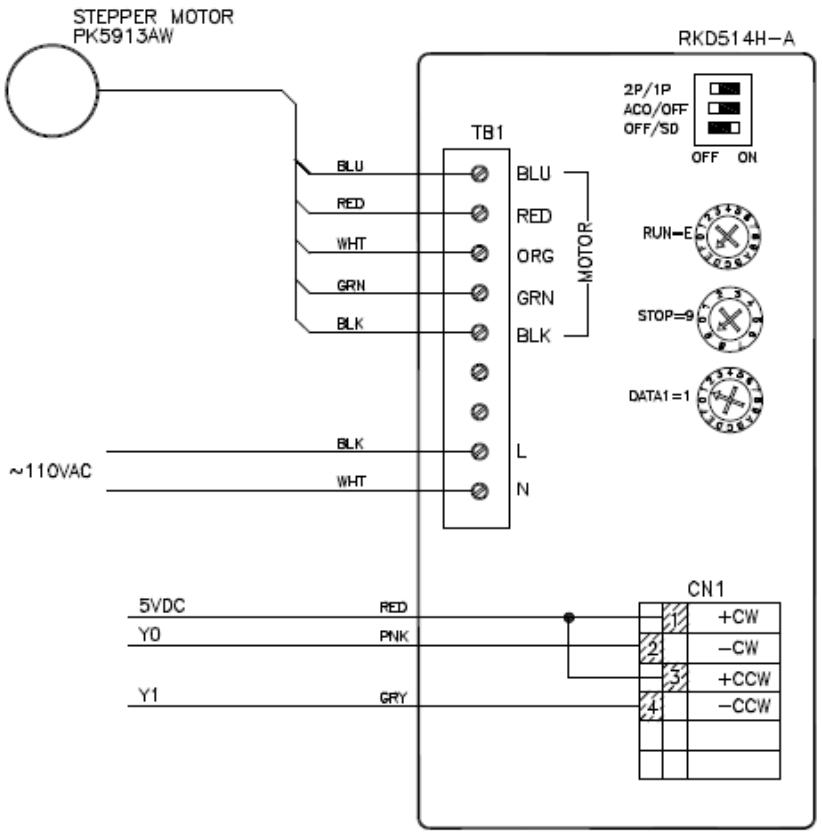


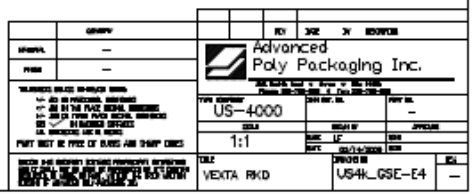
US4K_GSE-E3


STEPPER
HOME
PHS
KEYENCE
PZ-101
DRK ON
BRN
BLK
BLU
PNK
RED
WHT
GRN
24VDC
X4
COM
BAG COUNT
PHS
BANNER
SME312
BRN
WHT
BLU
RED
WHT
BLK
24VDC
X3
COM
ACCUMULATOR
SOL
BLK
RED
Y5
Advanced
Poly Packaging Inc.
US-4000
1:1
SCALE
US4k-E3

D. RKD

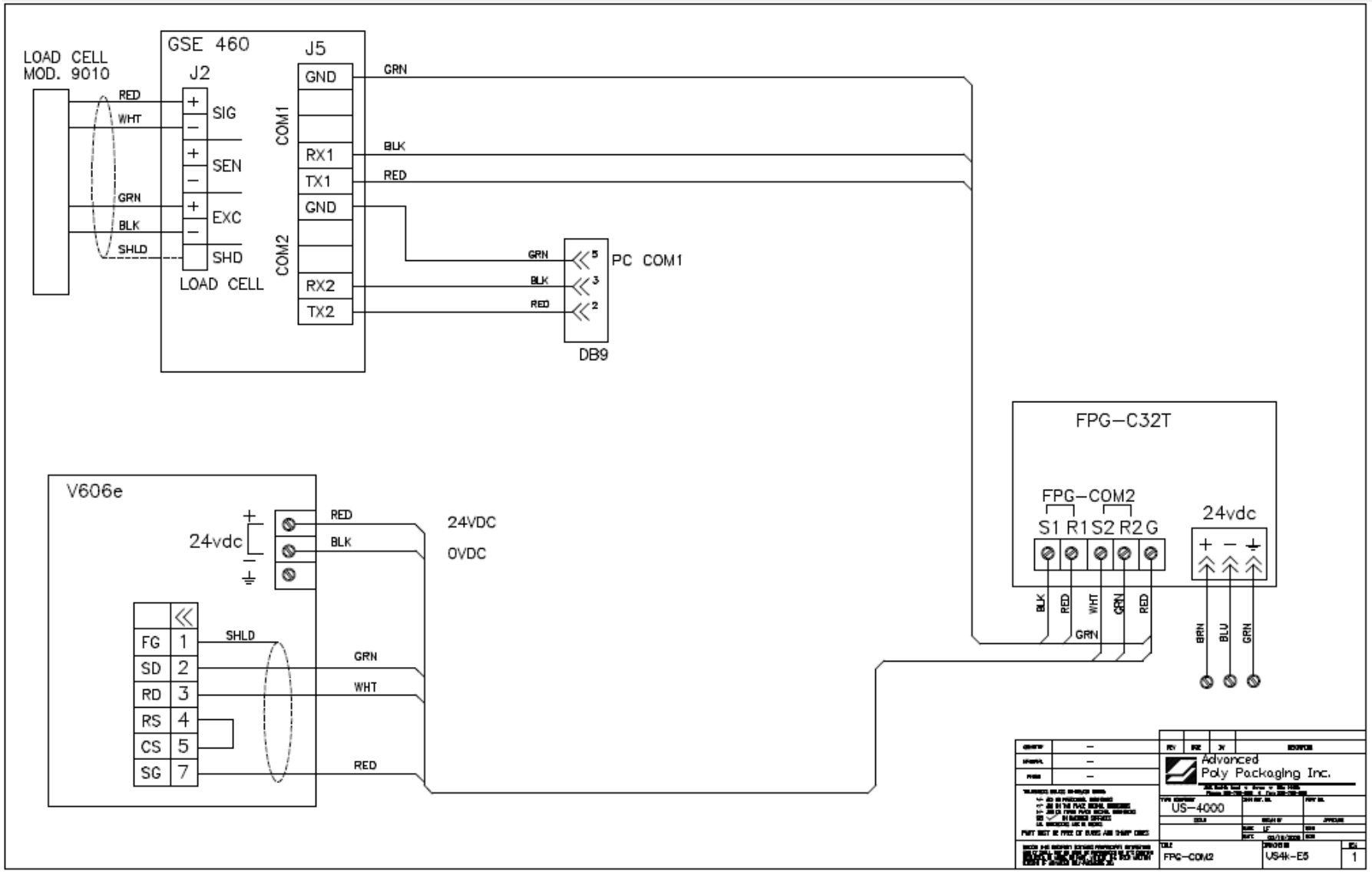
US4k_GSE-E4





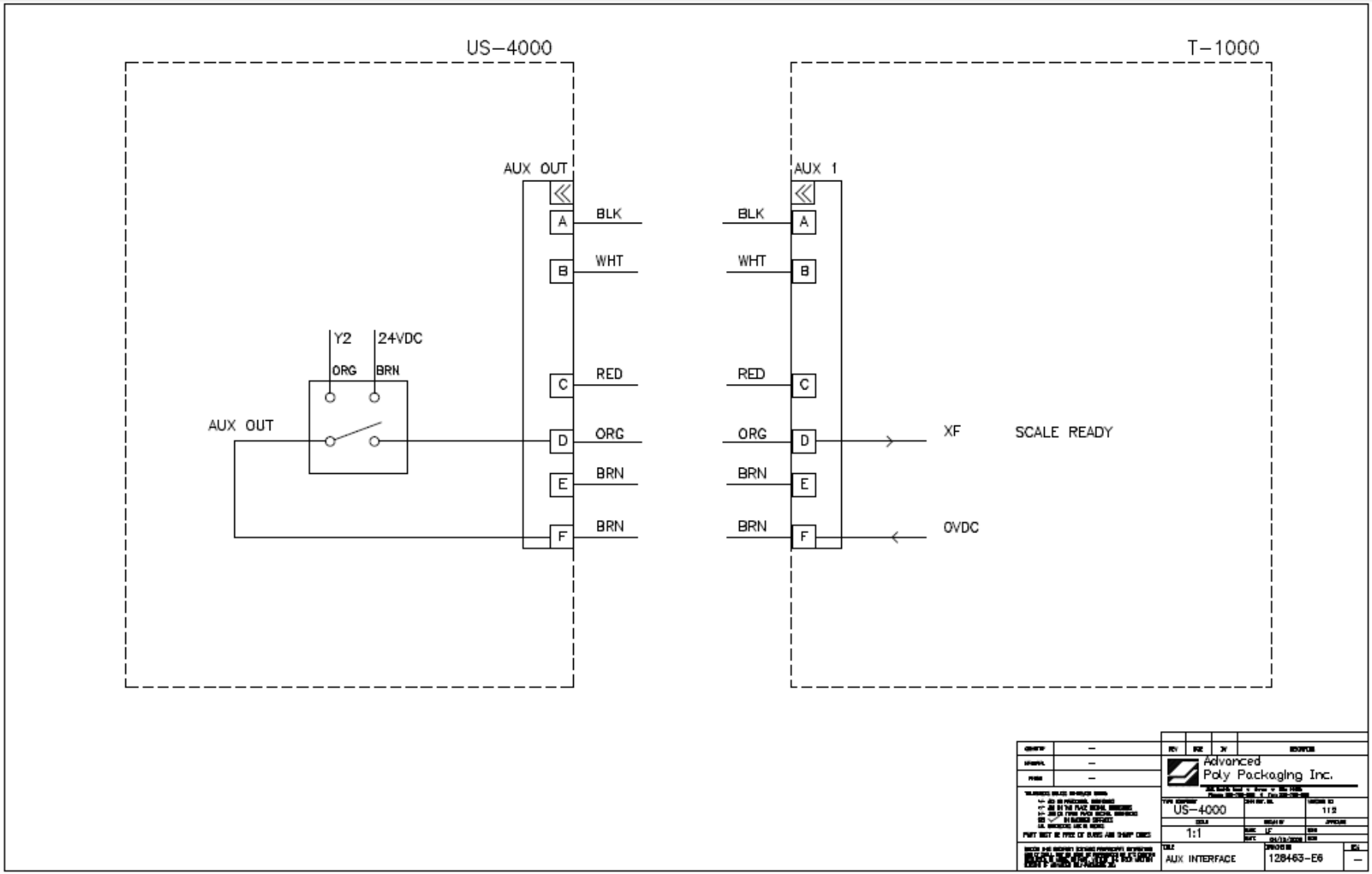
E. COM 2

US4k_GSE-E5_ Rev 1



F. AUX-IF

US4k_GSE-E6_ Rev 2



5.10 NOTES

DATE	NOTE