QUADREL
LABELING SYSTEMS

Operating & Maintenance
Manual
For

# ROCKTENN - DENVER

# Q44
## Automatic Labeling System

Labeler Model #: Q44 TAMP
Serial #: 84236-100

QUADREL LABELING SYSTEMS
7670 Jenther Drive
Mentor, Ohio 44060
440.602.4700

customerservice@quadrel.com
parts@quadrel.com

# TERMS AND CONDITIONS OF SALE
# QUADREL, INC
# D/B/A Quadrel Labeling Systems Hereinafter Referred to as Quadrel

**PERFORMANCE GUARANTEE:**

If the surface of the product to be labeled is free from contamination so as to ensure proper label adhesion, the labels are manufactured in accordance with label specifications provided and the equipment is operated and maintained in accordance with the instructions contained in the Quadrel manual (two copies of the manual will be supplied by Quadrel with the labeling system; one printed copy, and one electronic copy). Quadrel guarantees the EQUIPMENT to perform after installation as stated.

1. Provided a sufficient amount of products are presented to the labeling system.
2. Dimensional inconsistency from one like product to be labeled to the other may result in additional label placement inaccuracy in direct relationship to the product inconsistency.
3. Slitting inconsistency within a given roll of labels or from one like roll to another may result in additional label placement inaccuracy in direct relationship to the slitting inconsistency.
4. If the Quadrel labeling system proposed herein does not include physical control of the product during label application, additional placement inaccuracy can occur in direct relationship to the product control inconsistency.
5. Label Placement Accuracy: Within Sigma 2 (approximately 95.5%) to be normal.

In the event of the failure if the Quadrel system to meet customer's specifications, as quoted by Quadrel or subsequently agreed to by Quadrel. Quadrel upon written notice from buyer shall, at its option, repair the system, or refund the purchase price upon return of the system. The warranty provided in this article and the obligations and liabilities of Quadrel thereunder are exclusive and in lieu of, and buyer hereby waived, other remedies warranties, guarantees or liabilities, express or implied arising by law or otherwise (including without limitation, any obligations of Quadrel with respect to fitness for a particular purpose, merchantability, specific performance, incidental and consequential damages) whether or not occasioned by Quadrel's negligence. This warranty should not be extended altered or varied except by written instrument signed by Quadrel and buyer.

EXCLUSIVE TERMS OF SALE: The proposal attached hereto or to which these Terms and Conditions of Sale apply (the "Proposal"), together with these Terms and Conditions of sale (collectively, the "Sale Agreement"), constitutes the complete and exclusive statement of the agreement between Quadrel and the purchaser specified in the Proposal ("Purchaser") concerning the equipment and other goods specified in the Proposal (collectively, the "Equipment"), as well as any and all services specified in the Proposal (collectively, the "Services"), and supersedes all prior contemporaneous agreements, representations and/or communications, either oral or written, between Quadrel and Purchaser or any representative such as parties with the respect to the subject matter of the Sale Agreement. No change to the Sale Agreement or waiver of any provision thereof will be binding on Quadrel unless made in writing and signed off by and authorized officer of Quadrel. Acceptance of the Equipment, in whole or part, or other express or implied assent by Purchaser to the terms hereof shall constitute Purchaser's agreement to the terms of the Sale Agreement. Acceptance of any purchase order or other document of Purchaser by Quadrel is expressly made conditional on the Purchaser's assent to the Sale Agreement. ANY ATTEMPTED MEMORIALIZATION OF THIS SALE BY A PURCHASE ORDER OR OTHER DOCUMENT CONTAINING TERMAND CONDITIONS INCOSISTANT WITH OR IN ADDITION TO THE CONDITIONS CONTAINED IN THE SALE AGREEMENT SHALL NOT BE BINDING UPON QUADREL AND QUADREL HEREBY EXPRESSLY OBJECTS TO AND REJECTS THE SAME.

**GENERAL WARRANTY (EXCLUDES TABLETOP LABELERS)**

| Time from date of shipment | Covered Expenses |
|---|---|
| Up to 90 Days | All Parts , service time, living and travel expenses |
| UP to 12 Months | All parts |

**THE WARRANTIES PROVIDED ABOVE ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES AND LIABILITIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.** NO OTHER WARRANTIES ARE OFFERED BY QUADREL WITH RESPECT TO THE EQUIPMENT OR SERVICES AND QUADREL HAS NOT AUTHORIZED ANY EMPLOYEE OR AGENT TO OFFER ANY WARRANTIES EXCEPT THOSE PROVIDED ABOVE. PURCHASER AND QUADREL EXPRESSLY AGREE THAT THE WARRANTIES PROVIDED ABOVE SHALL SERVE AS PURCHASER'S SOLE AND EXCLUSIVE REMEDY WITH RESPECT TO THE EQUIPMENT AND SERVICES.

PURCHASER REEQUIRMENTS. Purchaser must provide Quadrel descriptions and specifications of all labels and items to be labeled, including, without limitation, label material, product and label dimensions, and any other items required by Quadrel. Further, purchaser shall furnish Quadrel one (1) production size roll of each label and 100 samples of each item to be labeled for testing purposes. **Quadrel shall have no liability (whether under its Limited One-Year Warranty or otherwise) for labeling performance on labels or items to be labeled:**

**(a) Which were not specified or sufficiently described in the Proposal: or**

**(b) With respect to which Purchaser fails to provide Quadrel the samples specified herein, even if such labels or items to be labeled were specified in the Proposal. Further, Quadrel shall have no liability for delays caused by Purchaser's failure to furnish samples as specified herein.**

LIMITATION OF WARRANTIES. Quadrel shall have no obligation to honor its warranties and shall have no liability with respect to defective Equipment if:

(a) The Equipment has been modified, altered, damaged, abused or used for any other than those purposes intended by Quadrel.
(b) The Equipment has been changed without prior written consent from Quadrel.
(c) The equipment has not been operated and maintained in accordance with generally accepted commercial practices for similar equipment and Quadrel's specifications and instructions, as published in the Quadrel manual.
(d) The surface if the product to be labeled is not clean and free of contamination, including, but not limited to, mold release agents, condensation, dirt and oil.
(e) Labels are not manufactured in accordance with label specifications provided by Quadrel, or are not from defects such as cracked edges, deep die strikes, *etc*.
(f) Labels and items to be labeled are not set forth in the Proposal.
(g) Samples of all products and labels were not provided to Quadrel for testing prior to Equipment shipment as required under "Purchaser Requirements" outlined above.
(h) There is dimensional inconsistency from one like roll of labels to another.
(i) *The Equipment does NOT include physical control of the product.*

LIMITATION OF REMEDIES. All warranty claims shall be subject to review and approval by Quadrel. Quadrel's obligation to honor warranties is in all cases limited to, at Quadrel's sole option:

(a) Repair of defective Equipment or components: or
(b) Providing a cash refund or credit, after Purchaser has returned Equipment to Quadrel.

Where warranty service is to be provided at the Quadrel facility, Purchaser shall return Equipment claimed to be defective to Quadrel, freight prepaid, for review. No Equipment shall be returned to Quadrel, whether for inspection, repair, refund, or any other reason, without prior return authorization from Quadrel. Quadrel may charge Purchaser cost resulting from testing, handling and disposition of Equipment claimed to be defective by Purchaser which is found by Quadrel to conform to Quadrel's warranties.

LIMITIATION OF LIABILITY. QUADREL SHALL HAVE NO LIABILITY FOR ANY CONSEQUENTIAL, INCIDENTAL, PUNITIVE OR SPECIAL DAMAGES BY REASON OF ANY ACT OR OMISSION OR ARISING OUT OF OR IN CONNECTION WITH THE (a) EQUIPMENT OR ITS SALE, DELIVERY, INSTALLATION, MAINTENANCE, OPERATION, OR PERFORMANCE, OR (b) SERVICES. IN NO EVENT SHALL QUADREL'S LIABILITY EXCEED THE PRICE OF THE EQUIPMENT (OR THE PRICE OF THE SERVICES IF A CLAIM IS MADE WITH RESPECT TO THE SERVICES) WITH RESPECT TO WHICH A CLAIM IS MADE REGARDLESS OF WHETHER SUCH CLAIM IS BROUGHT

AT LAS OR IN EQUITY AND REGARDLESS OF WHETHER SUCH CLAIM IS BROUGHT UNDER CONTRACT, BREACH OF WARRANTY, TORT OR ANY OTHER THEORY OF LAW OR EQUITY.

**ORDERS:**
Orders entered, verbal or written, cannot be cancelled except upon terms that will compensate Quadrel against any and all claims

**START-UP SERVICE:**
Quadrel will provide, at standard installation rates, the number of normal eight-hour working days for the Quadrel Field Service Technician to start the EQUIPMENT and to train PURCHASER'S operating and maintenance personnel. EQUIPMENT is not uncrated and emplaced in desired location by PURCHSER prior to arrival of Quadrel Field Service Technician, or if the EQUIPMENT cannot be made operational due to non-availability of products, labels, appropriate utilities and/or related production equipment, PURCHASER shall pay Quadrel for additional service time required including travel expenses, if applicable, in accordance with Quadrel's Field Service rates. It is PURCHASER's obligation to schedule the start-up service at a time when PURCHSER'S engineering, maintenance and selected production personnel are available.

**SERVICE AFTER INSTALLATION:**
Quadrel Field Service Technicians are available to customers who do not maintain their own service departments. This can be handles on a per visit basis. Field Service rates are available on request.

**PAYMENT TERMS:**
Payment terms are as follows: 50% of purchase with purchase order, 40% of purchase at the time of shipment, 10% of purchase (plus freight charges) due net 30 days. If shipment is delayed beyond 30 days after the EQUIPMENT has been made ready for shipment, and the delay is caused directly or indirectly by the PURCHASER, then the total of the unpaid balance, at option of Quadrel, may become immediately due and payable upon written notice. Payments not paid when due shall thereafter bear monthly service charges at the rate of 1.5% per month on the unpaid balance until paid. If, in Quadrel's opinion, PURCHASER'S financial condition does not justify continuance of production or shipment on the terms of payment specified above, Quadrel may require payments in advance.

FINANCIAL IMPAIRMENT. Quadrel may, at its option, suspend performance if in its opinion the credit of the Purchaser becomes impaired until such time as Quadrel has received full payment, including any general price increases or surcharges, is satisfactory security for deliveries made and is satisfied as to Purchasers credit for future deliveries. Quadrel reserves the right to cancel Purchaser's credit at any time for any reason. In addition, Quadrel reserves the right by written notice to cancel any order or require full or partial payment or adequate assurance of performance from Purchaser without Liability to Quadrel in the event of:

(a) Purchaser's insolvency
(b) Filing of a voluntary petition in bankruptcy by Purchaser
(c) Filing of an involuntary petition in bankruptcy against Purchaser
(d) Appointment of a receiver or trustee for Purchaser
(e) Execution by Purchaser of an assignment for the benefit of creditors

**TAXES:**
The amount of any present or future federal, state, local or other taxes applicable to the sale of EQUIPMENT shall be added to the price and paid by PURCHASER unless PURCHASER provides a valid exemption certificate acceptable to Quadrel and the appropriate tax authority.

GOVERNING LAW AND JURISDICTION. The sale agreement shall be governed and construed in accordance with the domestic laws of the State of Ohio without giving effect to any choice or conflict of law provision or rule that would cause the application of the laws of any jurisdiction other than the State of Ohio. Any legal action, suit or proceeding relating to the Sale Agreement shall be heard and determined exclusively in the United States District Court for the Northern District of Ohio or the Court of Common Pleas of Lake County, Ohio, and each party irrevocably submits to the jurisdiction of either such courts and waives any objection which such party may have to the laying of venue of any such legal action, suit or proceeding in any such court.

The Sale Agreement shall not be governed by the United Nations Convention on the International Sales of Goods. No actions arising out of the sale of Equipment or Services may be brought by either party more than one (1) year after shipment.

**RETURNS:**
EQUIPMENT sold by Quadrel is returnable only in accordance with the provisions hereof. Before returning of any EQUIPMENT or items thereof, PURCHASER must obtain Quadrel's written return authorization and instructions.

**FORCE MAJEURE:**
Quadrel shall not be liable for any loss, damage, delay, changes in shipment schedules or failure to deliver due to act of God, accidents, fires, strikes, riots, civil commotion, insurrection, war, the elements, embargoes, failure of carriers, inability to obtain electricity or other type of energy, transportation facilities, raw material, equipment or any problem or any similar or different contingency beyond its reasonable control which would make performance commercially impractical whether or not the contingency is of the same class as those above. Quadrel shall in no event be liable for any consequential damages.

**TITLE AND RISK OF LOSS:**
Title and risk of loss to EQUIPMENT shall pass to PURCHASER upon delivery by Quadrel to a common carrier, regardless of the freight terms stated or method of payment for transportation charges. Quadrel reserves the right to specify routing of shipments.

**ENTIRE AGREEMENT:**
This agreement embodies the entire agreement and understanding between the parties, is intended as complete and exclusive statement of terms of the agreement between the parties and supersedes any prior agreements or understandings between the parties relating to the subject matter hereof. PURCHASER acknowledges that Quadrel has not made any representations to PURCHASER other than those which are contained herein. Except as provided in this agreement, no change in or addition to the terms contained herein shall be valid as between the parties unless set forth in writing which is signed by an authorized representative of both parties and which specifically states that it constitutes an amendment to this agreement.

The parties may use their normal commercial forms in connection herewith: however, any such forms shall be used for convenience only and any terms or provisions which may be contained therein inconsistent with or in addition to those contained herein shall have no force or effect whatsoever between parties hereto.

**EFFECTIVE:**
This proposal is based upon the current cost of labor and materials and shall remain in effect for a period of sixty (60) days from the date hereof unless revoked by Quadrel in writing prior to acceptance.

**INDEMNIFICATION:**
The purchaser of this product ("Customer") hereby agrees to release, indemnify and hold harmless Quadrel and its agents, assignees and representatives for any and all liabilities, losses, costs, damages and expenses (including attorneys' fees and expenses) arising, directly or indirectly, from any and all manner of claims, demands, actions and proceedings that may be instituted against Quadrel on any grounds.
The Customer agrees to, at the Customer's own expense, promptly defend and continue the defense of any such claim, demands, actions or proceeding that may be brought against Quadrel, provided that Quadrel shall, within thirty (30) days of Quadrel receiving notice thereof, notify the Customer of such claims, demand, action or proceeding.
Quadrel shall at all times retain the right to defend itself and/or to otherwise participate in the defense of any such claim or action, and no settlement or other resolution of any such claims or action shall be finalized without Quadrel's written approval. Any failure by Quadrel to give prompt notice or provide copies of documents or furnish relevant data shall not constitute a defense in whole or in part to any claim by Quadrel against the Customer except to extend that such failure by Quadrel shall result in a material prejudice to the Customer.
The forgoing notwithstanding, if suit shall have been against Quadrel and the Customer shall have failed, after the lapse of a reasonable time after written notice to it of such suit, to take action to defend the same. Quadrel shall have the sole right to

defend the claim and shall be entitled to charge the customer with the reasonable cost of any such defense, including reasonable attorney's fees, and Quadrel shall have the right, after notifying but without consulting the Customer, to settle or compromise such claim on any terms reasonably provided by Quadrel.

This release and indemnification is and shall be binding upon the Customer, as well as the Customer's respective heirs, subsidiaries, affiliates, successors, assigns, agents and employees. If any provision or provisions of this release and indemnification shall be held to be invalid, illegal or unenforceable for any reason whatsoever, the validity, legality and enforceability of the remaining provisions aft h Agreement shall not in any way be affected or impaired thereby. No supplement, modification or amendment of this Agreement shall be binding unless executed in writing by all of the parties hereto.

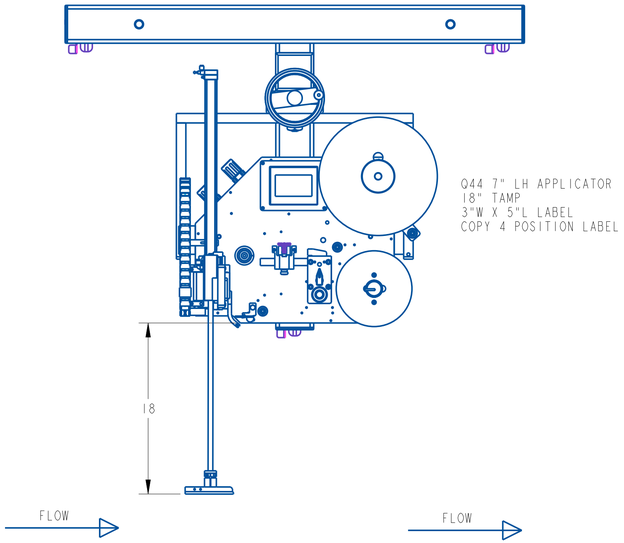
Any order put on hold or left dormant for any reason for 90 days will be considered cancelled. See Cancellation Policy below.

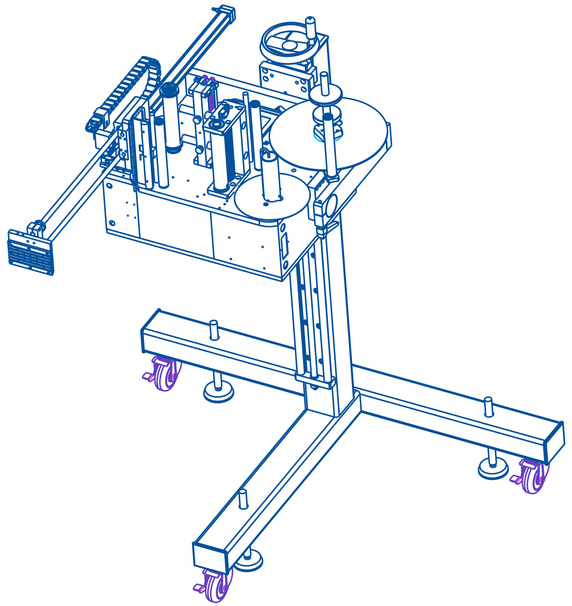
**CANCELLATION POLICY:**

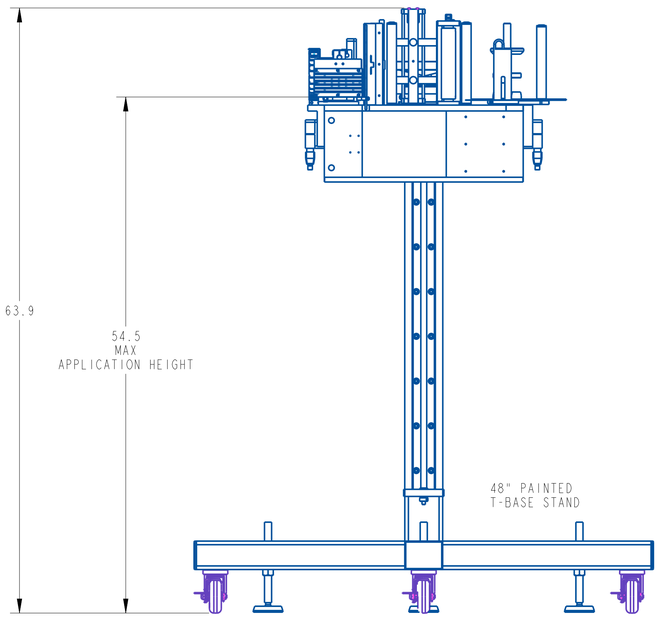
In the event of order cancellation, the 50% down payment is non-refundable. Customer may also be responsible for additional charges covering engineering resources expended and committed materials depending upon the custom nature of the project and the point in the order process in which the cancellation occurs.

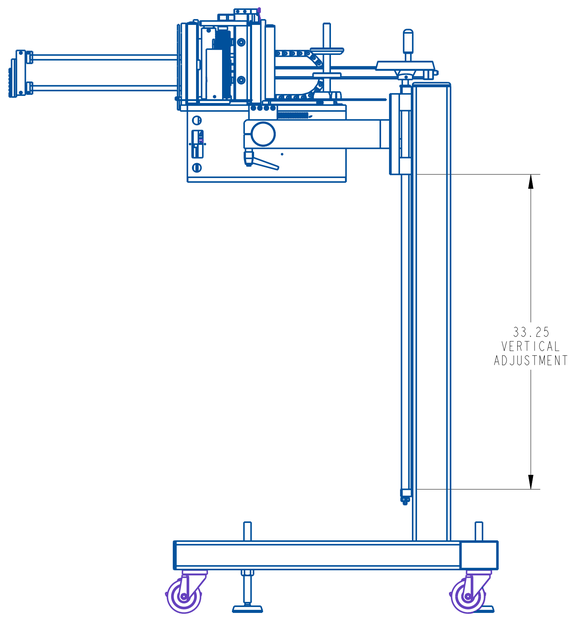
**NOTE.** No salesman, representative or agent of Quadrel is authorized to give a guarantee, warranty or make any representation contrary to above.

Please sign and acknowledge acceptance to these terms and conditions_____Date_____






| REV | DATE | DESCRIPTION | BY |
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| A | Oct-17-25 | NEW DRAWING | RDL |

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UNLESS OTHERWISE SPECIFIED
DIMENSIONAL TOLERANCE
X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'

SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

SCALE: 1/8
DATE: Oct-17-25
DRW BY: RDL
CHK BY:
APPR BY:

MAT'L

84236-100

SHEET 1 OF 1

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# Quadrel Labeling Systems
# Quality Manual

## Quality Statment:

Quadrel Labeling Systems strives to provide our customers with the highest quality labeling/sleeving solutions available on the market. In order to achieve total customer satisfaction, we shall adhere to the following objectives:

100% on-time delivery

zero defects

Value added service and support

Engineered solutions

Employee development and diversity

We will commit to continuously improve each facet of our business operations through implementation of, and compliance of this manual.

C. Wepl

Chuck Wepler
General Manager / President

Approved by: Jim Brazee
Issue Date: 1/1/2018

# 1 MANUAL PREFACE

Thank you for choosing Quadrel Labeling Systems. We have designed and manufactured this equipment with the upmost pride and care ensuring you the absolute best quality, maximum versatility and reliability.

This equipment is intended to be used only as described in this document. Quadrel Labeling Systems Inc. cannot be held responsible for the improper use or functioning of non-described functions of this machinery. Liability for any personal injury, loss of production or revenues, or property damage occasioned by the use of this manual in effect maintenance, operation, or repair of the equipment is in no way assumed by Quadrel Labeling Systems Inc. Anyone one using a procedure not recommended by the end user should first completely satisfy himself/herself that personal safety and equipment integrity will not be jeopardized in the method selected.

**DO NOT** attempt to install, operate, or adjust the labeling system without first reading and understanding the contents of this manual.

Only a trained person is to be permitted to operate this equipment. Training should include instruction in operation under normal conditions and emergency situations. Under no circumstances should an untrained person operate this machine.

This manual will provide operating instructions, parts listing and schematics. The information contained in this manual will help the user in his/her operations, troubleshooting, and maintaining the machine in good operating conditions. Information, illustrations and specifications contained in this manual are based on the latest product information available at the time of this manual release. Quadrel Labeling Systems Inc. reserves the right to alter and substitute information contained herein at any time.

Due to the customization it is also possible that you have received a different variation of this equipment, with several different options. Some pictures used in this manual may not totally reflect your configuration, although the labeling is completely the same.

# 3 WARNING/CAUTION SAFETY INSTRUCTION

Where safety is dependent upon starting or stopping devices, or both, they are to be kept free of obstructions that could endanger personnel.

The areas around loading and unloading points are to be kept free of obstructions that could endanger personnel. Instruct personnel working on or near this equipment as to the location and operation of pertinent stopping devices.

This equipment is to be used only for the purpose for which it is constructed.

Under no circumstances are the safety characteristics of this equipment to be altered.

Conduct routine inspections and corrective / preventive maintenance measures to ensure that all guards are installed and function properly. Alert personnel to the potential hazards indicated by the safety labels on this equipment.

## 3.1 SAFETY INTEGRATION

The end user's safety risk assessment will be the guiding document for proper integration of the equipment provided. Consideration of the following guidelines is recommended in order to achieve a safe result:

- Open areas under the equipment are to be guarded by the end user to prevent entry.
- Where conveyor flight lugs or product enters or exits the equipment, proper guarding and interlock are put in place by the end user to ensure mitigation of shear/jam points.
- The end user is responsible for properly guarding drive components on equipment that requires mechanical drive integration.

## 3.2 GENERAL SAFETY INFORMATION

This Quadrel Labeling System is engineered to feed and apply labels on your products. In designing the device, Quadrel valued personal safety; however we would like to draw your attention to the following safety acknowledgments.

**⚠ WARNING** Hazards or unsafe practices, which **COULD** result in severe personal injury or death.

**⚠ CAUTION** Hazards or unsafe practices, which **COULD** result in minor injury

**⚠ CAUTION** The presence of safety systems in these units does not exempt the operators to act cautiously, avoiding behaviors that could

endanger their health or the equipment. These models are engineered to feed and apply labels on your products. In designing this device, Quadrel valued personal safety; however we would like to draw your attention to the following safety acknowledgments.

- Operators should know the basic operations and setup procedures before operating this equipment.
- Safe operations should be maintained at all times.
- Know the location of E-stops and power switches prior to operating machinery such as this.

**⚠ WARNING**

To reduce risk of fire, electrocution, or other personal injury when operating. Follow basic safety precautions, including the following:

- This equipment must have an operator attending the machine at all times to monitor the operations. **DO NOT** leave this equipment unattended during maintenance or perform any maintenance unless the e-stop condition has been activated or power turned off.
- The electrical power to device is: ____220__ Volts, _SINGLE (1)_Phase, __60__Hz, ___5___Amps.
  While installing make sure it's properly configured and connected by a qualified electrical technician.
- **DO NOT** by pass any of the safety circuits or safety features designed into this equipment.



- ALWAYS turn off **power and pneumatics** before performing repairs.
- The doors on all electrical enclosures must be closed. All covers on labeling heads must be on labeling heads. (if applicable)

- This device is built to perform in humid conditions, but must not be pressure washed. Wiping down the device is the recommended cleaning method.



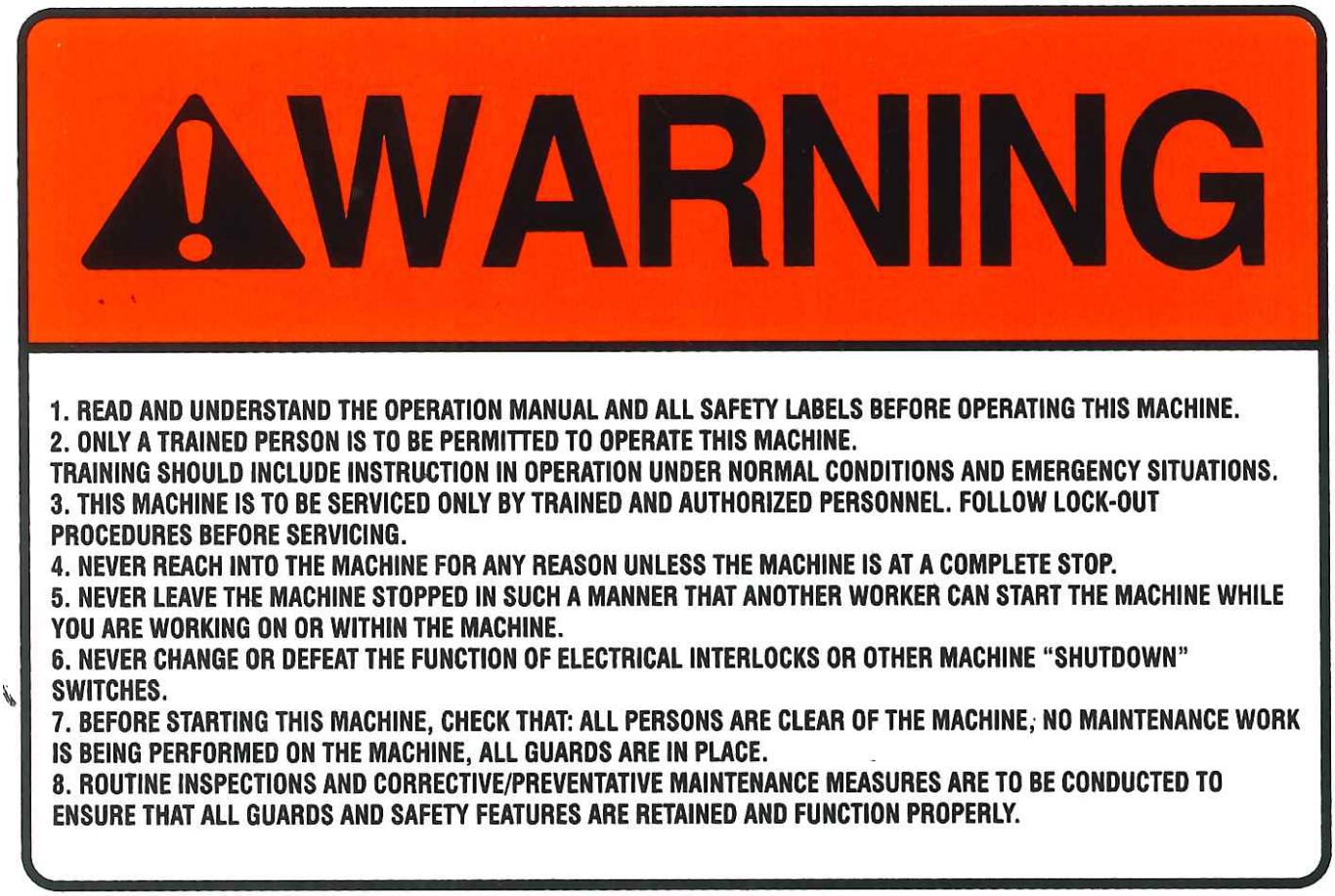
- Do not stand, sit, or allow any personnel to be within reach of the tamp cylinder/ swing arm activation (if so equip).
- Report any malfunctions, or problems with the equipment to qualified maintenance personnel for repair or adjustments that may be required.
- Keep hands clear of moving parts. Do not place hands near labeling head when in operation.

For systems containing conveyors, you must be vigilant with loose clothing or bodily parts as they can get caught in the conveyor's belt or chains as direct injury or death can incur. **DO NOT** use the conveyor as a working platform or walkway.

**TUCK IN ANY LOOSE CLOTHING. DO NOT WEAR TIES. PENDANTS, JEWLERY OR ANY OTHER ARTICLE OF CLOTHING OR ACCESSORY THAT MAY GET CAUGHT ON ANY PORTION OF THE SYSTEM.**

***FOR PROLINE SYSTEMS ONLY***

**CASTERS WERE IMPLEMENTED FOR EASE OF SHIPPING PURPOSES ONLY. PLEASE USE CAUTION WHEN MOVING PROLINE THROUGH FACILITY. THE PROLINE RECOMMENDED USE: SET IN PLACE/POSITION WITH LEVELING PADS DOWN TO SECURE.**



# Using VFDs On GFCI Devices

**By Bill Szatkiewicz, Senior Software Engineer**
**KB Electronics**
**for more information, email: info@kbelectronics.net**
**or visit: www.kbelectronics.com**

The National Electrical Code, or NEC, continues to expand protection requirements for safety reasons resulting in an increase in Ground-Fault Circuit-Interrupter (GFCI) outlets being used in more environments. As a result, the Variable Frequency Drives (VFDs) industry is finding more instances of VFDs being powered from GFCIs. VFDs introduce high frequency harmonic content which may cause nuisance tripping on some GFCI devices. This paper is intended to assist anyone that needs to use a VFD on a circuit with GFCI protection. KB Electronics has developed special VFDs suitable for use with most GFCIs*.
* Please contact KB Electronics with information regarding your specific GFCI.

**What is a VFD?**

A VFD (also termed adjustable frequency drive, variable speed drive, AC drive, adjustable speed drive, micro drive, motor control, or inverter drive) is a power conversion device that will accept normal fixed branch circuit voltage of (115V or 230V) and frequency (50 Hz or 60 Hz) and allow the operator to control the speed of an induction motor (AC Motor) by varying the output voltage and frequency. A simplistic version of a typical VFD system is shown in Figure-1.

In addition to operator controllability, the VFD with soft start/stop features offers extended equipment life, increased performance, reduced maintenance, protection from excessive currents and voltages, as well as energy savings.

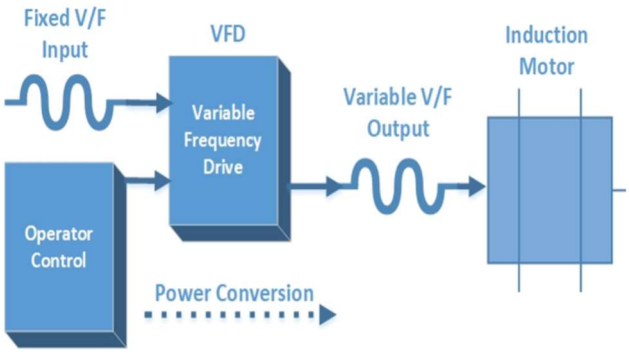



*Figure-1: Typical VFD System*

**What is a GFCI?**

A GFCI (shown in Figure-2) is a circuit breaker device which is designed to protect people from hazardous shock or electrocution by shutting off an electric power circuit when it detects current flowing in a way that it is not meant to, such as through water or a person.

*Figure-2: Typical GFCI Outlet*

The GFCI is intended to protect people from electrical shock, therefore, it is completely different from a fuse in the sense that it needs to shut off the electric power circuit at a low current, typically no more than 5 mA, in a quick amount of time (less than 1/10 of a second).

The GFCI does this by measuring and comparing the amount of current flowing in the ungrounded (hot) and grounded (neutral) conductors of the circuit. If the GFCI detects an imbalance in the circuit, it immediately shuts off the circuit.

**Why Nuisance Trips Occur with Standard VFDs**

Standard VFDs, when powered from GFCI outlets, can cause the GFCI to trip due to the leakage currents generated from the high switching frequency of the VFD's power devices and the harmonics associated with them. These high frequency leakage currents are not at the base frequency of the drive output which is normally 50 Hz or 60 Hz. These high frequency leakage currents, typically greater than 4 kHz, may cause the GFCI to trip because the GFCI is designed to work with 50 Hz or 60 Hz frequency inputs, not this higher value.

The high switching frequency of the VFD's power devices induce more capacitive-coupled currents, since a capacitor approximates a short circuit at high frequencies. This creates common-mode noise, referred to as leakage current, which travels through ground and can cause the GFCI to trip. The path to ground is made through the motor bearings or auxiliary equipment bearings.

In addition to the high switching frequency of the drive, there can be many other contributing factors which cause the GFCI to trip. Some drives have built-in filters which couple additional leakage current to earth ground. Other drives use external filters and replacing them with a low leakage filter may help.

One way to help determine if the GFCI tripping is occurring from the input filter or the VFD output is to remove either the input filter or the motor and observe if the GFCI still trips. For example, if the input filter is easily removed and doing so prevents the GFCI from tripping, the source of the leakage currents tripping the GFCI was largely from the input filter.

Another method is to disconnect the motor. If doing so prevents the GFCI from tripping the contributing source of leakage current is most likely from the output stage of the VFD. However, most often than not, the GFCI is tripping from a combination of the two and improvements on both the input and output will help.

Long motor power cables can also create noise spikes. These long leads add more capacitance which increases noise spikes from the fast switching power devices of the VFD. Use a VFD rated cable with the shortest leads possible when connecting the motor power cables. A choke on the VFD's motor outputs may help reduce noise spikes.

In addition, ensure that motor cables are properly shielded, sized, routed, terminated, and grounded at both the motor and drive.

**KB's GFCI Solution**

KB's engineering team has studied VFDs powered from a variety of GFCI devices. A solution has been created which considers all contributing factors to get a best-case scenario that successfully works with most GFCIs.

KB investigated switching frequencies and developed custom switching frequency algorithms to reduce audible noise and leakage currents. High frequency noise spikes and ringing were reduced by modifying our proprietary power circuits for optimal results. In addition, output chokes, low leakage filters, and shielded cable were introduced, if needed, to find a GFCI solution.

**Conclusion**

KB has had great success providing VFDs that work with GFCIs for numerous original equipment manufacturers (OEMs). KB offers a full range of motor controls (shown in Figure-3) which can be customized to work with GFCIs. Let KB Electronics provide a solution for you.

*Figure-3: VFDs Available from KB Electronics*

# Unboxing your Quadrel Labeling Systems Machine

This section of your manual is aimed towards making the transition from Shipping Crate to Assembly line less Dramatic. If you have scheduled an install with one of our Professional Technicians the set-up of your machine will be a breeze. If not your manual as all of the information needed to get you going. In this section there may be some equipment shown that does not apply to the machine you purchased.

*FOR PROLINE SYSTEMS ONLY* CASTERS WERE IMPLEMENTED FOR EASE OF SHIPPING PURPOSES ONLY. PLEASE USE CAUTION WHEN MOVING PROLINE THROUGH FACILITY. THE PROLINE RECOMMENDED USE: SET IN PLACE/POSITION WITH LEVELING PADS DOWN TO SECURE.

*NOTE* This is general instruction for all equipment (your equipment may vary slightly).

Let's get started…

First things first, check your crate/box/machine for damage. If there is damage please note the exception and contact Quadrel immediately. Any extra boxes or pallets will be either in your crate or tethered to the crate or pallet. Once you have inspected your shipment you can open the crate. Check packing slip Bill of lading against boxes received. Notify Quadrel of any discrepancies.

Carefully remove all banding on the legs, misc. boxes and assemblies in the crate or on the pallet. If your machine is wrapped in bubble wrap or plastic wrap go ahead and carefully cut and remove that as well. Ensure you are wearing the appropriate safety gear when removing your machine from the crate.

Ensure all plastic wrap is removed from the assembly you are removing the support from before removing the support.

Remove the supports under your labeling heads, wrap station, top trap, HMI, Pacing wheel or belt. See images for various supported assemblies.


Most assemblies supported have a tool-less vertical adjustment using a knob or hand wheel.

The hand wheel may be wrapped to the assembly to prevent damage.

Remove the hand wheel from the wrap, then fasten the hand wheel to the square end on the lead screw using a 3/32 “L” handle Allen wrench.

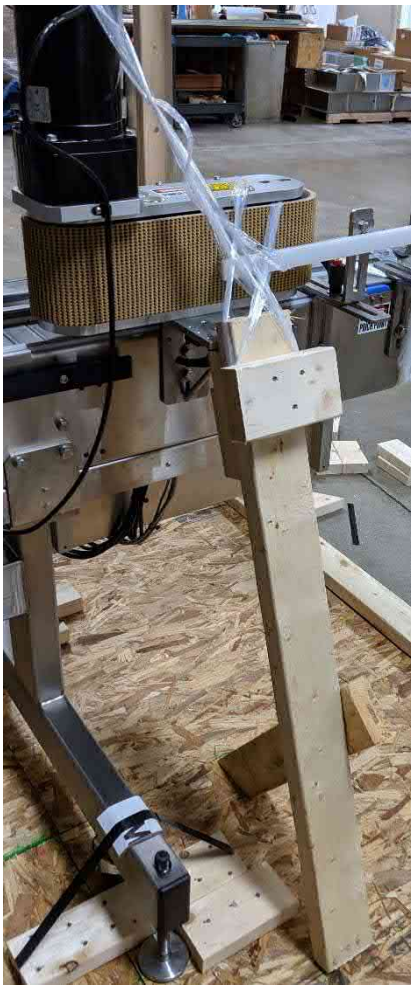
Turn the handle/knob to raise the assembly this will take the weight off the supports so you can remove them.

Top Trap Support (top) Labeler Head Support (bottom) Plastic wrapped hand wheel (right)

All top and bottom labeling heads will be supported similar to the image shown on the left.

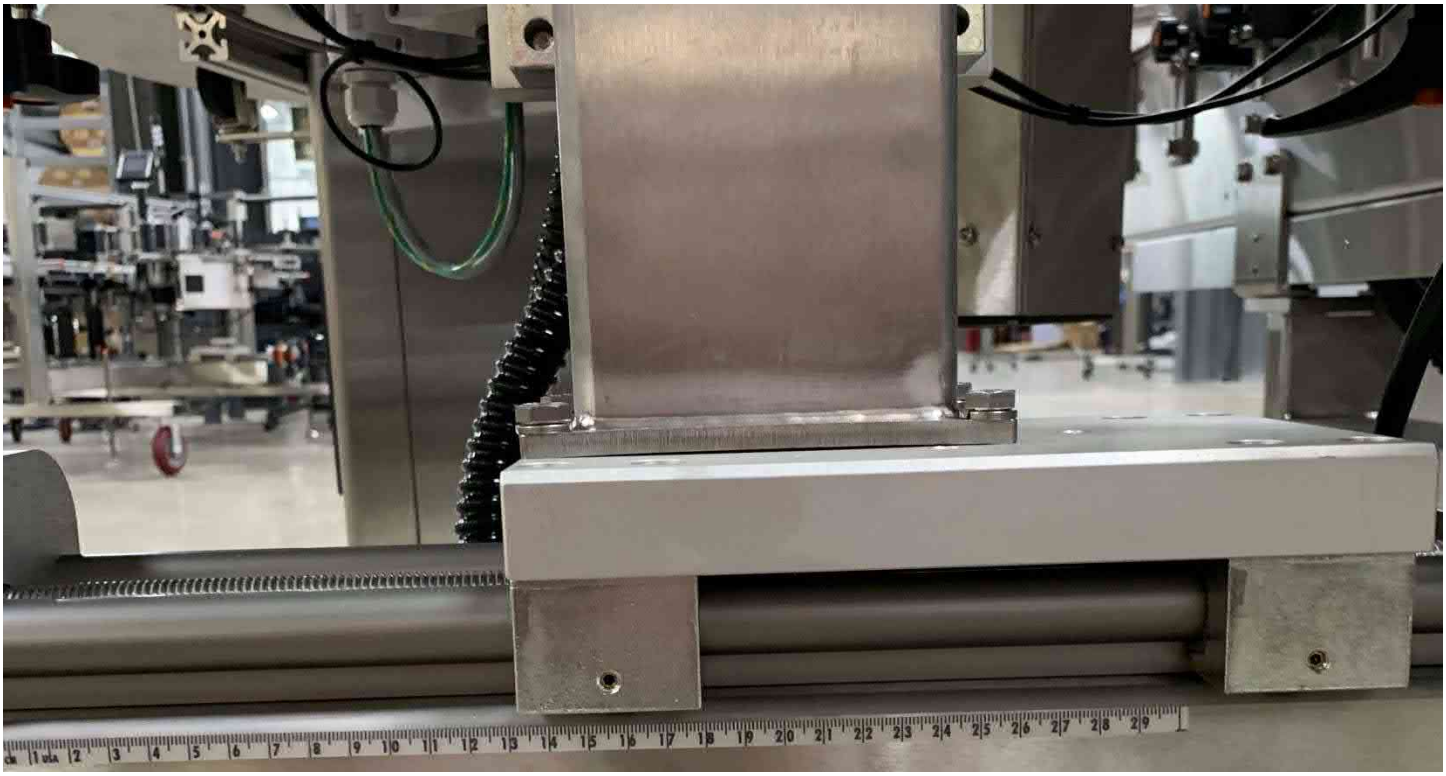
Wrap stations will have supports similar to the image to the right. These supports do not require moving the assembly.


Pacing belt assembly supports can be removed without raising the assembly.



Pacing wheels will be supported as shown

Often the head support will be moved in shipping or moved to be supported. When you are setting up your machine refer to your set up sheet in this manual. There are scales on the side of the assembly to line the carriage up to (as shown in the Image to the left and below).



Peel plates with or without the rods may be removed from the labeling head to move the head all the way in during shipping.

All assemblies removed will be bubble wrapped then plastic wrapped to the machine (as shown in image on the right) or in box on the pallet the machine is on (as shown in image below).

Mount the peel plate assembly using a 5/16 L handle Allen wrench (as shown in image on the left). The bolts are located in the assembly. You simply put the wrench in the quick change access holes to loosen or tighten the assembly.

*NOTE* When you are setting up your machine make sure the peel plate assembly is perpendicular to the conveyor. When the peel plate assembly is on the rods there is a small amount of play allowing you to make small adjustments to the assembly.

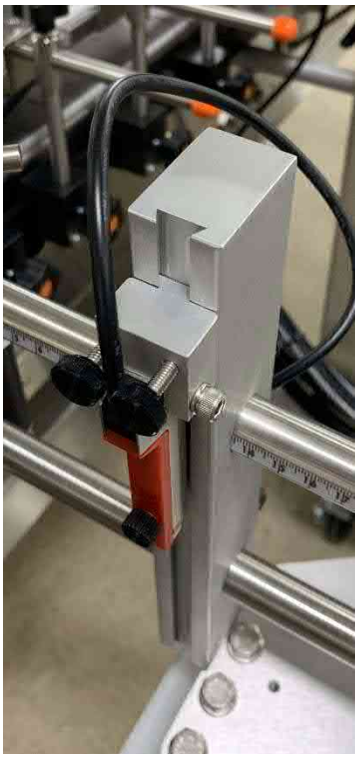
If you have the peel plate rods removed with the peel plate assembly and the label detect assembly (as shown below).

All assemblies removed will be bubble wrapped then plastic wrapped to the machine or in box on the pallet the machine is on.

First back the head out all the way. Locate your peel plate assembly and slide it into the holes in the drive roll assembly (as shown on the left of the image above). Make sure you take the bolts out of the end of the rods before putting them into the drive roll assembly.


Fasten the assembly to the drive roll with the bolts supplied using a 5/16 L handle Allen wrench. Make sure you have the lock washers on the bolts.

*NOTE* When you are setting up your machine make sure the peel plate assembly is perpendicular to the conveyor. When the peel plate assembly is on the rods there is a small amount of play allowing you to make small adjustments to the assembly.



When the peel plate rods are removed the label detect sensor is removed with it (show in image to the left). The sensor is locked into place so it won't move or need adjusted. All that will need done is simply reconnect the sensor to the zip port. To re-connect the sensor first locate the zip port (as shown in image on the right). The zip port is located under the head on the chassis or mounting plate. Take the cable coming from the sensor, route it neatly under the head, and screw it into the zip port where it says "label detect".

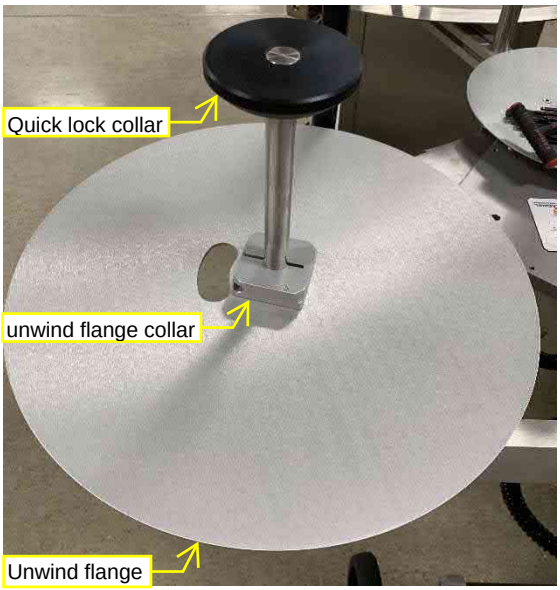

Some machines may have the unwind flange (shown in image to the right) removed to protect the flange during shipping do to the width of the machine.

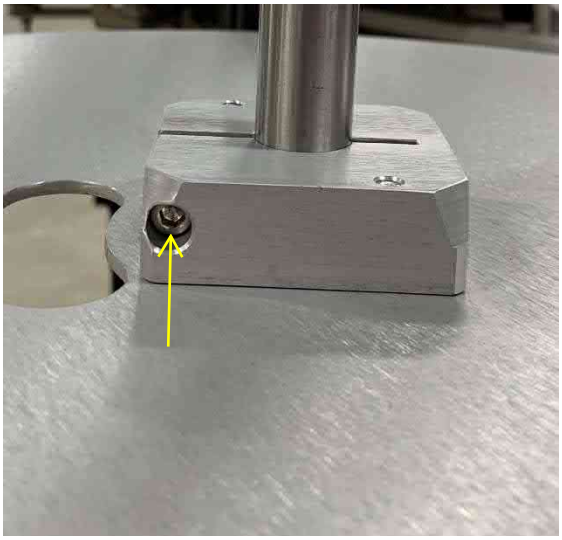
All assemblies removed will be bubble wrapped then plastic wrapped to the machine or in box on the pallet the machine is on.

First, slide the unwind flange (with the square unwind flange collar facing up as shown in image to the right) over the unwind shaft. Make sure the top of the flange is 1 ¼ inches off the side plate. There is a clamp colloar preset on unwind shaft so the unwind flange hub will rest on it.

Then, lock into place by tightening the collar with a 5/32 L handle Allen wrench.

Slide the quick lock collar over the shaft by lining the set screw up with the flat. The collar locks into place by rotating the collar 90 degrees.



Some machines may have the rewind flange (shown in image to the right) removed to protect the flange during shipping do to the width of the machine.

All assemblies removed will be bubble wrapped then plastic wrapped to the machine or in box on the pallet the machine is on.

First, slide the rewind flange (with the collar facing away from you as shown in image to the right) over the rewind hub make sure the flange just above the rubber bumper so it does not touch (roughly 1/2 inch off the side plate).

Then, lock into place by tightening the collar with a 5/32 L handle Allen wrench.


Rails and transfers on the infeed and outfeed may be removed for shipping purposes. They will be wrapped in bubble wrap and wrapped to the machine. Carefully remove wrap and place in position as shown lock into place by tightening the knobs or ratchet handles.

*NOTE* Your machine may have a different rail system either adjustment is tool-less and fastened by a knob of ratchet handle.

End transfers will be wrapped in bubble wrap and plastic wrap. They will be located in a box on the pallet with your machine or wrapped to the machine itself.

Fasten the end transfer plate to the machine using a 5/32 L handle Allen wrench and the supplied 10-32 socket head screws. Ensure the transfer plate is both level with the conveyor and DOES NOT hit the conveyor chain.

Stack lamps are usually placed at the highest point of the machine and for that reason they are either removed or rotated 180 degrees. The stack lamp will wrapped in bubble wrap and wrapped to the machine.

If the stack lamp is rotated then all you need to do is remove one of the bolts, rotate the stack lamp and put the screw back in. We use various screws on stack lamps you will need one of the following tools for the job.

-3/32 L handle Allen wrench

-1/8 L handle Allen wrench

-5/32 L handle Allen wrench

-3/16 L handle Allen wrench

-1/2 open end wrench

HMI over head touch screen displays may be laid flat across the top of the enclosure wrapped in bubble wrap and plastic wrap.

Carefully remove the plastic wrap and bubble wrap.

Rotate the HMI 90 degrees and slide into the mount on the enclosure.

Fasten the pole in place by tightening the 2 set screws on the mount with a 6MM L handle Allen wrench.


The HMI may be enclosed in a wooden support off the enclosure to hold it in place during shipping.

If HMI is located remotely off the enclosure it will still be supported during shipping.

If so, carefully remove the supports and you are done.

All printers, printer controllers and lasers are removed from the machine when shipping and placed in the manufacturer's box. The cabling will remain on the machine for ease of installation.

The printer is mounted to the printer mount with 1 ¼-20 ratchet handle. Make sure you line up the indents in the plates with the brass nut on the threaded rod. Then slide the ratchet handle through the center of all of the blocks and tighten. Plug in the cables and you are done.



Table top printers with printer tables will ship in separate boxes or pallets (as shown to the left) the printer will be disconnected and placed in the manufacturer's box. The table will either get banded to the pallet with the machine or a separate pallet tethered to the machine pallet. Printer tables may be connected to the machine via weldment or a remote from machine. If you have a weldment connected table, refer to the lay out drawing of your machine in this manual. Fasten the weldment to the frame of the conveyor using the supplied hardware and an open end wrench. If the table is remote then move into the desired position referring to your layout drawing. Remove the printer from the box set on the table and plug in the pre-wired connectors.


Print and apply printers will be removed from the labeling head as well and placed in the manufacturer's box. Your labeling head will likely ship in its own boxes with a few of the assemblies or flanges removed. Occasionally your head on a stand will ship on a framed pallet which will requires little work to get started.

The unwind flange is installed like the previous one discussed previously.

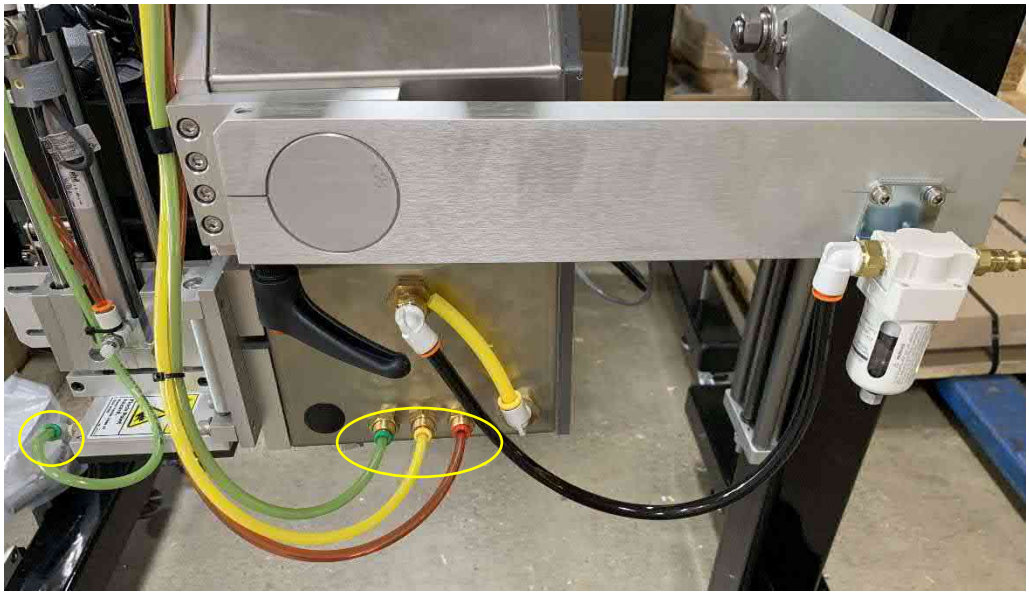
Remove the printer from the box and place it into the opening of the labeling head (as shown in image to the right). Fasten the printer to the side plate of the labeling head using the supplied (5) 10-32 socket head screws and a 5/32 L handle Allen wrench. Then, plug the printer in.


The corner wrap modules will be removed for shipping purposes. They will be wrapped in bubble wrap, plastic wrap, and placed into the box with the labeler.

Take out of the box, carefully remove the wrapping.

Then mount to the labeling head with (4) ¼-20 bolts using a 3/16 L handle Allen wrench.

To prevent kinking of the air lines during shipping on our Q34 print and apply labeling heads. All lines are pulled and labeled to the corresponding color. The hoses are color coded and marked. Simply plug in hose into the matching color (as shown in image to the right).



Rotary accumulation tables are banded to a pallet and wrapped.

These tables usually operate independently to the machine.

Carefully un-band and unwrap the table.

Line it up to the transfer plate on the conveyor.

Level the table using the leveling pads.

Plus in and adjust speed through the control box.

Sleeving applicators are typically on a stand and will ship on a pallet. They will be banded have many supports and be wrapped to protect the machine during the shipping process.

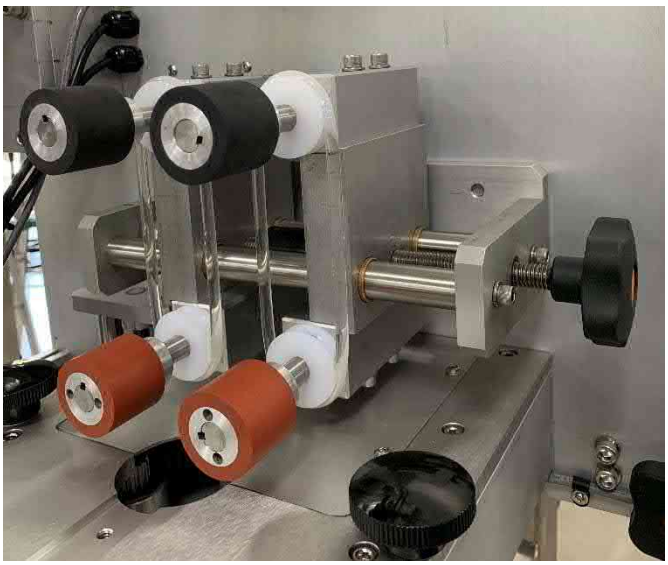

Carefully remove the banding and wrapping.

Raise the head and remove the supports.

The pallet will contain boxes with. Misc assemblies and or parts (ie mandrels).

Below is an image of the mandrel. The mandrel is the most precise and important part of the sleever system. Always handle the mandrel extremely carefully.

Your mandrel will be located on the machine pallet tethered to the machine. It will be wrapped and in a box or tube (as shown below).

Carefully remove the mandrel from the packaging.

Rotate the black handle to move the throw down rollers apart far enough to slide the mandrel in.

Ensure each roller is between 2 bearings, the fin on the top is between the sensor, and the cutter blades are in line with the cut in the mandrel.

Rotate the black handle to move the throw down rollers closer to the mandrel pinching it in the middle. DO NOT OVER TIGHTEN THE THROW DOWN ROLLERS INTO THE MANDREL. They need to be just tight enough that the bearing spins and a label feeds through.

Proline machines with guarding will either be left on the machine and have wooden supports to protect during shipping or the guards are removed and places on a pallet.

If the guarding has supports carefully remove the supports from the guarding.

If the guarding is removed from the machine each panel will be labeled and the machine will be labeled to make it easy to figure out which door goes where.

The doors are fastened to the frame of the machine with the supplied hardware.

Line the hinges up to the holes on the frame put the bolt through.

Tighten a nut on the opposite end with the supplied flat and lock washer.

During shipment if the conveyor gets skewed you may need to re-square it. First check the conveyor with a square to verify (as shown in images below). If the conveyor needs adjusted, adjust the conveyor by slightly loosening the 4 bolts connecting the 2 sections on conveyor you would like to adjust (as shown in image to left).

Make your adjustments and check the top and side with a square. Placing a square across the top will check the squareness vertically. Placing a square along the side will check squareness horizontally.

When the conveyor is square tighten the bolts and you are all set.

Due to customer height requirements and standard shipping doors. Shipment of prolines with an extended boom the dual swiveling elbows in the center of the boom get flipped 180 degrees to allow the machine to have enough over head clearance to ship safely (shown in image below).


Below are the instructions to flip the elbows to the correct configuration (as shown in image below)

Ensure the overhead controls are safely supported by a tow motor or at least 2 people so it does not fall when disconnecting the elbows.

Locate the 2 screws on the top and 2 screw on the bottom holding the prospective covers on.

With a t25 torx bit screw driver, loosen the 2 bolts holding the cover on the top and bottom.

With the cover off you can now access the 4 bolts holding each of the tubes in place.

Ensure the overhead enclosure is supported enough to hold for a few minutes while you loosen the bolts and flip the elbow.

Using a 6MM L handle Allen wrench loosen the 4 bolts on the top and bottom tube.

Quickly pull the tubes out and rotate the elbow as shown below.

BEFORE

AFTER

Slide the tubes in the overhead enclosures elevation is going to change when flipping the elbows if you have it supported via tow motor you will have to raise it.

Fasten the 8 bolts with a 6MM L handle Allen wrench.

Fasten the covers to the top and bottom elbow using a T25 torx bit screw driver.

To the left shows the correct orientation of the dual elbow boom for the overhead enclosure.

If you have any questions please give Technical Support team a call (440)602-4700.

# HMI GUIDE

# Operator Interface Guide

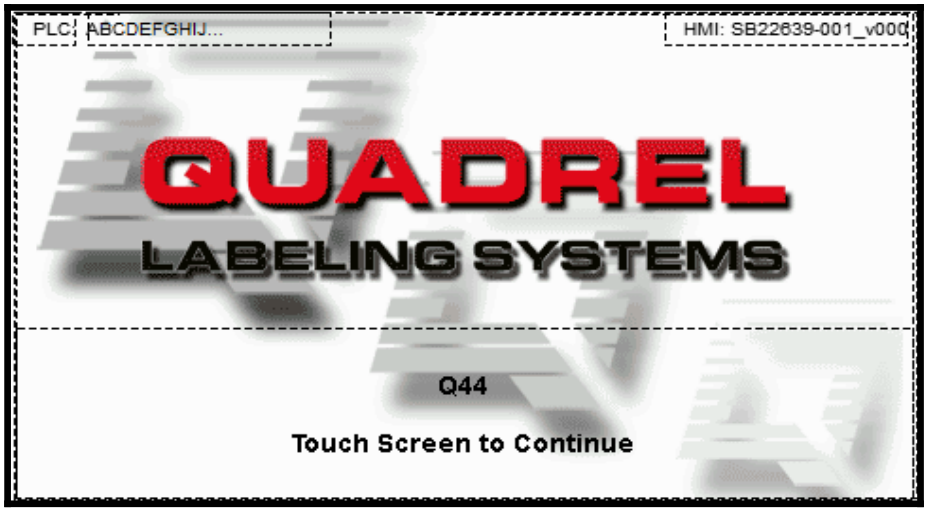
## Q44 Apply Only

## Delta DOP-103WQ touch screen with Keyence Nano PLC

# Table of Contents

## Opening Splash Screen

Upon initial power up, the terminal will initialize and display a splash screen. Once this screen opens, the screen will send a command to the PLC to start executing logic.
Touch the screen to continue.




**Button / Indicator Reference:**

**Menu Navigation Buttons:** Navigation buttons will be purple circles with white outlines and icons of the target screen. Some buttons will have text below them to identify the target screen.

**Standard Buttons:** Standard buttons are used to turn features on/off, reset faults, clear counters, or various other functions that require operator control. Toggle buttons will typically have icons to reflect the status of the function that is being toggled while momentary buttons like Resets are circular and do not change images/colors.
Many buttons and toggles may be password protected, which will appear differently if the current user does not have proper access.

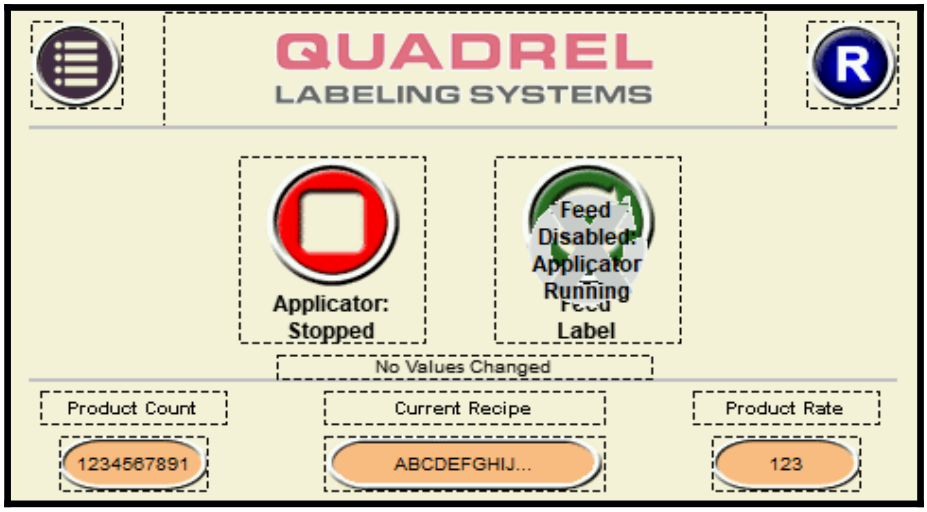
**Indicators:** Status Indicators will be circular and will change color based on states. Mode indicators will be oval in shape and will change colors and texts based on states.

**Numeric and Text Displays**: Numbers or Text displays will have a light orange background with black text, surrounded by a dark orange border. These are used to reflect numbers or recipe descriptions.

**Numeric and Text Inputs:** If a number or text can be entered, the button will have a dark green background with white text. The right side of the button will have a touch icon signify that it is an entry box.

## Main Screen

After touching the splash screen, the touch screen will display the Main screen.




**Setup Menus Button:**
This button in the top left will open up the System Menus screen.

**Fault/Message Window and Reset:**
The box at the top of the screen will display any fault or status messages that are active on the machine. The blue button with white "R" on it will reset any active faults. Note that when no faults or messages are active, the box will be hidden and the Quadrel logo will appear.

**Applicator Run/Stop:**
The applicator can be toggled between Run and Stop (pending fault conditions). The Run/Stop button will change colors and text based on the current status.

Green "Running" Button: This indicates the applicator is currently running and cannot be manually jogged. To **stop** the applicator, press this button. While Running, the applicator will dispense and apply labels to passing products.

Red "Stopped" Button: This indicates the applicator is currently stopped and can be manually jogged. To **run** the applicator, press this button.
The applicator ignore passing products while stopped.

**Manual Feed Button:**
The applicator can be manually fed to set up label stop position and dispensing speed.

Green "Feed" Button: This indicates the system can be manually fed. Upon pressing the button, one label will be fed out assuming the label gap sensor and label stop parameter are set up correctly. Note that pressing this button will not extend the tamp cylinder.

Greyed out "Feed" Button: This indicates the applicator is currently running, and may not be manually fed.

**Recipe Values Indicator:**
A flashing text indicator in the middle of the screen will appear if any recipe value is changed and has not been saved yet. Navigate to the Recipe Menu to save all current values.

**Note:**
Pressing and holding the Reset button for 2 seconds will clear the current status of the applicator while stopped.

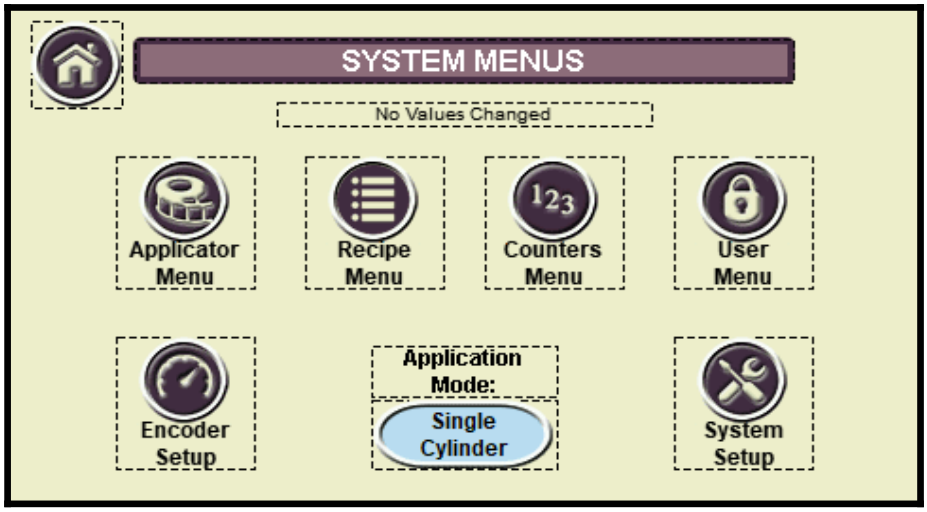
# Machine Functions:

**Single Cylinder Cycle:**
The applicator must be in RUN in order to apply labels to products.
1: The Product Detect Sensor gets activated by a passing product. Once activated, the Extend Delay parameter starts (Time based when no encoder used, Inch based when encoder used).
2: The Extend Delay parameter expires and a label will be fed onto the tamp pad.
3: Once the label feed completes, the Extend Duration timer will start (in seconds) and cylinder will be active.
4: The cylinder will retract once the Extend Duration timer expires.
    4a: Smart Tamp Option: If the Smart Tamp mode is active and sensor installed, the system will monitor the smart tamp sensor while the cylinder is active. If the sensor becomes activated, the Retract Delay timer will start (in seconds). If this timer expires prior to the Extend Duration timer finishing, the cylinder will return home.
5: When the cylinder is requested to retract back home the Air Blast duration timer (in seconds will start). While active, air will be forced out of the tamp pad to make sure the label has been removed from the pad and may help with adhesion around irregular surfaces like shrink wrap.
6: The system is now ready to restart the cycle.

**Leading and Side Cycle:**
The applicator must be in RUN in order to apply labels to products.
1: The Product Detect Sensor gets activated by a passing product. Once activated, the Extend Delay #1 parameter starts (Time based when no encoder used, Inch based when encoder used).
2: The Extend Delay #1 parameter expires and a label will be fed onto the tamp pad.
3: Once the label feed completes, the Extend Duration #1 timer will start (in seconds) and Leading cylinder will be active.
4: The Leading cylinder will retract once the Extend Duration #2 timer expires.
    4a: Smart Tamp Option: If the Smart Tamp mode is active and sensor installed, the system will monitor the smart tamp sensor while the Leading cylinder is active. If the sensor becomes activated, the Retract Delay timer will start (in seconds). If this timer expires prior to the Extend Duration #1 timer finishing, the Leading cylinder will return home.
5: When the Leading cylinder is requested to retract back home the Air Blast duration timer (in seconds will start). While active, air will be forced out of the tamp pad to make sure the label has been removed from the pad and may help with adhesion around irregular surfaces like shrink wrap.
6: The Extend Delay #2 parameter will start once the Leading cylinder starts the return home. This parameter is time based when no encoder used or inch based when an encoder is used.
7: The Extend Delay #2 parameter expires and a label will be fed onto the tamp pad.
8: Once the label feed completes, the Extend Duration #2 timer will start (in seconds) and Adjacent cylinder will be active.
9: The Adjacent cylinder will retract once the Extend Duration #2 timer expires.
    9a: Smart Tamp Option: If the Smart Tamp mode is active and sensor installed, the system will monitor the smart tamp sensor while the Adjacent cylinder is active. If the sensor becomes activated, the Retract Delay timer will start (in seconds). If this timer expires prior to the Extend Duration #2 timer finishing, the Adjacent cylinder will return home.
10: When the Adjacent cylinder is requested to retract back home the Air Blast duration timer (in seconds will start). While active, air will be forced out of the tamp pad to make sure the label has been removed from the pad and may help with adhesion around irregular surfaces like shrink wrap.
11: The system is now ready to restart the cycle.

## Setup Menus

The Setup Menu provides shortcuts to individual menus.




**Home button:**
Returns to the Main Menu.

**Applicator Menu:**
Navigates to a menu containing parameters specific to the Applicator.

**Recipe Menu:**
The system recipes can be saved, copied, and loaded here.

**Counters Menu:**
Navigates to a menu containing product and label counters.

**User Menu:**
Navigates to a menu that allows the user to log in / log out.

**Encoder Setup:**
The optional encoder function can be enabled and set up in this menu.

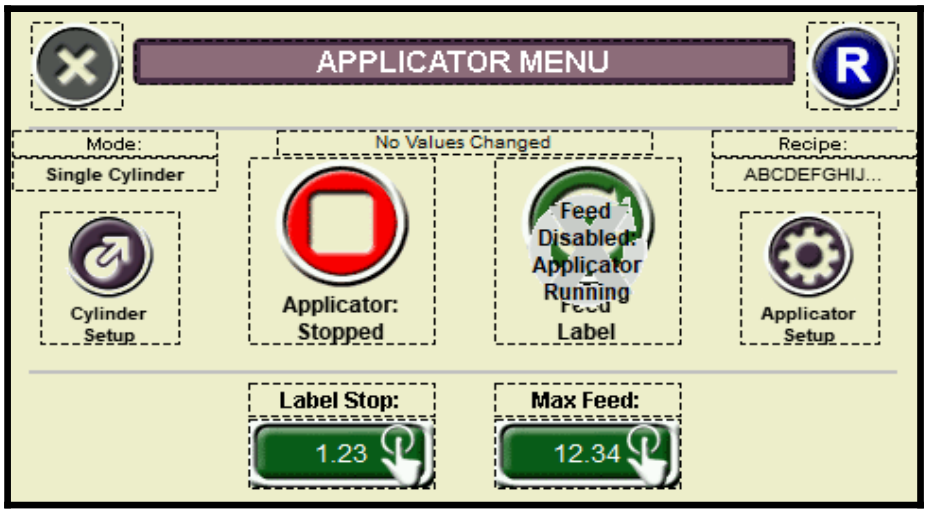
**System Setup Menu:**
The mode of the system and other options can be toggled in this menu.

**Recipe Values Indicator:**
A flashing text indicator in the middle of the screen will appear if any recipe value is changed and has not been saved yet. Navigate to the Recipe Menu to save all current values.

**Application Mode:**
This indicator shows which mode the system will operate in.
Single Cylinder: This should be set for systems that only have a single cylinder installed. All parameters and designations for Cylinder #1 will be used.
Leading and Side: The system will use two cylinders to apply two labels to a single product. This will typically apply a front label followed by a side label.
Leading Only: The system will extend a cylinder that "swings" away from the applicator. This will typically apply a label to the front or back of a product. Note that this mode should only be used if two cylinders are installed on the system.
Side Only: The system will extend a cylinder that is perpendicular to the product. This will typically apply a label to the side or top of a product. Note that this mode should only be used if two cylinders are installed on the system.

## Applicator Menu

Parameters and toggles associated with the Applicator are found in this menu.




**Fault/Message Window and Reset:**
The box at the top of the screen will display any fault or status messages that are active on the machine. The blue button with white "R" on it will reset any active faults. Note that when no faults or messages are active, the box will be hidden and the Quadrel logo will appear.

**Cylinder Setup:**
The timers that control the installed cylinders will be in this menu.

**Applicator Setup:**
Parameters associated with the dispensing of labels are found in the Applicator Setup.

**Applicator Run/Stop:**
The applicator can be toggled between Run and Stop (pending fault conditions). The Run/Stop button will change colors and text based on the current status.

Green "Running" Button: This indicates the applicator is currently running and cannot be manually jogged. To **stop** the applicator, press this button. While Running, the applicator will dispense and apply labels to passing products.

Red "Stopped" Button: This indicates the applicator is currently stopped and can be manually jogged. To **run** the applicator, press this button.
The applicator ignore passing products while stopped.

**Manual Feed Button:**
The applicator can be manually fed to set up label stop position and dispensing speed.

Green "Feed" Button: This indicates the system can be manually fed. Upon pressing the button, one label will be fed out assuming the label gap sensor and label stop parameter are set up correctly. Note that pressing this button will not extend the tamp cylinder.

Greyed out "Feed" Button: This indicates the applicator is currently running, and may not be manually fed.

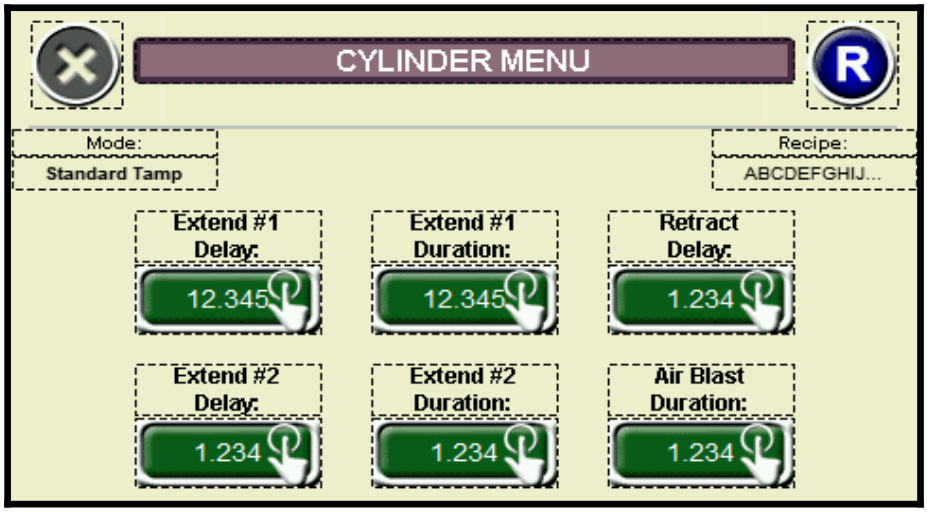
**Label Stop:**
The Label Stop (entered in inches) is the distance that the label will move after the label gap sensor is activated. Adjust this value so the end of the label is at the tip of the peel plate edge.

**Max Feed:**
The Max Feed parameter is the distance (in inches) that the liner will travel in the event no label gap is detected. Typically this value is set to at least 1/4" longer than the label length. Note that while setting up a new label it may be necessary to greatly increase this to prevent false stops and then lower it once proper stopping function has been proven.

**Recipe Values Indicator:**
A flashing text indicator in the middle of the screen will appear if any recipe value is changed and has not been saved yet. Navigate to the Recipe Menu to save all current values.

## Cylinder Menu

The timers that control the cylinders are in this menu.




**Extend Delay:**
The Extend Delay determines when the associated cylinder will become active and is entered in seconds when no encoder used or inches when an encoder is used.
Cylinder #1 will be used for the single cylinder or leading only modes.
Cylinder #2 is used for the side cylinder in the Leading and Side mode.

**Extend Duration:**
The Extend Duration (entered in seconds) is used to adjust how long the associated cylinder is active when triggered. Too low of a value may prevent the cylinder from fully extending. Too high of a value may damage a passing product or prevent an incoming product from moving down the conveyor.

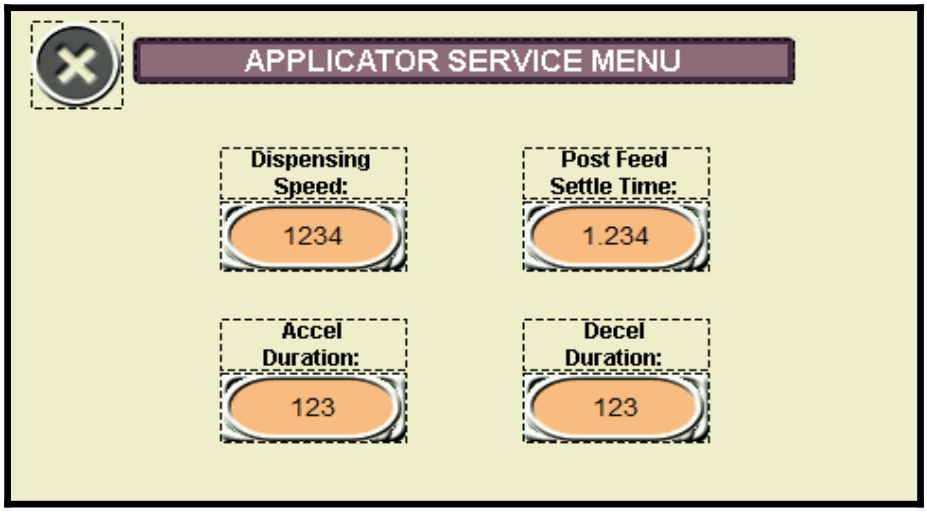
**Retract Delay:**
The Retract Delay (entered in seconds) is used when an optional Smart Tamp sensor is installed on the tamp pad assembly. When the Smart Tamp sensor is active for the amount of time entered in the Retract Delay, the cylinder will stop its current cycle and return home. This is used when products of varying heights are run through the system.

**Air Blast Duration:**
The Air Blast Duration (entered in seconds) determines how long the system will force air out of the tamp pad once a cylinder is requested to return home. The Air Blast can help remove the label from the pad and promote adhesion around irregular surfaces such as shrink wrap.

**Recipe Values Indicator:**
A flashing text indicator in the middle of the screen will appear if any recipe value is changed and has not been saved yet. Navigate to the Recipe Menu to save all current values.

## Applicator Service Menu

Other parameters associated with the dispensing of labels are in this menu.



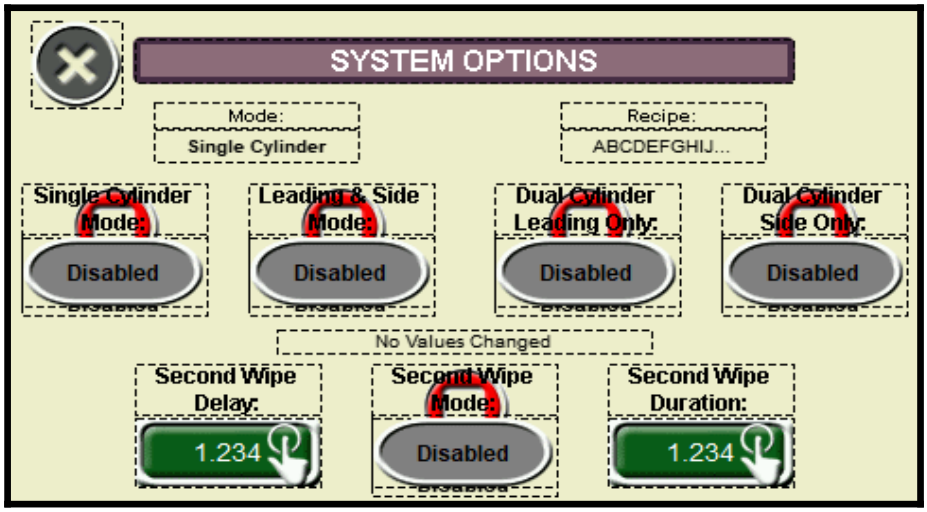

**Dispensing Speed (Maintenance Level):**
This speed entry (entered as inches per minute) determines how fast the labeler will dispense when manually jogged in any mode and when the Product Delay expires in the non-encoder mode.

**Post Feed Settle Time (Maintenance Level):**
After the label is done dispensing this timer (in seconds) will start. After this timer expires the cylinder will activate.

**Accel and Decel Duration (Supervisor Level):**
The Accel and Decel Durations (entered as Hz/ms) are the rate at which the label will reach the target dispensing speed or come to a stop. Too low of a value may result in motor stalling or liner tears. Too high of a value may result in the label not being dispensed in time to reach production rates.

## System Options Menu

The overall function of the system is set in this menu.




**Single Cylinder Mode (Supervisor Level):**
This should be set for systems that only have a single cylinder installed. All parameters and designations for Cylinder #1 will be used.

**Leading and Side Mode (Supervisor Level):**
This mode will use two cylinders to apply a label to the front and another label to the side of a single passing product.

**Leading Only Mode (Supervisor Level):**
The system will extend a cylinder that "swings" away from the applicator. This will typically apply a label to the front or back of a product. Note that this mode should only be used if two cylinders are installed on the system.

**Side Only Mode (Supervisor Level):**
The system will extend a cylinder that is perpendicular to the product. This will typically apply a label to the side or top of a product. Note that this mode should only be used if two cylinders are installed on the system.

**Smart Tamp Mode (Supervisor Level):**
The Smart Tamp Mode can use an optional sensor installed on the tamp pad to determine when the cylinder retracts. If this is enabled but no sensor is installed, the cylinder will continue to return when the Extend Duration expires.

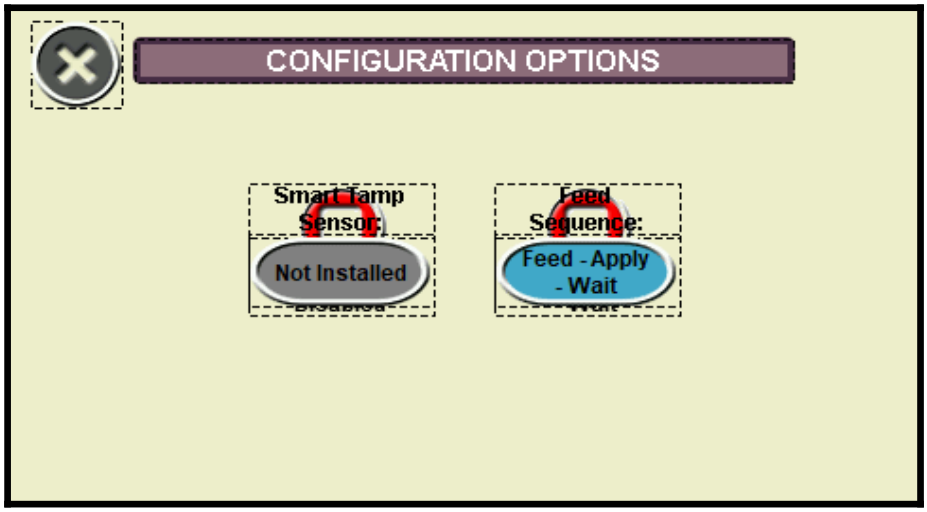
**Second Wipe Mode (Supervisor Level):**
The system can control an optional cylinder used to wipe down the back of products.

**Second Wipe Delay:**
This timer (entered in seconds) will start after the Product Detect sensor has been activated. Once this timer expires, the second wipe cylinder will activate.

**Second Wipe Duration:**
This timer (entered in seconds) will start once the second wipe cylinder activates. After this timer expires, the second wipe cylinder will return home.

## System Configuration Menu

Global Options can be set here.

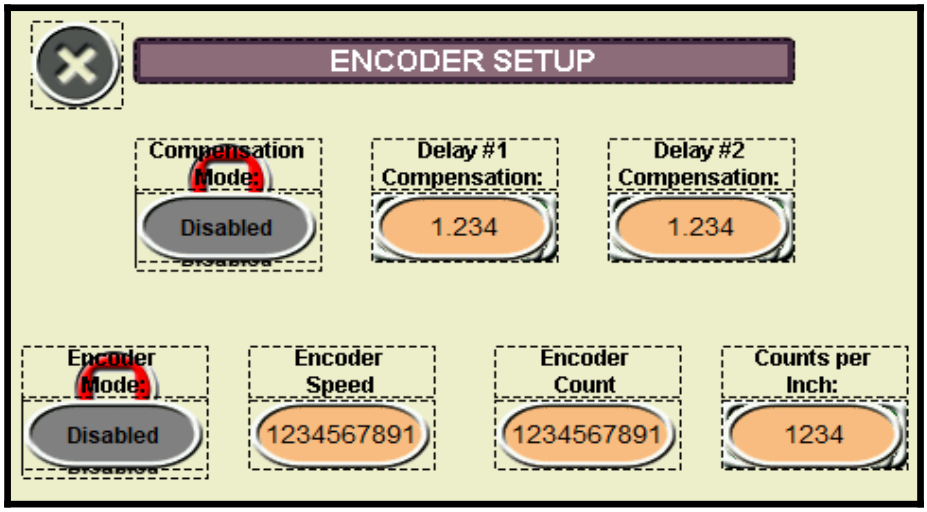



**Smart Tamp Sensor (Supervisor Level):**
An optional smart tamp sensor can be mounted to the tamp pad.
**Installed / Enabled:** when Enabled, the system will monitor the smart tamp sensor to determine when to retract the cylinder. This works with the Retract Delay timer found in the Cylinder Menu.
**Not Installed / Disabled:** The cylinder will be active for the cylinder duration only and system will not monitor the Smart Tamp sensor input.

**Feed Sequence (Supervisor Level):**
The action of the applicator while running can be changed to accommodate different situations.
**Feed – Apply - Wait:** This is the default mode.
When the applicator is running and a product delay expires, the applicator will feed a label and then extend the cylinder (apply the label). Once the cylinder returns home it will wait for another Product Detect signal / Delay.
Note that this mode only uses vacuum while the label is on the pad, so it is designed to reduce air consumption.
**Feed – Wait - Apply:**
When the applicator is placed in the run mode, a label will immediately be fed onto the pad. The system will then wait until a Product Detect signal /Delay expires until the cylinder extends (applies the label). When the cylinder returns home, another label will be fed and it will then wait for another application request.
Note that while waiting the vacuum will remain active, so this method will consume more air.

## Encoder Menu

The encoder function can be enabled and set up in this menu.




**Compensation Mode (Supervisor Level):**
Enabled: The system will internally adjust the extend delay parameters based on the Compensation values. This helps to retain accuracy across speed ranges since the air cylinders are time based.
Disabled: The system will not change any values based on the encoder speed.

**Delay Compensation (Supervisor Level):**
Since air is used in the application process and is a time constant, the system must adjust the Extend Delay internally to compensate based on the encoder speed. This value is set in inches and is the maximum amount of Extend Delay that can be subtracted between min (0) and max (1600) encoder speed. This is only used when the Encoder is enabled.

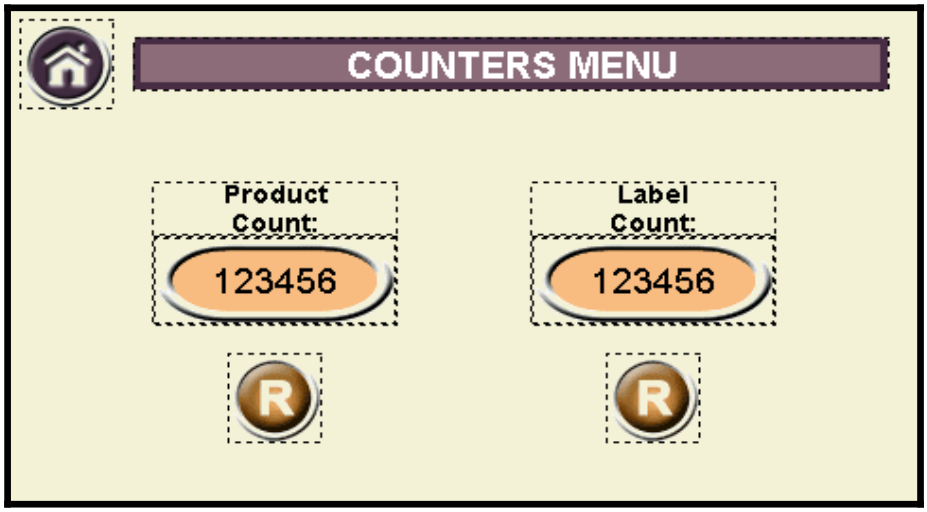
**Encoder Mode (Supervisor Level):**
Enabled: The system will monitor an encoder signal to determine running dispensing speed and when to apply labels to products. Values will be entered as inches where applicable when the Encoder is enabled.
Disabled: The system will dispense at a fixed speed and values will be entered as milliseconds.

**Encoder Speed:**
This indicator will reflect the encoder's speed in inches per minute. Note that this is based on the Counts per Inch value.

**Encoder Count:**
This indicator will reflect the current encoder count as interpreted by the PLC. This value will roll over at 1,000,000.

**Counts per Inch (Supervisor Level):**
This value tells the PLC how many encoder counts are received for each inch of encoder travel. This value is critical for the Product Delay, Encoder Speed, and Compensation values.

## Counters Menu



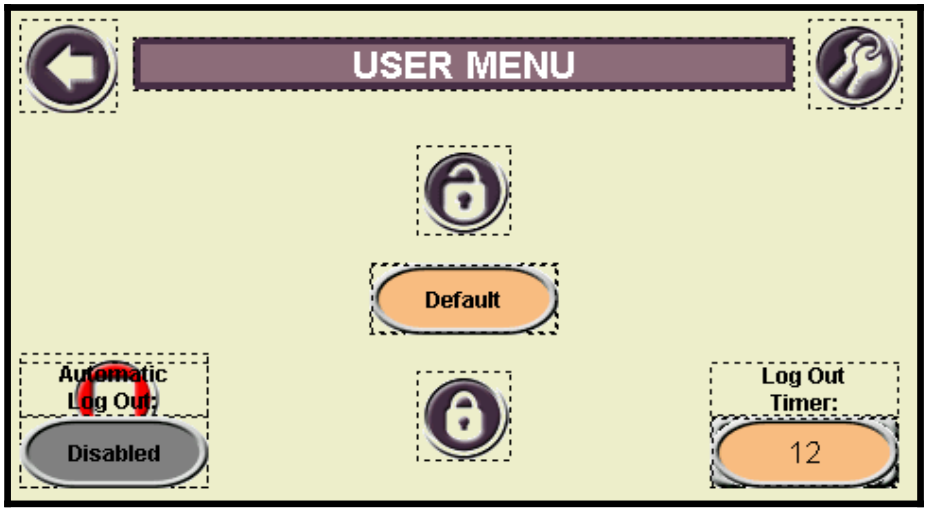

**Product Count:**
This counter reflects how many times the product detect sensor has been activated while the applicator is running.

**Label Count:**
This counter reflects how many labels have been dispensed while jogging or running.

**Reset Buttons:**
Pressing the Reset Button under each counter will reset that counter to 0.

## User Menu

The User Menu enables alternate login levels to access protected screens and buttons.




**Password Input:** Press this button to enter a user password.

**Log Out:** Press this button to enter to log the current user out.

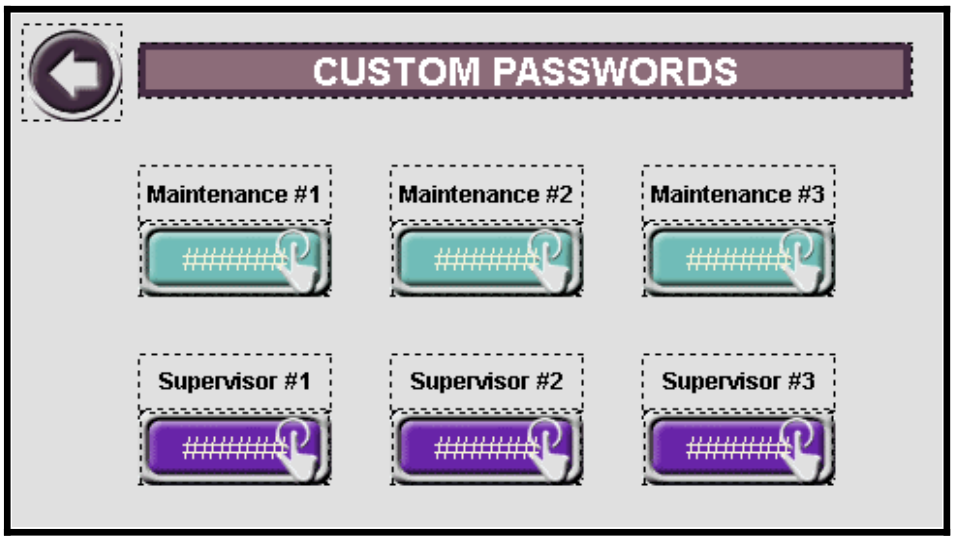
**Password Menu:** This will open up a security prompt before opening the password menu, where the passwords for the Maintenance and Supervisor levels are set.

**Auto Log Out (Supervisor Level):**
When Enabled (button will be Green), the logged in user will automatically be logged off at a set amount of time. Note that the system automatically enables the Auto Log Out feature upon startup.

**Log Out Timer (Supervisor Level):**
This timer (in minutes) determines the time it takes to log off a user if Auto Log Out is enabled.

## Password Menu

The Password Menu allows the creation and editing of the passwords for different security levels.




**Maintenance:**
There can be 3 user defined passwords for the Maintenance level. Note that there is one hard coded Maintenance Level password that cannot be viewed or changed.

**Supervisor:**
There can be 3 user defined passwords for the Supervisor level. Note that there is one hard coded Supervisor Level password that cannot be viewed or changed.

If a Maintenance and Supervisor password are the same, the system will log that user in at the Maintenance level.

The password(s) to open the Password Menu are stored in the HMI and cannot be modified. This will prevent any password loss in the event the PLC logic is altered.

## Fault Messages and Indicators

Green Lamp: The green lamp will be steady while the applicator is running and no warning is present on the system. The green lamp will flash if the applicator is stopped or a warning is present.

Amber Lamp An Amber lamp will be steady while there is a warning condition present on the system. Warning conditions typically allow the system to function normally, but action will be needed soon to replace labels, ribbon, etc. Some warning messages will turn into fatal faults if they are not addressed before taking additional actions. If the applicator is running, the amber lamp will flash opposite the green lamp.

Red Lamp: A flashing Red lamp indicates that a fatal fault occurred and the system is unable to run properly.

| Messages | Cause/Solution |
|---|---|
| **Warning Messages** | |
| **Low Label Supply** | The label supply on the applicator has been determined low by the sensor fiber under the flange. |
| **End of Web Warning** | The End Of Web sensor (between the drive system and unwind) on the applicator is active and the applicator is Stopped. Placing the applicator into Run will generate a Fatal Fault. |
| **Broken Web Warning** | The Broken Web sensor (between the drive system and rewind) on the applicator is active and the applicator is Stopped. Placing the applicator into Run will generate a Fatal Fault. |
| **Drive Faulted Warning** | The driver that controls the stepping motor on the applicator has been turned off or has become faulted. Placing the applicator into Run will generate a Fatal Fault. |
| **Max Feed Fault** | The labeler started a dispensing cycle and did not receive a signal from the label sensor to identify a gap. Check the label sensor and Max Feed parameter. |
| **Product Delay Warning** | The system attempted to apply a label to a product but was already in a dispensing process. Verify the products are properly spaced and increase the Product Delay parameter. |
| **PLC Cycled without Screen** | The PLC was cycled but the touch screen was not. The Screen sends a signal to the PLC on startup to execute logic. Cycle the screen or system power. |

| Fatal Fault Messages | |
|---|---|
| **End of Web Fault** | The End Of Web sensor (between the drive system and unwind) on the applicator is active and the applicator was Running or placed into Run. |
| **Broken Web Fault** | The Broken Web sensor (between the drive system and rewind) on the applicator is active and the applicator was Running or placed into Run. |
| **Drive Faulted / Turned Off** | The driver that controls the stepping motor on the applicator has been turned off or has become faulted. |
| **Cylinder Not Home Fault** | The applicator was requested to feed a label but the cylinder was not home. Verify the system has proper air pressure, the cylinder is not pinching a cable/line, and the home sensor is properly set. |
| **Safety Fault / EStop Active** | The Emergency Stop on the unit has been pressed in. |
| **Product Delay too Low Fault** | The Product Delay value is too low to properly be compensated at the current speed. Increase the Product Delay, move the product detect sensor, and verify that the encoder counts per inch value is set properly to clear this fault. |
| **Product Present Fault** | If an optional Product Present sensor is used, this fault indicates that the swinging cylinder attempted to extend while the Product Present sensor was active. This is done to identify that something is in the way of the cylinder's path and improper application may result. |
| **No Label on Pad Fault** | When using the Feed – Wait – Apply mode, this fault will occur if the Product Delay expires but no label has been fed onto the pad. |

# Setup Sheets

S/N: 84236-100

QUADREL
LABELING SYSTEMS

# Q44 TAMP SETUP PARAMETERS

## SYSTEM MENU

| | FACTORY SETTINGS | USER SETTINGS |
|---|---|---|
| RECIPE | 1 | |

## APPLICATOR MENU

| | FACTORY SETTINGS | USER SETTINGS |
|---|---|---|
| LABEL STOP | 0.50 | |
| MAX FEED | 5.38 | |

## CYLINDER MENU

| | FACTORY SETTINGS | USER SETTINGS |
|---|---|---|
| EXTEND #1 DELAY | 0.500 | |
| EXTEND #1 DURATION | 1.000 | |
| RETRACT DELAY | 0.250 | |
| EXTEND #2 DELAY | 1.000 | |
| EXTEND #2 DURATION | 1.000 | |
| AIR BLAST DURATION | 0.500 | |

## APPLICATOR SERVICE

| | FACTORY SETTINGS | USER SETTINGS |
|---|---|---|
| DISPENSING SPEED | 750 | |
| POST FEED SETTLE TIME | 0.250 | |
| ACCEL DURATION | 200 | |
| DECEL DURATION | 300 | |

## ENCODER SETUP

| | FACTORY SETTINGS | USER SETTINGS |
|---|---|---|
| COMPENSATION | DISABLED | |
| ENCODER MODE | DISABLED | |
| DELAY #1 COMP | 1.000 | |
| DELAY #2 COMP | 1.000 | |
| COUNTS PER INCH | 500 | |

S/N: 84236-100

## SYSTEM OPTIONS

| | FACTORY SETTINGS | USER SETTINGS |
|---|---|---|
| SINGLE CYLINDER | ENABLED | |
| LEADING & SIDE | DISABLED | |
| LEADING ONLY | DISABLED | |
| SIDE ONLY | DISABLED | |
| SECOND WIPE DELAY | 1.000 | |
| SECOND WIPE | DISABLED | |
| SECOND WIPE DURATION | 1.000 | |

## CONFIGURATION OPTIONS

| | FACTORY SETTINGS | USER SETTINGS |
|---|---|---|
| SMART TAMP | ENABLED | |
| FEED – APPLY – WAIT | DISABLED | |

## AIR PRESSURE GAUGES

| | | |
|---|---|---|
| TAMP CYLINDER | 40 | |
| VACUUM | 30 | |
| AIR ASSIST | 40 | |
| AIR BLOW | 50 | |

# WARNING


- **KEEP HAND CLEAR OF MOVING PARTS. DO NOT PLACE HANDS NEAR LABELING HEAD WHEN IN OPERATION**


- **DO NOT OPERATE EQUIPMENT WITHOUT GUARDS OR COVERS INSTALLED**


## 6.1 GENERAL LABELING HEAD INFORMATION

## (YOUR LABELING HEAD MAY BE SLIGHTLY DIFFERENT. FOLLOW THREADING DIAGRAM FOR YOUR MACHINE)

### 6.1.1 LOADING AND UNLOADING STOCK ROLL

⚠ **CAUTION** **To avoid injuries, you must keep the labeler. You stopped/paused can manually jog labels with the JOG button.**

Look carefully at the diagram and follow the threading procedures indicated below.

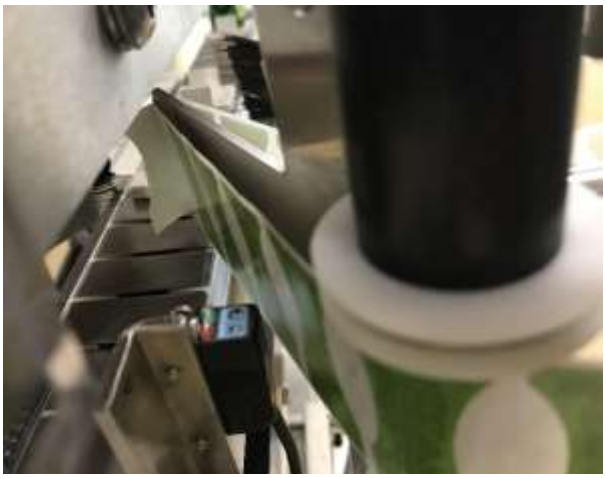
You will also find the threading diagram directly on the labeling head.

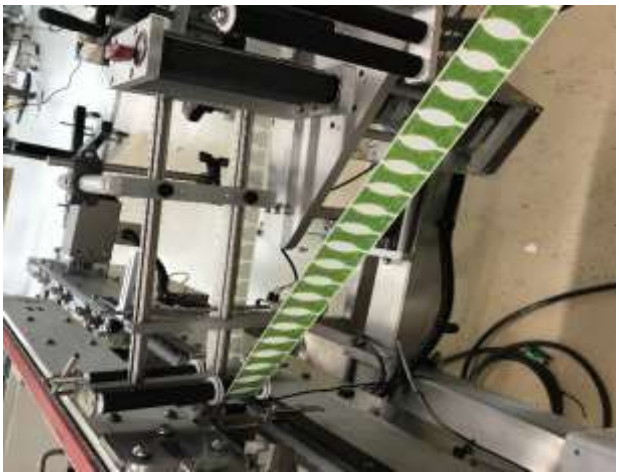
**1)** Place the label stock roll on the unwind shaft. Press the roll firmly against the flange. Then slide the locking collar over the unwind shaft aligning the set screw with the shaft. Press into the roll and twist to lock the collar in place.

**2)** Pull Approximately 36-40” of stock from label stock roll.

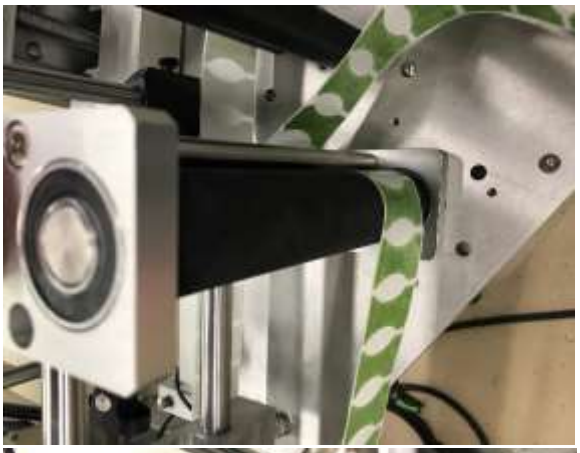
**3)** Follow the threading diagram on the labeling head for routing the web.
**4)** Thread through the dancer to the peel plate.

**5)** Feed the label around the peel plate and under the pressure shoe if ( if there is one). Feed the label up the head to the pull roll. Pull all the slack out.

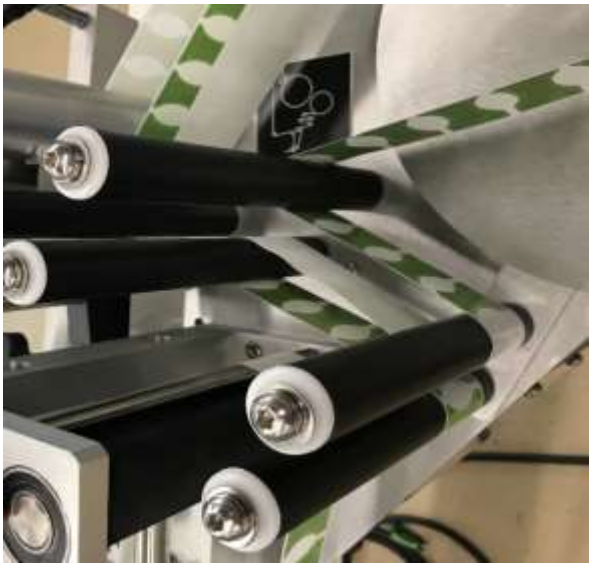




**6)** Wrap labels around the rubber roller as shown, then around the knurled roller. Make sure the knurled roller is not locked in by turning the red knob to the left or right of the red dot on the drive roll. When you have the labels completely threaded you can turn the knob to the red dot.



**7)** Thread the labels through the rewind dancers to the rewind shaft. Place the end of the label through the clip and rotate the rewind hub to take up the slack.



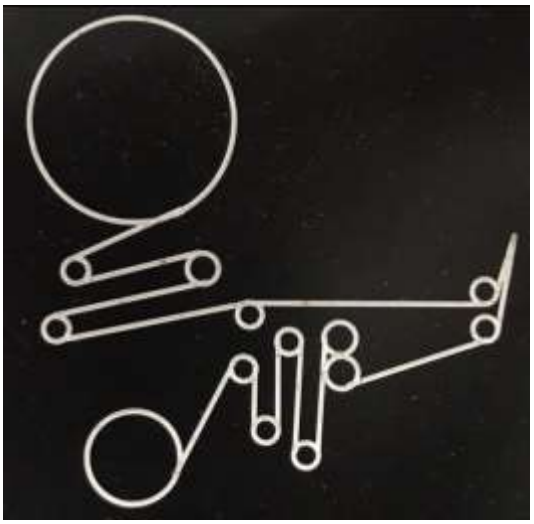
**8)** The finished product should look similar to the pictures below. Some heads are threaded differently depending on the style head you have. See threading diagrams on the head itself or the manual.

**9)** To unload the rewind loosen (counter clockwise) the “clevis” bolt on the top of the rewind hub. this will collapse the rewind and you can pull the liner off the hub.

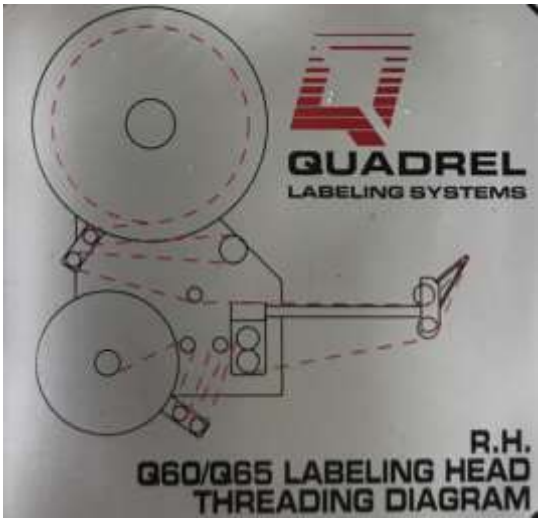
⚠ **CAUTION** **There are many pinch points on a labeler. to avoid injury read and understand the owner’s manual before operating.**

## 6.1.2 THREADING DIAGRAMS

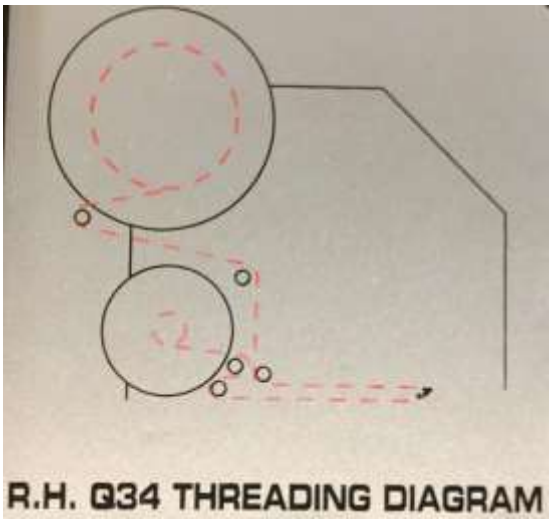
Here are the following threading diagrams for our standard labeling heads.



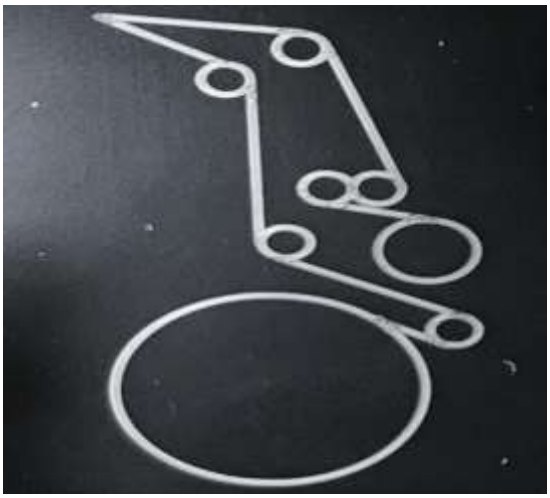
Q120/Q125/Q115/Q110




Q60/Q65




Q34



E100

## 6.1.3 GENERAL LABELER ADJUSTMENTS

## (YOUR LABELER MIGHT BE SLIGHTLY DIFFERENT. FOLLOW THREADING DIAGRAM FOR YOUR MACHINE)

The vertical adjustment is to position the label on the container at different heights. It's practical if you have different size labels and/or containers. To adjust the height you simply rotate the handwheel at the top of the labeler counter clockwise to go down and clockwise to go up.


Horizontal adjustments are made the same way except you rotate the hand wheel under the labeler. Rotating the hand wheel counter clockwise will move the labeler in and rotating clockwise with move the labeler out.


To adjust the angle of the labeling head you first need to loosen the large ¾-10 nut with a 1 ¼ “wrench and the 5/16-18 hex head bolt. The angular adjustment is very important to increase the repeatability of the process. A good adjustment is when the exit of the label is tangent with the surface of the application.

⚠ **CAUTION** **DO NOT remove the nut & bolt.**

Now to adjust the tilt of the labeling head by tightening and loosening the jack screws.


Rotate adjustment is achieved by loosening the 2 ratchet handles under the labeling head.  There is a jack screw holding the labeling head in place, but still use caution when loosening the ratchet handles the labeling head can rotate freely when loose. This is a fine adjustment that increases the parallelism of the label to the shape of the container.

⚠ **CAUTION** **When loosening the labeling head, the head may rotate freely. Keep positive pressure against the head to prevent the head from rotating on its own.**

**ASSEMBLY TITLE:** **Q44 LABELING HEAD - THREADING**

**GENERAL FUNCTION:**

- This section is used to guide the user through loading and feeding the label through the web path.

**SET UP AND ADJUSTMENTS:**

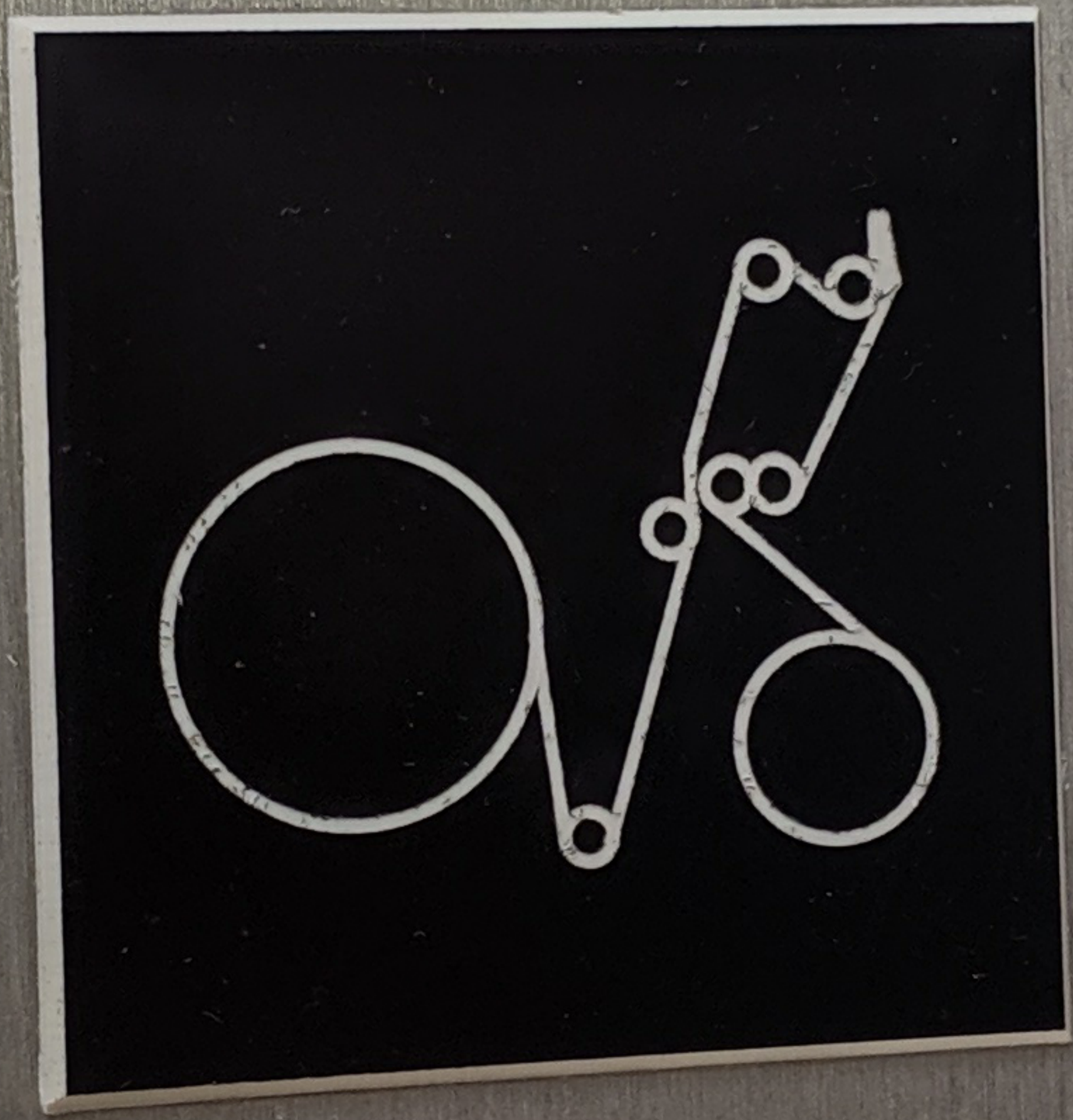
- Load label spool onto unwind hub. Secure unwind retainer onto hub and lock. Pull 3-4 feet of web from unwind and strip labels free of web.
- Unlock the drive roller locking handle.
- Using the threading diagram located on the labeling head, feed the web through the labeling head. Start at the unwind dancer assembly and work forward.
- Feed the web through the drive roller assembly.
- Feed the web around the rewind dancer assembly and onto the rewind hub. Wrap the web around the hub once. Lock the web in place with the rewind retaining bracket.
- Once the web has been threaded, lock down the drive roll assembly by rotating the drive roll locking arm into the locked position. (Towards the drive roller assembly)

**MAINTENANCE:**

- None this section.

**TROUBLESHOOTING**:

| PROBLEM | WHAT TO DO |
|---|---|
| - Web break | - Check web path and insure web routed correctly.<br>- Debris causing web tear and break. Clear as needed. |
| - No Web Tension | - Check web path through unwind and dancer assembly.<br>- Check drive roller lock position. |



**ASSEMBLY TITLE:** **Q44 SIDE PLATE ASSEMBLY**

**DRAWING NO:**

**GENERAL FUNCTION:**

- The side plate assembly is the main mounting surface for the blow grid, pneumatic and drive components.

**SET UP AND ADJUSTMENT:**

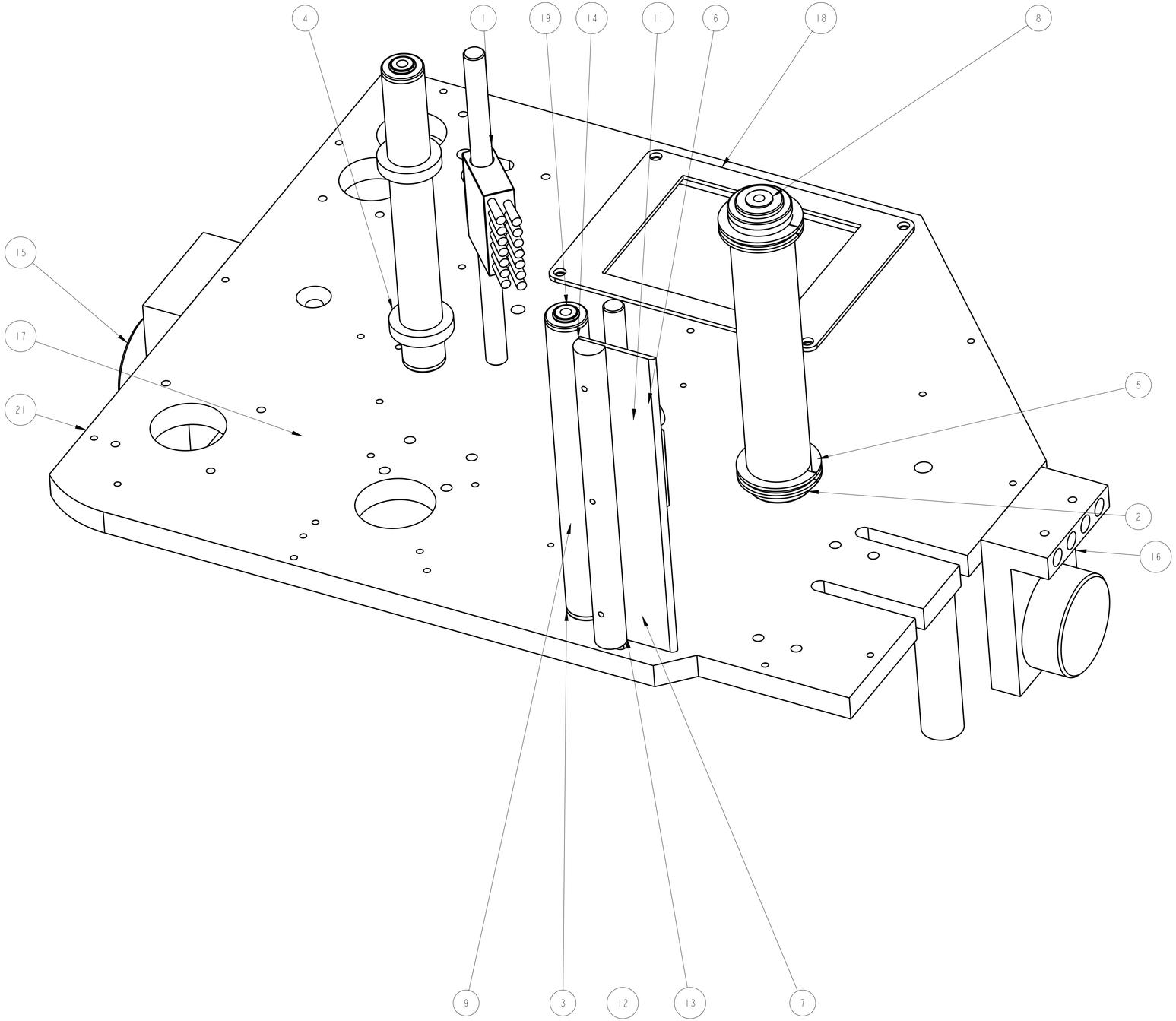
- No set up required.

**MAINTENANCE:**

- No scheduled maintenance for this assembly.

**TROUBLESHOOTING:**

- None this section




| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 1 | 00669-01 | BRAKE BRUSH | 22639SP-000 |
| 2 | 2 | 181062-000 | BEARING, ROLL END | 22639SP-000 |
| 3 | 4 | 181063-000 | BEARING, ROLL END | 22639SP-000 |
| 4 | 2 | 361198-000 | COLLAR, GUIDE, 1 IN. ID | 22639SP-000 |
| 5 | 2 | 361199-000 | COLLAR, GUIDE, 1-1/2 IN. ID | 22639SP-000 |
| 6 | 1 | 801849-000 | KNOB W/ STUD | 22639SP-000 |
| 7 | 2 | A20654-003 | ADJ. ROD | 22639SP-000 |
| 8 | 1 | A21618-001 | IDLER SHAFT | 22639SP-000 |
| 9 | 2 | A21811-000 | ROLLER SHAFT | 22639SP-000 |
| 10 | 1 | A22291-006 | ROLLER | 22639SP-000 |
| 11 | 1 | A22449-000 | TENSION SHOE | 22639SP-000 |
| 12 | 1 | A22450-002 | TENSION SHOE MOUNTING | 22639SP-000 |
| 13 | 1 | A23307-000 | PEEL PLATE SUPPORT ROD | 22639SP-000 |
| 14 | 1 | A23308-000 | PEEL PLATE | 22639SP-000 |
| 15 | 1 | A24905-112 | PIVOT PIN MOUNTING PLATE | 22639SP-000 |
| 16 | 1 | A24905-113 | PIVOT PIN MOUNTING PLATE | 22639SP-000 |
| 17 | 2 | A26147-000 | COVER STAND OFF | 22639SP-000 |
| 18 | 1 | A26215-000 | MOUNTING PLATE, PANELVIEW 800 | 22639SP-000 |
| 19 | 2 | B20073-000 | IDLER ROLLER | 22639SP-000 |
| 20 | 1 | D24990-134 | COVER | 22639SP-000 |
| 21 | 1 | D24990-500 | Q34 TAMP SIDE PLATE | 22639SP-000 |
| 22 | 1 | D24995-000 | Q34 ENCLOSURE | 22639SP-000 |
| 23 | 1 | D24995-500 | FILLER ENCLOSURE | 22639SP-000 |

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| C | Mar-05-24 | BACK TO A | TAZ |
| B | Dec-13-23 | WAS -000 | TAZ |
| A | 11-26-13 | NEW DRAWING | |

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UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE
X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030

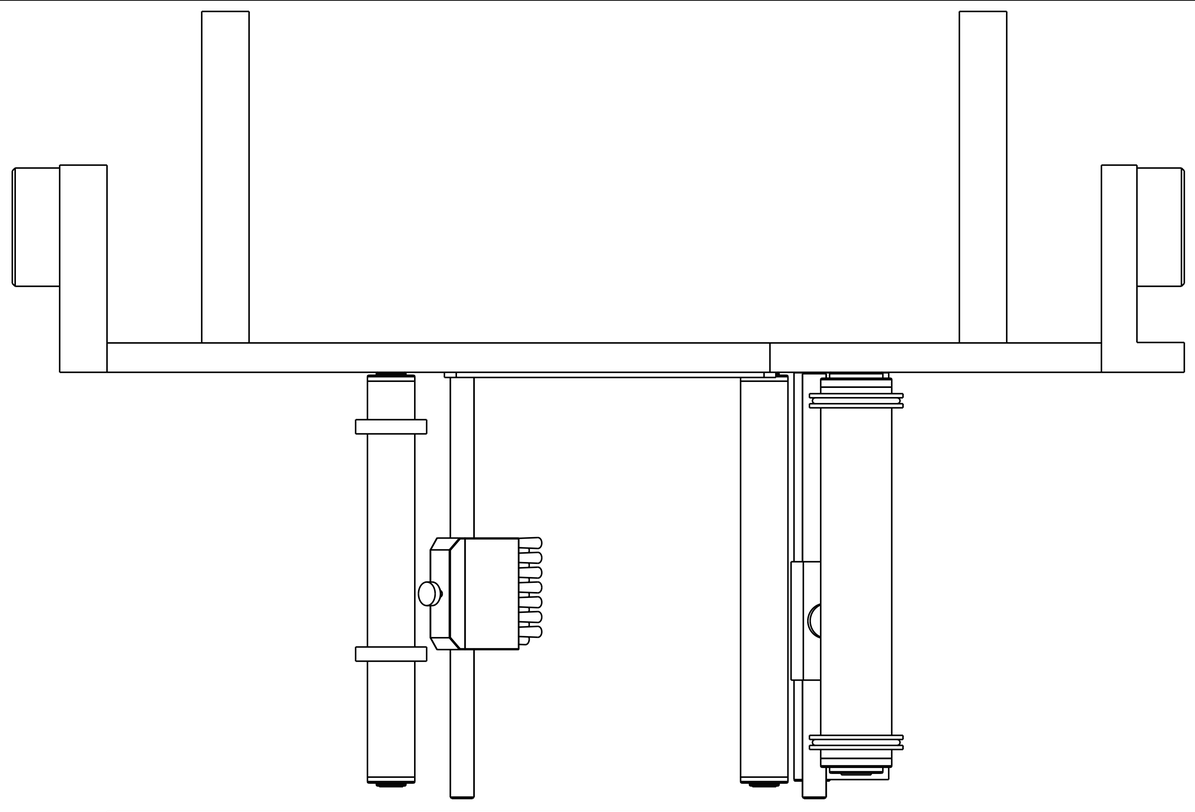
QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

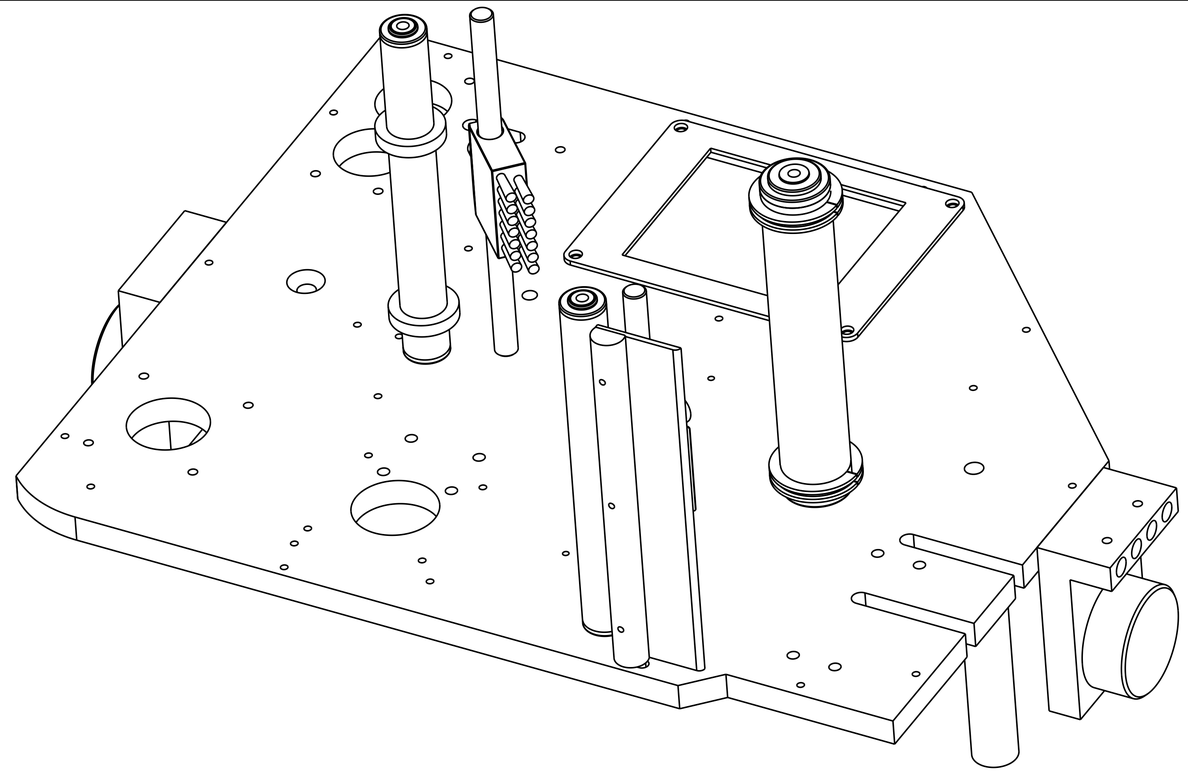
| SCALE | 3/4 |
|---|---|
| DATE | 11-26-13 |
| DRAWN BY | MAW |

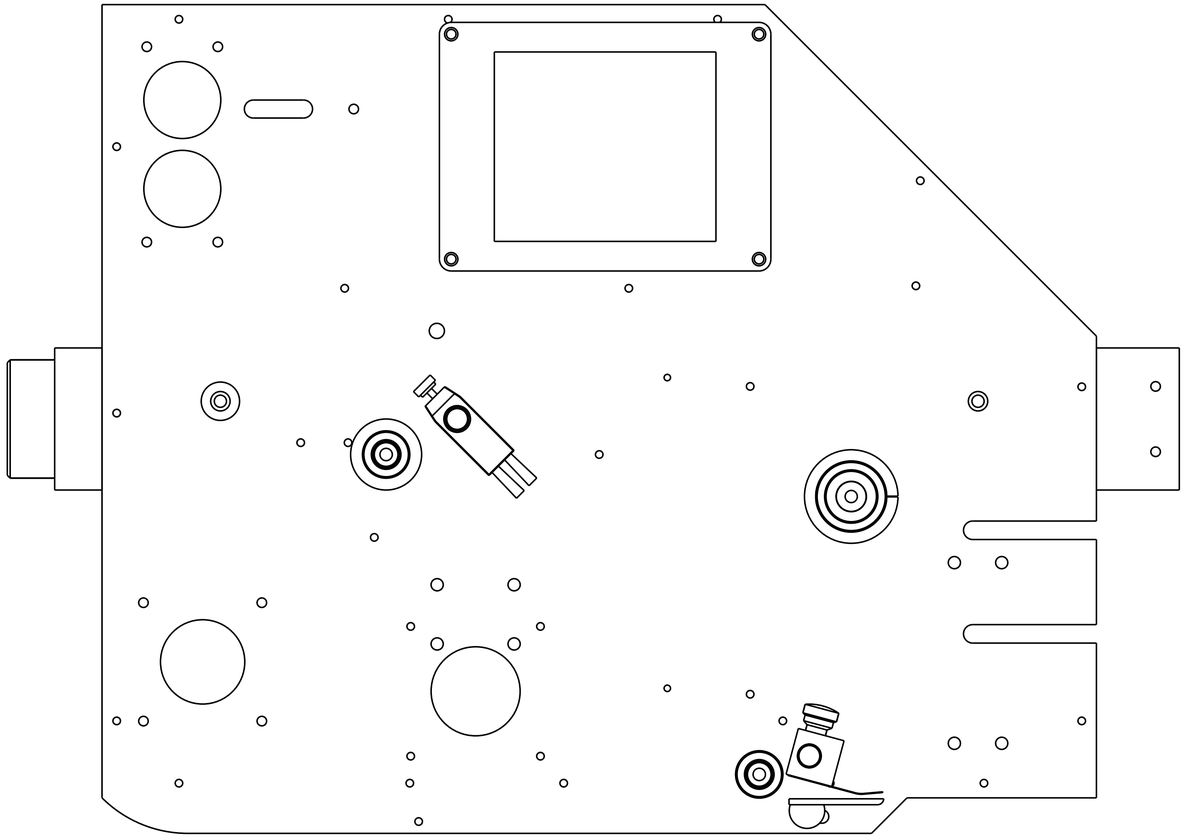
Q44 SIDE PLATE

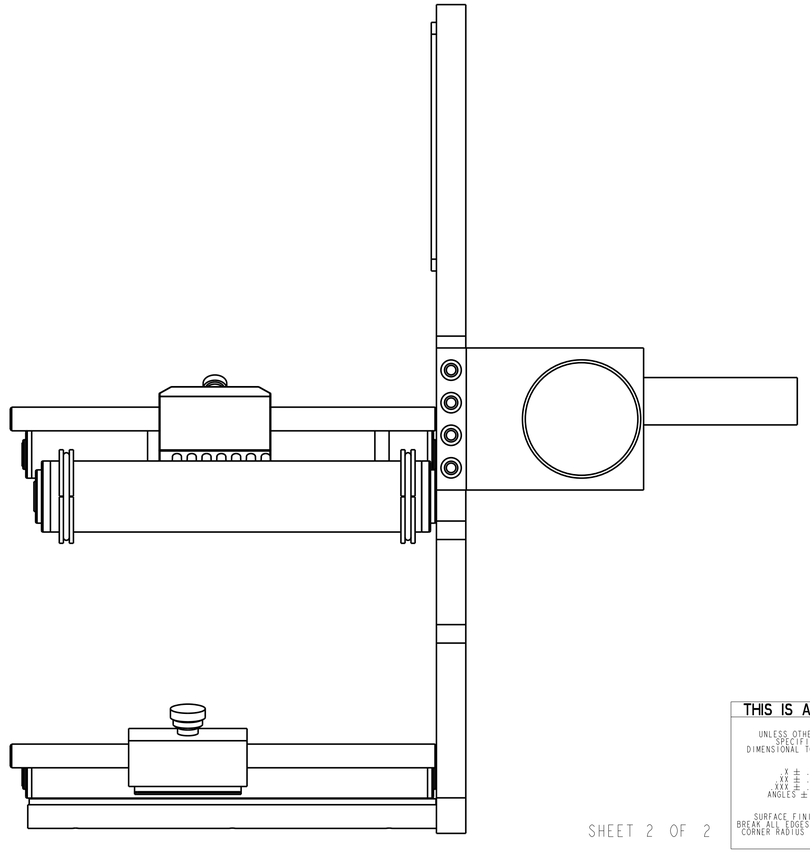
MAT'L 22639SP-000

22639SP-000









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ANGLES ± 30'

SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .0107/.030

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

| SCALE | 3/8 |
|---|---|
| DATE | 11-26-13 |
| DRAWN BY | MAW |

Q44 SIDE PLATE

MAT'L 22639SP-000

22639SP-000

**ASSEMBLY TITLE:** **Q55 7” UNWIND ASSEMBLY**

**DRAWING NO.:** **D21946-000**

**GENERAL FUNCTION:**

- Unwind flange provides support for label rolls (side application)
- Dual flanges prevent roll and label movement (top application)
- Dancer arm prevents roll run-away.
- Idler roller with guide collars guides web through slot sensor.
- Brake brush prevents web buckling through slot sensor.

**SET UP AND ADJUSTMENTS:**

- Move flange to required height and tighten set screw in flange hub.
- For top labeling, add second flange and tighten ratchet knob.
- Adjust dancer tension by turning check nut so that dancer roll snaps back to braking position when labeling head is threaded.
- Slide brake brush so that center of brush lines up with center of web.
- Rotate brush to provide web tension, then lock into place using the locking knob.
- Position guide collars on idler roll, one slightly above, the other slightly below the web.

**DANCER TENSION ADJUSTMENT LOCATION:**

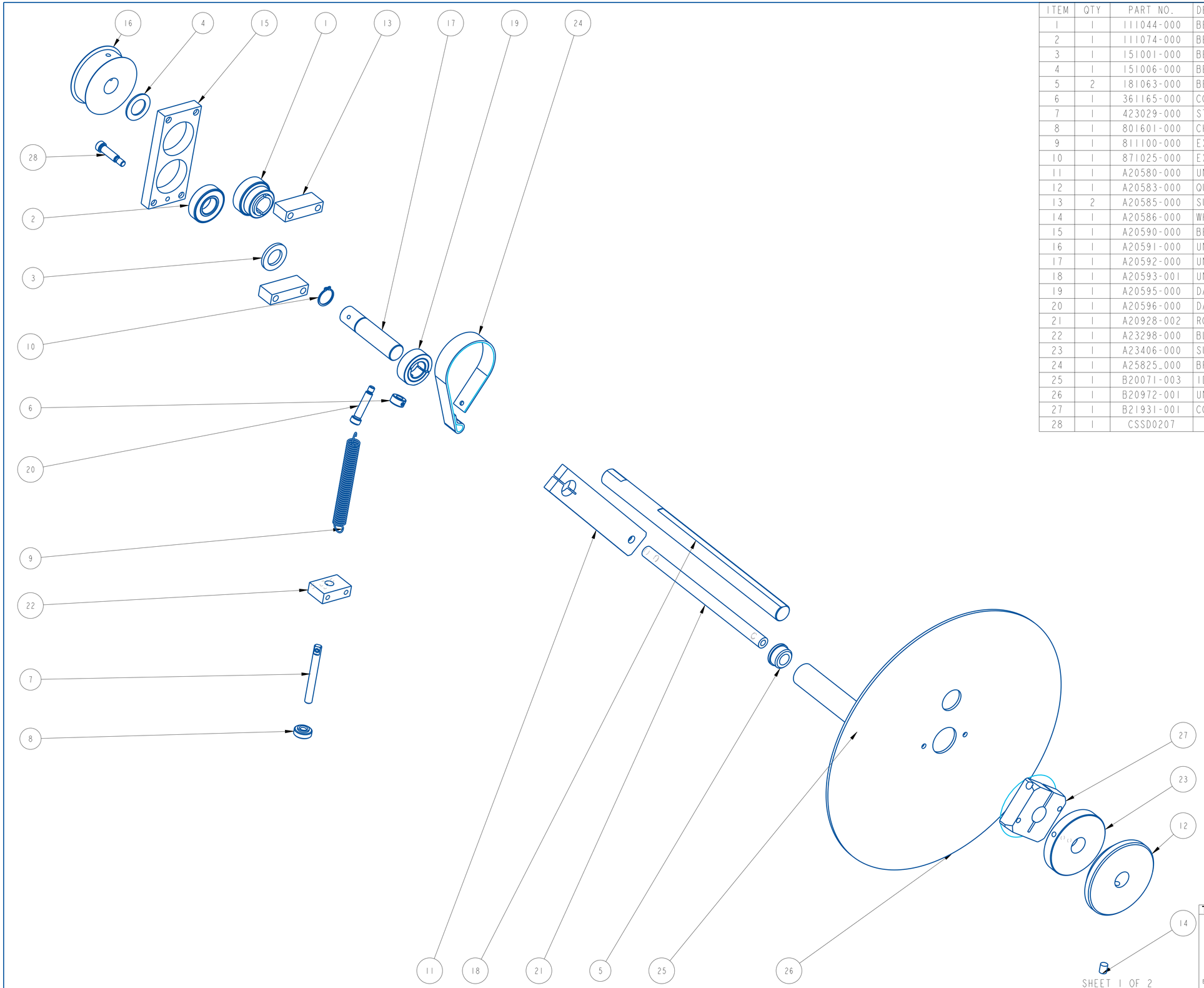
- **The unwind tension adjustment is located on the middle underside of the Q55 head. Use the knurled ring to adjust the dancer tension.**

**MAINTENANCE:**

- Clean all the parts that may acquire glue residue

**TROUBLESHOOTING:**

| **PROBLEM** | **WHAT TO DO** |
|---|---|
| - Unwind roll run-away | - Tighten dancer spring, check nut or replace dancer spring, if necessary. |
| - Unwind roll not stopping | - Replace brake ring-belt if broken, or unevenly worn. |
| - Drive roll stalling | - Release web tension produced by brake brush. |
| - Brush taking fixed shape | - Turn brush around |

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|---|---|---|---|---|
| 1 | 1 | 111044-000 | BEARING, 3/4 ID CLAMP TYPE | 22496U-000 |
| 2 | 1 | 111074-000 | BEARING, BALL | 22496U-000 |
| 3 | 1 | 151001-000 | BEARING, THRUST WASHER | 22496U-000 |
| 4 | 1 | 151006-000 | BEARING, THRUST WASHER | 22496U-000 |
| 5 | 2 | 181063-000 | BEARING, ROLL END | 22496U-000 |
| 6 | 1 | 361165-000 | COLLAR, SETSCREW, 5/16" BORE | 22496U-000 |
| 7 | 1 | 423029-000 | STUD | 22496U-000 |
| 8 | 1 | 801601-000 | CHECK NUT | 22496U-000 |
| 9 | 1 | 811100-000 | EXTENSION SPRING | 22496U-000 |
| 10 | 1 | 871025-000 | EXTERNAL SNAP RING | 22496U-000 |
| 11 | 1 | A20580-000 | UNWIND DANCER ARM | 22496U-000 |
| 12 | 1 | A20583-000 | QUICK LOCK COLLAR REWORK | 22496U-000 |
| 13 | 2 | A20585-000 | SUPPORT SPACER | 22496U-000 |
| 14 | 1 | A20586-000 | WHITE NYLON SLUG | 22496U-000 |
| 15 | 1 | A20590-000 | BEARING PLATE | 22496U-000 |
| 16 | 1 | A20591-000 | UNWIND BRAKE DRUM | 22496U-000 |
| 17 | 1 | A20592-000 | UNWIND DANCER SHAFT | 22496U-000 |
| 18 | 1 | A20593-001 | UNWIND SHAFT | 22496U-000 |
| 19 | 1 | A20595-000 | DANCER COLLAR | 22496U-000 |
| 20 | 1 | A20596-000 | DANCER BOLT | 22496U-000 |
| 21 | 1 | A20928-002 | ROLLER SHAFT | 22496U-000 |
| 22 | 1 | A23298-000 | BLOCK, SPRING TENSION | 22496U-000 |
| 23 | 1 | A23406-000 | SUPPLY REEL CENTER HUB | 22496U-000 |
| 24 | 1 | A25825_000 | BRAKE BAND | 22496U-000 |
| 25 | 1 | B20071-003 | IDLER ROLLER (DANCER) | 22496U-000 |
| 26 | 1 | B20972-001 | UNWIND FLANGE | 22496U-000 |
| 27 | 1 | B21931-001 | CORE HUB | 22496U-000 |
| 28 | 1 | CSSD0207 | | 22496U-000 |

SHEET 1 OF 2

| REV | DATE | DESCRIPTION | BY |
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| A | 9/19/01 | NEW DRAWING | MAS |

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SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030

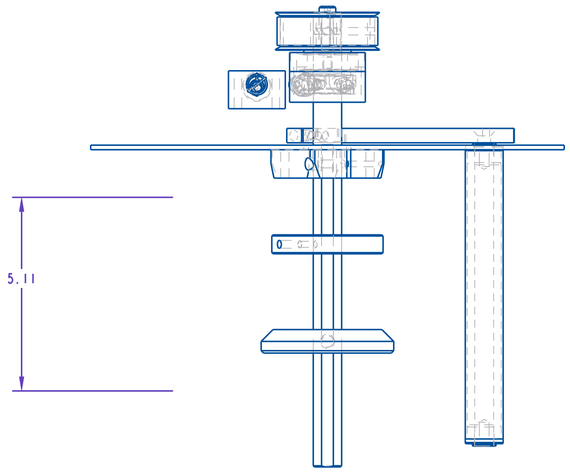
QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

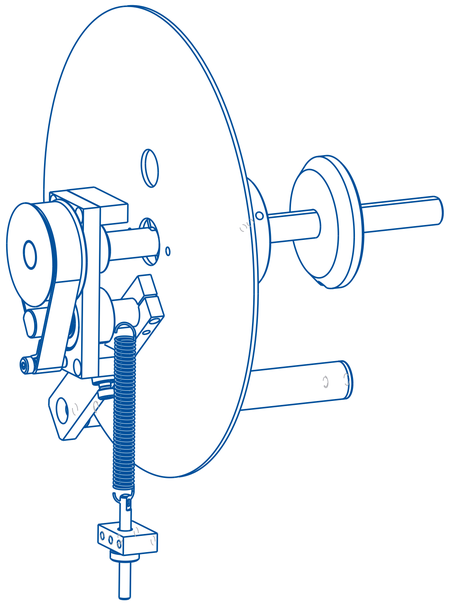
SCALE: 1/2
DATE: 9/19/01
DRW BY: MAS
CHK BY:03/15/2024-SEM
APPR BY:

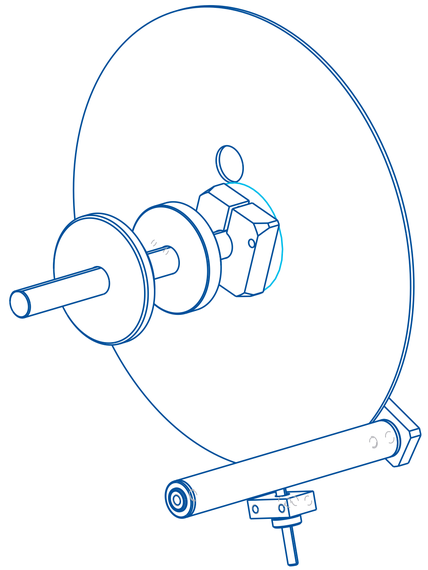
Q41 UNWIND ASSEMBLY

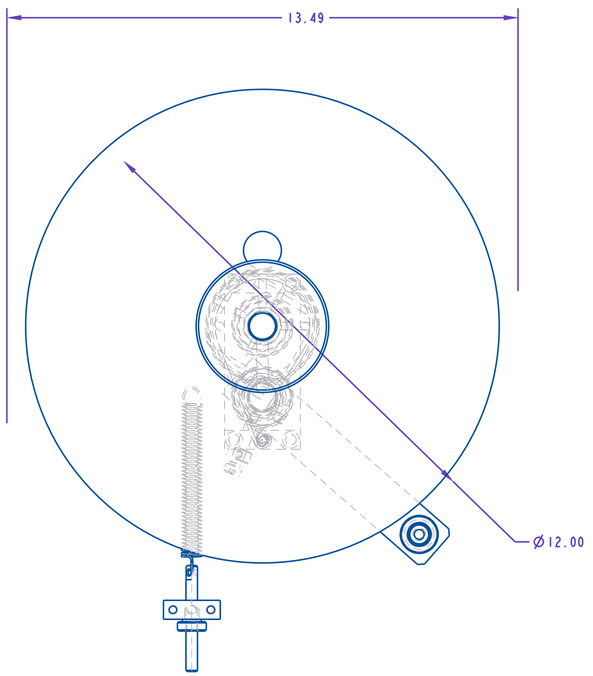
MAT'L 22403U-000

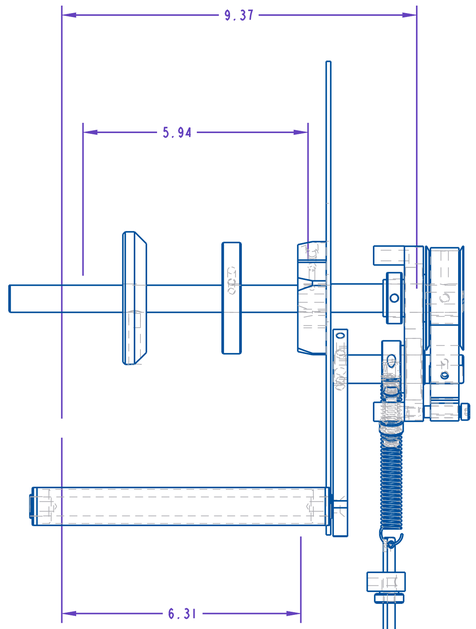
22496U-000





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XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

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SCALE: 1/2
DATE: 9/19/01
DRW BY: MAS
CHK BY:03/15/2024-SEM
APPR BY:

Q41 UNWIND ASSEMBLY

MAT'L
22403U-000

22496U-000

**ASSEMBLY TITLE:** **Q41 DRIVE ROLL ASSEMBLY**

**DRAWING NO:** **D23649-000**

**GENERAL FUNCTION:**

- The drive roll pulls the web through the entire labeling head. As the liner is pulled over the peel edge, the label dispenses.
- The spring loaded pinch roll squeezes the liner against the drive roll to provide positive drive.

**SET UP AND ADJUSTMENT:**

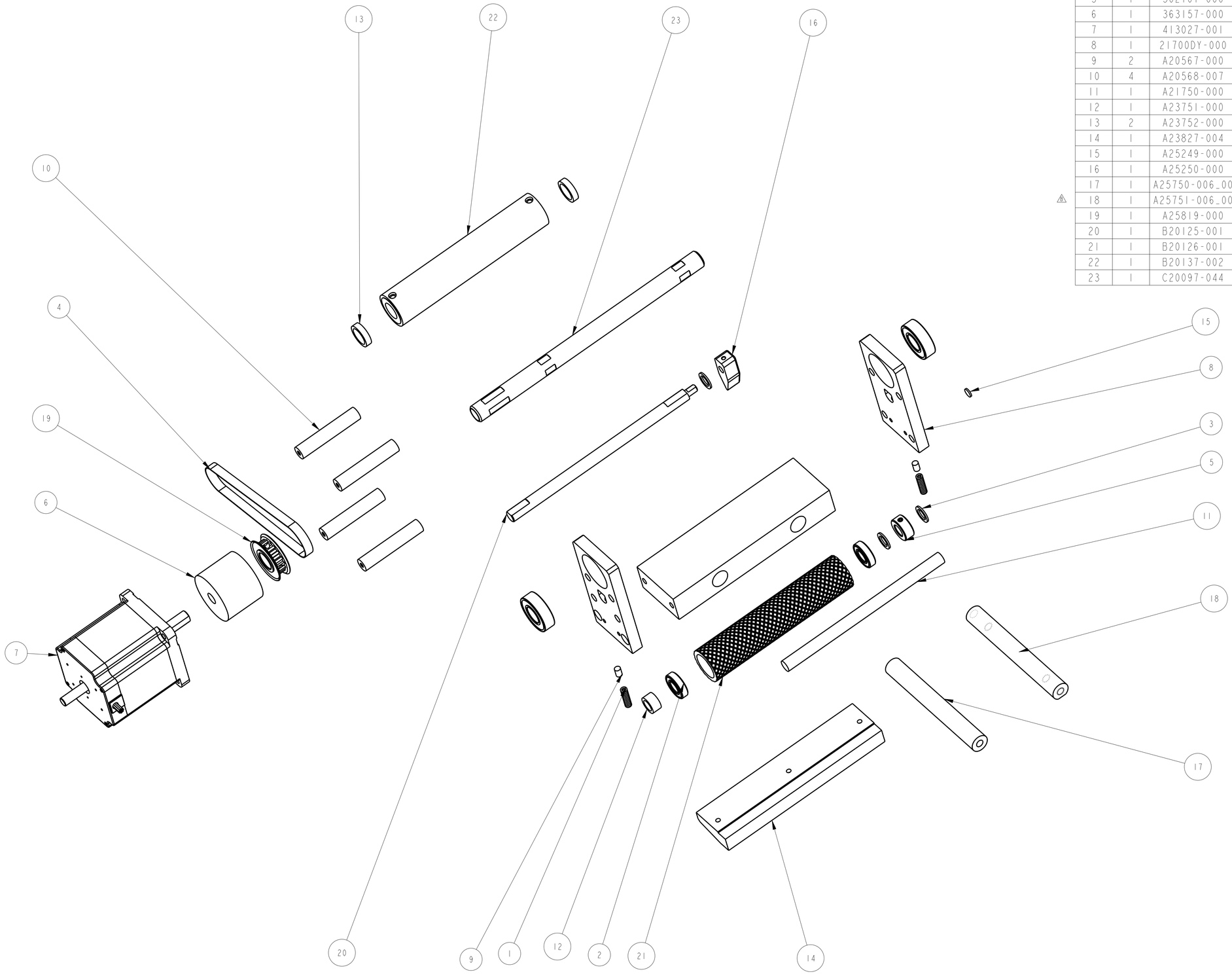
- Drive roll tension is controlled by the two (2) spring loaded tensioners mounted at each end of the drive roll mounting blocks. Tension should be adjusted to insure uniform pressure over the surface of the web.
- Drive roll pressure is increased by turning the set screw tensioner clockwise (CW). Do not over-tighten as this will prevent the locking lever to open.
- Adjust both the outer and inner tensioners to achieve uniform tension.

**MAINTENANCE**:

- Clean any glue or label flash that may accumulate around or inside the drive roll assembly.
- If web wraps around drive roller, turn system off. Raise pressure release arm and unwind web.

**TROUBLESHOOTING**:

| **Problem** | **What to Do** |
|---|---|
| - Web slipping | - Close drive roller pressure release arm<br>- Increase drive roll pressure by adjusting spring loaded tensioners. |
| - Web break | - Lower drive roll tension by adjusting spring loaded tensioners.<br>- Web jammed with labels. Clear web path through roller assembly. |




| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 2 | 00301-17 | SPRING, .275 x .052 x .94 | 22639D-000 |
| 2 | 2 | 111072-000 | BEARING, BALL | 22639D-000 |
| 3 | 3 | 151004-000 | BEARING, THRUST WASHER | 22639D-000 |
| 4 | 1 | 191655-Q41 | TIMING BELT | 22639D-000 |
| 5 | 1 | 362161-000 | COLLAR, SETSCREW, 1/2 IN. ID | 22639D-000 |
| 6 | 1 | 363157-000 | SERVO CLASS COUPLING | 22639D-000 |
| 7 | 1 | 413027-001 | MOTOR | 22639D-000 |
| 8 | 1 | 21700DY-000 | 3 PIECE ROLL ASSEMBLY | 22639D-000 |
| 9 | 2 | A20567-000 | WHITE NYLON SLUG | 22639D-000 |
| 10 | 4 | A20568-007 | DRIVE MOTOR RISER | 22639D-000 |
| 11 | 1 | A21750-000 | PINCH POINT GUARD ROD | 22639D-000 |
| 12 | 1 | A23751-000 | SPACER | 22639D-000 |
| 13 | 2 | A23752-000 | SPACER | 22639D-000 |
| 14 | 1 | A23827-004 | PULL ROLL YOKE WEDGE | 22639D-000 |
| 15 | 1 | A25249-000 | INDEX DOT | 22639D-000 |
| 16 | 1 | A25250-000 | IND KNOB | 22639D-000 |
| 17 | 1 | A25750-006_00 | PEEL PLATE MTG. ROD | 22639D-000 |
| ⚠ 18 | 1 | A25751-006_00 | PEEL PLATE MTG. ROD | 22639D-000 |
| 19 | 1 | A25819-000 | DRIVE PULLEY (MODIFIED) | 22639D-000 |
| 20 | 1 | B20125-001 | KNURLED ROLL SHAFT, | 22639D-000 |
| 21 | 1 | B20126-001 | KNURLED ROLL | 22639D-000 |
| 22 | 1 | B20137-002 | PULL ROLL, 7" | 22639D-000 |
| 23 | 1 | C20097-044 | PULL ROLL DRIVE SHAFT | 22639D-000 |

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| C | Mar-05-24 | WAS 412027-000 | TAZ |
| B | Aug-15-22 | ADDED ROD WITH FLAT | TAZ |
| A | 4-12-22 | NEW DRAWING | ATT |

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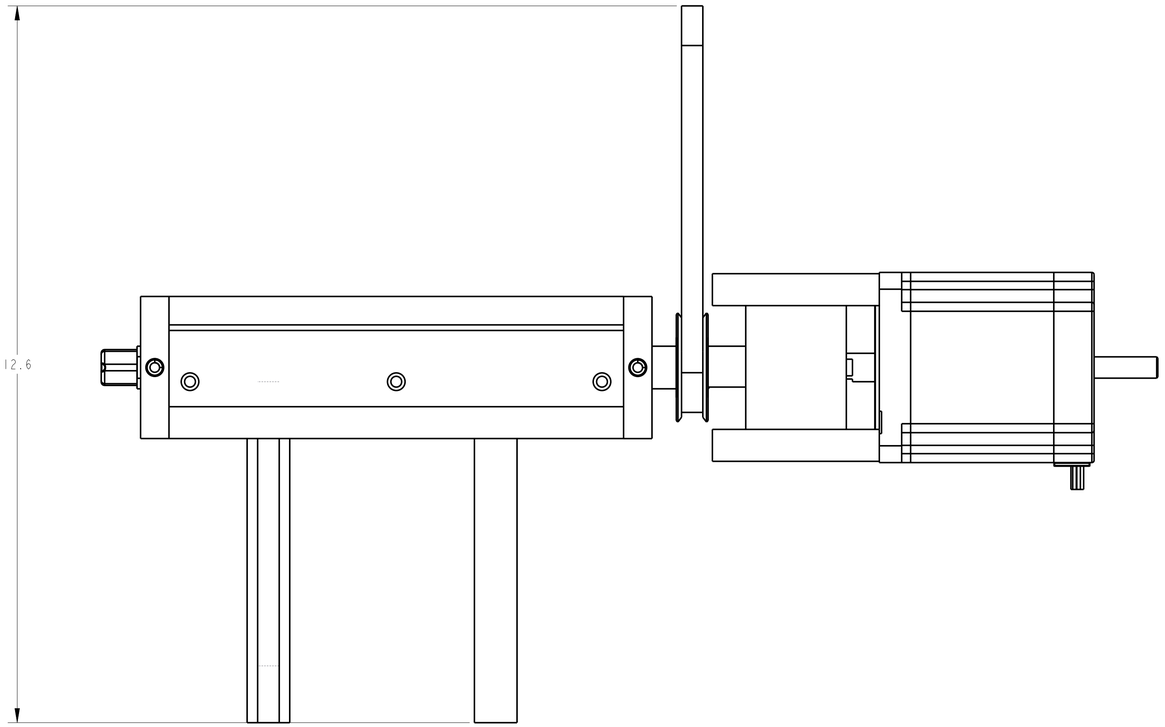
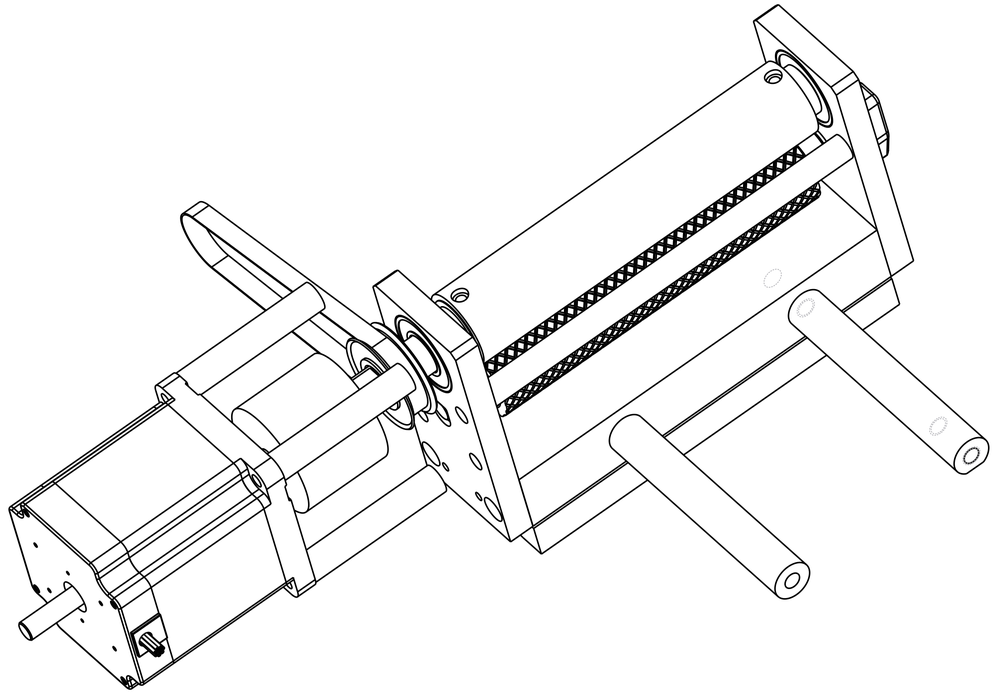
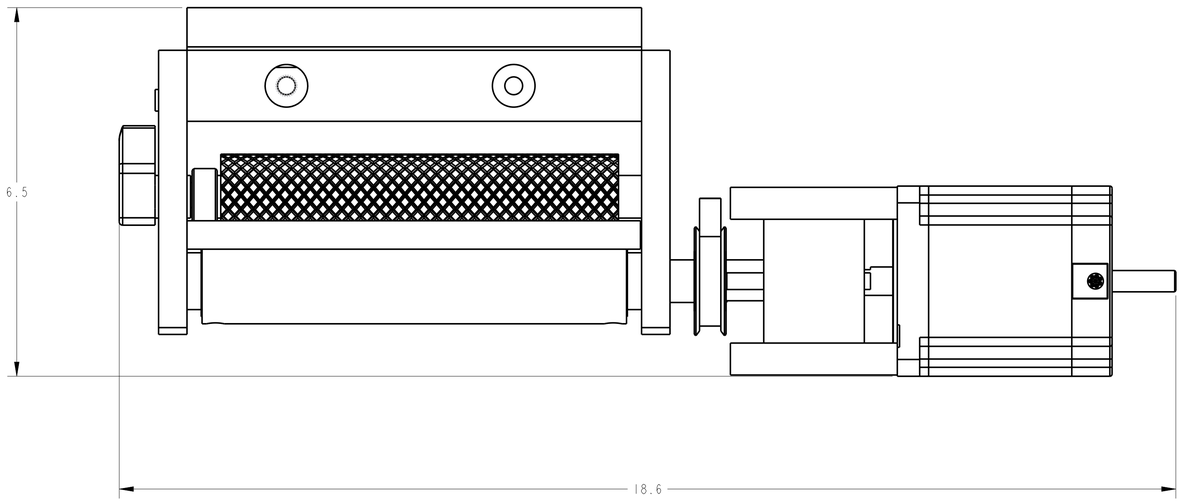
Q44-DRIVE ROLL

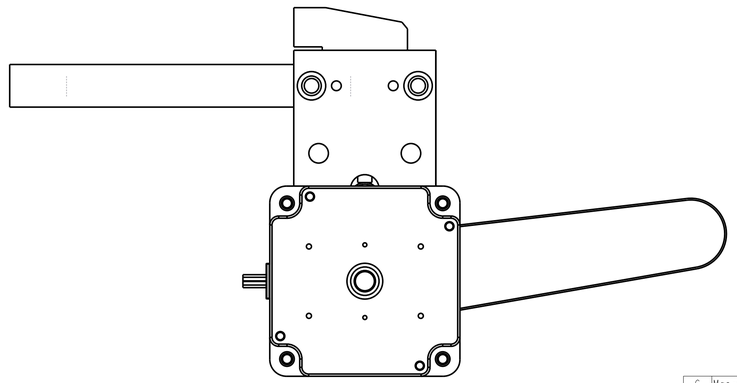
MAT'L 22639D-000

22639D-000





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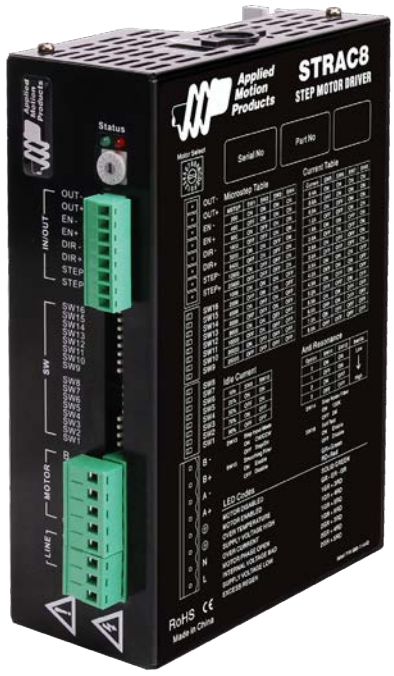
Q44-DRIVE ROLL

MAT'L 22639D-000

22639D-000

# STRAC8

## AC Input Step Motor Drive




Hardware Manual

Applied Motion Products, Inc.

920-0128 Rev B
02/06/18

# Contents

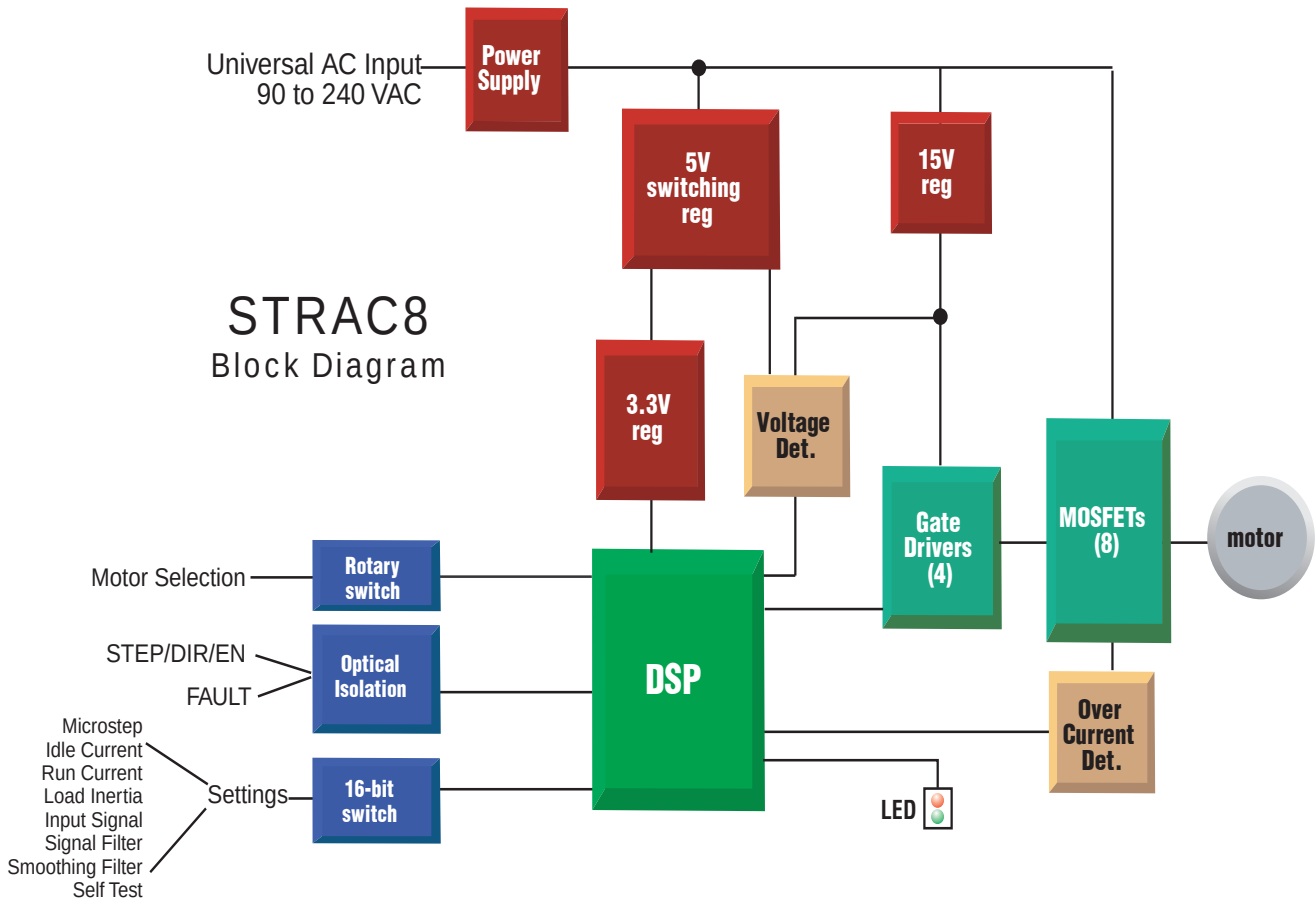
# 1 Introduction

Thank you for selecting the Applied Motion Products' STRAC8 Step Motor Drive. The STRAC8 series AC input drives are based on advanced digital current control technology and provide high torque, low noise and low vibration. Many of the operational paramteres are switch selectable. We hope our dedication to performance, quality and economy will make your motion control project successful.

## 1.1 Features

- Advanced digital current control provides excellent high speed torque
- Auto Setup measures motor parameters and configures motor current control and anti-resonance gain settings
- Uses universal AC input 90 to 240 VAC
- Speed Range - up to 50 rps
- Microstep Resolution - switch selectable, 16 settings: 200, 400, 800, 1600, 3200, 6400, 12800, 25600, 1000, 2000, 4000, 5000, 8000, 10000, 20000, 25000 steps/rev
- Running Current - peak setting, switch selectable, 16 settings: 0.4, 0.6, 0.9, 1.2, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.2, 5.9, 6.6, 7.3, 8.0A
- Idle Current - automatic reduction of running current 1 second after the motor stops, switch selectable, 4 settings: 25%, 50%, 70%, 90% of running current
- Anti Resonance - raises the system-damping ratio to eliminate midrange instability and allow stable operation throughout the speed range of the motor, switch selectable, 4 settings for low to high inertia loads
- Control Modes - Step/Direction pulse input or CW/CCW pulse input, switch selectable
- Input Signal Filter - filters out unwanted noise that can cause extra steps, switch selectable, 2MHz or 150KHz
- Step Smoothing Filter (Microstep Emulation) - performs high resolution stepping by synthesizing coarse steps into fine micro-steps, switch selectable, ON or OFF
- Self Test - performs a 2 rev, 0.5RPS, CW/CCW move test, switch selectable, ON or OFF
- Motor Selection - a 16 bit rotary switch is used to select the desired motor database which is pre-loaded at the Factory

## 1.2 Block diagram




# 2 Mounting the Drive

The STRAC8 drive can be mounted only on the narrow side of the chassis. M4 screws should be used in the two holes at the back of the drive.

The amplifiers in the drive generate heat. To operate the drive continuously at maximum power forced air cooling, as from a fan, should be provided.

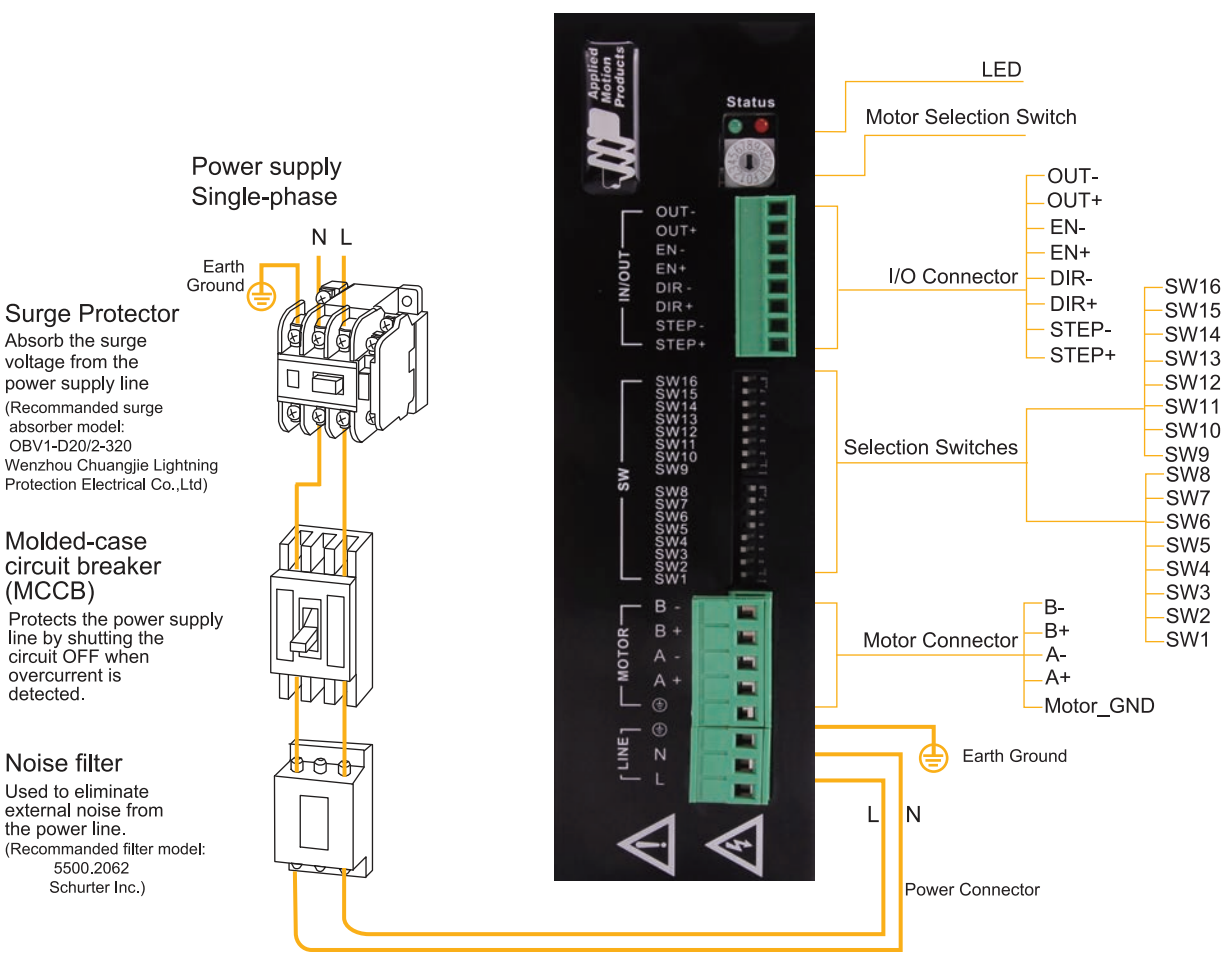
Never use the drive in a space where there is no air flow or where other devices can cause the surrounding air to be more than 40 °C. Never put the drive where it can get wet or where metal particles can fall into it.

# 3 Connections

To use the STRAC8 Step Drive, the following items are needed:

- Universal AC input of 90 to 240 VAC
- Pulse & Direction signal
- A compatible step motor

## STRAC8 Wiring Diagram



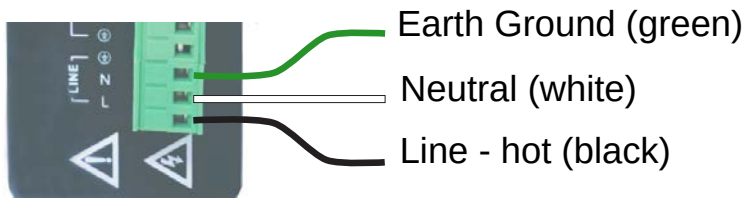
## 3.1 Connecting to Power

Use the supplied connector to connect to the AC supply according to the diagram below. Use 16 AWG wire for Line (L) and Neutral (N). Use 14 AWG for Earth Ground (G).

**Care should always be taken when working with high voltages.**

In regions where the single-phase supply is higher, an auto transformer can be used to drop the voltage to the correct level.

The STRAC8 contains an internal 10A fast acting fuse.




### Regeneration Clamping Circuit

High speed motion generates high voltage which can be transferred to the drive during rapid deceleration, and the drive may indicate an over-voltage error condition after stopping from a high speed motion. The STRAC8 has regeneration clamping circuitry with an internal 200ohm 10W resistor. To protect the drive in a high speed, high load inertia application Applied Motion Products' recommends connecting an external 80ohm 80W resistor to the regen connector located on the side of the STRAC8 drive.

### External Resistor Connector

Housing: 39-01-3028(MOLEX)


Crimp: 39-00-0038(MOLEX)

## 3.2 Connecting to a Motor

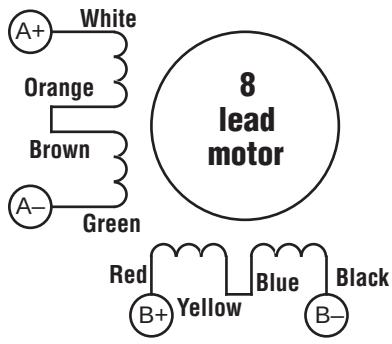
Motor connections should be made according to the following diagrams.

Never connect or disconnect the motor while the power is on.

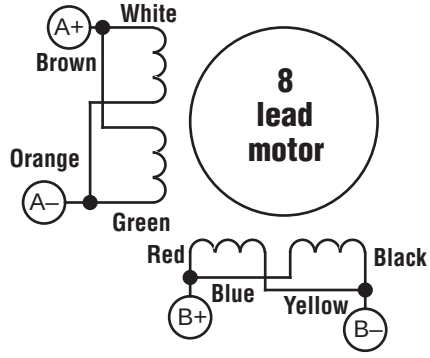
Note: it is highly recommended that you use a motor with a shielded cable with the STRAC8. Always connect the cable drain wire to the drive's ⏚ terminal (next to the A+ terminal)

The recommended Applied Motion motors for the STRAC8 include shielded cables. See the Recommended Motors section for a list of part numbers. The recommended motors should be connected to 120V drives in parallel, and to 220V drives in series, according to the diagram below.

Be sure to connect the cable shield for safety and to minimize electrical interference.



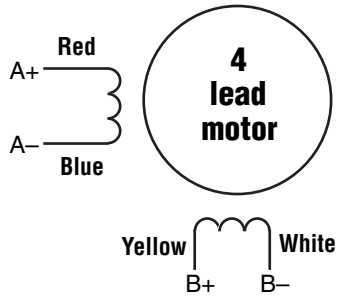

**8 Leads Series Connected**




**8 Leads Parallel Connected**

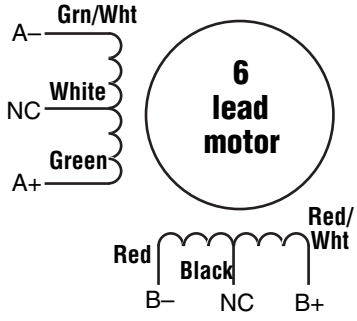
### Connecting Other Motors

Four lead motors can only be connected one way. Please follow the sketch at the right.

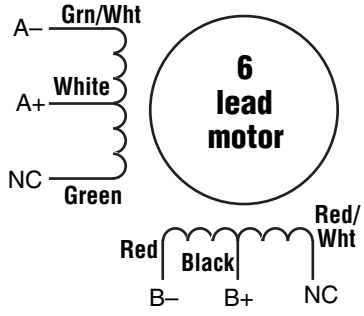



**4 Leads**

Six lead motors can be connected in series or center tap. In series mode, motors produce more torque at low speeds, but cannot run as fast as in the center tap configuration. In series operation, the motor should be operated at 30% less than the rated current to prevent overheating. Winding diagrams for both connection methods are shown below. NC means not connected.

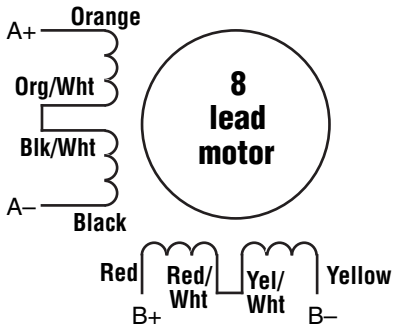



**6 Leads Series Connected**

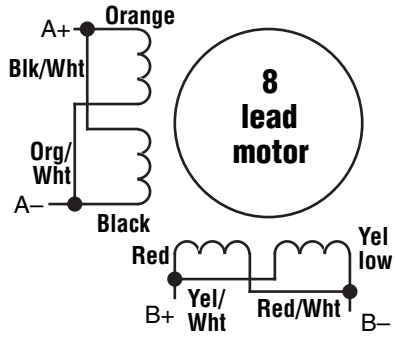



**6 Leads Center Tap Connected**

Eight lead motors can also be connected in two ways: series and parallel. As with six lead motors, series operation gives you less torque at high speeds, but may result in lower motor losses and less heating. In series operation, the motor should be operated at 30% less than the unipolar rated current. The wiring diagrams for eight lead motors without shielded cables are shown below.




**8 Leads Series Connected**




**8 Leads Parallel Connected**

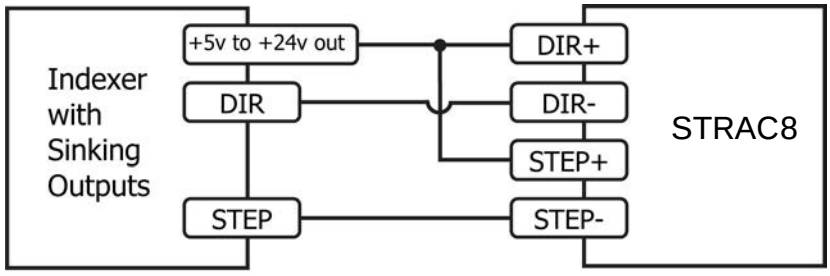
## 3.3 Connecting the Inputs and Outputs

### 3.3.1 Step & Direction Inputs

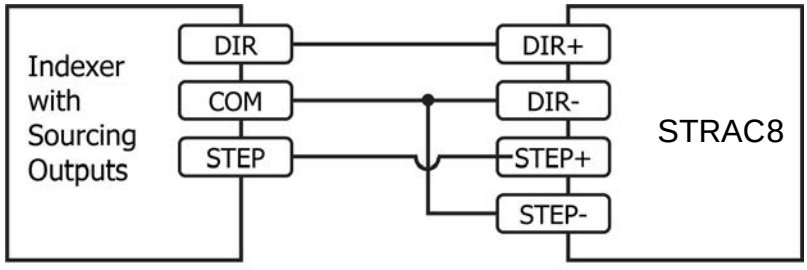
The STRAC8 Step Drive has two high speed optically isolated inputs called STEP and DIR. They accept 5 to 24 volt single-ended or differential signals, up to 2MHz. The maximum voltage that can be applied to the input is 28V.

The motor executes one step when the STEP input closes.

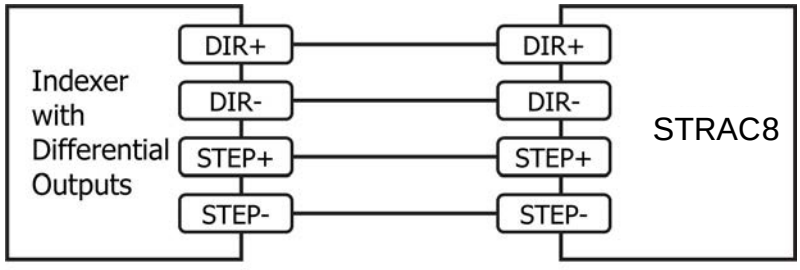
The direction of rotation is controlled by the DIR input state. A closed input (logic "0") will result in clockwise rotation, and an open input (logic "1") will result in counterclockwise rotation.




Connecting to Indexer with Sinking Outputs




Connecting to Indexer with Sourcing Outputs



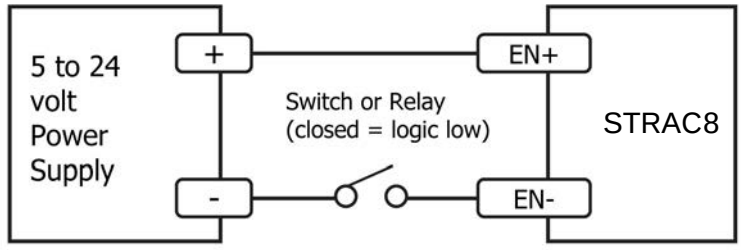

Connecting to Indexer with Differential Outputs
Many high-speed indexers have differential outputs

### 3.3.2 EN input

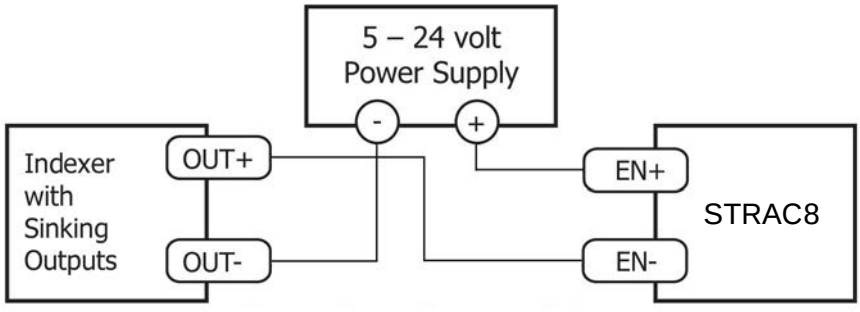
The EN input enables or disables the drive amplifier. It is an optically isolated input that accepts a 5 to 24 volt single-ended or differential signal. The maximum voltage that can be applied to the input is 28V.

When EN input is closed, the driver amplifier is deactivated, all the MOSFETs will shut down, and the motor will be free. When EN input is open, the drive is activated.

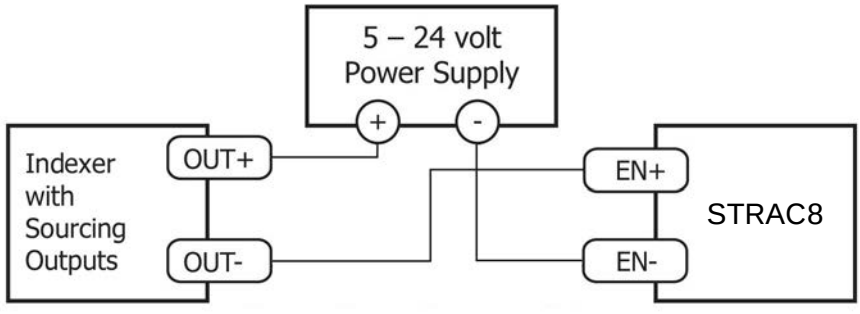
When the drive has encountered an error and the fault is removed from the system, a falling signal into the EN input will reset the error status and activate the drive amplifier again.




Connecting the Input to a Switch or Relay




Connecting the Input to Sinking Outputs

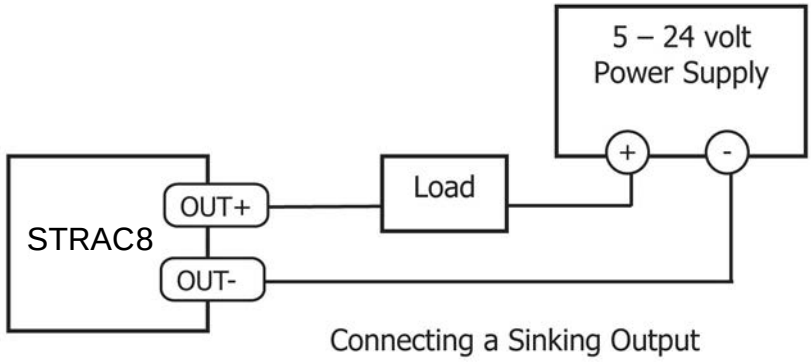



Connecting the Input to Sourcing Outputs

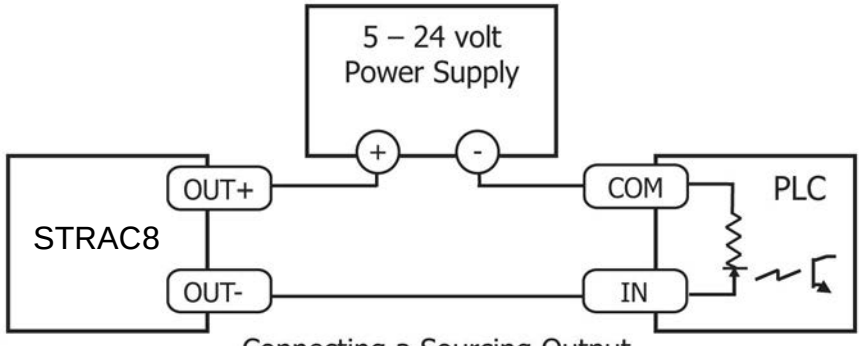
### 3.3.3 Fault Output

The FAULT Output is optically isolated. The maximum collector current is 100mA, and the maximum collector to emitter voltage is 30 volts. The output can be wired to sink or source current.

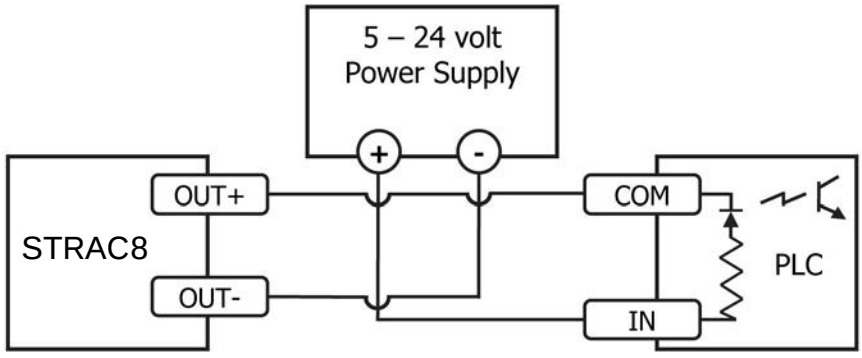
When drive is working normally, the output is open. When the drive encounters an error, the output closes.



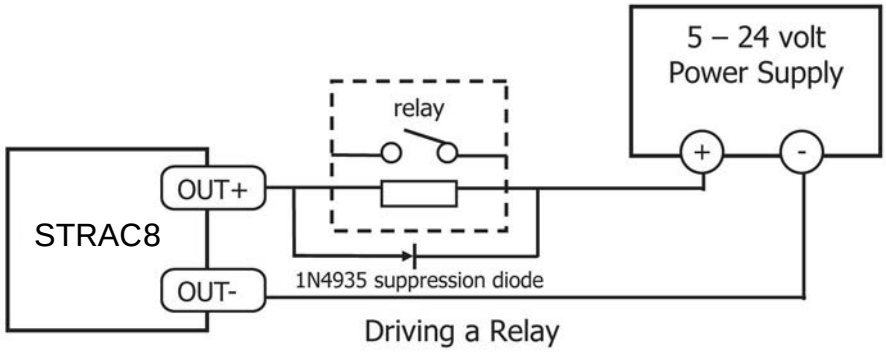

Connecting a Sinking Output




Connecting a Sourcing Output



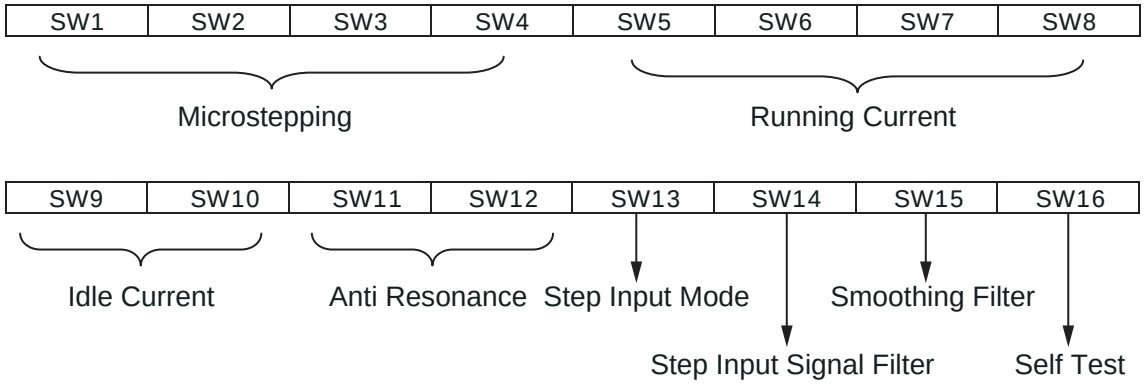

Connecting a Sourcing Output again




Driving a Relay

# 4 Switch Selection

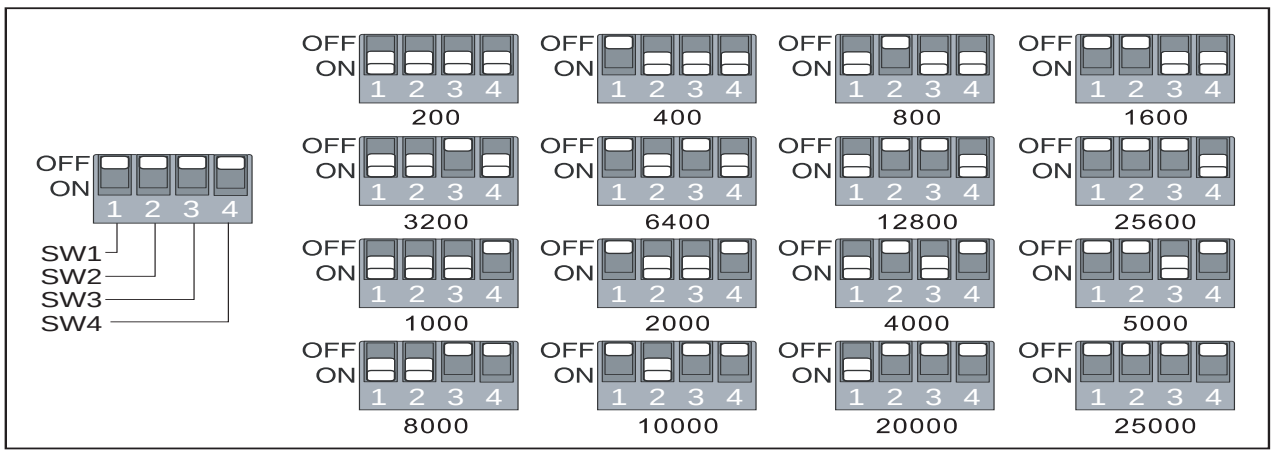
Many of the operational parameters of the STRAC8 can be set or changed by position switches - either by a single switch or a combination of ON/OFF settings of 2 or more switches.




## 4.1 Microstep Resolution

The microstep resolution is set by the SW1, SW2, SW3 and SW4 switches. There are 16 settings.

| Microstep(steps/rev) | SW1 | SW2 | SW3 | SW4 |
|---|---|---|---|---|
| 200 | ON | ON | ON | ON |
| 400 | OFF | ON | ON | ON |
| 800 | ON | OFF | ON | ON |
| 1600 | OFF | OFF | ON | ON |
| 3200 | ON | ON | OFF | ON |
| 6400 | OFF | ON | OFF | ON |
| 12800 | ON | OFF | OFF | ON |
| 25600 | OFF | OFF | OFF | ON |
| 1000 | ON | ON | ON | OFF |
| 2000 | OFF | ON | ON | OFF |
| 4000 | ON | OFF | ON | OFF |
| 5000 | OFF | OFF | ON | OFF |
| 8000 | ON | ON | OFF | OFF |
| 10000 | OFF | ON | OFF | OFF |
| 20000 | ON | OFF | OFF | OFF |
| 25000 | OFF | OFF | OFF | OFF |

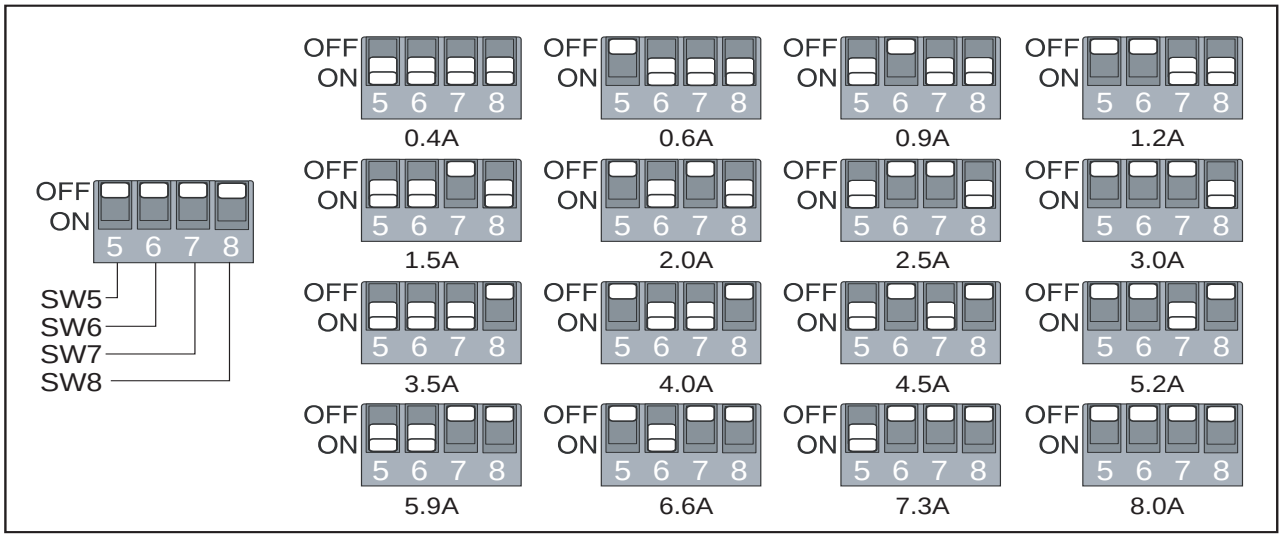


## 4.2 Running Current

The output current is set by the SW5, SW6, SW7and SW8 switches. There are 16 settings.

**NOTE: Drive's running current will be limited by the lower value between motor selection rotary switch and the dip current switch**

| Current (Peak) | SW5 | SW6 | SW7 | SW8 |
|---|---|---|---|---|
| 0.4A | ON | ON | ON | ON |
| 0.6A | OFF | ON | ON | ON |
| 0.9A | ON | OFF | ON | ON |
| 1.2A | OFF | OFF | ON | ON |
| 1.5A | ON | ON | OFF | ON |
| 2.0A | OFF | ON | OFF | ON |
| 2.5A | ON | OFF | OFF | ON |
| 3.0A | OFF | OFF | OFF | ON |
| 3.5A | ON | ON | ON | OFF |
| 4.0A | OFF | ON | ON | OFF |
| 4.5A | ON | OFF | ON | OFF |
| 5.2A | OFF | OFF | ON | OFF |
| 5.9A | ON | ON | OFF | OFF |
| 6.6A | OFF | ON | OFF | OFF |
| 7.3A | ON | OFF | OFF | OFF |
| 8.0A | OFF | OFF | OFF | OFF |




## 4.3 Idle Current

The running current of the STRAC8 drive is automatically reduced whenever the motor isn't moving. The SW9 and SW10 switches control the percentage of the running current the idle current is reduced to. The 90% setting is useful when a high holding torque is required. To minimize motor and drive heating it is highly recommended that the idle current reduction feature be set as low as the application can tolerate.

| Idle | SW9 | SW10 |
|---|---|---|
| 25% | ON | ON |
| 50% | OFF | ON |
| 70% | ON | OFF |
| 90% | OFF | OFF |

## 4.4 Anti Resonance

The SW11 and SW12 switches select the load inertia. There are 4 settings. The inertia selection can help the STRAC8 drive to calculate the current control parameter. If the load inertia is close to that of the motor rotor, the low setting should be selected. If the load inertia is higher than that of the rotor, a proportionally higher setting should be selected.

| Option | SW11 | SW12 | Inertia |
|---|---|---|---|
| 0 | ON | ON | Low ↓ High |
| 1 | OFF | ON | |
| 2 | ON | OFF | |
| 3 | OFF | OFF | |

## 4.5 Step Input Mode

Most indexers and motion controllers provide motion commands in the Step and Direction format. The Step signal pulses once for each motor step and the Direction signal commands direction. Some PLCs use a CW/CCW command signal: one signal pulses once for each desired step in the clockwise direction (CW Step), while a second signal pulses for counterclockwise motion (CCW Step). In the CW/CCW control mode, the CW signal should be connected to the STEP input and the CCW signal to the DIR input.

**Setting SW13 to OFF enables the Step & Direction format, the ON position enables the CW/CCW format.**

**Note: The power must be cycled each time the position of SW13 is changed.**

## 4.6 Step Input Signal Filter

The STEP and DIR signal inputs have a built-in digital filter to reduce the external noise. If the system works on the low microstep, the 150 KHz setting should be selected. If the system works on the high microstep, the 2 MHz setting should be used.

The SW14 switch selects the digital signal filter. ON sets it to 150 KHz, OFF sets it to 2 MHz.

**Note: The power must be cycled each time the position of SW14 is changed.**

## 4.7 Step Smoothing Filter

Command signal smoothing can soften the effect of immediate changes in velocity and direction, making the motion of the motor less jerky. An added advantage is that it can reduce the wear on mechanical components. SW15 selects this function - ON enables it, OFF disables it.

This function can cause a small delay in following the control signal, and it should be used with that in mind.

**Note: The power must be cycled each time the position of SW15 is changed.**

## 4.8 Self Test

Setting SW16 to ON after the drive is powered up, will cause the drive to perform a Self Test move of 2 revolutions both CW and CCW at .5 rps. Setting SW16 to OFF will disable this feature.

## 5 Motor selection

Each position of the 16-bit rotary switch selects a different motor, and automatically sets the configuration parameters in the drive. The STRAC8 drive comes programmed with up to 16 typical motors as factory defaults. Drives can be customized with specially selected motors when required.

**NOTE: Drive's running current will be limited by the lower value between motor selection rotary switch and the dip current switch**

**NOTE: When the motor selection is changed, the drive power supply will need to be cycled.**

| SW position | MOTOR | WIRING | Input Voltage | Input Voltage |
|---|---|---|---|---|
| 0 | Reserved | Reserved | 0 A | |
| 1 | Reserved | Reserved | 0 A | |
| 2 | HT23-552 | Parallel | 1.5 A | 120VAC |
| 3 | HT23-553 | Parallel | 1.5 A | 120VAC |
| 4 | HT23-554 | Parallel | 1.8 A | 120VAC |
| 5 | HT34-495/695 | Parallel | 5.1 A | 120VAC |
| 6 | HT34-496/696 | Parallel | 5.1 A | 120VAC |
| 7 | HT34-497/697 | Parallel | 5.8 A | 120VAC |
| 8 | HT23-552 | Series | 0.75 A | 240VAC |
| 9 | HT23-553 | Series | 0.75 A | 240VAC |
| A | HT23-554 | Series | 0.9 A | 240VAC |
| B | HT34-495/695 | Series | 2.5 A | 240VAC |
| C | HT34-496/696 | Series | 2.5 A | 240VAC |
| D | HT34-497/697 | Series | 2.5 A | 240VAC |
| E | Custom Motor | Reserved | 8 A | 120VAC/240VAC |
| F | Custom Motor | Reserved | 8 A | 120VAC/240VAC |

## 5.1 Recommended motors

### Recommended Motors - NEMA 23

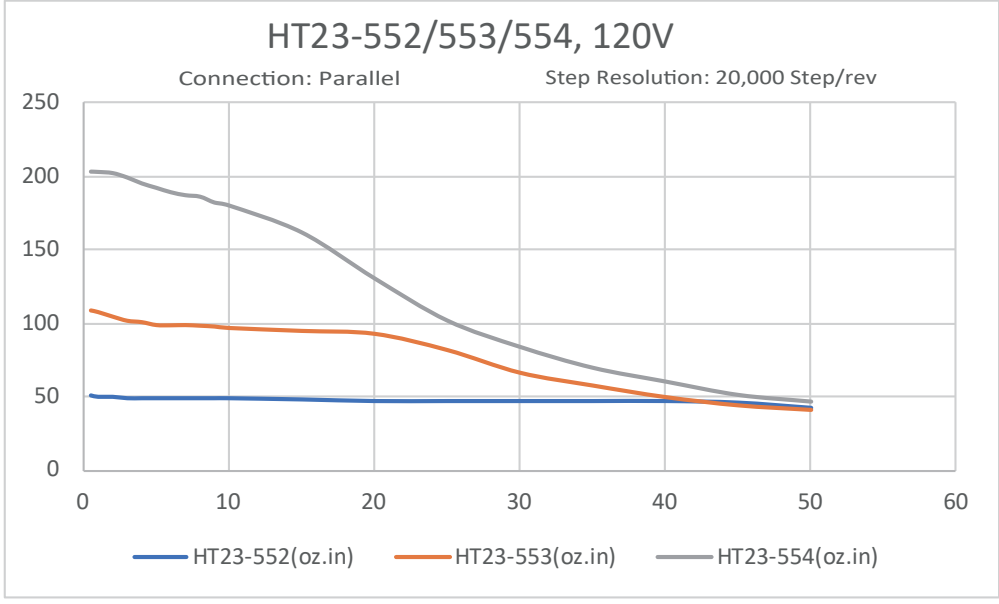
| Motor Part No. | STRAC8 (120) | | STRAC8 (220) | | Holding Torque oz-in | Rotor Inertia oz-in-sec^2 | Motor Length inch (mm) |
|---|---|---|---|---|---|---|---|
| | Connection | Drive Current Setting amps/phase | Connection | Drive Current Setting amps/phase | | | |
| HT23-552 | parallel | 1.50 | series | 0.75 | 84.4 | 1.70E-03 | 1.71 (43.5) |
| HT23-553 | parallel | 1.50 | series | 0.75 | 167 | 4.25E-03 | 2.17 (55) |
| HT23-554 | parallel | 1.80 | series | 0.90 | 255 | 6.80E-03 | 3.05 (77.5) |

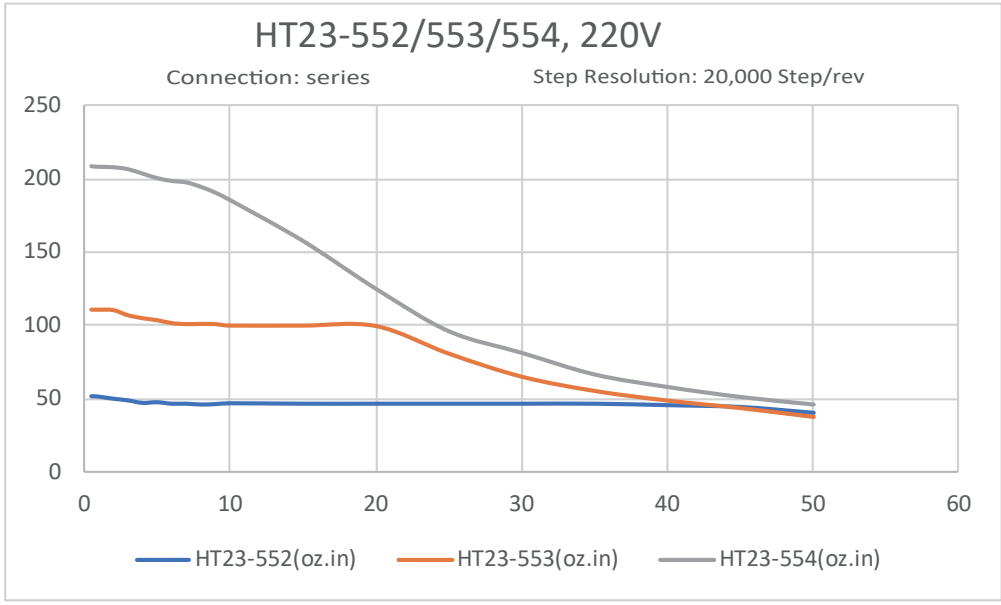
### Recommended Motors - NEMA 34

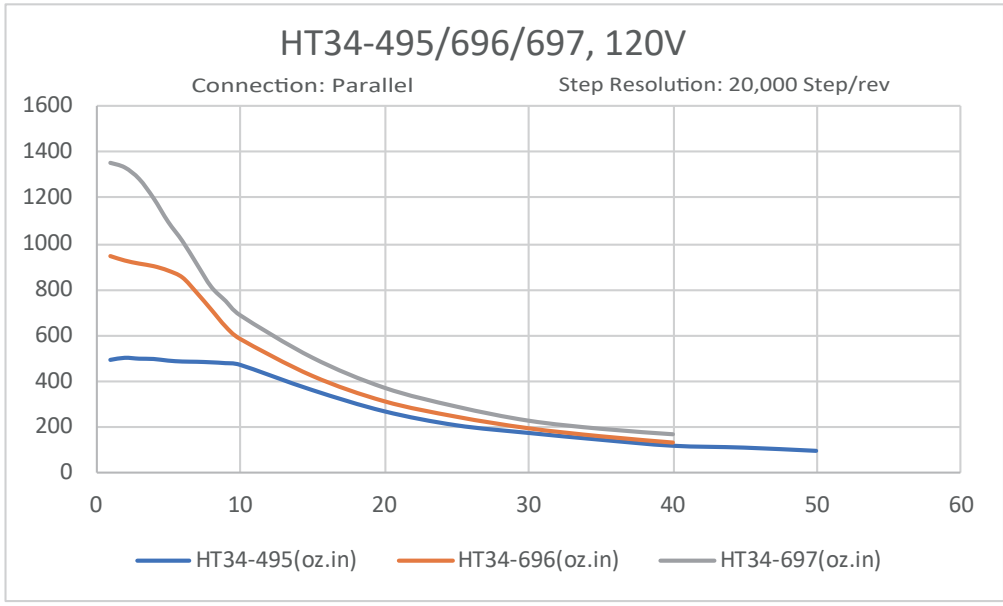
| Motor Part No. | STRAC8 (120) | | STRAC8 (220) | | Holding Torque oz-in | Rotor Inertia oz-in-sec^2 | Motor Length inch (mm) |
|---|---|---|---|---|---|---|---|
| | Connection | Drive Current Setting amps/phase | Connection | Drive Current Setting amps/phase | | | |
| HT34-495/695 | parallel | 5.10 | series | 2.55 | 555 | 2.27E-02 | 3.11 (79) |
| HT34-496/696 | parallel | 5.10 | series | 2.55 | 1110 | 4.53E-02 | 4.63 (117.5) |
| HT34-497/697 | parallel | 5.80 | series | 3.20 | 1694 | 6.80E-02 | 6.14 (156) |

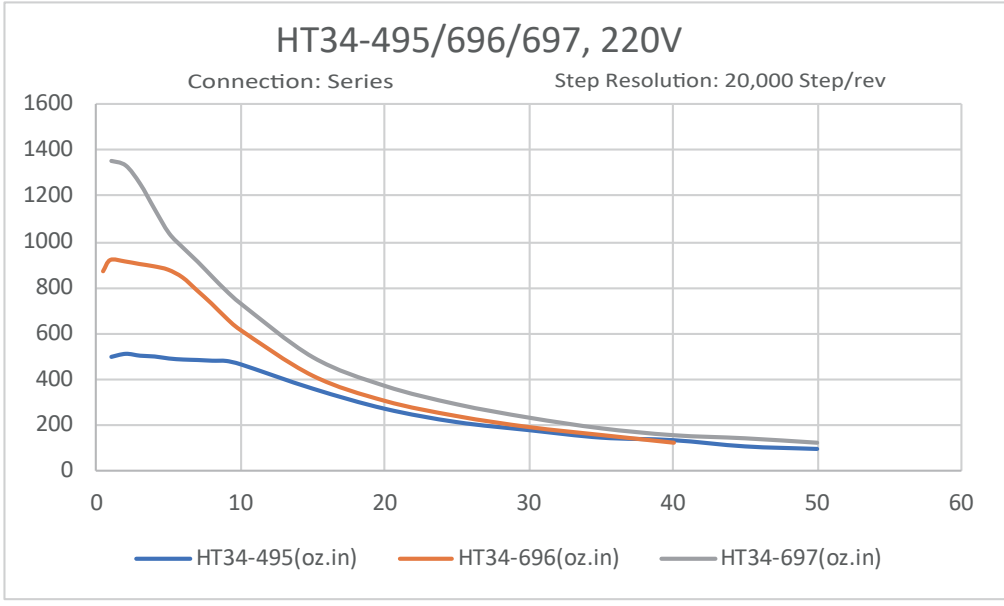
*Note: The "Drive Current Setting" shown here differs from the rated current of each motor because the rated current is RMS and the drive current setting is peak sine. If you are using a motor not listed here, for best results set the drive current at the motor's rated current x 1.2.*

## 5.2 Torque-Speed Curves



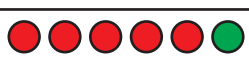

HT23-552/553/554, 220V
Connection: series
Step Resolution: 20,000 Step/rev
250
200
150
100
50
0
0
10
20
30
40
50
60
HT23-552(oz.in)
HT23-553(oz.in)
HT23-554(oz.in)


HT34-495/696/697, 120V
Connection: Parallel
Step Resolution: 20,000 Step/rev
1600
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
HT34-495(oz.in)
HT34-696(oz.in)
HT34-697(oz.in)


HT34-495/696/697, 220V
Connection: Series
Step Resolution: 20,000 Step/rev
1600
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
HT34-495(oz.in)
HT34-696(oz.in)
HT34-697(oz.in)

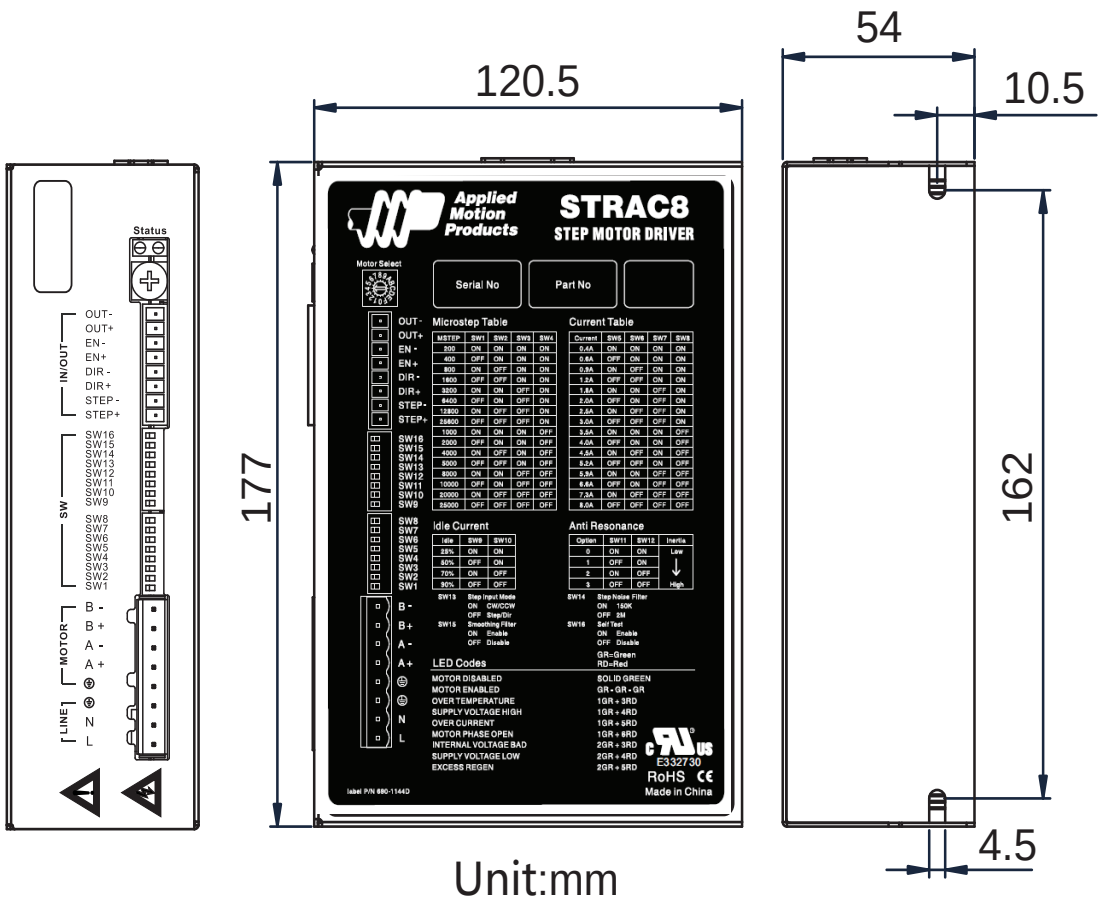
## 6 Error Codes

The STRAC8 Drive has two LEDs to indicate status. When the motor is enabled the green LED flashes slowly, when the green LED is solid the motor is disabled. If the red LED flashes, an error has occurred. Errors are indicated by combinations of red and green flashes as shown below:

| Code | | Error |
|---|---|---|
|  | Solid green | Motor Disabled |
|  | Flashing green | Motor Enabled |
|  | 3 red, 1 green | Over Temperature |
|  | 3 red, 2 green | Bad Internal Voltage |
|  | 4 red, 1 green | Supply Voltage High |
|  | 4 red, 2 green | Supply Voltage Low |
|  | 5 red, 1 green | Over Current |
|  | 5 red, 2 green | Excess Regen |
|  | 6 red, 1 green | Open Motor Phase |

# 7 Reference Materials

## 7.1 Mechanical Outline·



## 7.2 Specifications

### 7.2.1 Electrical Specifications

| Electrical Specifications | | | | | |
|---|---|---|---|---|---|
| Parameter | | Min. | Typ. | Max. | Unit |
| Power Supply | Universal AC input | 90 | - | 240 | VAC |
| Output Current (Peak) | | 0.4 | - | 8.0 | amps |
| Step Frequency | | 2 | - | 2M | Hz |
| STEP Minimum Pulse Width Hi and Low | | 250 | - | - | ns |
| DIR Minimum Pulse Width | | 62.5 | - | - | us |
| Under Voltage Protection | | - | 80 | - | VAC |
| Over Voltage Protection | | - | 295 | - | VAC |
| STEP/DIR Input Signal Voltage | | 4.0 | - | 28 | V |
| OUT Maximum Output Current | | - | - | 100 | mA |
| OUT Maximum Output | | - | - | 30 | V |

### 7.2.2 Environmental Specifications

| Environmental Specifications | |
|---|---|
| Heat Sinking Method | Natural cooling or fan-forced cooling |
| Surrounding Air Conditions | Avoid dust, oily mist and corrosive air |
| Operating Temperature | 0 - 40°C (32 - 104°F) |
| Maximum Ambient Humidity | 90% non-condensing |
| Shock | 5.9m/s² maximum |
| Storage Temperature | -10 - 70°C (14 - 158°F) |

# 8 Contacting Applied Motion Products

404 Westridge Dr.
Watsonville, CA 95076, USA
1-800-525-1609
Tel (831) 761-6555
www.applied-motion.com

**ASSEMBLY TITLE:** **Q55 REWIND ASSEMBLY**

**DRAWING NO.:** **D22576-000**

**GENERAL FUNCTION:**

- The rewind drum rolls up the liner
- The rewind pin, when pulled out, allows the liner to be released from the rewind drum.
- The rewind flange supports and guides the liner.
- The friction clutch allows for slippage to accommodate for varying speeds between the drive roll and rewind drum.
- The adjusting knob controls the torque adjustment of the drum.

**SET UP AND ADJUSTMENTS:**

- Position the rewind flange slightly below the web path and lock with the set screw in the hub.
- When threading liner to the rewind, place the liner between the drum and pin.
- Tighten adjusting knob just enough to allow the rewind drum to keep up with the drive roll.

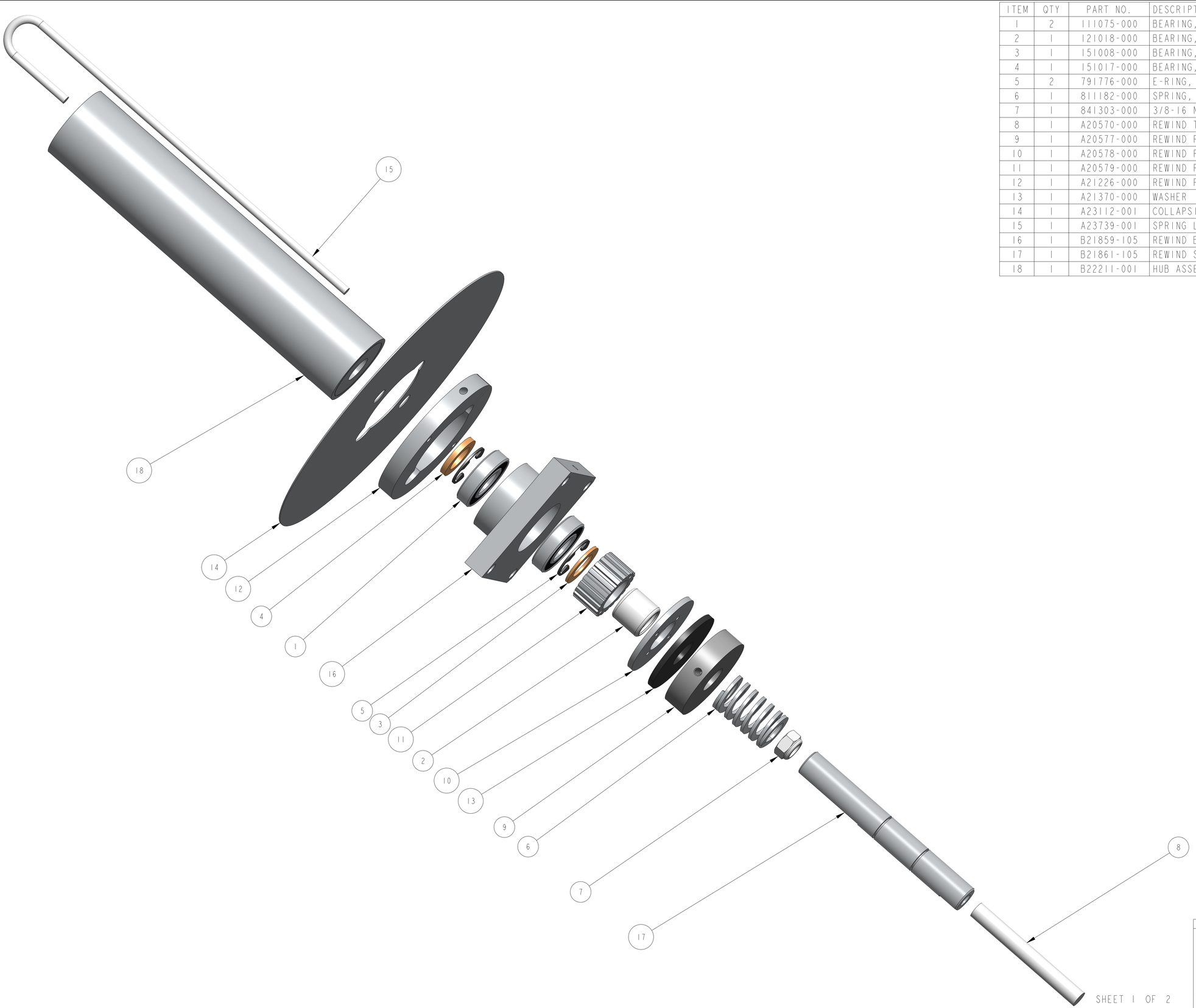
**NOTE:** Excessive tightening will cause the web to be wound very tight, causing difficulty in removal and possible step motor stall.

**MAINTENANCE:**

- Clean all parts that have acquired label or glue residue
- Replace friction disc when worn out.

**TROUBLESHOOTING:**

| PROBLEM | WHAT TO DO |
|---|---|
| - Rewind drum not rotating When stepping motor rotates | -Replace timing belt from motor to rewind |
| - Rewind drum not keeping up With drive roll | -Tighten adjusting knob |
| - Web winding too tight on hub | -Loosen adjusting knob |
| - Grinding in rewind hub | -Replace friction disc by removing knob and sliding off rewind drum |




| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 2 | 111075-000 | BEARING, BALL | 22639R-000 |
| 2 | 1 | 121018-000 | BEARING, NEEDLE | 22639R-000 |
| 3 | 1 | 151008-000 | BEARING, THRUST WASHER | 22639R-000 |
| 4 | 1 | 151017-000 | BEARING, THRUST WASHER | 22639R-000 |
| 5 | 2 | 791776-000 | E-RING, RETAINING | 22639R-000 |
| 6 | 1 | 811182-000 | SPRING, COMPRESSION HEAVY DUTY | 22639R-000 |
| 7 | 1 | 841303-000 | 3/8-16 NUT | 22639R-000 |
| 8 | 1 | A20570-000 | REWIND THREADED SHAFT | 22639R-000 |
| 9 | 1 | A20577-000 | REWIND PRESSURE DISC | 22639R-000 |
| 10 | 1 | A20578-000 | REWIND PULLEY ADAPTER PLATE | 22639R-000 |
| 11 | 1 | A20579-000 | REWIND PULLEY | 22639R-000 |
| 12 | 1 | A21226-000 | REWIND FLANGE HUB COLLAR | 22639R-000 |
| 13 | 1 | A21370-000 | WASHER | 22639R-000 |
| 14 | 1 | A23112-001 | COLLAPSIBLE REWIND FLANGE | 22639R-000 |
| 15 | 1 | A23739-001 | SPRING LATCH | 22639R-000 |
| 16 | 1 | B21859-105 | REWIND BEARING PLATE | 22639R-000 |
| 17 | 1 | B21861-105 | REWIND SHAFT | 22639R-000 |
| 18 | 1 | B22211-001 | HUB ASSEMBLY | 22639R-000 |

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | Aug-15-22 | NEW DRAWING | TJS |

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X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'
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BREAK ALL EDGES .065/.015
CORNER RADIUS .010/.030

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

| | |
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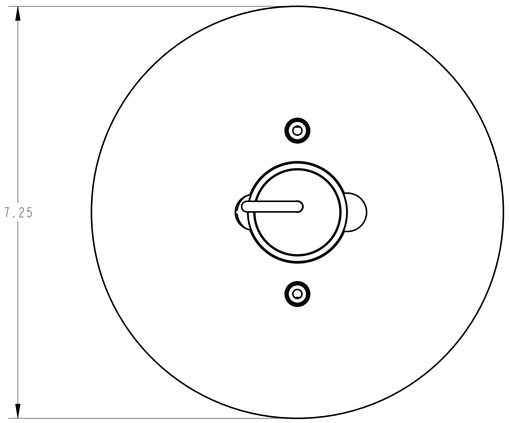
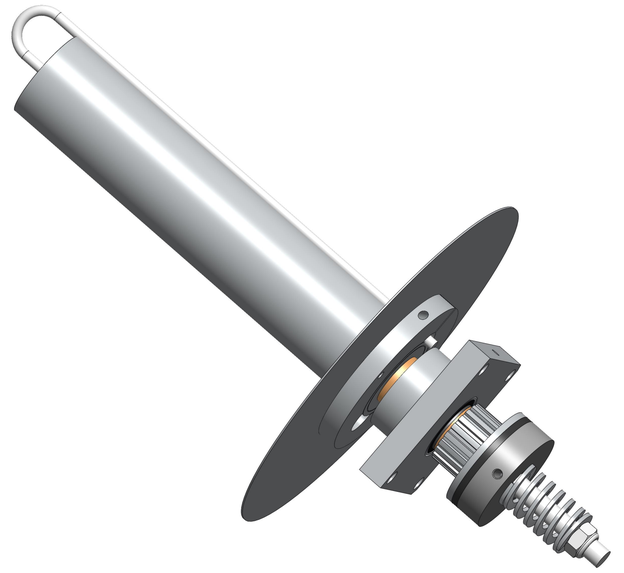
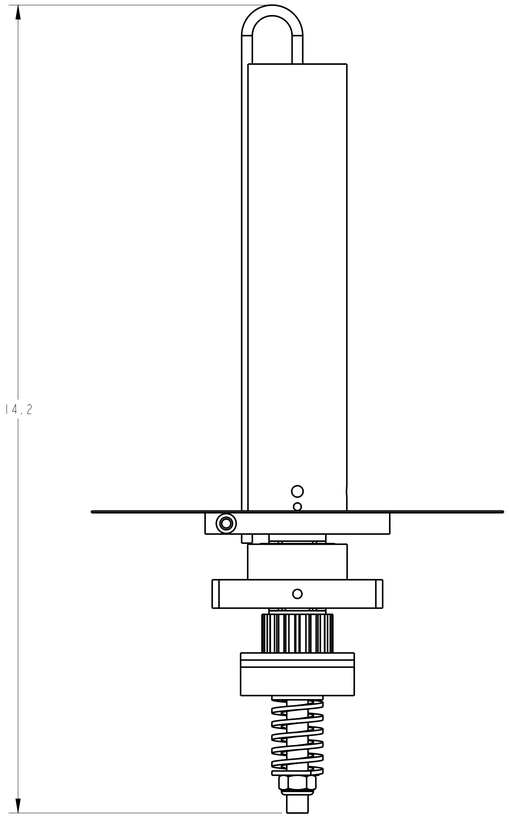
Q44 REWIND

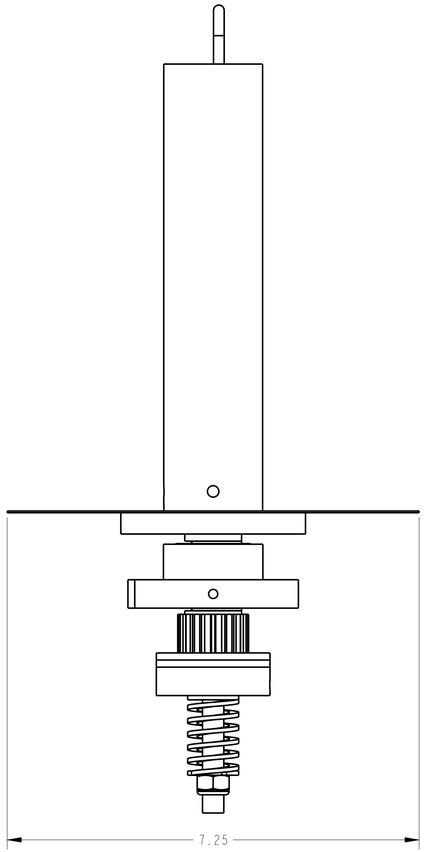
MAT'L 22639R-000

22639R-000






| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | Aug-15-22 | NEW DRAWING | |

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.X ± .1
.XX ± .01
.XXX ± .005
ANGLES ± 30'

SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

| | |
|---|---|
| SCALE | 3/4 |
| DATE | Aug-15-22 |
| DRAWN BY | TJS |

Q44 REWIND

MAT'L | 22639R-000 | 22639R-000

**ASSEMBLY TITLE:** **SLOT SENSOR ASSEMBLY**

**GENERAL FUNCTION:**

- The slot sensor detects the separation between labels. This signals the electronics to stop the drive motor.
- The two (2) liner support rods prevent the liner from wearing out the slot sensor.
- The knob and thumbscrew lock the sensor firmly on the mounting rods.
- The male connector provides quick connection to the labeling head.

**SET UP AND ADJUSTMENTS:**

- See attached cut sheet

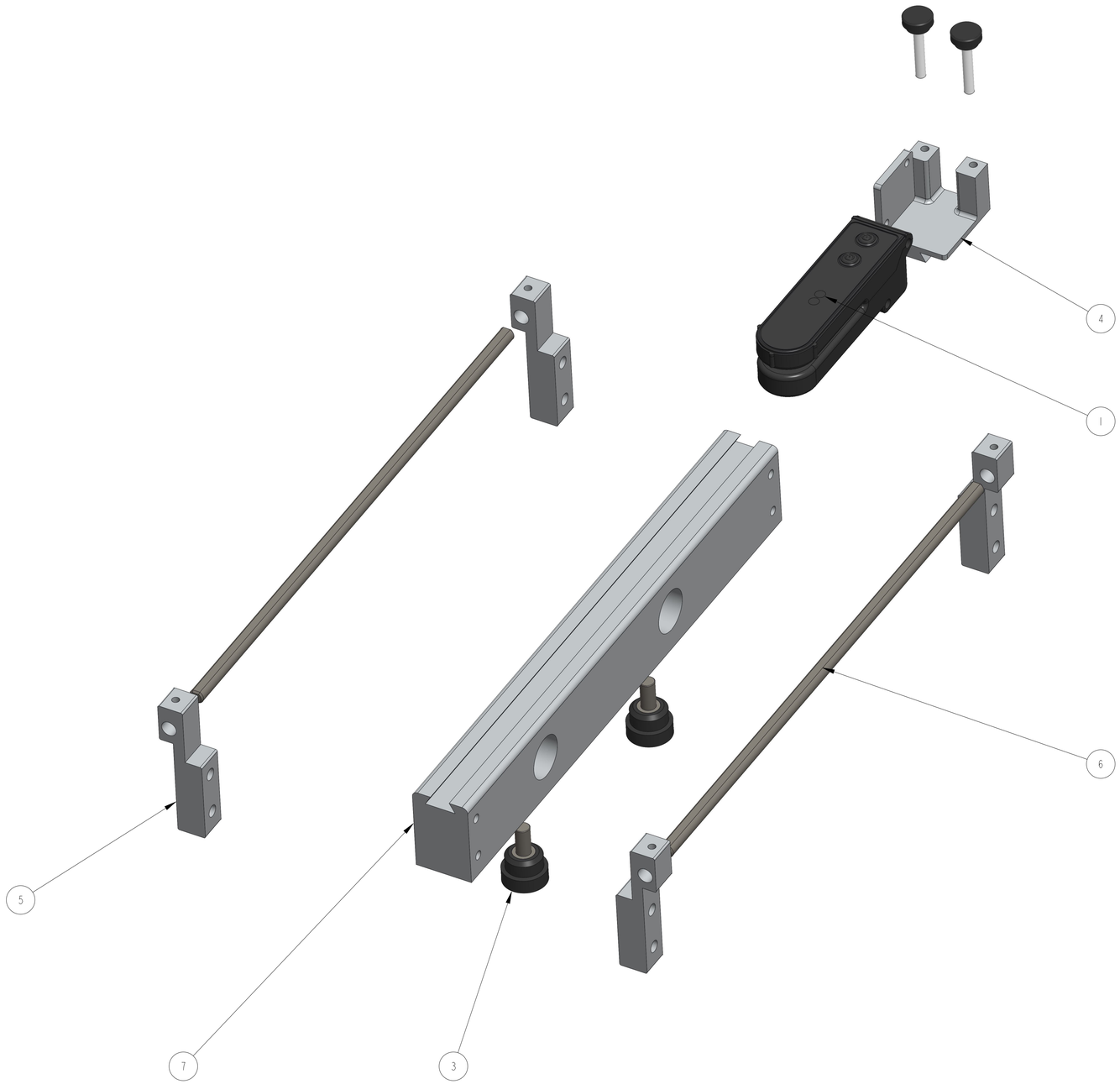
**MAINTENANCE:**

- Keep the sensor optical area clean from label and glue residue

**TROUBLESHOOTING:**

| PROBLEM | WHAT TO DO |
|---|---|
| - No power to the sensor | - Check male connector and tightly secure connection to the head. |
| - Liner dragging over the slot | - Loosen knob and rotate slot sensor slot sensor surface liner rests on both support rods |
| - Too much slack through slot sensor | - Adjust brake brush tension |
| - Slot sensor moving with web | - Tighten all three (3) adjusting knobs |

| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 1 | 201444-300 | TRITRONICS MODEL LERC | 20033-300 |
| 2 | 2 | 801297-000 | THUMB SCREW PLSTC HEAD 8-32x1 | 20033-300 |
| 3 | 2 | 801299-000 | KNOB WITH STUD | 20033-300 |
| 4 | 1 | A21391-301 | SLOT SENSOR ADAPTER | 20033-300 |
| 5 | 4 | A21749-300 | SLOT SENSOR SUPPORT ROD MTG BLOCK | 20033-300 |
| 6 | 2 | A21770-300 | SUPPORT ROD WITH FLAT | 20033-300 |
| 7 | 1 | B20852-300 | 7 IN. WEB SLOT SENSOR MTG. BAR | 20033-300 |
| 8 | 1 | 203035-000 | CABLE, M8, 4COND | NOT SHOWN |




| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | Mar-04-21 | NEW DRAWING | TJS |

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X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'

SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030

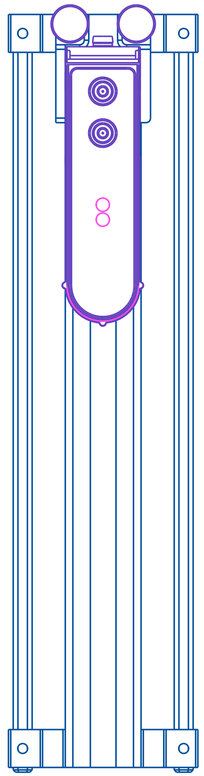
QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

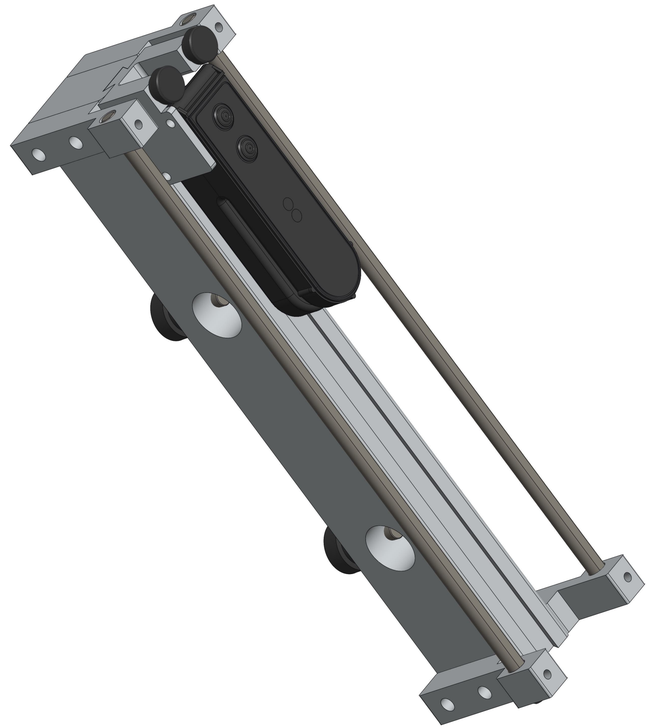
SCALE: 1/1
DATE: Mar-04-21
DRW BY: TJS
CHK BY:02/24/2024-SEM
APPR BY:

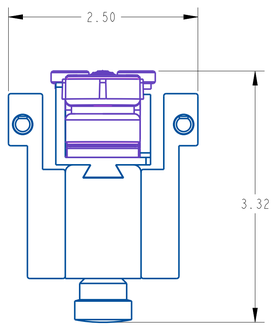
LABEL DETECT ASSEMBLY

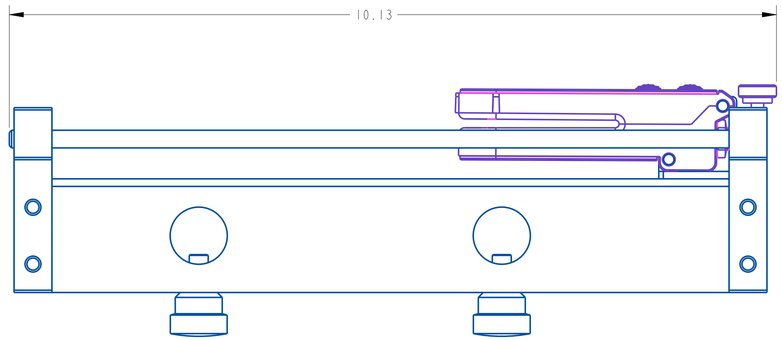
MAT'L

20033-300








| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
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.X ± .1
.XX ± .01
.XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

SCALE: 1/1
DATE: Mar-04-21
DRW BY: TJS
CHK BY:02/24/2024-SEM
APPR BY:

LABEL DETECT ASSEMBLY

MAT'L

20033-300

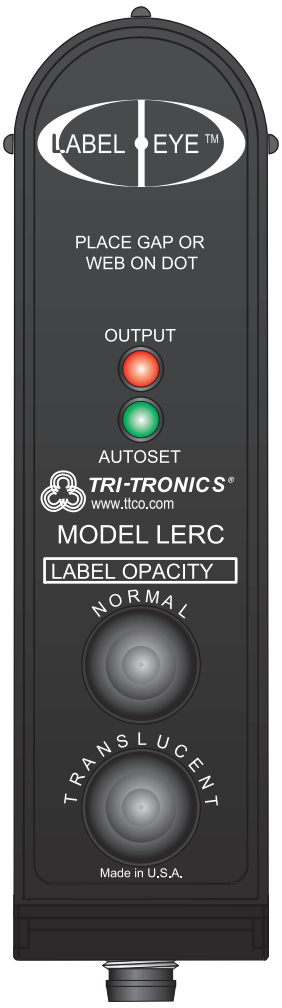
# LABEL•EYE
# Set-Up Instructions

## Standard LABEL•EYE

**Normal Label Opacity AUTOSET Button**
This category includes most paper or melallized film labels adhering to paper or transparent backing materials. To implement the one button AUTOSET routine, utilize the external alignment guides to position the gap between labels in line with the dot shown in the center of the detection zone. Then push the AUTOSET button marked "Normal."

An alternative set up procedure would be to remove a label and the push the "Normal" AUTOSET button.

On rare occasions, when the light is unable to penetrate the backing materials, both the red and green led indicators will blink four times. When this indication occurs, the sensor will be unable to detect the presence of the labels.




**Translucent Label Opacity AUTOSET Button**
This category includes translucent labels adhering to transparent or paper backing materials. To implement the one button AUTOSET routine, utilize the external alignment guides to position the gap between labels in line with the dot shown in the center of the detection zone. Then push the AUTOSET button marked "Translucent".
*Note: This sensor cannot detect transparent labels.*

**INVERT OUTPUT:** The status of the red LED and output transistors can be inverted by pressing both buttons simultaneously. When the output status has been inverted, the red LED and the output transistors will turn off when the label comes into view.

TRI-TRONICS®

# SPECIFICATIONS

**SUPPLY VOLTAGE**
- 10 to 30Vdc
- Polarity Protected
- Intended for use in class two circuits

**CURRENT REQUIREMENTS**
- 45 milliamps (exclusive of load)

**OUTPUT TRANSISTORS**
- (1) NPN and (1) PNP output transistors
- Sensor outputs can sink or source up to 150 milliamps (current limit)
- All outputs are continuously short circuit protected

**REMOTE AUTOSET INPUT**
- opto isolated momentary sinking input (10 milliamps)

*Note: Remote models only*

**RESPONSE TIME**
- Light state response = 100 microseconds
- Dark state response = 100 microseconds

**LED LIGHT SOURCE**
- High intensity red LED
- Pulse modulated

**PUSH BUTTON CONTROL**
- Automatic set-up routines based on web opacity
- One push button set-up
- Simultaneously pushing both buttons inverts the output

**HYSTERESIS**
- Minimal hysteresis promotes the detection between the backing material and the label depending on the settings

**LIGHT IMMUNITY**
- Responds to sensor's pulsed modulated light source … immune to most ambient light

**INDICATORS**
- Green LED flashes when AUTOSET routine is activated and stays illuminated when AUTOSET is completed
- Red LED illuminates when sensors output transistors are ON. *Note: The status of the output transistors can be inverted by pushing both buttons simultaneously. If Output LED flashes, a short circuit condition exists.*

**AMBIENT TEMPERATURE**
- -40°C to 70°C (-40°F to 158°F)

**RUGGED CONSTRUCTION**
- Chemical resistance to harsh cleaners such as detergents, alcohols, and ketones
- Type 1 Enclosure
- Conforms to heavy industry grade CE and UL requirements

RoHS Compliant
Product subject to change without notice.

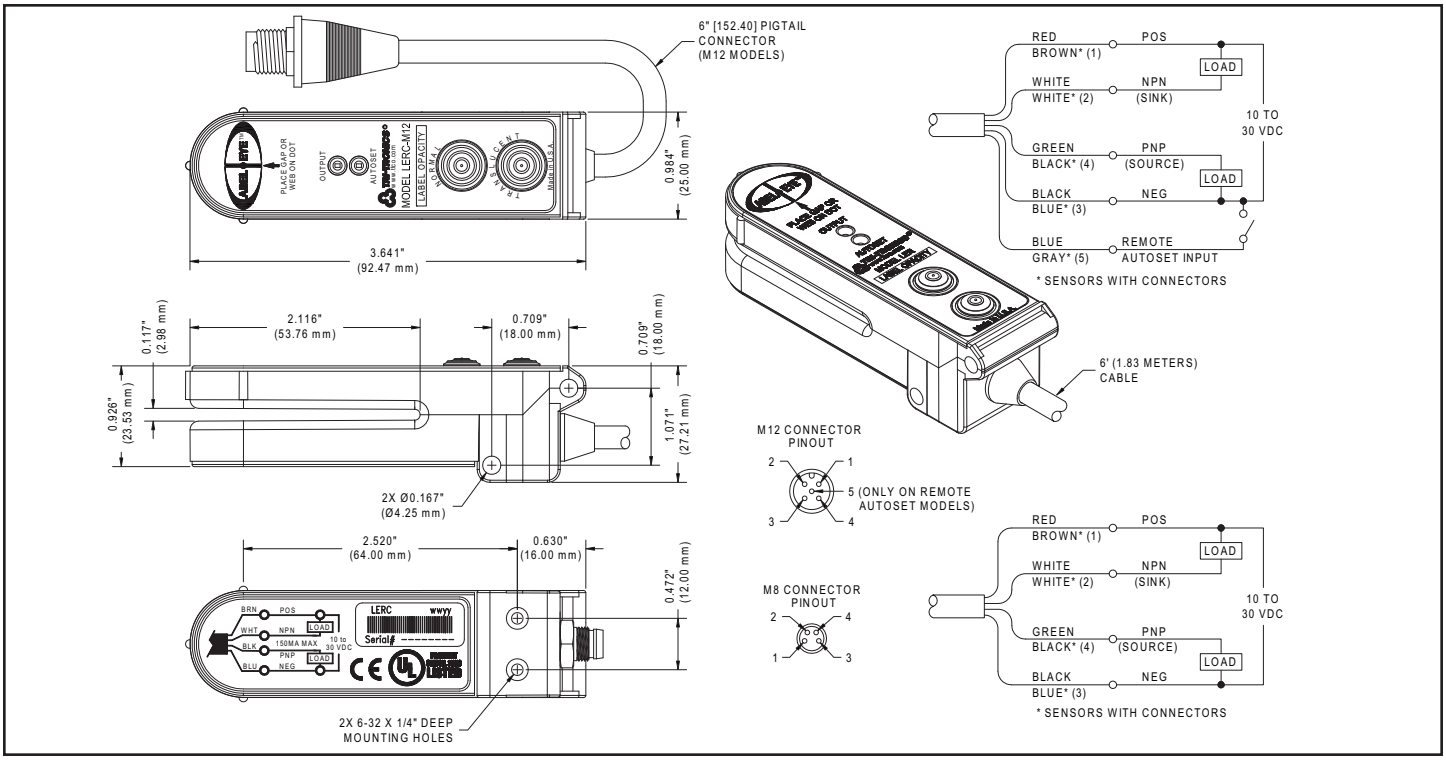
**Model Numbers:**

| Label•Eye | Description |
|---|---|
| LER | Red LED, 4 Conductor 6ft Cable |
| LERC | Red LED, 4-pin M8 Connector |
| LERR | Red LED, 5 Conductor, 6ft Cable |
| LERRC-M12 | Red LED, 5-Pin M12 Pigtail Connector |
| LERC-M12 | Red LED, 4-Pin M12 Pigtail Connector |

**Nano Cable (M8) Selection Guide**

| P/N | Length | Thread Coupling |
|---|---|---|
| GEC-6 | 6ft (1.8m | Straight Female |
| GEC-15 | 15ft (4.6m) | Straight Female |
| RGEC-6 | 6ft (1.8m) | 90° Female |
| RGEC-15 | 15ft (4.6m) | 90° Female |

# DIMENSIONS





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813-886-4000 / 800-237-0946
ttco.com / info@ttco.com

**ASSEMBLY TITLE:** **Q33 PNEUMATIC ASSEMBLY**

**GENERAL FUNCTION:**

- The pneumatic assembly controls all air and vacuum functions under direction from the PLC
- Main functions are air assist, tamp pad vacuum, and tamp cylinder activation.
- The air assist tube provides a jet of air to the label, required to support the label as it is being dispensed.
- A filter removes water vapor from the compressed air, which could damage the pneumatic components.
- Vacuum holds the label on the tamp pad until a tamp cycle is initiated.

**SET UP AND ADJUSTMENT:**

- The supplied compressed air should be between 80 and 90 PSI with a flow greater than 2 CFM.
- Use the air assist adjustment to enable correct label feed onto the vacuum pad. See air assist set up and adjustment.
- Keep the filter positioned vertically, as the water must accumulate in the lower portion of the drain basin. If side labeling application, rotate the filter.

**MAINTENANCE**:

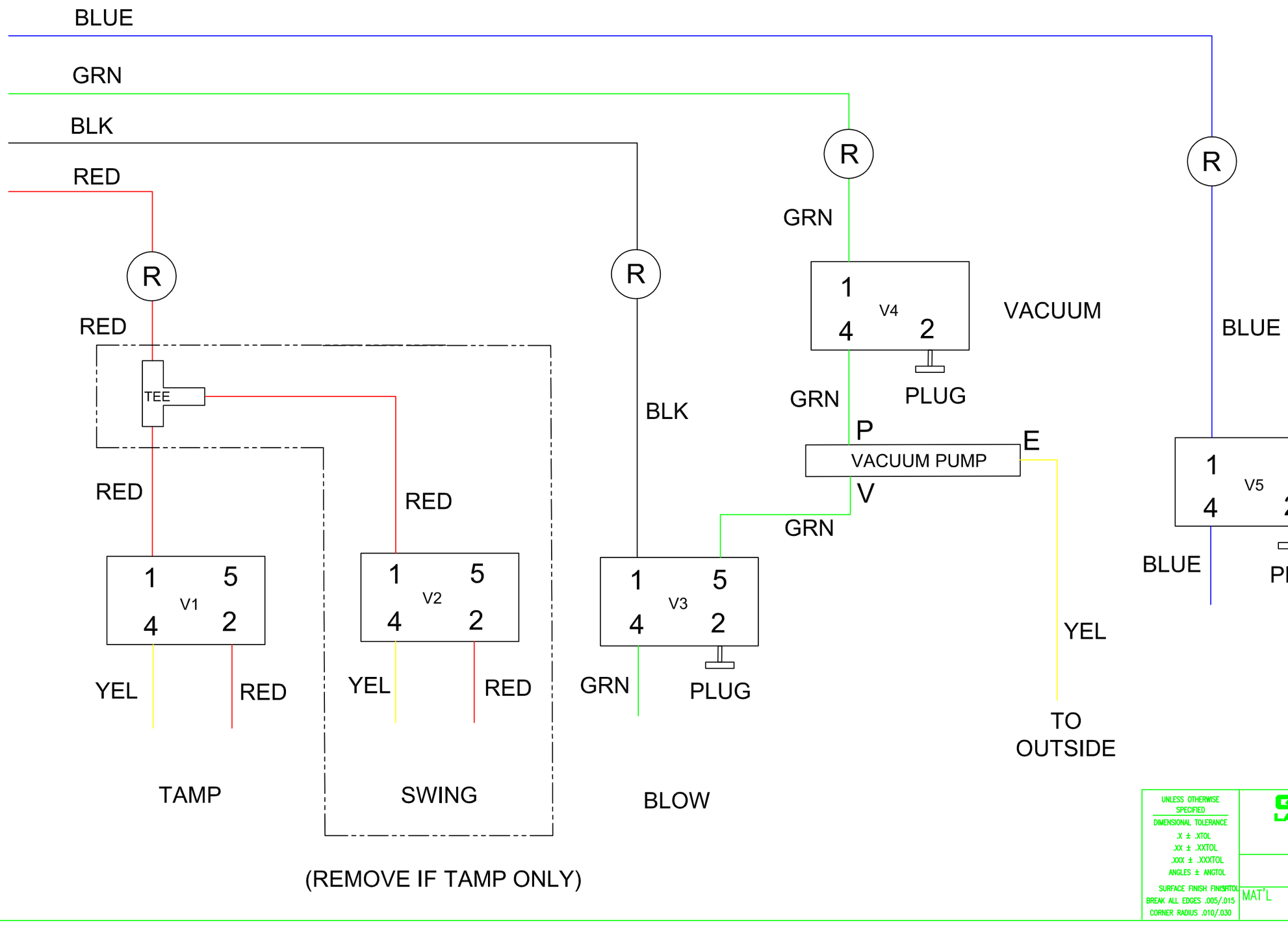
- Check the filter located at the side of the unit for water accumulation. Drain the water by loosening the valve at the bottom of the filter.
- Check air tubes for cracks or leaks. Replace if needed.

**TROUBLESHOOTING**:

| **Problem** | **What to Do** |
|---|---|
| -Label falls away | - Increase vacuum pressure<br>- Increase air assist pressure<br>- Rotate angle of the tube to 45° |

Also see Tamp Assembly Troubleshooting

MAIN AIR PIPE




| | | |
|---|---|---|
| UNLESS OTHERWISE SPECIFIED<br>DIMENSIONAL TOLERANCE<br>.X ± .XTOL<br>.XX ± .XXTOL<br>.XXX ± .XXXTOL<br>ANGLES ± ANGTOL<br>SURFACE FINISH FINISHTOL<br>BREAK ALL EDGES .005/.015<br>CORNER RADIUS .010/.030 | QUADREL LABELING SYSTEMS<br>7670 Jenther Drive<br>Mentor, Ohio 44060<br>(440) 602-4700 | SCALE: 1:1<br>DATE: 01AUG18<br>DRAWN BY: GW<br>REVISED: |
| | Q34 Pneumatics Schematic | |
| | MAT'L B22600-PNEU | B22600-PNEU |

INDENTED BILL OF MATERIAL

Items: 22639P-000 Thru 22639P-000 Location: 01 QUADREL WHSE
Activity Codes: Active Items Only
1 Levels With No Blow Through
No Selection On Basis Of Effectivity Date No Selection On Basis Of Obsolete Date

| Level | Seq | Component-Item | Component-Description | Opr Loc | UOM LLC | Draw | Scrap REV | Act P/M | Stk Ctl | B/I B/F | Qty On-Hand Qty-Allocated | Qty-Per-Parent Qty-On-Order |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parent Item: 22639P-000 | | Q44 | PNEUMATICS | Loc: 01 | LLC: 6 | | | | | | | |
| 1 | 145 | 392029-000 | FLOW CONTROL PIPE/TUBE FITTING | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | SMC AS2201F-N01-07S ******** | | 01 | 8 | | | P | Y | N | | |
| 1 | 150 | 391809-000 | FITTING, 90, 1/4 NPT, 3/8" TUB | 0 | EA | | .0 | A | Y | N | | 2.000000 |
| | | "SMC" KQ2L11-35AS ** | | 01 | 7 | | | P | Y | N | | |
| 1 | 170 | 392097-000 | PNEUMATICS, PLUG, 1/4" | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | "SMC" KQ2P-07 | | 01 | 7 | | | P | Y | N | | |
| 1 | 175 | 392819-000 | PLUG IN ELBOW, 3/8" TO 3/8" | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | "SMC" KQ2L11-99 | | 01 | 7 | | | P | Y | N | | |
| 1 | 195 | 391802-000 | FITTING, 90, 1/4 NPT, 1/4" TUB | 0 | EA | | .0 | A | Y | N | | 4.000000 |
| | | "SMC" KQ2L07-35AS | | 01 | 7 | | | P | Y | N | | |
| 1 | 200 | 392270-000 | REGULATOR W/GUAGE (INCL.NUT) | 0 | EA | | .0 | A | Y | N | | 4.000000 |
| | | "SMC" ARG20-NO2G1H-Z-B * | | 01 | 7 | | | P | Y | N | | |
| 1 | 205 | 391991-000 | ANCHOR COUPLING, 1/4 PIPE X | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | 3/4-16 THD., MDA#28-302 *** | | 01 | 7 | | | P | Y | N | | |
| 1 | 210 | 391201-000 | FILTER, AIR WITH BRACKET * | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | "SMC" AF20-N02B-CZ-A * | | 01 | 7 | | | P | Y | N | | |
| 1 | 215 | 391191-000 | VALVE,SMC PORTED VALVE 1/8" TH | 0 | EA | | .0 | A | Y | N | | 4.000000 |
| | | SMC #VQZ2121-5L1-N7T | | 01 | 7 | | | P | Y | N | | |
| 1 | 225 | 392109-000 | FITTING, 90 4P, 1/4NPT, 3/8" T | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | "SMC" KQ2ZD11-35AS | | 01 | 7 | | | P | Y | N | | |
| 1 | 230 | 392097-000 | PNEUMATICS, PLUG, 1/4" | 0 | EA | | .0 | A | Y | N | | 2.000000 |
| | | "SMC" KQ2P-07 | | 01 | 7 | | | P | Y | N | | |
| 1 | 235 | 392107-000 | ELBOW,MALE 1/4"TUBE X 1/16"THD | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | SMC KJL07-33NS | | 01 | 7 | | | P | Y | N | | |
| 1 | 240 | 391906-000 | ELBOW,90 DEGREE 1/4FEM-1/4MALE | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | SMC #KV-LS35-99 ***** | | 01 | 7 | | | P | Y | N | | |
| 1 | 245 | 392146-000 | REDUCER 5/16" TO 1/4" TUBE | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | "SMC" KQ2R07-09A | | 01 | 7 | | | P | Y | N | | |
| 1 | 250 | 392147-000 | REDUCER 3/8" TO 1/4" TUBE | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | "SMC" KQ2R07-11A | | 01 | 7 | | | P | Y | N | | |
| 1 | 255 | 392609-000 | VACUUM GENERATOR | 0 | EA | | .0 | A | Y | N | | 1.000000 |
| | | SMC# ZH13DS-09-11-11 *** | | 01 | 7 | | | P | Y | N | | |

INDENTED BILL OF MATERIAL

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 260 | 394428-001 | CONNECTOR, SOLENOID, 39" | | 0 | EA | .0 | A | Y | N | | | | 4.000000 |
| | | "SMC" #SY100-30-4A-10 *** | | 01 | 7 | | | P | Y | N | | | | |
| 1 | 265 | 392128-000 | BULKHEAD, 90, 9/16-18, 1/4" TU | | 0 | EA | .0 | A | Y | N | | | | 4.000000 |
| | | "SMC" KQ2LE07-00A | | 01 | 7 | | | P | Y | N | | | | |
| 1 | 270 | 391954-000 | COUPLING 1/4"NPT HOSE DISCONN. | | 0 | EA | .0 | A | Y | N | | | | 1.000000 |
| | | AIR CHIEF# DCP21B | | 01 | 7 | | | P | Y | N | | | | |
| 1 | 275 | 392277-000 | BULKHEAD, 90, 7/8-14, 3/8" TUB | | 0 | EA | .0 | A | Y | N | | | | 1.000000 |
| | | "SMC" KQ2LE11-00 (PACKS OF 10) | | 01 | 7 | | | P | Y | N | | | | |

**ASSEMBLY TITLE: TAMP CYLINDER, MECHANICAL ADJUSTMENT**

**GENERAL FUNCTION:**

- The mechanical position of the tamp cylinder is critical for proper label placement.
- There are 3 axis of adjustment to assure pad positioning.

**NOTE:** Before attempting mechanical adjustment of the tamp applicator, power down unit and disconnect air.

**SET UP AND ADJUSTMENTS:**

**TAMP PAD ASSEMBLY HORIZONTAL POSITION:**

Normally the tamp pad should be centered to the dispensing edge of the printer. To adjust the horizontal position, loosen the (4) horizontal positioning screws located at the tamp cylinder mounting plate.

Position the tamp/air cylinder assembly as required to center the assembly to the dispensing edge of the printer. Re-tighten when centered.

**TAMP PAD ASSEMBLY VERTICAL POSITION:**

- For vertical adjustment, loosen the (2) socket head screws holding the tamp cylinder mounting block to the applicator side plate. Move the entire assembly as needed. Re-tighten the (2) socket head screws when the proper position is set.
- Manually move the tamp pad down to verify the correct position and clearance from the printer and air assist tube.
- The lower face of the tamp pad should be positioned even or about 0.01” above the label peel edge.
- Use the JOG function to feed labels and index the tamp applicator. Observe the position of the label on the tamp pad as it its applied. Adjust the position of the tamp applicator as required. Once a label is dispensed, it should be centered across the width of the tamp pad.

**ASSEMBLY TITLE:** **TAMP CYLINDER, MECHANICAL ADJUSTMENT**

**TROUBLESHOOTING**:

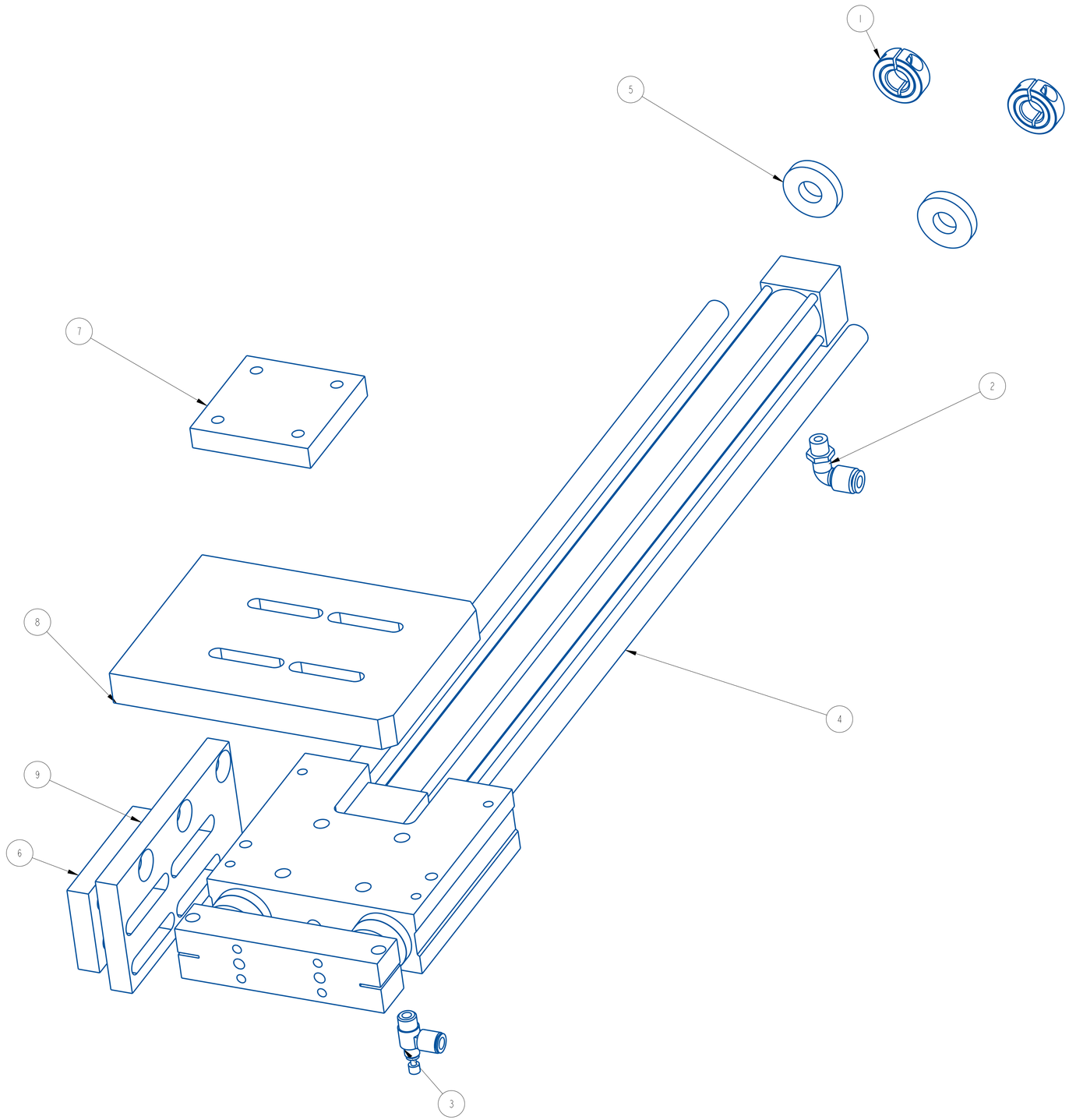
| **Problem** | **What to Do** |
|---|---|
| - Label not positioned on tamp pad correctly | - Correct tamp cylinder position |
| - Label not feeding completely onto tamp pad. | - Tamp pad to far from peel edge. |
| - Label jams into the side of the | - Tamp pad vertical position to low tamp pad. |



| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 2 | 361169-000 | COLLAR, 1/2 IN. ID ONE-PIECE CLAMP | 22600T-018 |
| 2 | 1 | 391801-000 | FITTING, 1/4 TUBE X 1/8 NPT ELBOW | 22600T-018 |
| 3 | 1 | 392029-000 | FLOW CONTROL FITTING | 22600T-018 |
| 4 | 1 | 393531-000 | POWER SLIDE 18" STROKE CYL. | 22600T-018 |
| 5 | 2 | 393561-000 | BUMPERS FOR PHD CYLINDER | 22600T-018 |
| 6 | 1 | A20641-001 | STRAP PLATE | 22600T-018 |
| 7 | 1 | A20642-000 | STRAP PLATE | 22600T-018 |
| 8 | 1 | B20164-000 | SLIDE MOUNTING PLATE | 22600T-018 |
| 9 | 1 | B20165-006 | SLIDE PLATE MOUNTING PLATE | 22600T-018 |

NOT SHOWN:

B25032-1003 TAMP PAD BLOCK, 3.0" X 5.0"
B25032-257 TAMP PAD 3" X 5"




| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | Sep-27-24 | NEW DRAWING | TAZ |

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DIMENSIONAL TOLERANCE
X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

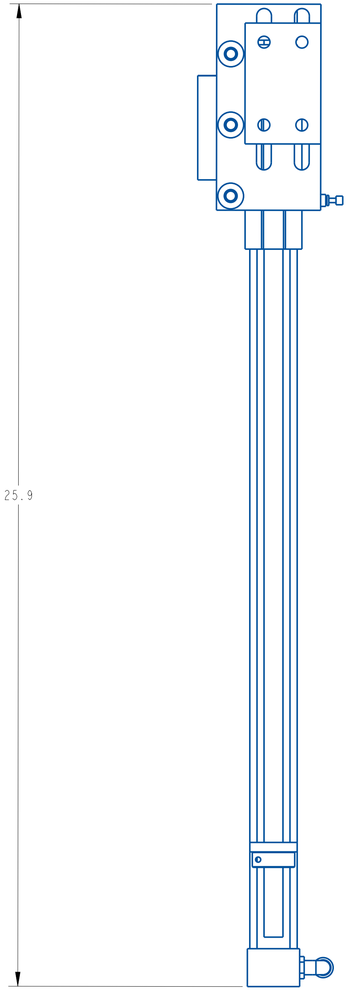
QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

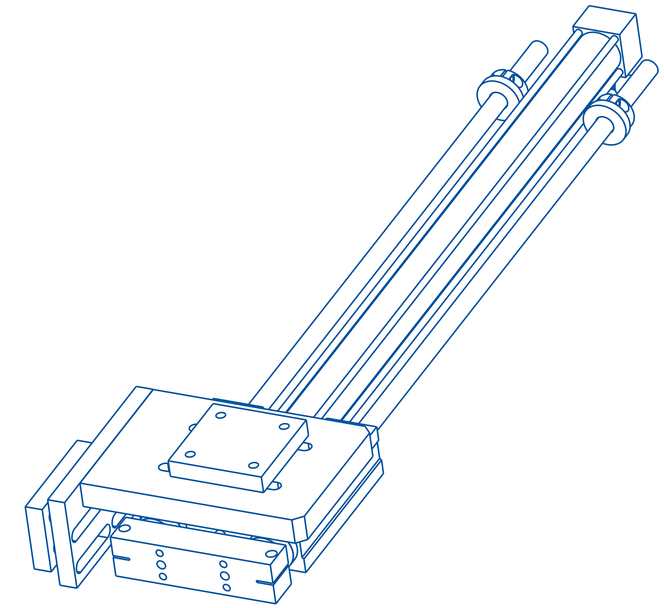
SCALE: 13/16
DATE: Sep-27-24
DRW BY: TAZ
CHK BY:10/03/2024-SEM
APPR BY:

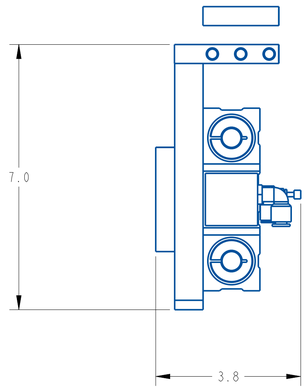
Q34 TAMP ASSEMBLY

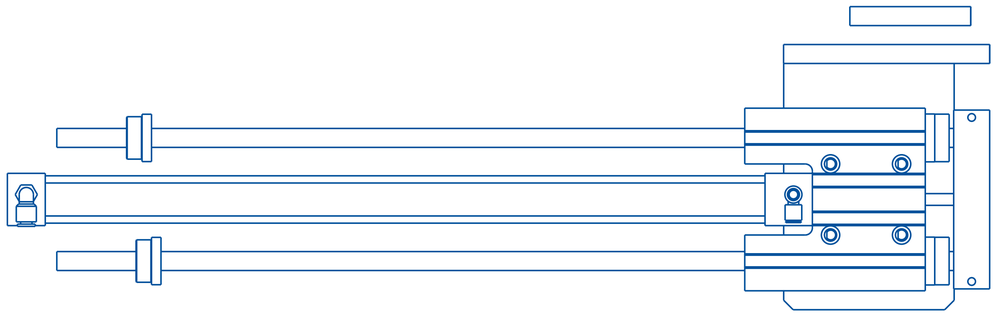
MAT'L

22600T-018





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| A | Sep-27-24 | NEW DRAWING | TAZ |

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DIMENSIONAL TOLERANCE
X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

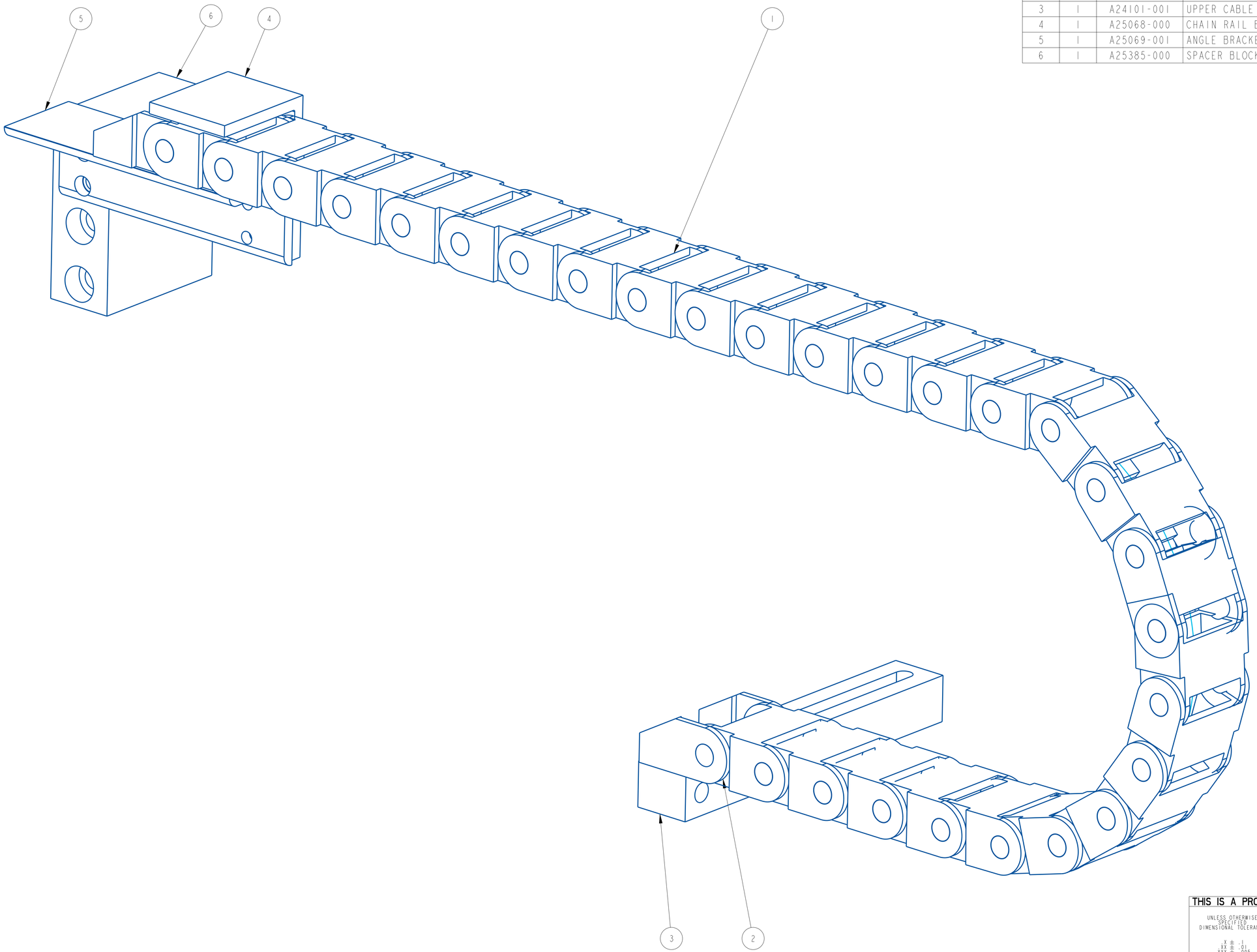
SCALE: 1/2
DATE: Sep-27-24
DRW BY: TAZ
CHK BY:10/03/2024-SEM
APPR BY:

Q34 TAMP ASSEMBLY

MAT'L

22600T-018

| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 1 | 792155-000 | ENERGY CHAIN | 21583-004 |
| 2 | 1 | 792155-001 | MOUNTING BRACKET | 21583-004 |
| 3 | 1 | A24101-001 | UPPER CABLE CARRIER MOUNTING BLOCK | 21583-004 |
| 4 | 1 | A25068-000 | CHAIN RAIL BRACKET | 21583-004 |
| 5 | 1 | A25069-001 | ANGLE BRACKET | 21583-004 |
| 6 | 1 | A25385-000 | SPACER BLOCK, ENERGY CHAIN | 21583-004 |




| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | 1-25-19 | NEW DRAWING | TJS |

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UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE
X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30°

SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .0107.030

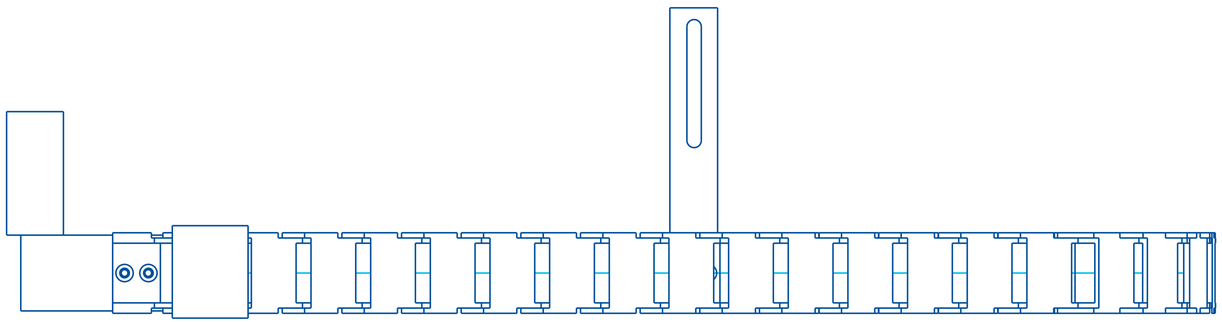
QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

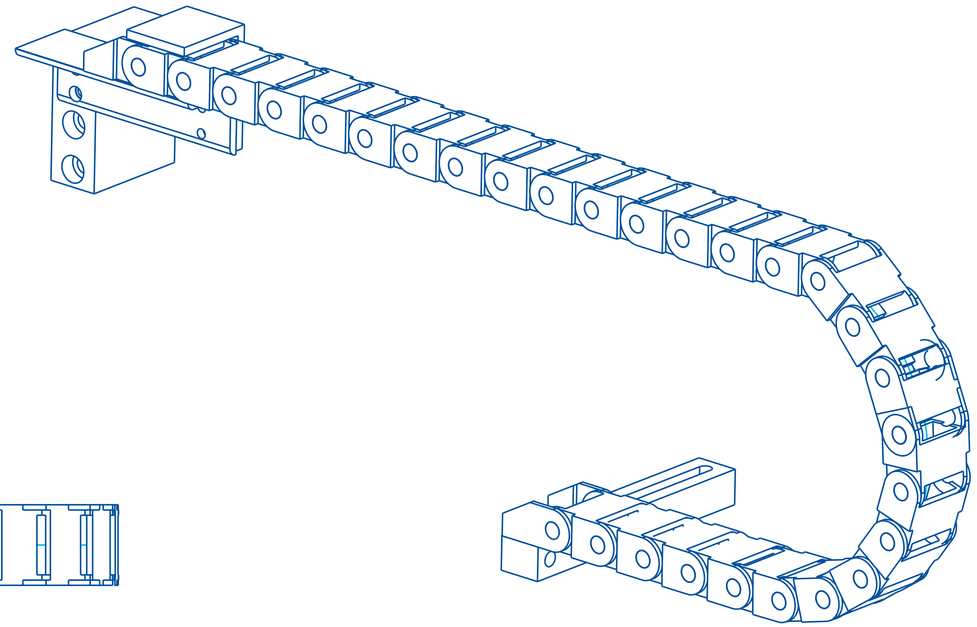
SCALE: 2/1
DATE: 1-25-19
DRW BY: TJS
CHK BY:03/15/2024-SEM
APPR BY:

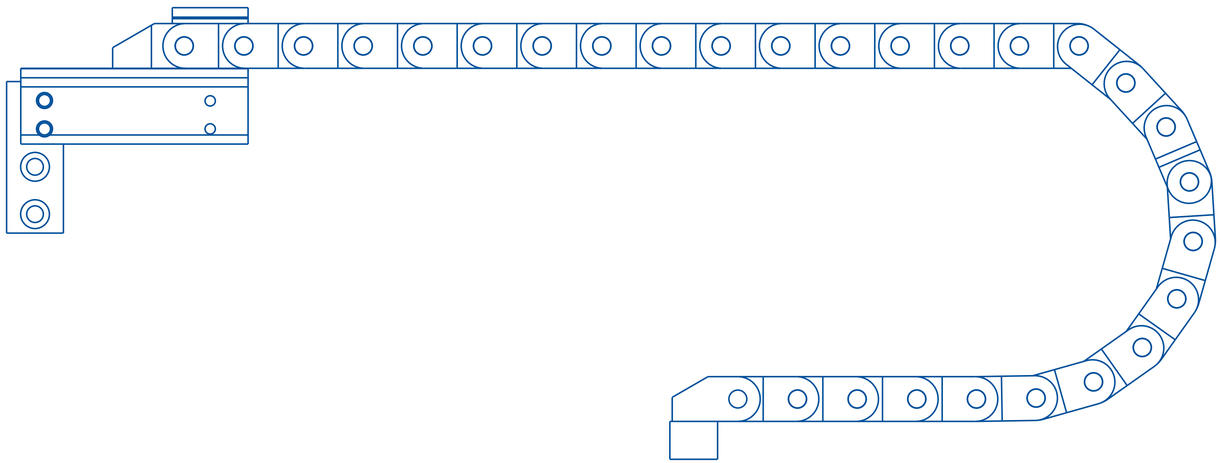
CABLE CARRIER ASSEMBLY

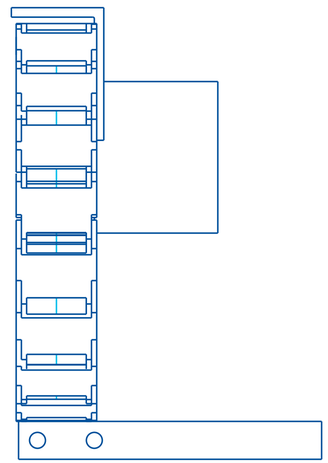
MAT'L

21583-004









| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | TJS | NEW DRAWING | TJS |

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UNLESS OTHERWISE SPECIFIED
DIMENSIONAL TOLERANCE
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XX ± .01
XXX ± .005
ANGLES ± 30'

SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

SCALE: 1/1
DATE: 1-25-19
DRW BY: TJS
CHK BY:03/15/2024-SEM
APPR BY:

CABLE CARRIER ASSEMBLY

MAT'L

21583-004

INDENTED BILL OF MATERIAL

Items: 22639SN-008 Thru 22639SN-008 Location: 01 QUADREL WHSE
Activity Codes: Active Items Only
1 Levels With No Blow Through
No Selection On Basis Of Effectivity Date No Selection On Basis Of Obsolete Date

| Level | Seq | Component-Item | Component-Description | Loc | Opr LLC | UOM Draw | Scrap REV | Act P/M | Stk Ctl | B/I B/F | Qty On-Hand Qty-Allocated | Qty-Per-Parent Qty-On-Order |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parent Item: 22639SN-008 | | | SENSOR KIT, SMART TAMP PNP, M8 QD HALL | 01 | LLC: 1 | | | | | | | |
| 1 | 5 | 271305-001 | HALL EFFECT SENSOR BRACKET | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | "PHD" 92100 | | 01 | 8 | | | P | Y | N | | |
| 1 | 10 | 252019-000 | CONNECTOR, M12, 4P, MALE | | 0 | EA | .0 | A | Y | N | | 3.000000 |
| | | "LUMBERG" RSC4/7 | | 01 | 10 | | | P | Y | N | | |
| 1 | 15 | 202201-001 | MOUNTING BRACKET FOR FS-N41 | | 0 | EA | .0 | A | Y | N | | 2.000000 |
| | | "KEYENCE" OP-88245 | | 01 | 7 | | | P | Y | N | | |
| 1 | 20 | A23728-000 | SENSOR TUBE, 3/8" X 3" | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | | | 01 | 7 | | | M | Y | N | | |
| 1 | 25 | A23727-000 | LOW LEVEL BRACKET | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | | | 01 | 8 | | | M | Y | N | | |
| 1 | 30 | 203170-000 | FIBER, REFLECTIVE, M6 HEAD | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | "KEYENCE" FU-67V | | 01 | 7 | | | P | Y | N | | |
| 1 | 35 | 202201-000 | DIGITAL FIBER AMPLIFIER, PNP | | 0 | EA | .0 | A | Y | N | | 2.000000 |
| | | "KEYENCE" FS-N41P | | 01 | 7 | | | P | Y | N | | |
| 1 | 40 | 271316-002 | SENSOR, HALL EFFECT, PNP M8 QD | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | "PHD" JC1HDP-K | | 01 | 6 | | | P | Y | N | | |
| 1 | 45 | 202624-000 | CABLE, M8, 3 PIN, 2m | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | LUMBERG# RKMV3-224-2M *** | | 01 | 7 | | | P | Y | N | | |
| 1 | 50 | 202960-000 | REFLECTIVE FIBER ARMORED TOUGH | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | "KEYENCE" FU-67G | | 01 | 7 | | | P | Y | N | | |
| 1 | 55 | A20733-001 | SENSOR MTG. BRACKET | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | 6mm THREAD | | 01 | 7 | | | M | Y | N | | |
| 1 | 60 | 841378-001 | SHOULDER BOLT,5/16 X 1 1/4" LG | | 0 | EA | .0 | A | Y | N | | 4.000000 |
| | | SS. | | 01 | 7 | | | M | Y | N | | |
| 1 | 65 | 811233-000 | SPRING-COMPRESSION | | 0 | EA | .0 | A | Y | N | | 4.000000 |
| | | "LEE" LC-045G-6 STAINLESS STL. | | 01 | 7 | | | P | Y | N | | |
| 1 | 70 | A21358-001 | Q32 SMART TAMP MTG. BLOCK | | 0 | EA | .0 | A | Y | N | | 1.000000 |
| | | | | 01 | 7 | | | M | Y | N | | |

# Tamp Pad Assembly

The tamp pad assembly is the mechanism which applies a label to the product. A printed label is fed from the printer to the tamp pad. A vacuum draws the label towards the pad with the adhesive side facing away from the pad. Once the label is completely dispensed from the liner, it is suspended under the pad by vacuum. Once a product is detected, the tamp pad extends, contacts the product and applies the label. The position of the tamp pad is critical to the correct operation of your labeling system.

**Procedure**

The tamp pad position may be adjusted as show below.

Each unique label requires a custom tamp pad. The pad is sized to match the label dimensions and the vacuum ports are drilled according to the shape of the label.

Position the tamp pad so that the slide is fully retracted. Loosen the vertical position locking screws and slide the tamp pad assembly so that the lower surface of the tamp pad is positioned slightly above the dispensing edge of the printer. After the correct height adjustment is achieved, lock the screws into position.

Loosen the screws which attach the tamp pad to the mounting block of the slide. Position the leading edge of the tamp pad, the edge closest to the dispensing edge of the printer, 3/16” away from the dispensing edge. After correct position is achieved, lock the pad into place.

To correctly set up a tamp pad to a peel edge two things must be kept in mind.

1. Maintain approx. 3/16” between the edge of the peel plate and the front of the tamp pad.
2. Maintain approx. 3/16” from the peel point to the bottom of the tamp pad.

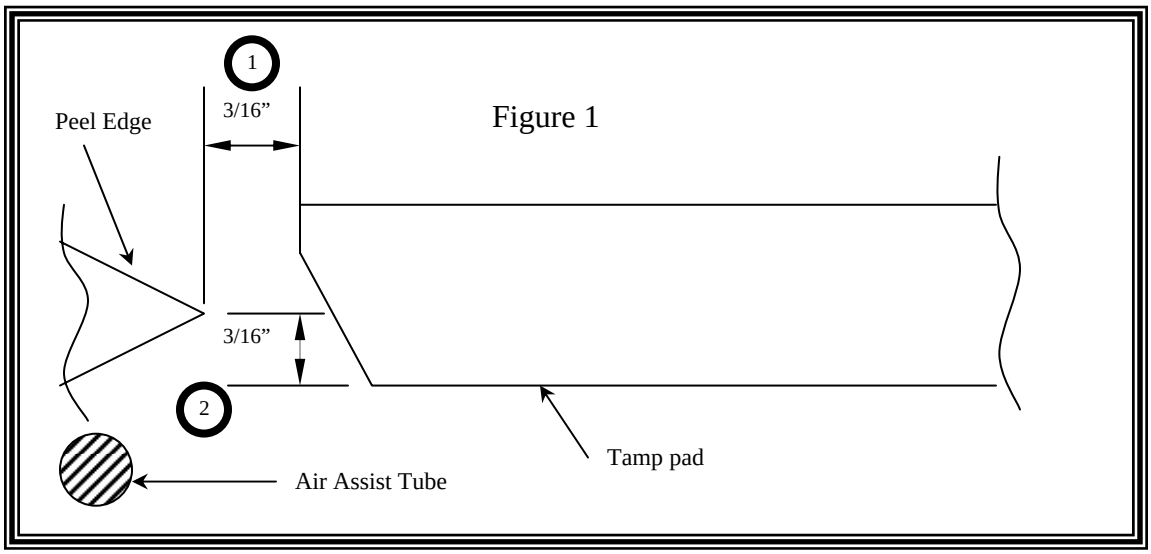



Figure 1

Loosen the horizontal position locking screw. After threading the labels through the labeler, center the tamp pad across the width of the label. Once a label is dispensed, it should be centered across the width of the tamp pad.

The four ports of the air assist delivery tube should be directed upwards towards the front of the vacuum tamp pad. The tube may slide along its axis to permit the centering of the ports across the width of the label. Unused ports not located under the label or tamp pad maybe covered with tape if not required. As each label is dispensed, the ports deliver a blast of air which directs the label out and onto the lower surface of the vacuum pad.

When the label is dispensed it should feed on to the chamfered edge of the peel plate, then follow along the angle of the tamp pad. The air assist will blow the label along the tamp pad and assist in pushing the label out on the pad.

**Note:** Figure 2

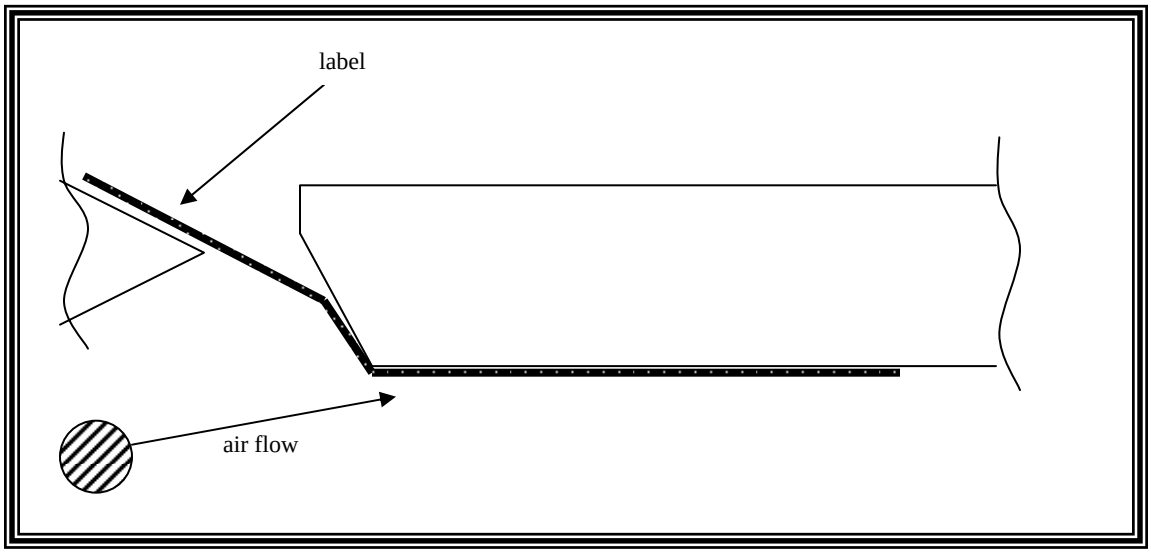



*Figure 2*

With the compressed air supply disconnected and with a label dispensed on the tamp pad, verify that the label is sitting below the peel plate edge. Verify that the dispensing edge of the printer does not interfere with the tamp cycle during extension or retraction.

**Note:** Figure 3

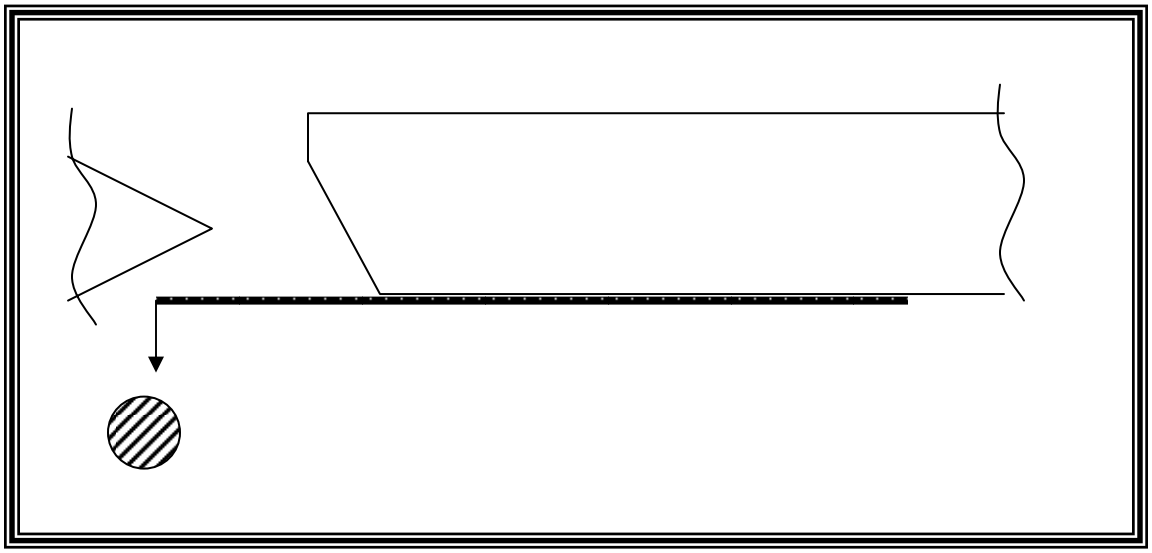


*Figure 3*

The speed and force associated with the extension and retraction of the air tamp cylinder are variable and are adjusted in a number of ways. The speed of extension is adjusted by opening and closing the intake/exhaust port of the cylinder.

In addition to regulating the rate of the tamp pad extension and retraction, the force contributing to the movement of the tamp cylinder may also be adjusted. A regulator mounted to the pneumatic control side panel permits the adjustment of the supply pressure to the tamp cylinder.

The tamp cylinder pressure maybe adjusted by first releasing the locking regulator knob by pulling on it. Once released, turn the knob in the direction indicated to raise or lower the pressure supplied to the tamp cylinder.

The pressure gauge reflects the static pressure of the air supply to the tamp cylinder. During operation, the reading may drop slightly while the tamp cylinder is in motion. The air pressure is typically set between 40-60psi. Adjust the pressure, so that the cylinder extends smoothly while fully impressing the label onto the product with out deforming or damaging the product.

While the labeler waits for a product, the vacuum tamp pad must securely hold the label in place until a product is in position to be labeled. The strength of the

vacuum is adjusted with a regulator mounted to the same side plate as the air tamp pressure regulator.

After releasing the knob, turn as indicated to increase or decrease the strength of the vacuum must be strong enough to prevent the label from falling from the pad. However, the vacuum should not prevent the proper dispensing of the label from the printer. If the label wrinkles, the vacuum is too strong.

The last major adjustment to the tamp pad assembly focuses on the air assist deliver tube. As previously described, the ports of the air assist delivery tube are angled towards the tamp pad. As a label is dispensed from the printer, compressed air flows from these ports and directs the label against the pad. The air assist pressure is adjusted in the same manner as the tamp pressure and the vacuum.

Typically operating pressure for the air assist is between 10-30psi. When the air assist is operating properly, the label does not blow across the pad. Instead, the label slides smoothly under the pad while it is being dispensed.

Although the air assist assembly only releases air flow during the dispensing of the label, the supply pressure maybe adjusted at any time.

After a label is applied to a product, and the tamp dwell cycle has expired, the tamp dwell cycle has expired, the tamp cylinder begins to retract. Once the tamp pad returns to its retracted position the microprocessor receives a signal that the tamp cycle is complete.

**ASSEMBLY TITLE:** **TAMP PAD POSITIONING**

**GENERAL FUNCTION:**

The tamp pad assembly is the support platform for label capture and application. As the label is dispensed over the tamp pad, the vacuum keeps it in place, ready for application. The position of the tamp pad is critical to reliable system operation as well as accurate and repeatable label placement.

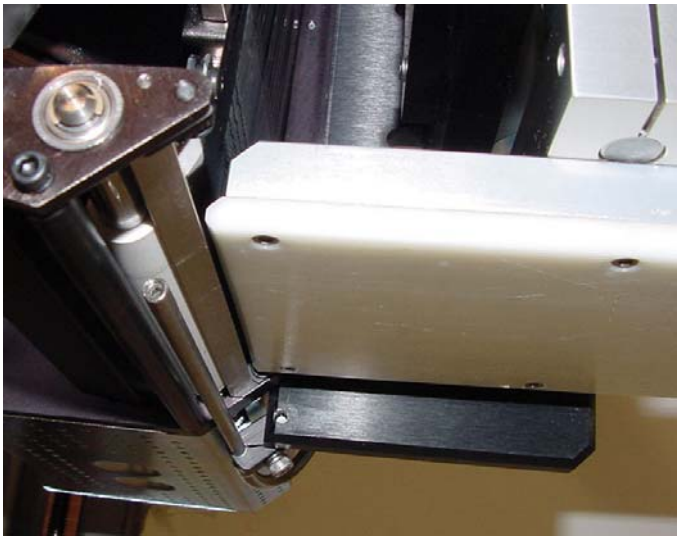
**SET UP AND ADJUSTMENTS:**

**NOTE:** For tamp cylinder adjustment, see previous section.

Insure that the air supply to the tamp cylinder is turned off.
Position the tamp pad so the slide is fully retracted by pulling the tamp pad to the full extended position.

Loosen the two screws which attach the tamp pad to the mounting block mounted on the end of the slide. Position the leading edge of the tamp pad (edge closest to the printer) so that the edge is approximately 1/16” away from the dispensing edge of the printer.

Position the leading edge of the tamp pad parallel to the dispensing edge of the printer. Lock the pad into place by tightening the locking screws.



**ASSEMBLY TITLE:** **TAMP PAD POSITIONING (CONT.)**

**TROUBLESHOOTING**:

| **Problem** | **What to Do** |
|---|---|
| - Label jams at leading edge pad. | - Tamp pad set to low. Raise position of tamp tamp pad |
| - Label applied at an angle | - Tamp pad not parallel to peel edge Re-seat to parallel position. |
| - Label falls away after feed | - Tamp pad set to high. Lower tamp pad with vertical adjustment. |

**ASSEMBLY TITLE:** **VACUUM AND TAMP PAD - SET UP AND ADJUSTMENT**

**DRAWING NO:** **CUSTOM PER LABEL**

**GENERAL FUNCTION:**

- A venturi style vacuum generator provides vacuum through the tamp pad holes to allow the label to be held during label application.
- This function is directly controlled by the vacuum air valve and by masking of the excessive tamp pad holes.
- The vacuum air adjustment controls the vacuum in the tamp pad that holds the label in place

**SET UP AND ADJUSTMENT:**

- Use the feed function on the printer to dispense labels
- Adjust the Vacuum air regulator until the label is retained by the tamp pad.
- Depending on the size of the label, areas of the tamp pad may be masked off with tape or label stock to increase the vacuum under the label retention area.
- If the labels in use are smaller than the tamp pad, mask off the unused portion of the pad with tape or label material. This will focus the vacuum at the point of label adhesion.

**TROUBLESHOOTING**:

| **Problem** | **What to Do** |
|---|---|
| -Label falls away | - Insufficient vacuum, Increase vacuum pressure.<br>- Mask off excessive holes in the tamp pad |

**ASSEMBLY TITLE:** **AIR ASSIST - SET UP AND ADJUSTMENT**

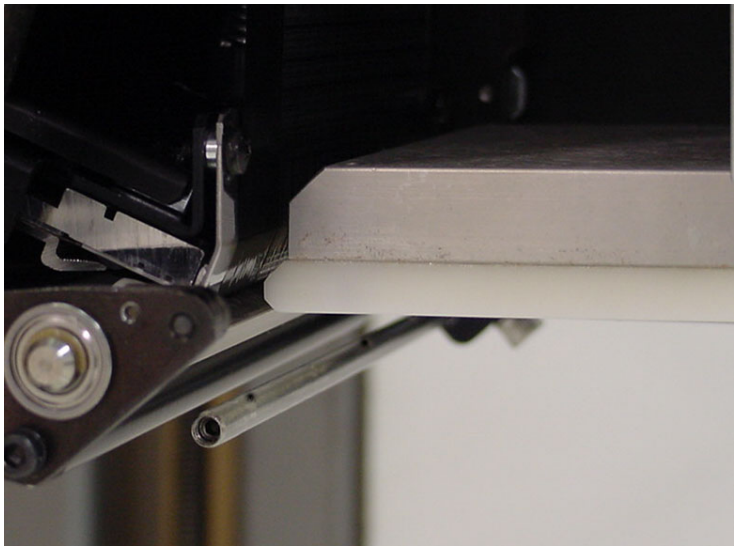
**DRAWING NO:** **SEE BELOW**

**GENERAL FUNCTION:**

- The air assist tube provides a jet of air to the label, required to support the label as it is being dispensed.
- This function is directly controlled by the air assist air valve and the position of the air assist tube.

**SET UP AND ADJUSTMENTS:**

- Normally the air assist tube is mechanically set at the factory. If re-positioning is necessary, follow these guidelines.
- To rotate tube, loosen the screw clamping the tube
- To set the angle of air assist direction, position the tube so that the exhaust holes are facing the label at a 45 degree angle.
- Final position:
    a. Under the label exit area of the printer
    b. Exhaust holes facing at 45 degree angle to the tamp pad.
    c. Exhaust holes centered on label exit area
- While feeding labels, adjust the AIR ASSIST pressure until the label is uniformly positioned under the tamp pad.
- Use jog button to cycle tamp and then feed a label onto the tamp pad



**ASSEMBLY TITLE:** **AIR ASSIST - SET UP AND ADJUSTMENT (CONT.)**

**TROUBLESHOOTING**:

| **Problem** | **What to Do** |
|---|---|
| -Label blows away | - Increase vacuum pressure<br>- Decrease air pressure to the air assist tube<br>- Rotate angle of the tube to 45 deg. of label |
| -Label falls away | - Increase vacuum pressure<br>- Increase air pressure to the air assist tube<br>- Rotate angle of the tube to 45 deg. of label |

**ASSEMBLY TITLE:** **PRODUCT DETECT ASSEMBLY**

**DRAWING NO.:** **B22291-MOD**

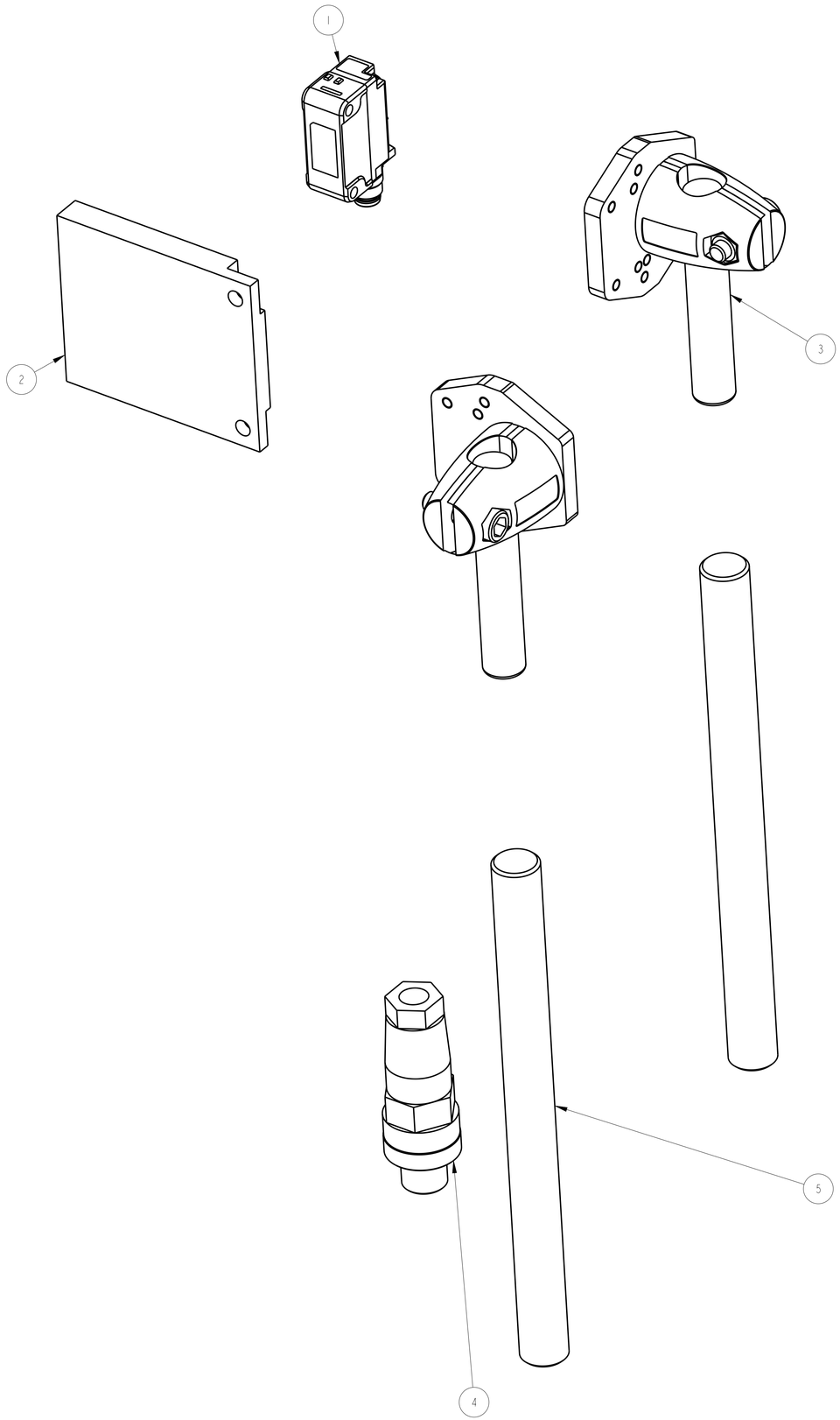
**GENERAL FUNCTION**:

- The product detect signal is used to trigger the labeling cycle. Optimum placement and setup of the product detect sensor is critical to accurate and repeatable label placement.

**SETUP AND ADJUSTMENTS**:

- Set the position of the product detect sensor at a point up-steam of the peel plate area.
- Set the vertical position of the sensor at a point on the product that provides a stable and repeatable sense area. Loosen the bolts securing the sensor, and move as required, then retighten screws.
- The sensor is configured at the factory for optimum performance however if a new product is introduced adjustments may be required or a different sensor may if adjustments are required please refer to manufacturers data sheet for detailed setup and calibration if needed.

**MAINTENANCE:** None




| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 1 | 203376-001 | LASER SENSOR | 21679-014 |
| 2 | 1 | NOT USED | | 21679-014 |
| 3 | 2 | 203300-001 | | 21679-014 |
| 4 | 1 | 252019-000 | 4 PIN MALE CONNECTOR | 21679-014 |
| 5 | 2 | A20654-003 | ADJ. ROD | 21679-014 |

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | Jan-30-24 | NEW DRAWING | TAZ |

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SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

| | |
|---|---|
| SCALE | 3/2 |
| DATE | Jan-30-24 |
| DRAWN BY | TAZ |

PRODUCT DETECT

MAT'L 21679-016

21679-016

# Q4X Stainless Steel Laser Sensor

more sensors, more solutions

## Quick Start Guide

*Class 1 laser CMOS sensor with a discrete (PNP or NPN) output. Patent pending.*

This guide is designed to help you set up and install the Q4X Sensor. For complete information on programming, performance, troubleshooting, dimensions, and accessories, please refer to the Instruction Manual at *www.bannerengineering.com*. Search for p/n 181483 to view the Instruction Manual. Use of this document assumes familiarity with pertinent industry standards and practices.

For illustration purposes, the threaded barrel model Q4X images are used throughout this document.

**WARNING: Not To Be Used for Personnel Protection**

**Never use this device as a sensing device for personnel protection. Doing so could lead to serious injury or death.** This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

## Features

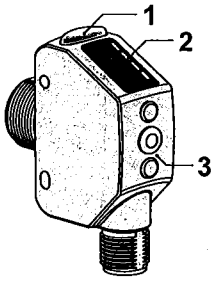



*Figure 1. Sensor Features—Threaded Barrel Models*

1. Output Indicator (Amber)
2. Display
3. Buttons

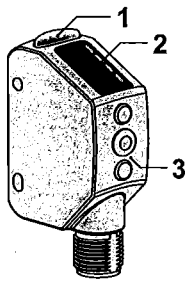



*Figure 2. Sensor Features—Flush Mount Models*

### Display and Indicators

The display is a 4-digit, 7-segment LED. The main screen is the Run mode screen.

For 2-pt, BGS, FGS, and DYN TEACH modes, the display shows the current distance to the target in millimeters. For dual TEACH mode, the display shows the percentage matched to the taught reference surface. A display value of 999P indicates the sensor has not been taught.

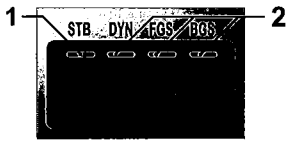



*Figure 3. Display in Run Mode*

1. Stability Indicator (STB—Green)
2. Active TEACH Indicators
   - DYN—Dynamic (Amber)
   - FGS—Foreground Suppression (Amber)
   - BGS—Background Suppression (Amber)

**Output Indicator**

- On—Outputs conducting (closed)
- Off—Outputs not conducting (open)

**Active TEACH Indicators (DYN, FGS, and BGS)**

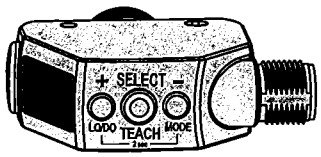
- DYN, FGS, and BGS all off—Two-point TEACH mode selected (default)
- DYN on—Dynamic TEACH mode selected
- FGS on—Foreground suppression TEACH mode selected
- BGS on—Background suppression TEACH mode selected
- DYN, FGS, and BGS all on—Dual TEACH mode selected

**Stability Indicator (STB)**

- On—Stable signal within the specified sensing range
- Flashing—Marginal signal, the target is outside the limits of the specified sensing range, or a multiple peak condition exists
- Off—No target detected within the specified sensing range

### Buttons

Use the sensor buttons **(SELECT)(TEACH)**, **(+)(DISP)**, and **(-)(MODE)** to program the sensor.




**(SELECT)(TEACH)**

- Press to select menu items in Setup mode
- Press and hold for longer than 2 seconds to start the currently selected TEACH mode (the default is two-point TEACH)

**(-)(MODE)**

- Press to navigate the sensor menu in Setup mode
- Press to change setting values; press and hold to decrease numeric values
- Press and hold for longer than 2 seconds to enter Setup mode

**(+)(DISP)**

- Press to navigate the sensor menu in Setup mode
- Press to change setting values; press and hold to increase numeric values
- Press and hold for longer than 2 seconds to switch between light operate (LO) and dark operate (DO)

**Note:** When navigating the menu, the menu items loop.

## Laser Description and Safety Information

**CAUTION:** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Do not attempt to disassemble this sensor for repair. A defective unit must be returned to the manufacturer.

**Class 1 Lasers**

Class 1 lasers are lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

COMPLIES WITH 21 CFR 1040.10 AND 1040.11
EXCEPT FOR DEVIATIONS PURSUANT TO
LASER NOTICE No. 50, DATED JUNE 24, 2007.
BANNER ENGINEERING CORP.
9714 10TH AVENUE NORTH
MINNEAPOLIS, MN 55441

CLASS 1
LASER PRODUCT

COMPLIES WITH IEC 60825-1:2007

**Laser wavelength:** 655 nm **Output:** < 0.20 mW **Pulse Duration:** 7 µs to 2 ms

## Installation

### Install the Safety Label

The safety label must be installed on Q4X sensors that are used in the United States.

**Note:** Position the label on the cable in a location that has minimal chemical exposure.

1. Remove the protective cover from the adhesive on the label.
2. Wrap the label around the Q4X cable, as shown.
3. Press the two halves of the label together.

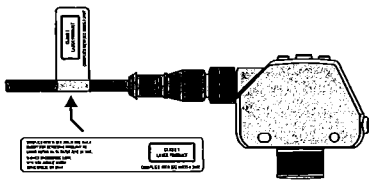


*Figure 4. Safety Label Installation*

## Sensor Orientation

Optimize detection reliability and minimum object separation performance with correct sensor-to-target orientation. To ensure reliable detection, orient the sensor as shown in relation to the target to be detected.

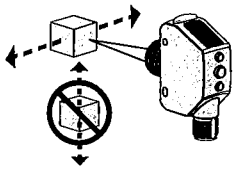


*Figure 5. Optimal Orientation of Target to Sensor*

See the following figures for examples of correct and incorrect sensor-to-target orientation as certain placements may pose problems for sensing some targets. The Q4X can be used in the less preferred orientation and provide reliable detection performance; refer to the *Performance Curves* for the minimum object separation distance required for each case.

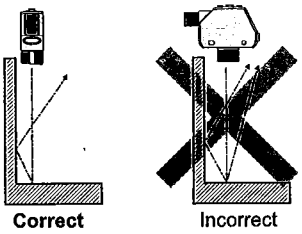



*Figure 6. Orientation by a wall*

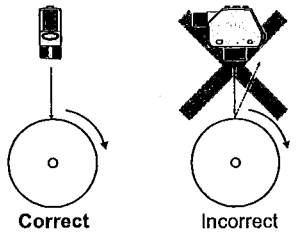



*Figure 7. Orientation for a turning object*

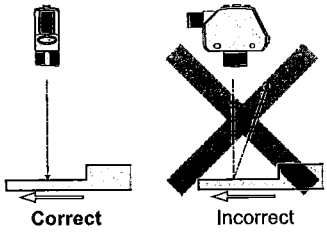



*Figure 8. Orientation for a height difference*

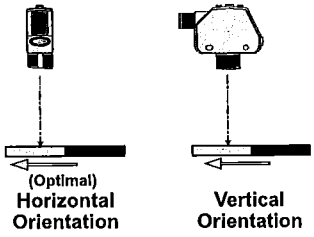
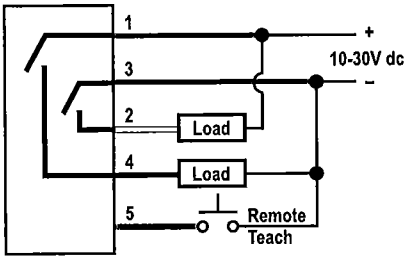


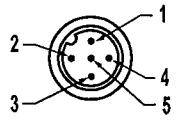

*Figure 9. Orientation for a color or luster difference*

## Mount the Sensor

1. If a bracket is needed, mount the sensor onto the bracket.
2. Mount the sensor (or the sensor and the bracket) to the machine or equipment at the desired location. Do not tighten the mounting screws at this time.
3. Check the sensor alignment.
4. Tighten the mounting screws to secure the sensor (or the sensor and the bracket) in the aligned position.

## Wiring Diagram—Threaded Barrel Models




**Key**

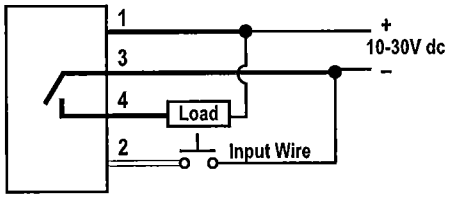
1 = Brown
2 = White
3 = Blue
4 = Black
5 = Gray

**Note:** Open lead wires must be connected to a terminal block.

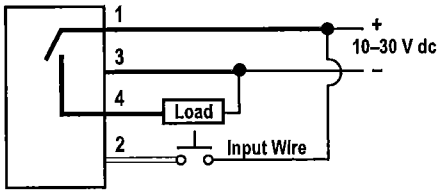
**Note:** The input wire function is user-selectable; see the Instruction Manual for details. The default for the input wire function is off (disabled).

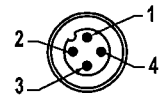
## Wiring Diagram—Flush Mount Models

**NPN Models**




**PNP Models**




**Key**
1 = Brown
2 = White
3 = Blue
4 = Black

**Note:** Open lead wires must be connected to a terminal block.

**Note:** The input wire function is user-selectable; see the Instruction Manual for details. The default for the input wire function is off (disabled).

## Cleaning and Maintenance

Handle the sensor with care during installation and operation. Sensor windows soiled by fingerprints, dust, water, oil, etc. may create stray light that may degrade the peak performance of the sensor. Blow the window clear using filtered, compressed air, then clean as necessary using water and a lint-free cloth.

## Sensor Programming

Program the sensor using the buttons on the sensor or the remote input (limited programming options).

In addition to programming the sensor, use the remote input to disable the buttons for security, preventing unauthorized or accidental programming changes. See the Instruction Manual, p/n 181483 for more information.

## Setup Mode

Access Setup mode and the sensor menu from Run mode by pressing and holding **MODE** for longer than 2 seconds. Use ⊕ and ⊖ to navigate through the menu. Press **SELECT** to select a menu option and access the submenus. Use ⊕ and ⊖ to navigate through the submenus. Press **SELECT** to select a submenu option and return to the top menu, or press and hold **SELECT** for longer than 2 seconds to select a submenu option and return immediately to Run mode.

To exit Setup mode and return to Run mode, navigate to End and press **SELECT**.

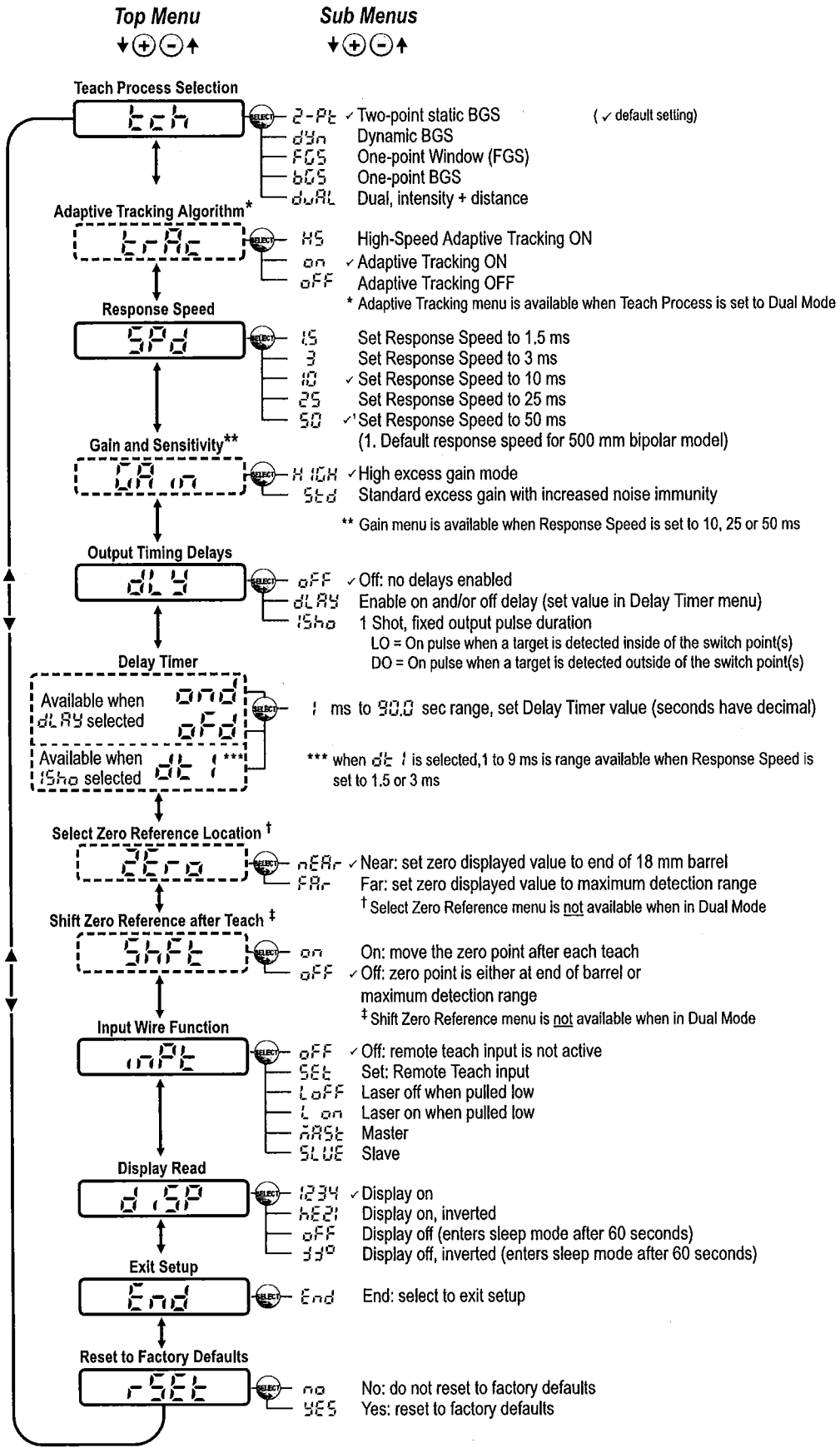



*Figure 10. Sensor Menu Map—Channel 1*

## Basic TEACH Instructions

Use the following instructions to teach the Q4X sensor. The instructions provided on the sensor display vary depending on the type of TEACH mode selected. Two-point TEACH is the default TEACH mode.

1. Press and hold **TEACH** for longer than 2 seconds to start the selected TEACH mode.
2. Present the target.
3. Press **TEACH** to teach the target. The target is taught and the sensor waits for the second target, if required by the selected TEACH mode, or returns to Run mode.

   Complete steps 4 and 5 only if required for the selected TEACH mode:
4. Present the second target.
5. Press **TEACH** to teach the target. The target is taught and the sensor returns to Run mode.

See the Instruction Manual for detailed instructions and other available TEACH modes. The TEACH modes include:

- Two-point static background suppression 2-Pt —Two-point TEACH sets a single switch point. The sensor sets the switch point between two taught target distances, relative to the shifted origin location.
- Dynamic background suppression dyn —Dynamic TEACH sets a single switch point during machine run conditions. The sensor takes multiple samples and the switch point is set between the minimum and the maximum sampled distances.
- One-point window (foreground suppression) FGS —One-point window sets a window (two switch points) centered around the taught target distance.
- One-point background suppression bGS —One-point background suppression sets a single switch point in front of the taught target distance. Objects beyond the taught switch point are ignored.
- Dual intensity + distance duAL —Dual mode records the distance and amount of light received from the reference surface. See *Dual Mode Reference Surface Considerations* on page 10 for more information about selecting a reference surface. The output switches when an object passing between the sensor and the reference surface changes the perceived distance or amount of returned light.

## Manual Adjustments

Manually adjust the sensor switch point using the ⊕ and ⊖ buttons.

1. From Run mode, press either ⊕ or ⊖ one time. The current switch point value flashes slowly.
2. Press ⊕ to move the switch point up or ⊖ to move the switch point down. After 1 second of inactivity, the new switch point value flashes rapidly, the new setting is accepted, and the sensor returns to Run mode.

**Note:** When FGS mode is selected (FGS indicator is on), manual adjustment moves both sides of the symmetrical threshold window simultaneously, expanding and collapsing the window size. Manual adjustment does not move the center point of the window.

**Note:** When dual mode is selected (DYN, FGS, and BGS indicators are on), after the TEACH process is completed, use the manual adjustment to adjust the sensitivity of the thresholds around the taught reference point. The taught reference point is a combination of the measured distance and returned signal intensity from the reference target.

Manual adjustment does not move the taught reference point, but pressing ⊕ increases the sensitivity, and pressing ⊖ decreases the sensitivity. When re-positioning the sensor or changing the reference target, re-teach the sensor.

## Light Operate/Dark Operate

The default output configuration is light operate. To switch between light operate and dark operate, use the following instructions:

1. Press and hold **LO/DO** for longer than 2 seconds. The current selection displays.
2. Press **LO/DO** again. The new selection flashes slowly.
3. Press **SELECT** to change the output configuration and return to Run mode.

**Note:** If neither **SELECT** nor **LO/DO** are pressed after step 2, the new selection flashes slowly for a few seconds, then flashes quickly and the sensor automatically changes the output configuration and returns to Run mode.

## Locking and Unlocking the Sensor Buttons

Use the lock and unlock feature to prevent unauthorized or accidental programming changes. Three settings are available:

- uLoc —The sensor is unlocked and all settings can be modified (default).
- Loc — The sensor is locked and no changes can be made.

- OLoc —The switch point value can be changed by teaching or manual adjustment, but no sensor settings can be changed through the menu.

When in Loc mode, Loc displays when the **(SELECT)(TEACH)** button is pressed. The switch point displays when **(+)(DISP)** or **(-)(MODE)** are pressed, but Loc displays if the buttons are pressed and held.

When in OLoc mode, Loc displays when **(+)(DISP)** or **(-)(MODE)** are pressed and held. To access the manual adjust options, briefly press and release **(+)(DISP)** or **(-)(MODE)**. To enter TEACH mode, press the **(SELECT)(TEACH)** button and hold for longer than 2 seconds.

To enter Loc mode, hold ⊕ and press ⊖ four times. To enter OLoc mode, hold ⊕ and press ⊖ seven times. Holding ⊕ and pressing ⊖ four times unlocks the sensor from either lock mode and the sensor displays uLoc.

## Specifications

**Sensing Beam**
Visible red Class 1 laser, 655 nm

**Supply Voltage (Vcc)**
10 to 30 V dc

**Power and Current Consumption, exclusive of load**
< 675 mW

**Sensing Range—Threaded Barrel Models**
**500 mm models:** 25 mm to 500 mm (0.98 in to 19.69 in)
**300 mm models:** 25 mm to 300 mm (0.98 in to 11.81 in)
**100 mm models:** 25 mm to 100 mm (0.98 in to 3.94 in)

**Sensing Range—Flush Mount Models**
**310 mm models:** 35 mm to 310 mm (1.38 in to 12.20 in)
**110 mm models:** 35 mm to 110 mm (1.38 in to 4.33 in)

**Output Configuration**
**Threaded Barrel Models:** Bipolar (1 PNP and 1 NPN) output
**Flush Mount Models:** PNP or NPN output, depending on model

**Output Rating**
100 mA total maximum (protected against continuous overload and short circuit)
**Off-state leakage current:** < 5 µA at 30 V dc
**PNP On-state saturation voltage:** < 1.5 V dc at 100 mA load
**NPN On-state saturation voltage:** < 1.0 V dc at 100 mA load

**Discrete Output Distance Repeatability**

*Table 1: Beam Spot Size—300/310 mm and 500 mm Models*

| Distance (mm) | | Repeatability |
|---|---|---|
| Threaded Barrel Models | Flush Mount Models | |
| 25 to 50 mm | 35 to 60 mm | ± 0.5 mm |
| 50 to maximum range | 60 to 310 mm | ± 1% of range |

*Table 2: Beam Spot Size—100/110 mm Models*

| Distance (mm) | | Repeatability |
|---|---|---|
| Threaded Barrel Models | Flush Mount Models | |
| 25 to 100 mm | 35 to 110 mm | +/-0.2 mm |

**Remote Input**
**Allowable Input Voltage Range:** 0 to Vcc
**Active Low (Internal weak pullup—sinking current):** Low State < 2.0 V at 1 mA max.

**Supply Protection Circuitry**
Protected against reverse polarity and transient overvoltages

**Response Speed**
User selectable:

- 1.5 —1.5 milliseconds
- 3 —3 milliseconds
- 10 —10 milliseconds
- 25 —25 milliseconds
- 50 —50 milliseconds

**Excess Gain—Threaded Barrel Models**

*Table 3: HIGH Excess Gain ( Std Excess Gain[1])*

| Response Speed (ms) | Excess Gain—90% White Card | | | |
|---|---|---|---|---|
| | at 25 mm | at 100 mm | at 300 mm | at 500 mm |
| 1.5 | 200 | 100 | 20 | 7 |
| 3 | 200 | 100 | 20 | 7 |
| 10 | 1000 (500) | 500 (250) | 100 (50) | 36 (18) |
| 25 | 2500 (1000) | 1250 (500) | 250 (100) | 90 (36) |
| 50 | 5000 (2500) | 2500 (1250) | 500 (250) | 180 (90) |

**Excess Gain—Flush Mount Models**

*Table 4: HIGH Excess Gain ( Std Excess Gain[2])*

| Response Speed (ms) | Excess Gain—90% White Card | | |
|---|---|---|---|
| | at 35 mm | at 110 mm | at 310 mm |
| 1.5 | 200 | 100 | 20 |
| 3 | 200 | 100 | 20 |
| 10 | 1000 (500) | 500 (250) | 100 (50) |
| 25 | 2500 (1000) | 1250 (500) | 250 (100) |
| 50 | 5000 (2500) | 2500 (1250) | 500 (250) |

1
- Std *excess gain available in 10 ms, 25 ms, and 50 ms response speeds only*
- Std *excess gain provides increased noise immunity*

2
- Std *excess gain available in 10 ms, 25 ms, and 50 ms response speeds only*
- Std *excess gain provides increased noise immunity*

### Beam Spot Size—300/310 mm and 500 mm Models

*Table 5: Beam Spot Size—300/310 mm and 500 mm Models*

| Distance (mm) | | Size (Horizontal × Vertical) |
|---|---|---|
| Threaded Barrel Models | Flush Mount Models | |
| 25 | 35 | 2.6 mm × 1.0 mm |
| 150 | 160 | 2.3 mm × 0.9 mm |
| 300 | 310 | 2.0 mm × 0.8 mm |
| 500 | - | 1.9 mm × 1.0 mm |

### Beam Spot Size—100/110 mm Models

*Table 6: Beam Spot Size—100/110 mm Models*

| Distance (mm) | | Size (Horizontal × Vertical) |
|---|---|---|
| Threaded Barrel Models | Flush Mount Models | |
| 25 | 35 | 2.4 mm × 1.0 mm |
| 50 | 60 | 2.2 mm × 0.9 mm |
| 100 | 110 | 1.8 mm × 0.7 mm |

**Delay at Power Up**
< 750 ms

**Maximum Torque**
**Side mounting:** 1 N·m (9 in·lbs)
**Nose mounting:** 20 N·m (177 in·lbs)

**Ambient Light Immunity**
> 5,000 lux at 300 mm
> 2,000 lux at 500 mm

**Connector**
**Threaded Barrel Models:** Integral 5-pin M12/Euro-style male quick disconnect (QD)
**Flush Mount Models:** Integral 4-pin M12/Euro-style male quick disconnect (QD)

**Construction**
**Housing:** 316 L stainless steel
**Lens cover:** PMMA acrylic
**Lightpipe and display window:** polysulfone

**Temperature Effect**
0.05 mm/°C at <125 mm (threaded barrel models)/< 135 mm (flush mount models)
0.35 mm/°C at 300 mm (threaded barrel models)/< 310 mm (flush mount models)
1 mm/°C at 500 mm (threaded barrel models)

**Chemical Compatibility**
Compatible with commonly used acidic or caustic cleaning and disinfecting chemicals used in equipment cleaning and sanitation. ECOLAB® certified.
Compatible with typical cutting fluids and lubricating fluids used in machining centers

**Application Note**
For optimum performance, allow 10 minutes for the sensor to warm up

**Environmental Rating**
IEC IP67 per IEC60529
IEC IP68 per IEC60529
IEC IP69K per DIN40050-9

**Vibration**
MIL-STD-202G, Method 201A (10 Hz to 60 Hz, 0.06 inch (1.52 mm) double amplitude, 2 hours each along X, Y and Z axes), with sensor operating

**Shock**
MIL-STD-202G, Method 213B, Condition I (100G 6x along X, Y and Z axes, 18 total shocks), with sensor operating

**Operating Conditions**
–10 °C to +50 °C (+14 °F to +122 °F)
35% to 95% relative humidity

**Storage Temperature**
–25 °C to +75 °C (–13 °F to +167 °F)

**Required Overcurrent Protection**

**WARNING:** Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.
Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.
Supply wiring leads < 24 AWG shall not be spliced.
For additional product support, go to *www.bannerengineering.com*.

| Supply Wiring (AWG) | Required Overcurrent Protection (Amps) |
|---|---|
| 20 | 5.0 |
| 22 | 3.0 |
| 24 | 2.0 |
| 26 | 1.0 |
| 28 | 0.8 |
| 30 | 0.5 |

**Certifications**

Class 2 power
UL Environmental Rating: Type 1

chemical compatibility certified

## Performance Curves—Threaded Barrel Models

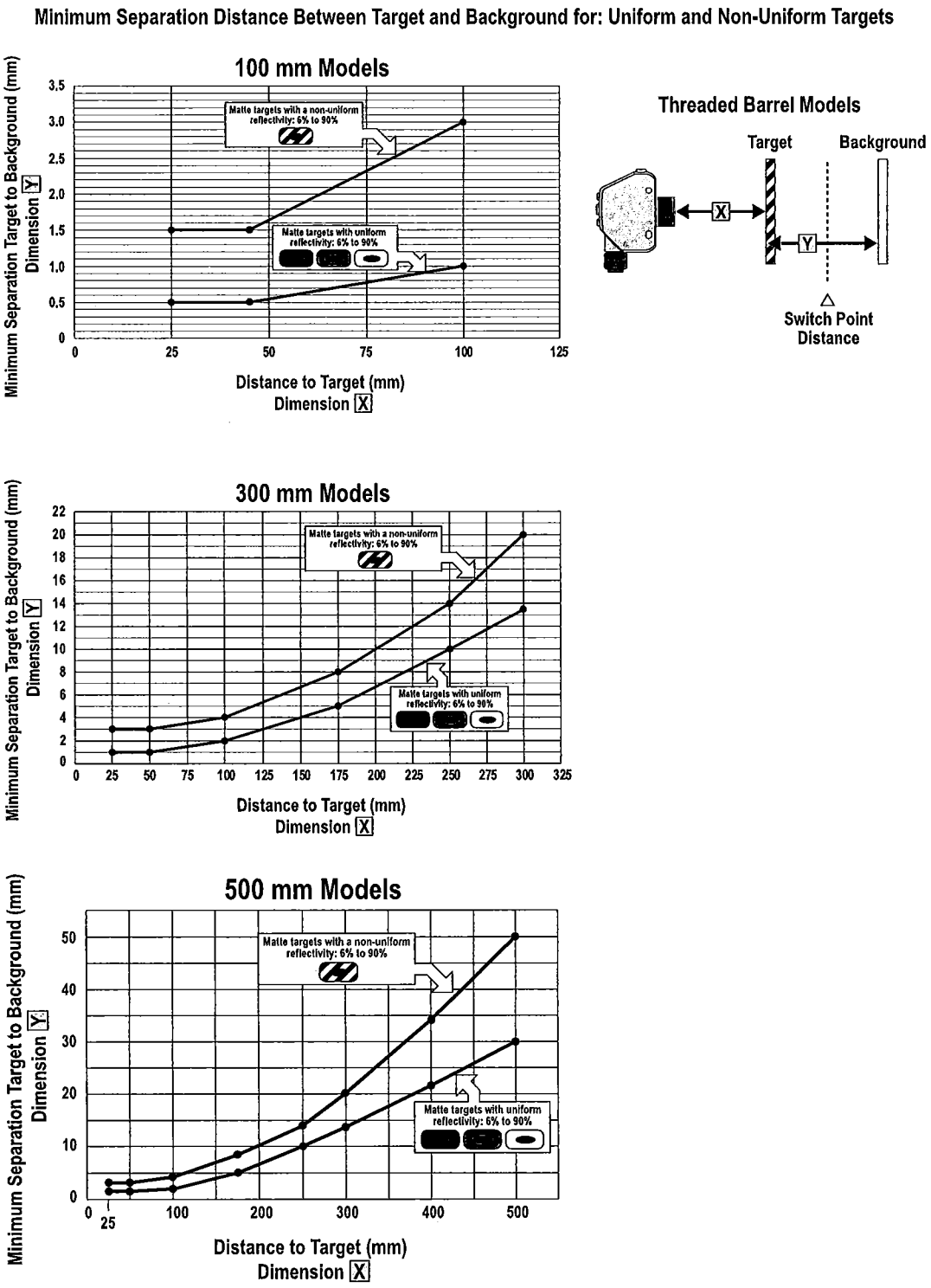



*Figure 11. Minimum Object Separation Distance (90% to 6% reflectance)*

## Performance Curves—Flush Mount Models

**Minimum Separation Distance Between Target and Background for: Uniform and Non-Uniform Targets**

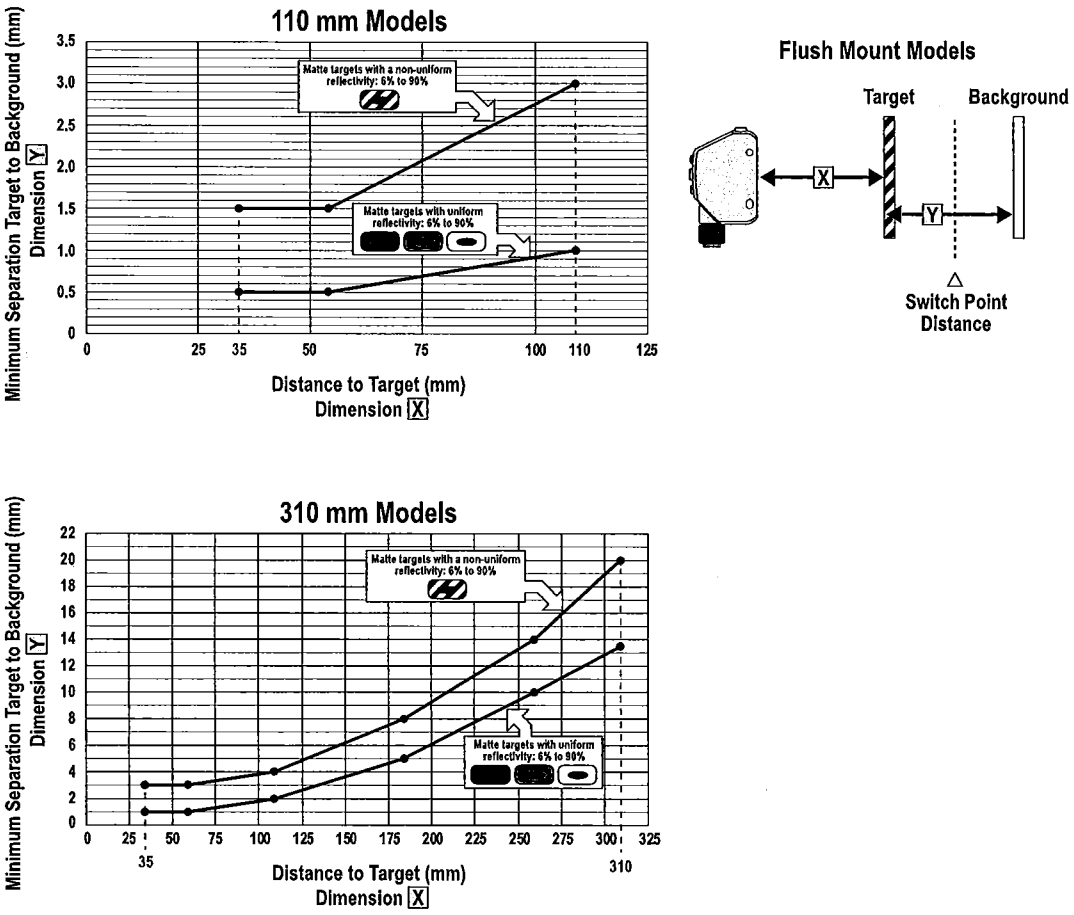



*Figure 12. Minimum Object Separation Distance (90% to 6% reflectance)*

## Dual Mode Reference Surface Considerations

Optimize reliable detection by applying these principals when selecting your reference surface, positioning your sensor relative to the reference surface, and presenting your target. The robust detection capabilities of the Q4X allows successful detection even under non-ideal conditions in many cases. Typical reference surfaces are metal machine frames, conveyor side rails, or mounted plastic targets. Contact Banner Engineering if you require assistance setting up a stable reference surface in your application. For detailed instructions for detecting clear or transparent objects, refer to the Instruction Manual, p/n 181483.

1. Select a reference surface with these characteristics where possible:
   - Matte or diffuse surface finish
   - Fixed surface with no vibration
   - Dry surface with no build-up of oil, water, or dust
2. Position the reference surface between 50 mm and the maximum sensing range for threaded barrel models or between 60 mm and the maximum sensing range for flush mount models.
3. Position the target to be detected as close to the sensor as possible, and as far away from the reference surface as possible.
4. Angle the sensing beam relative to the target and relative to the reference surface 10 degrees or more.

## Banner Engineering Corp. Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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**ASSEMBLY TITLE:** **T-BASE STAND ASSEMBLY**

## GENERAL FUNCTION:

- Provides solid mounting for labeling head if not installed on a system that allows for vertical adjustment.
- Minimizes possible damage to the labeling head.

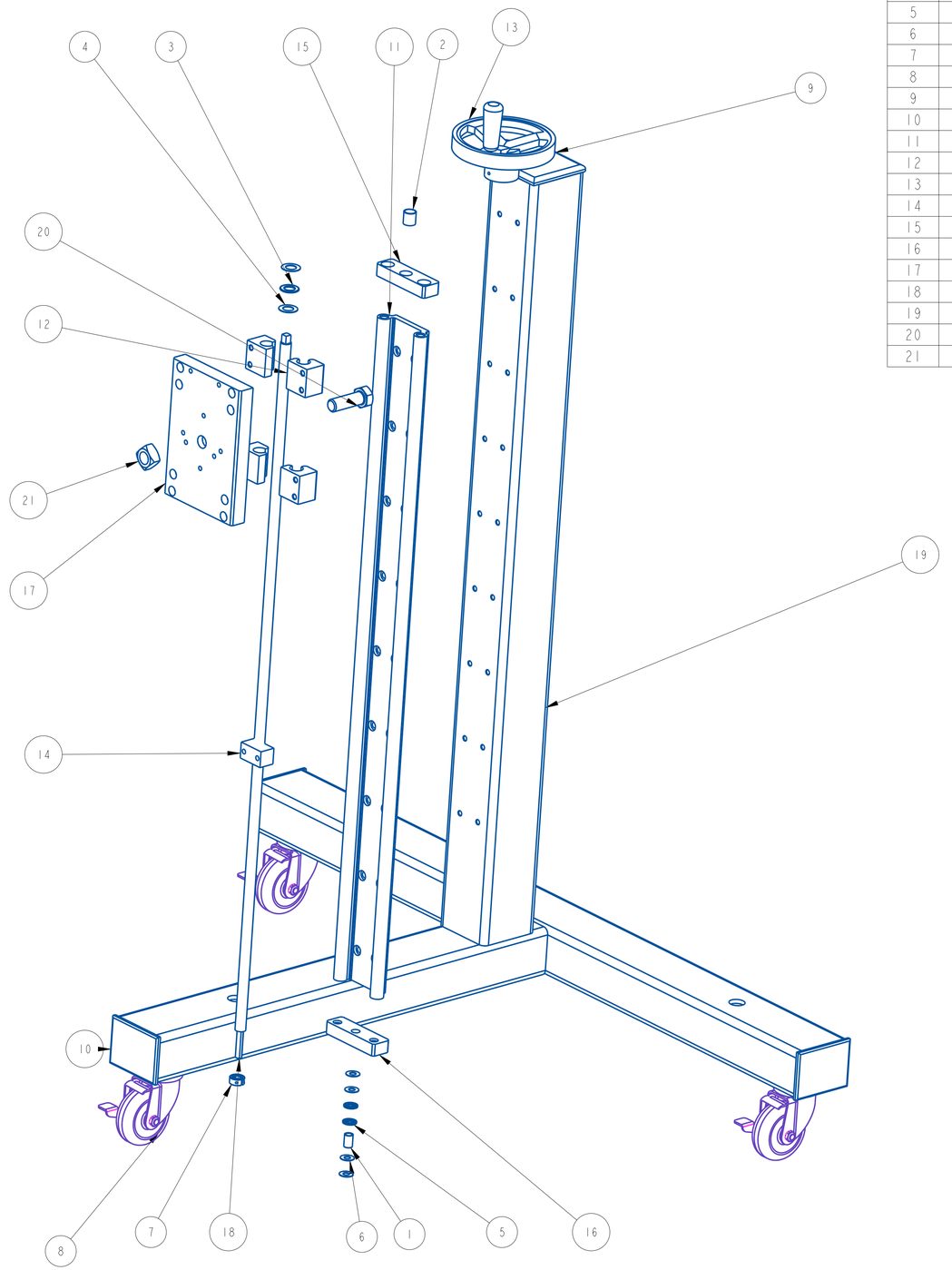
## SET-UP AND ADJUSTMENTS:

- Rotate leveling pads to appropriate position. Secure locknut when proper height is achieved.
- Using handle, adjust labeling head's vertical position.

## MAINTENANCE:

No scheduled maintenance is required for this assembly. Always keep the drive areas free of label flash and debris.

## TROUBLESHOOTING: None this section




| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 1 | 141172-000 | SLEEVE BEARING, 1/2OD. x 3/8ID. x 3/4LNG | 21770-000_018 |
| 2 | 1 | 141173-000 | SLEEVE BEARING, 23/32OD. x 5/8ID. x 3/4LNG | 21770-000_018 |
| 3 | 1 | 181081-000 | BEARING, NEEDLE ROLLER | 21770-000_018 |
| 4 | 2 | 181082-000 | BEARING, THRUST WASHER | 21770-000_018 |
| 5 | 2 | 181108-000 | BEARING, NEEDLE ROLLER | 21770-000_018 |
| 6 | 4 | 181111-000 | THRUST WASHER | 21770-000_018 |
| 7 | 1 | 362186-000 | COLLAR, 3/8 IN. ID ONE-PIECE CLAMP | 21770-000_018 |
| 8 | 3 | 791449-000 | CASTERS, SWIVEL 3-1/2" | 21770-000_018 |
| 9 | 1 | 792065-000 | CAP INSERT FOR 4X4 TUBE (1/4WALL) | 21770-000_018 |
| 10 | 3 | 792245-000 | CAP INSERT FOR 3 X 4 TUBE | 21770-000_018 |
| 11 | 1 | 792247-000 | DRYLIN RAIL | 21770-000_018 |
| 12 | 4 | 792248-001 | PILLOW BLOCK | 21770-000_018 |
| 13 | 1 | 801080-000 | HANDLE WHEEL, MODIFIED | 21770-000_018 |
| 14 | 1 | A24077-000 | BRONZE NUT, RH | 21770-000_018 |
| 15 | 1 | B21345-000 | TOP BEARING PLATE | 21770-000_018 |
| 16 | 1 | B21346-000 | BOTTOM BEARING PLATE | 21770-000_018 |
| 17 | 1 | C20626-000 | STAND SLED | 21770-000_018 |
| 18 | 1 | C20835-000 | THREADED ROD, SQUARE END | 21770-000_018 |
| 19 | 1 | D21235-000 | T-BASE STAND | 21770-000_018 |
| 20 | 1 | HCS281 | BOLT, 3/4-10 X 2-1/4 | 21770-000_018 |
| 21 | 1 | SQN022 | SQUARE NUT, 3/4-10 | 21770-000_018 |

SHEET 1 OF 2

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | 02/22/24 | NEW DRAWING | SEM |

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UNLESS OTHERWISE SPECIFIED
DIMENSIONAL TOLERANCE
X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

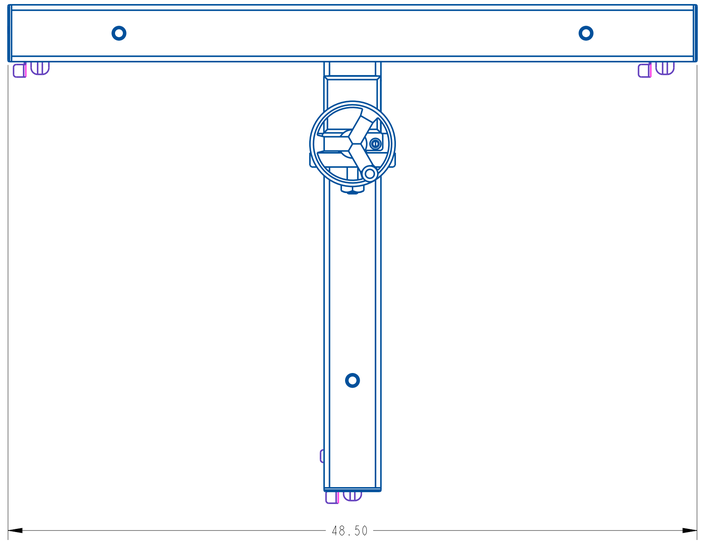
QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

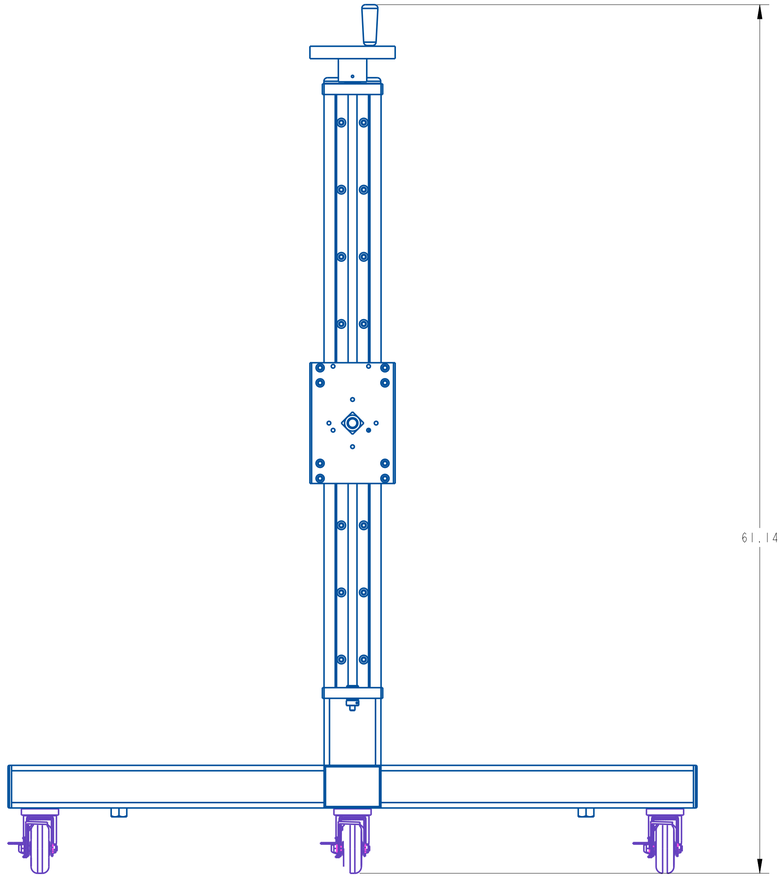
SCALE: 1/4
DATE: 02/22/24
DRW BY: SEM
CHK BY:
APPR BY:

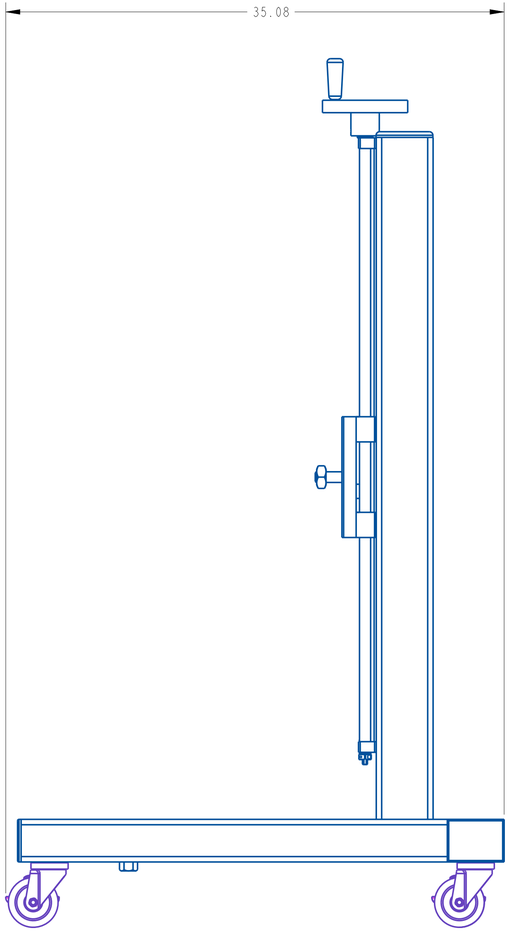
48" T-BASE STAND WITH IGUS SLIDE

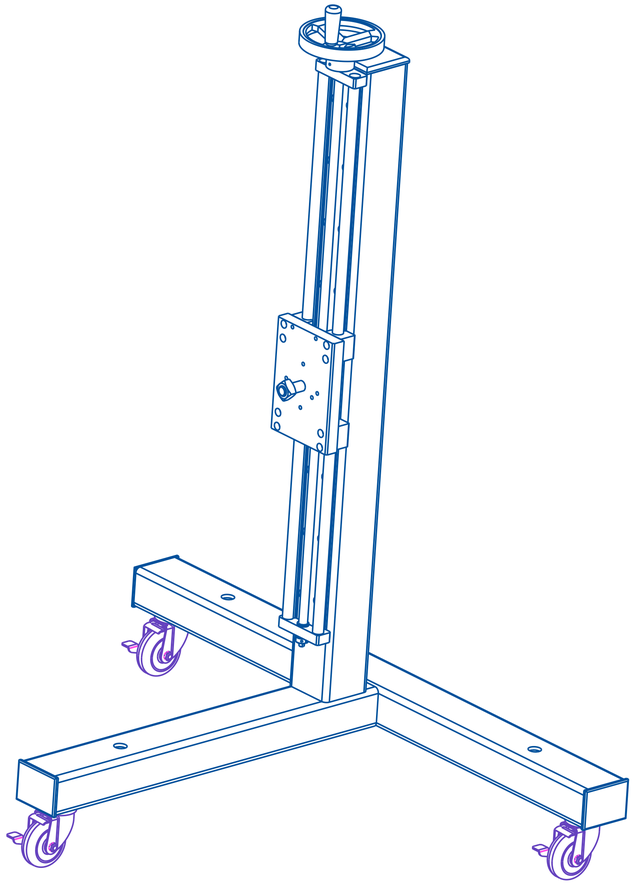
MAT'L

21770-000



| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| A | 02/22/24 | NEW DRAWING | SEM |

THIS IS A PRO-ENGINEER DOCUMENT AND MAY NOT BE MODIFIED MANUALLY

UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE
X ± .1
XX ± .01
XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

| | |
|---|---|
| SCALE: | 3/16 |
| DATE: | 02/22/24 |
| DRW BY: | SEM |
| CHK BY: | |
| APPR BY: | |

48" T-BASE STAND WITH IGUS SLIDE

MAT'L 21770-000

21770-000

**ASSEMBLY TITLE:** **Q33 YOKE ASSEMBLY**

**GENERAL FUNCTION:**

- The yoke assembly is the main mounting bracket assembly to mount the labeling head to the stand.
- Adjustments are provided to set the labeling head up for either top or side labeling applications.

**SET UP AND ADJUSTMENTS:**

- Loosen both locking handles to adjust the angular position of the labeling head.
- Re-tighten each handle when the correct angular position is set.

**NOTE:** Make sure each handle is secure, as the labeling head is heavy and could rotate if the locking handles are not firmly secured.

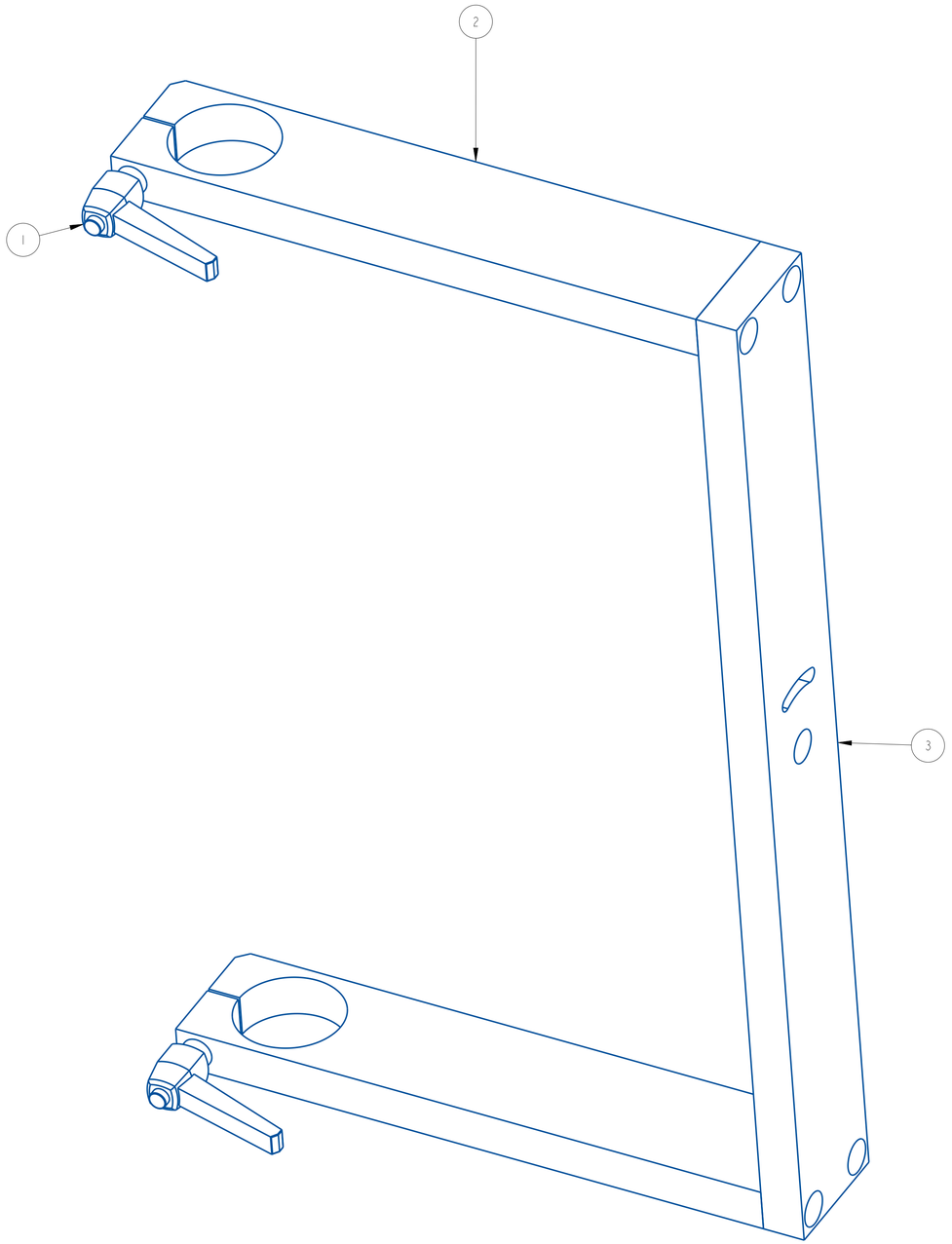
**MAINTENANCE:**

- No scheduled maintenance for this assembly.

**TROUBLESHOOTING:**

| Problem | What To Do |
|---|---|
| - Labeler angular position moves | Secure locking tension by turning locking handles clock-wise |

| ITEM | QTY | PART NO. | DESCRIPTION | PARENT ITEM |
|---|---|---|---|---|
| 1 | 2 | 801850-000 | CLAMPING LEVER | 22600Y-000 |
| 2 | 2 | B21190-010 | YOKE SIDE PLATE | 22600Y-000 |
| 3 | 1 | B21555-000 | MTG YOKE BACK PLATE | 22600Y-000 |




| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| C | Sep-17-20 | WAS B21555-002 | TJS |
| B | 30-MAR-16 | REPLACED WITH B21190-010 | CRT |
| A | 11-26-13 | NEW DRAWING | |

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UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE

.X ± .1
.XX ± .01
.XXX ± .005
ANGLES ± 30'

SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIOS .010/.030

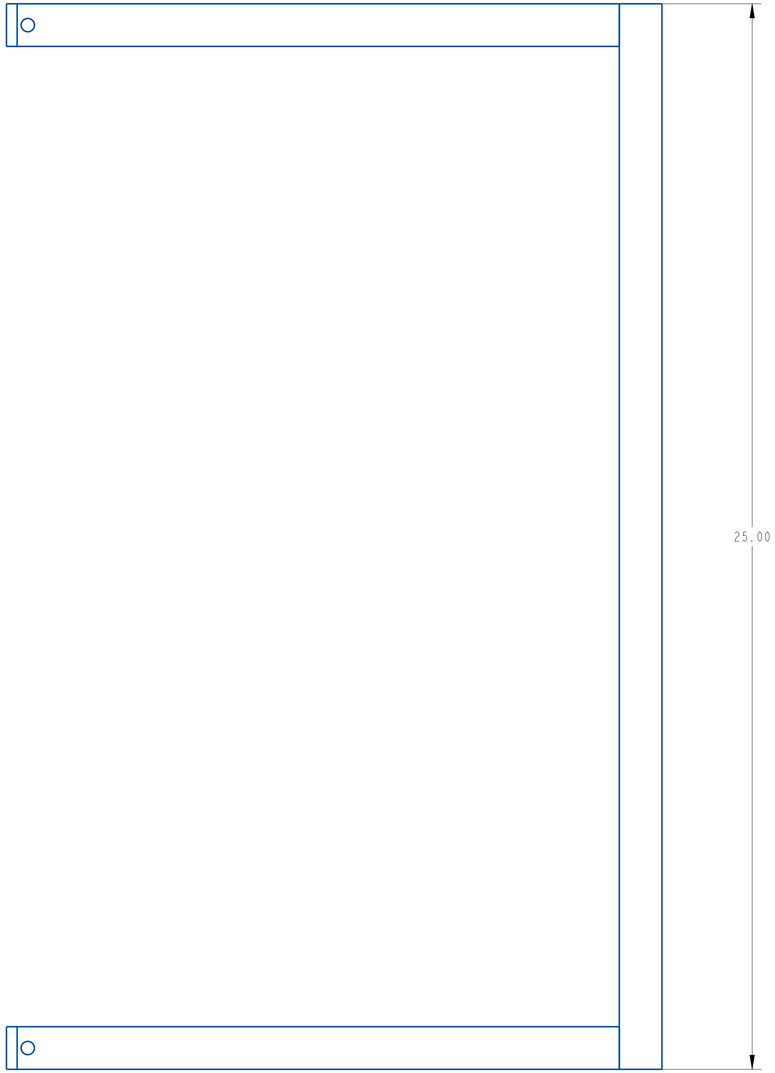
QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

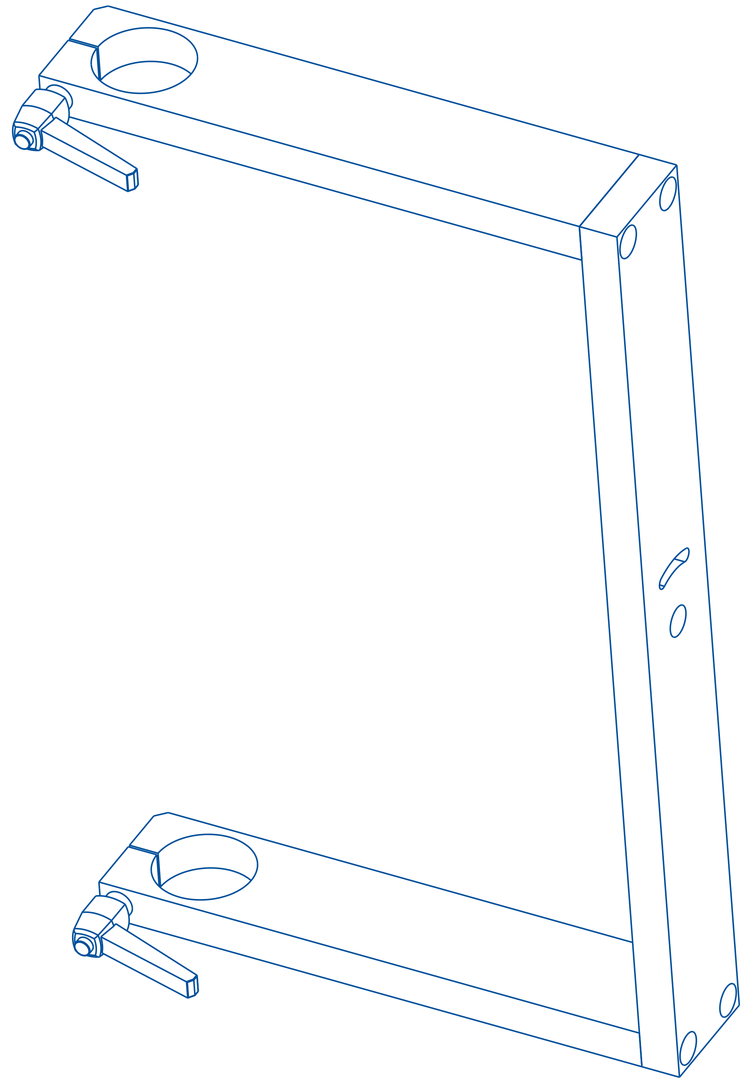
SCALE: 5/8
DATE: 11-26-13
DRW BY: MAW
CHK BY: 03/15/2024-SEM
APPR BY:

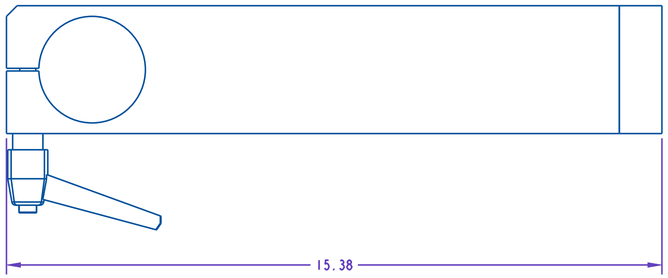
Q34 YOKE

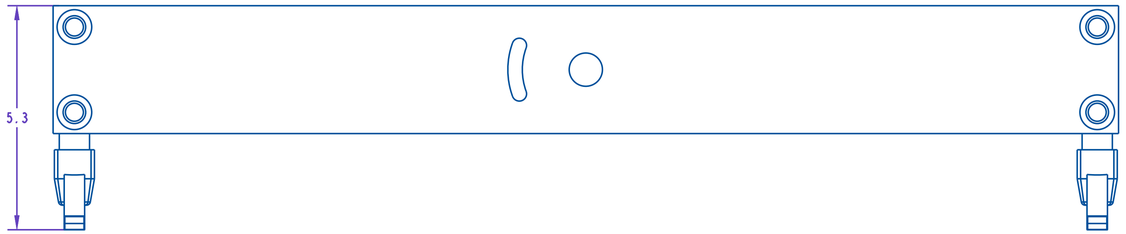
MAT'L

22600Y-000






| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| B | 30-MAR-16 | REPLACED WITH B21190-010 | CRT |
| A | 11-26-13 | NEW DRAWING | |

THIS IS A PRO-ENGINEER DOCUMENT AND MAY NOT BE MODIFIED MANUALLY

UNLESS OTHERWISE SPECIFIED
DIMENSIONAL TOLERANCE
.X ± .1
.XX ± .01
.XXX ± .005
ANGLES ± 30'
SURFACE FINISH 125
BREAK ALL EDGES .005/.015
CORNER RADIUS .010/.030
ALL ANGLES ARE 90°

QUADREL LABELING SYSTEMS
7670 JENTHER DRIVE
MENTOR, OHIO 44060
(440) 602-4700

| | |
|---|---|
| SCALE: | 9/16 |
| DATE: | 11-26-13 |
| DRW BY: | MAW |
| CHK BY: | 03/15/2024-SEM |
| APPR BY: | |

Q34 YOKE

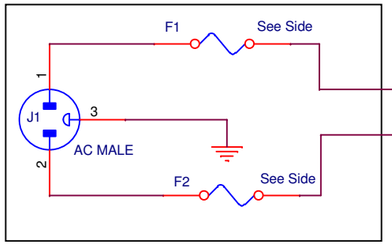
MAT'L

22600Y-000

# Schematics

# Main AC, Stepper Page 1

## Q44 FUSED POWER RECEPTACLE




120V, 8A
220V, 5A

L1 Black
L2 White (N)

LF1
LINE-L1 LOAD-L1
LINE-L2 LOAD-L2
GND
FILTER 6A

AC TB's
2/ea

L1A Black → L1A (1)
L2A White (N) → L2A (1)

AC Wiring: 18AWG
L1: Black
L2: White

L1A (1)
L2A (1)
L1A Black
L2A White (N)
F3 1A
F4* 1A
*220V Only

PS1
L1-AC 24VDC V+
L2-AC
0VDC V-
GND
POWER SUPPLY - 24V

1L1
1L2 or L2A

24VDC → 24VDC (All)
0VDC → 0VDC (All)

DC / Signal Wiring: 20AWG
VDC / Signal: Blue
0VDC: White / Blue

CR1

L1A (1)
L2A (1)
L1A Black
L2A White (N)
F5 5A
F6* 5A
*220V Only

2L1 11 14 2T1 → DR1 L1 (1)
2L2* 21 24 2T2* → DR1 L2 (1)

Stepper Drive

## DR1: 220V Series

DR1 Status (2) 413 → Out -
24VDC (1) 24VDC → Out +
EN-
EN+
Remove to Change Motor Direction
0VDC (1) 0VDC → Dir -
24VDC (1) 24VDC → Dir +
0VDC (1) 0VDC → Step -
Pulse Out (2) 500 → Step +

Set Motor Dial to E or F
ON = Right
SW16 SW15 SW14 SW13 SW12 SW11 SW10 SW9
120V 220V
SW8 SW7 SW6 SW5
SW4 SW3 SW2 SW1

220V
DR1 L1 (1) 2T1 → L1
DR1 L2 (1) 2T2 → L2
GND

A1+ A1- B1+ B1- MTR GND

1A+ 1A- 1B+ 1B-
SHIELD

HT34-505 Motor
STEPPER MOTOR
Yellow
Wht/Yel + Wht/Red
Red
Orange
Wht/Org + Wht/Blk
Black

Shield to Motor Connector Ground

Applied Motion STRAC8

## DR1: 120V Parallel

Out - Out + EN- EN+ Dir - Dir + Step - Step +

Set Motor Dial to E or F
ON = Right
SW16 SW15 SW14 SW13 SW12 SW11 SW10 SW9
120V 220V
SW8 SW7 SW6 SW5
SW4 SW3 SW2 SW1

120V
DR1 L1 (1) 2T1 → L1
L2A (1) L2A → L2
GND

A1+ A1- B1+ B1- MTR GND

Yellow + Red/White
Red + Yellow/White
Orange + Black/White
Black + Orange/White
SHIELD

HT34-505 Motor
Stepper Motor
Stepper Motor
Stepper Motor
Stepper Motor

Applied Motion STRAC8

| COLOR | TECHNICIAN | DATE |
|---|---|---|
| | | |
| | | |
| | | |

For Quadrel Assembly Use

AC Wiring: 18AWG
L1: Black
L2: White

DC / Signal Wiring: 20AWG
VDC / Signal: Blue
0VDC: White / Blue

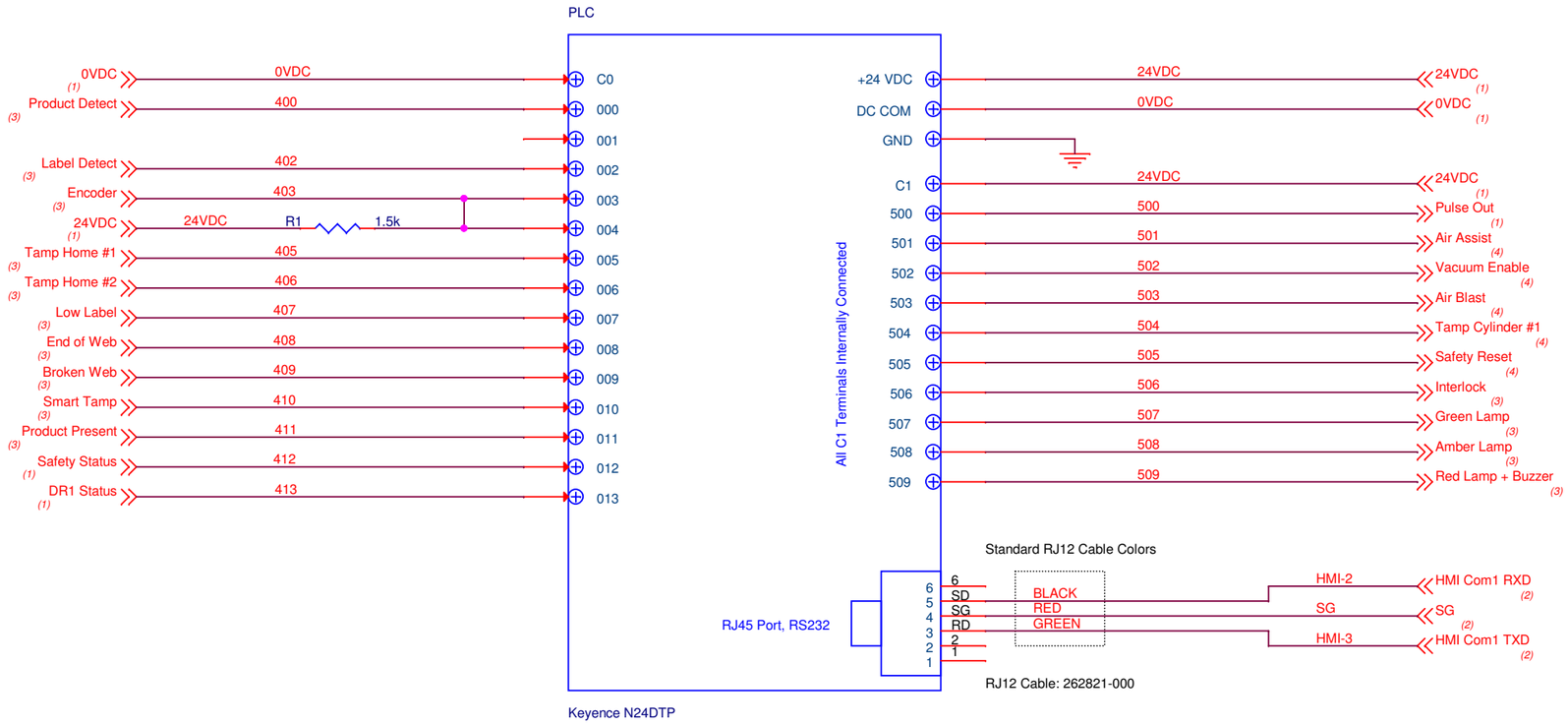
QUADREL LABELING SYSTEMS
7670 JENTHER DR.
MENTOR, OH
44060

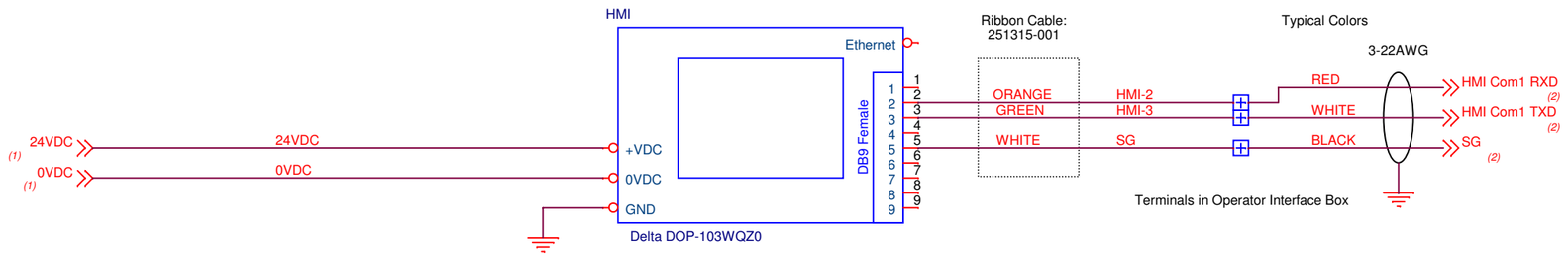
Drawn By: CAV

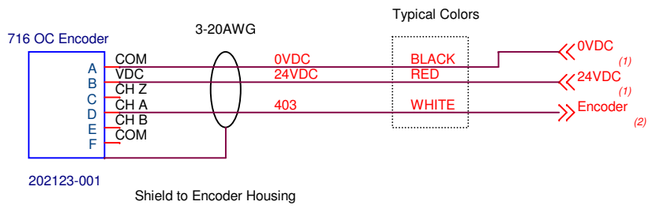
| REV | DESCRIPTION | BY | DATE |
|---|---|---|---|
| C | Safety Relay Change | CAV | 14APR2025 |
| B | Updated Stepper Switches | CAV | 16APR2024 |
| A | Solenoid Relay Options | CAV | 19DEC2023 |
| - | RELEASE | CAV | 20FEB2023 |

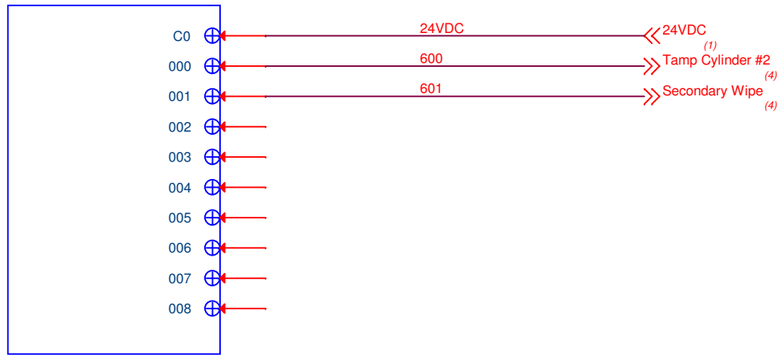
Title: POWER, STEPPER
Schematic # SB22639-001
Rev C
Date: Monday, May 19, 2025
Sheet 01 of 05

# PLC
# Page 2




| COLOR | TECHNICIAN | DATE |
|---|---|---|
| | | |
| | | |
| | | |

For Quadrel Assembly Use

QUADREL LABELING SYSTEMS
7670 Jenther Dr.
Mentor, OH
44060

Drawn By: CAV

| REV | DESCRIPTION | BY | DATE |
|---|---|---|---|
| C | Safety Relay Change | CAV | 14APR2025 |
| B | Updated Stepper Switches | CAV | 16APR2024 |
| A | Solenoid Relay Options | CAV | 19DEC2023 |
| - | RELEASE | CAV | 20FEB2023 |

Title: PLC BASE, EXPANSION

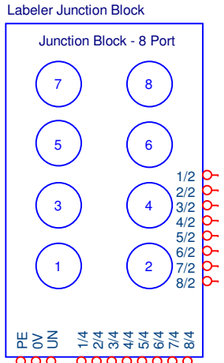
Schematic # SB22639-001

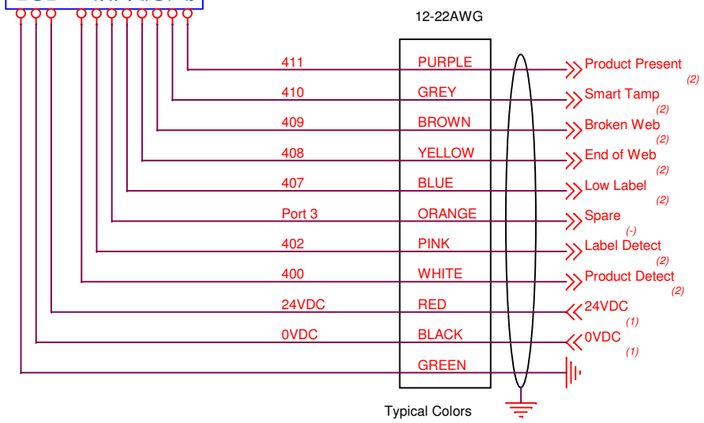
Rev C

Date: Monday, May 19, 2025

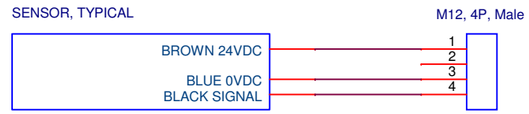
Sheet 02 of 05

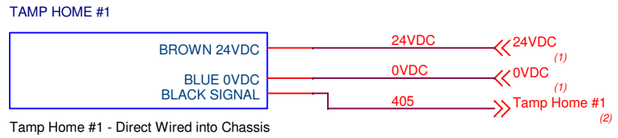
# Sensors
# Page 3



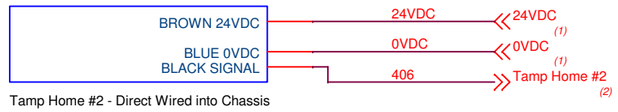




Typical Colors



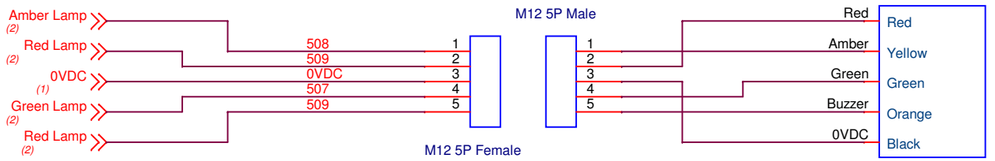

Tamp Home #1 - Direct Wired into Chassis




Tamp Home #2 - Direct Wired into Chassis

For Leading & Adjacent:
Tamp #1: Leading
Tamp #2: Adjacent

All single cylinder systems use Tamp #1

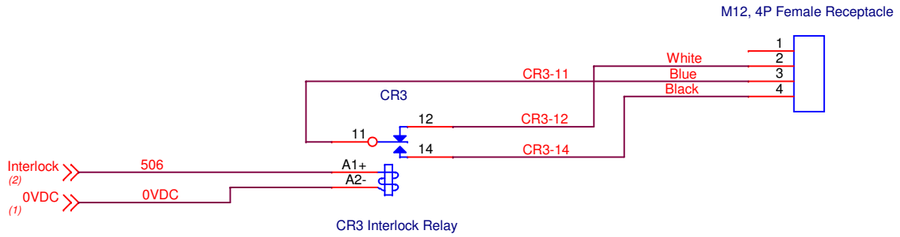



Red Lamp Output used for Buzzer

Red / Amber / Green / Audible

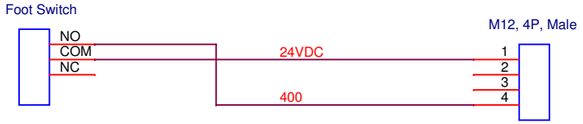
## Fault Interlock for Head on System

CR3 inside Q44 Chassis. 4P Female Receptacle mounted to Q44 Chassis




Relay is ON when Labeler is not Faulted

## Foot Switch Option (in place of Product Detect)




| COLOR | TECHNICIAN | DATE |
|---|---|---|
| | | |
| | | |
| | | |

For Quadrel Assembly Use


QUADREL
LABELING SYSTEMS
7670 JENTHER DR.
MENTOR, OH
44060


Drawn By: CAV

| REV | DESCRIPTION | BY | DATE |
|---|---|---|---|
| C | Safety Relay Change | CAV | 14APR2025 |
| B | Updated Stepper Switches | CAV | 16APR2024 |
| A | Solenoid Relay Options | CAV | 19DEC2023 |
| - | RELEASE | CAV | 20FEB2023 |

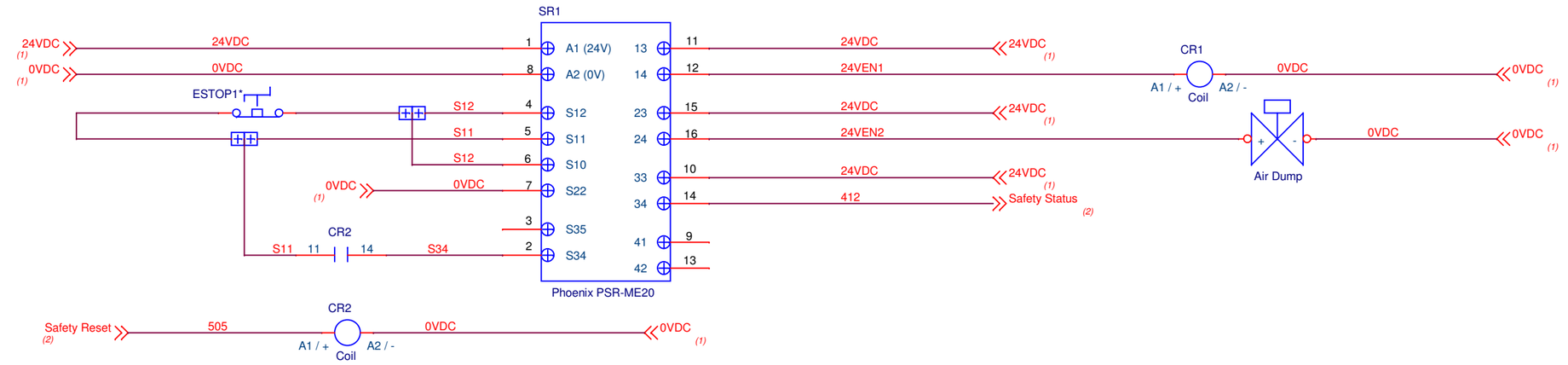
Title: SENSORS

Schematic # SB22639-001 Rev C

Date: Monday, May 19, 2025 Sheet 03 of 05

# Safety Relay, Solenoids Page 4

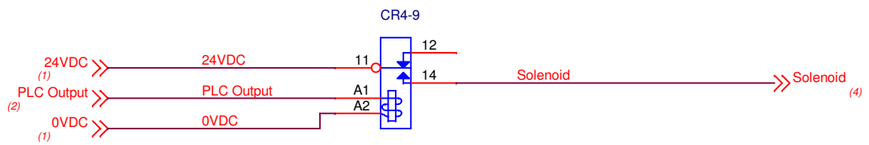
Jump 200 to 24VDC if No EStop Installed




*Head On System: Emergency Stops Wired to System's Control Box. Q44 Safety Relay monitors CR1 in System Control Box

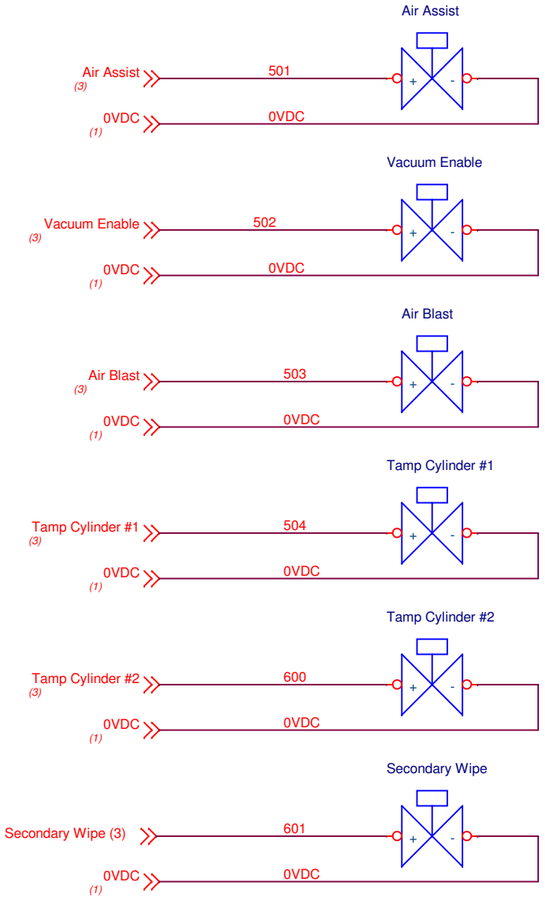



Relay Option for Solenoids without protection
(If both solenoid wires are same color)




| Signal | Relay | PLC Output | Solenoid |
|---|---|---|---|
| Air Assist | CR4 | 501 | 501A |
| Vacuum | CR5 | 502 | 502A |
| Air Blast | CR6 | 503 | 503A |
| Cylinder #1 | CR7 | 504 | 504A |
| Cylinder #2 | CR8 | 600 | 600A |
| Wipe | CR9 | 601 | 601A |

Refer to Table for Solenoid Markings based on Relay Usage




For Leading & Adjacent:
Tamp #1: Leading
Tamp #2: Adjacent

All single cylinder systems use Tamp #1

| COLOR | TECHNICIAN | DATE |
|---|---|---|
| | | |
| | | |
| | | |

For Quadrel Assembly Use

QUADREL LABELING SYSTEMS
7670 Jenther Dr.
Mentor, OH
44060

| REV | DESCRIPTION | BY | DATE |
|---|---|---|---|
| C | Safety Relay Change | CAV | 14APR2025 |
| B | Updated Stepper Switches | CAV | 16APR2024 |
| A | Solenoid Relay Options | CAV | 19DEC2023 |
| - | RELEASE | CAV | 20FEB2023 |

Drawn By: CAV

Title: SAFETY, SOLENOIDS

Schematic # SB22639-001

Rev C

Date: Wednesday, October 08, 2025

Sheet 04 of 05

# Air Diagram
# Page 5

Regulators: 392270-000

Valves: 391191-000

Plugs: 392097-000

Soft Start Valve on Leading/Swing Systems

4 Port Elbow: 392109-000

Incoming Air Supply

Filter
IN OUT
391201-000

Black A00

Soft Start Valve
P A R
391174-000

Muffler 391631-001

Black A01

Black A02

Assist Regulator
IN OUT

Blue A10

Air Assist Valve
3 4 (A)
1 (P)
5 2 (B)

Blue A11 — To Air Assist Tube

Plug

Black A03

Air Blast Regulator
IN OUT

Black A20

Air Blast Valve
3 4 (A)
1 (P)
5 2 (B)

Green A33 — To Tamp Pad

Plug

Black A04

Vacuum Regulator
IN OUT

Green A30

Vacuum Valve
3 4 (A)
1 (P)
5 2 (B)

Green A31

Vacuum Generator
P V
392609-000
E

Green A32

Green EXH — To Exhaust Port on Chassis

Plug

Vacuum #2: Optional Equipment

Green A30

Vacuum Valve #2
3 4 (A)
1 (P)
5 2 (B)

Green A34

Vacuum Generator#2
P V
392609-000
E

Green A35 — To Tamp Pad Second Chamber

Green EXH — To Exhaust Port on Chassis

Plug

Black A05

Tamp Regulator
IN OUT

Red A40

Tamp Valve
3 4 (A)
1 (P)
5 2 (B)

Red A41

Yellow A42

Tamp/Side/Leading Only Cylinder
-
-

Cylinder #2: Optional Equipment

Red A40

Tamp Valve #2
3 4 (A)
1 (P)
5 2 (B)

Red A43

Yellow A44

Secondary Swing Cylinder
-
-

| COLOR | TECHNICIAN | DATE |
|---|---|---|
| | | |
| | | |
| | | |

For Quadrel Assembly Use

QUADREL LABELING SYSTEMS
7670 Jenther Dr.
Mentor, OH
44060

Drawn By: CAV

| REV | DESCRIPTION | BY | DATE |
|---|---|---|---|
| C | Safety Relay Change | CAV | 14APR2025 |
| B | Updated Stepper Switches | CAV | 16APR2024 |
| A | Solenoid Relay Options | CAV | 19DEC2023 |
| - | RELEASE | CAV | 20FEB2023 |

Title: AIR DIAGRAM

Schematic # SB22639-001

Rev C

Date: Monday, May 19, 2025

Sheet 05 of 05

# 9 MAINTENANCE

## 9.1 GENERAL INFORMATION

This labeler has been designed with the minimal maintenance requirement possible. There are however some things to take into consideration.

The system is built to perform in humid conditions, but must not be pressure washed. In case of wash down conditions, it is recommended to cover each labeling head with a plastic tarp.

For the overall cleaning, it is recommended to use compressed air and clean, damp wipes.

Always turn off the system before proceeding with cleaning and maintenance.

The following section explains the preventive maintenance for each section

After every 100 hours of operation, a visual inspection of the system should be done and where it is necessary, lubricate and cleaning should be performed.

⚠ CAUTION WEAR PROTECTIVE EYEWEAR when performing any maintenance on this equipment.

⚠ CAUTION To reduce risk of fire, electrocution or other personal Injury when operating or maintaning the labeling head, follow basic safety precaution, including the following:

DO NOT perform any servicing or maintenance with the power ON.

Always disconnect the electrical plug from the wall socket

Make sure that the power is OFF or that the available E-stop buttons have been activated.

**Quadrel labeling heads are reliable, versatile and durable. They will operate for years with very light maintenance. Most of the maintenance takes only a few minutes and substantially increases the operational life of the machine and maintains label placement accuracy. Not all items listed below are applicable to every machine. See sections that apply to your equipment**

**Daily: D**
**Weekly: W**
**Monthly M**
**Semi-Annually S**

***ASSEMBLY TITLE:*** **LABELING HEAD ASSEMBLY**

**D-** Remove glue residue and labels from all rollers and idler
**M-** Check and tighten all fasteners.

***ASSEMBLY TITLE:*** **UNWIND ASSEMBLY**

**W-** Check and adjust dancer spring if final spring tension is too soft. Replace
**W-** Check and inspect band brake. Replace if torn

***ASSEMBLY TITLE:*** **REWIND ASSEMBLY**

**W-** Check and inspect friction disc, Replace when worn out. (A-DRIVE only)
**W-** Check kinetrol for leaks, Replace if necessary. (B-DRIVE only)

***ASSEMBLY TITLE:*** **BRAKE BRUSH ASSEMBLY**

**W-** Reverse brake brush direction.
**M-** Inspect Brake brush when brush body contour no longer viable or bristles are worn down. Replace

***ASSEMBLY TITLE:*** **SLOT SENSOR ASSEMBLY**

**D-** Keep the sensor optical area clean from label and glue residue

***ASSEMBLY TITLE:*** **SIDE PLATE ASSEMBLY**

**S-** Check and inspect and grease all rollers and idler**.**

***ASSEMBLY TITLE:*** **PEEL PLATE ASSEMBLY**

**D-** Clean all the parts that may acquire labels or glue residue.
**W-** Inspect Teflon tap on peel plate tip
**S-** Check and inspect and grease all rollers and idler**.**

***ASSEMBLY TITLE:*** **DRIVE AND PINCH ROLL ASSEMBLY**

**D-** Remove glue residue and labels from drive roller.
**W-** Clean with soft brass brush knurled roll.
**W-** Check and inspect drive roll, No play when powered up
**S-** Replace springs and slugs.

***ASSEMBLY TITLE:*** **ROLLER/BRUSH IMPRESSER**

**D-** Check the rollers/brushes free of label flash, glue and debris. This will prevent jamming and web tears.
**W-** Check the foam rollers. If foam wear is noticeable, replace as necessary.

***NOTE:*** Exercise caution when removing bad labels from foam. Careless removal can result in torn foam which may leave the labeler inoperable until the roller is replaced!

***ASSEMBLY TITLE:*** **OPERATOR PANEL**

-No maintenance is required for the operator panel

-Occasionally, the keypad may be cleaned with any non-solvent based cleaning solution.

***ASSEMBLY TITLE:*** **ELECTRICAL**

**W-** Check the foam for fan clean or replace.

**ASSEMBLY TITLE:** **ROLLER/BRUSH IMPRESSER**

**D-** Check the rollers/brushes free of label flash, glue and debris. This will prevent jamming and web tears.

**W-** Check the foam rollers. If foam wear is noticeable, replace as necessary.

***NOTE:*** Exercise caution when removing bad labels from foam. Careless removal can result in torn foam which may leave the labeler inoperable until the roller is replaced!

**ASSEMBLY TITLE:** **TAMP PAD ASSEMBLY**

**D** – Check the tamp pad for label flash, glue residue and debris on tamp pad. If found clean tamp pad with adhesive remover and/or cleaner

**D** – (**RFID REJECT PADDLE ONLY**) – Remove rejected labels from reject paddle at least 1 time per shift and/or as needed. **No more than 5-6 labels are to be on reject paddle at any time. Once 5-6 labels are on reject paddle they should be removed to ensure proper operation**

**W** – Lightly run scotch bright across pad to ensure it is lightly scuffed. A shiny pad could cause label to stick to the pad as it is dispensing

**W** – Check for air leaks around tamp pad block and pad. Reseal as necessary with RTV silicon sealant.

**W** – Inspect all pneumatic components for wear.

**W** – Lubricate Pneumatic cylinder slide rods

**ASSEMBLY TITLE:** **OPERATOR PANEL**

-No maintenance is required for the operator panel

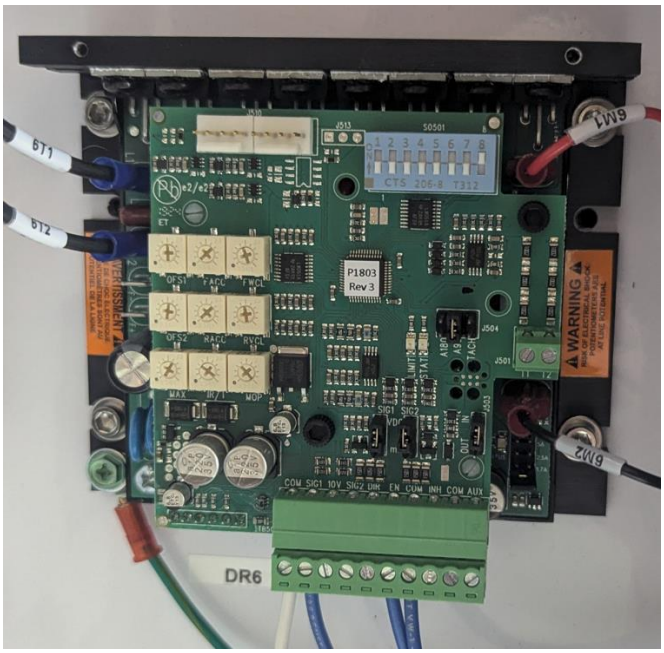
-Occasionally, the keypad may be cleaned with any non-solvent based cleaning solution.

**ASSEMBLY TITLE:** **ELECTRICAL**

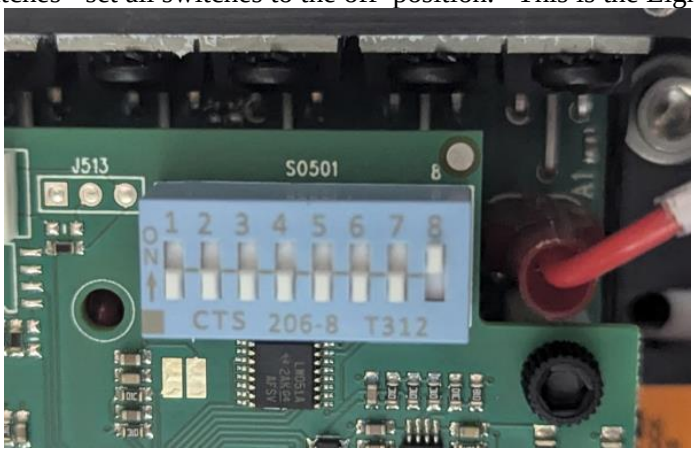
**W-** Check the foam for fan clean or replace.

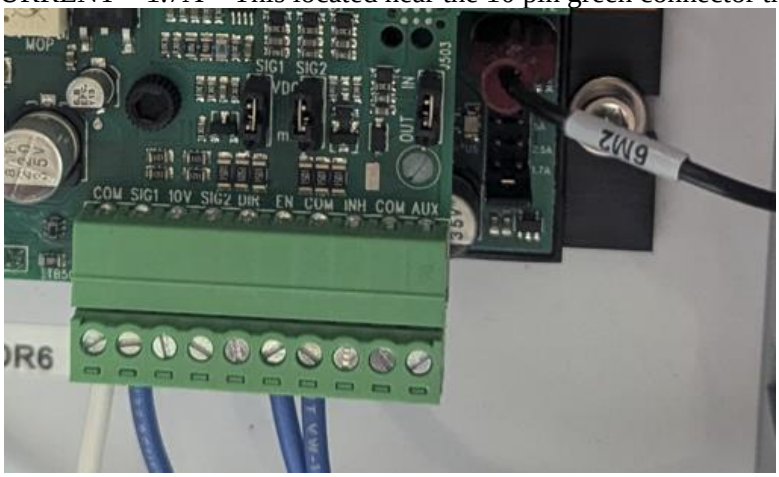
**NOTES:**

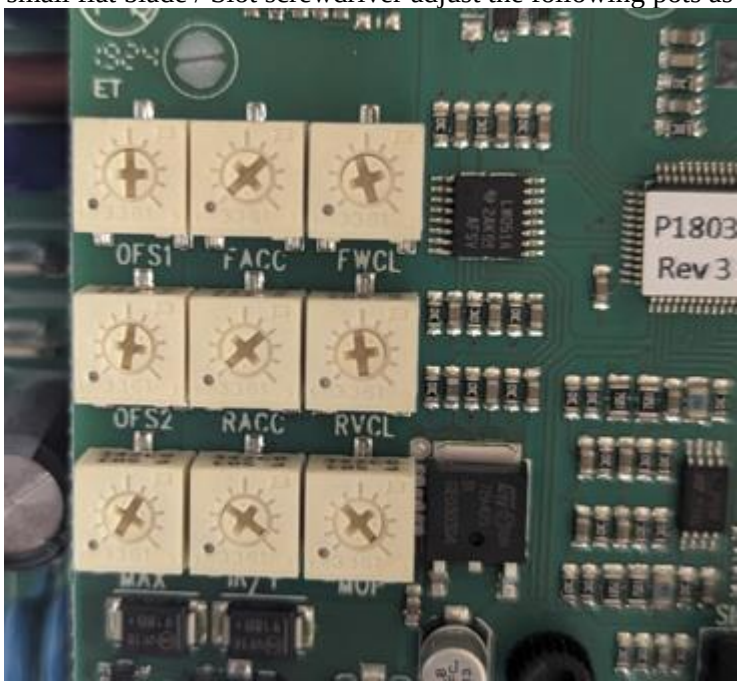
**Setup procedure for Powered rewind using MGC403-11-00MD drive**



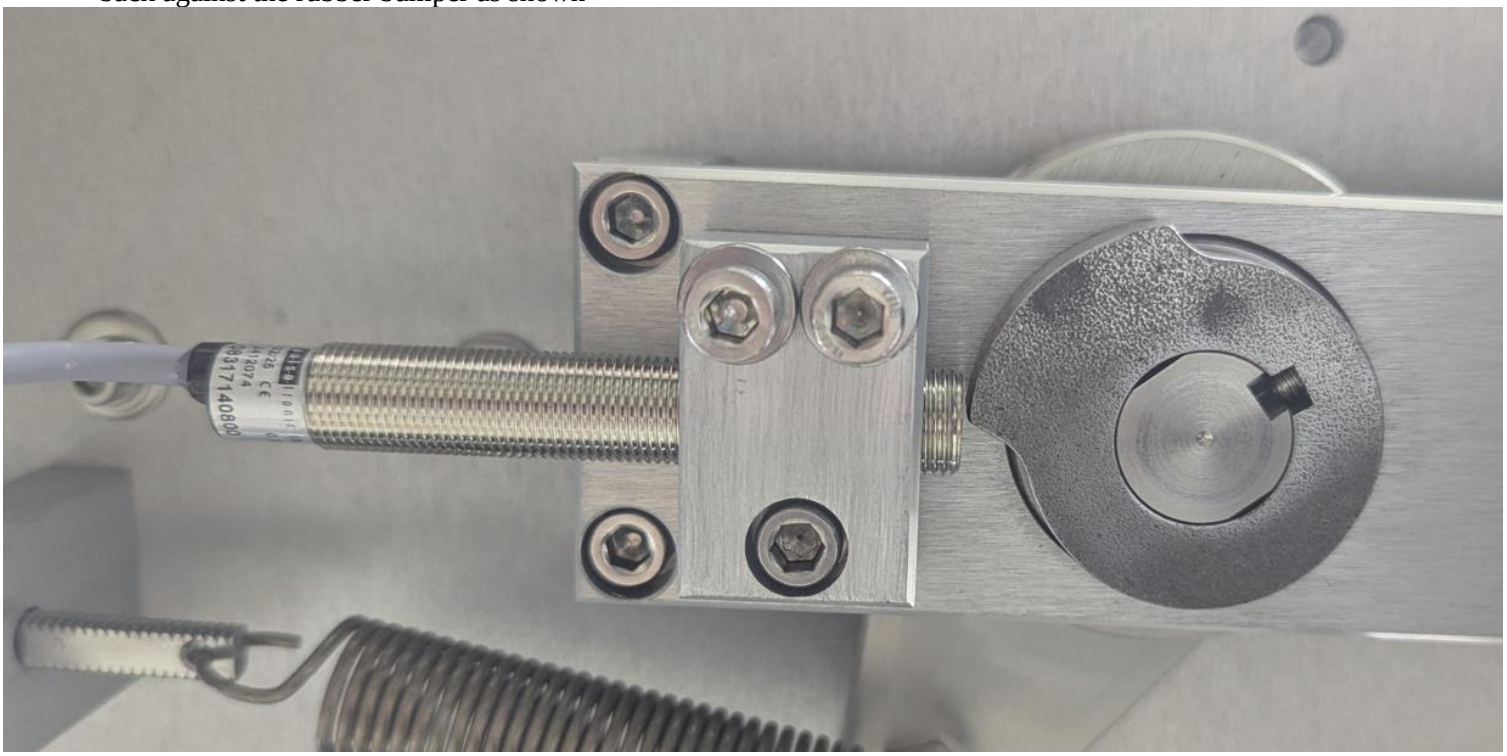

**Upon receiving drive set the following BEFORE installing in the machine.**

1. Dip switches - set all switches to the off position. This is the Light blue row of switches shown in the image below
   a. 

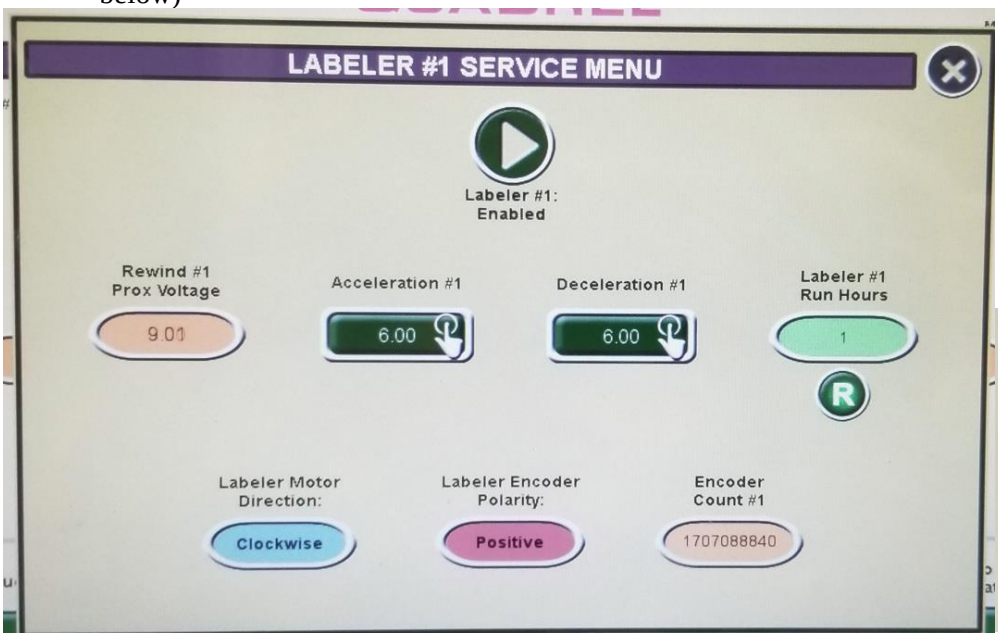
2. Set Jumpers on drive based on electrical schematic for your machine
   a. SIG1 – VDC
   b. SIG2 – VDC
   c. J504 – A90
   d. AMP CURRENT – 1.7A – This located near the 10 pin green connector that
      i. 

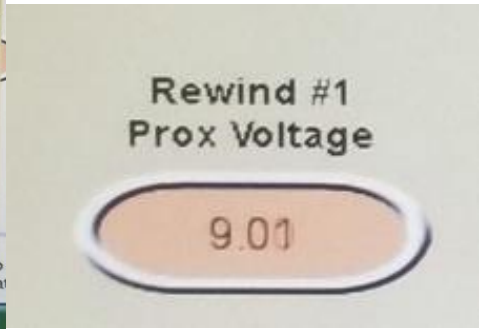
3. Using a small flat blade / Slot screwdriver adjust the following pots as indicated in the image below:
   a. 

      i. Top row **OFS1** – WILL BE ADJUSTED AT LATER STEP
      ii. Top row – **FACC -** turn counter clockwise until it stops.
      iii. Top row **FWCL** – set to half way point – midpoint
      iv. Middle row **- OFS2** – turn counter clockwise until it stops. This turns the pot OFF
      v. Middle row – **RACC -** turn counter clockwise until it stops
      vi. Middle row – **RVCL** – set to half way point – midpoint
      vii. Bottom row – **MAX** – Set to 3/4 point
      viii. Bottom row **– Leave other 2 pots at factory setting – DO NOT ADJUST**
4. **Install drive in machine then proceed to next steps**
5. Set the Cam on the rewind dancer per image below when the dancer arm is at rest. Rest is when the arm is all the way back against the rubber bumper as shown

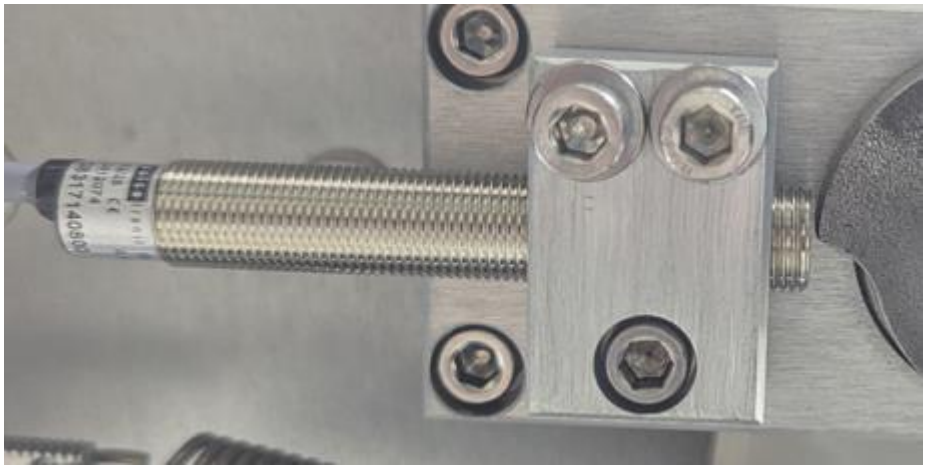


6. On the HMI go to into labeling head service menu. You will be looking at the REWIND PROX VOLTAGE (example below)

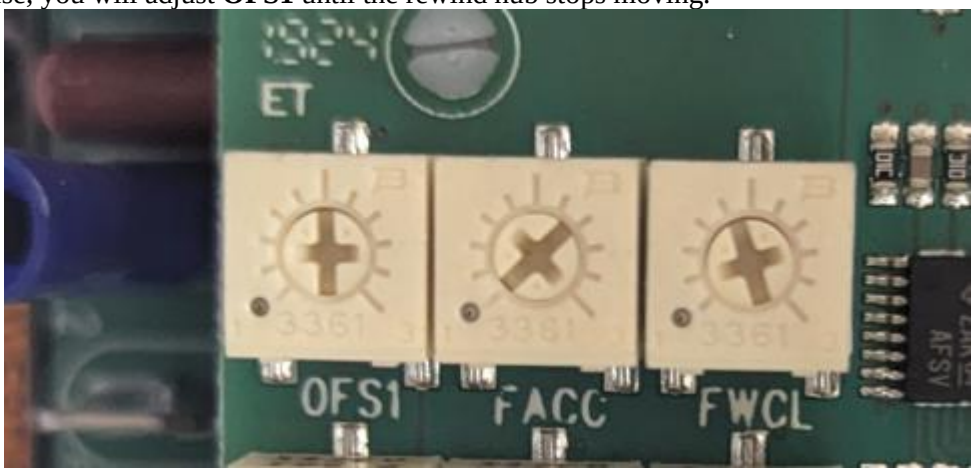



7. Adjust the sensor gap at the cam by loosening the bolt using an allen key so that the sensor can be moved forward or backward. The bolt does NOT touch the sensor. Loosening it opens the clamp so you can adjust.
8. Set the gap so the REWIND PROX VOLTAGE on the HMI reads .**90 it must be under 1 volt.**
    a. **Retighten screw so the clamp sensor no longer moves**

b. 

9. Test by moving the rewind dancer arm forward. When doing this you should see the rewind prox voltage on the HMI increase up to 9 volts

    a. **If you do not see the voltage increase steadily, recheck cam sensor gap in step 7**
10. Turn on rewind switch on the back of the labeler. This will engage / turn on the motor.
11. Move the rewind dancer arm forward the rewind hub should start to turn clockwise. It will slow then stop as you move forward. Rewind hub should ALWAYS be turning clockwise. If it moves counter clockwise move to **step 11a**
    a. While holding the arm in the position where it started to run counter clockwise, it MUST be running counter clockwise, you will adjust **OFS1** until the rewind hub stops moving.
    i. 

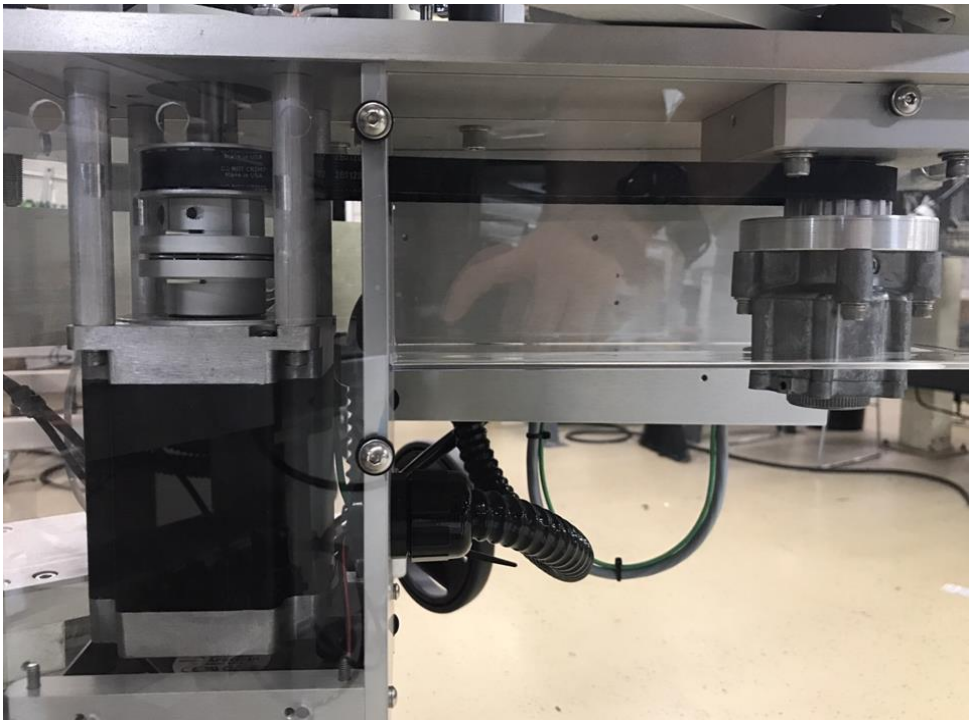
    b. This adjustment may need to be done multiple times until it no longer moves counter clockwise when rewind arm is all the forward and at rest.

## 9.2 BELTS

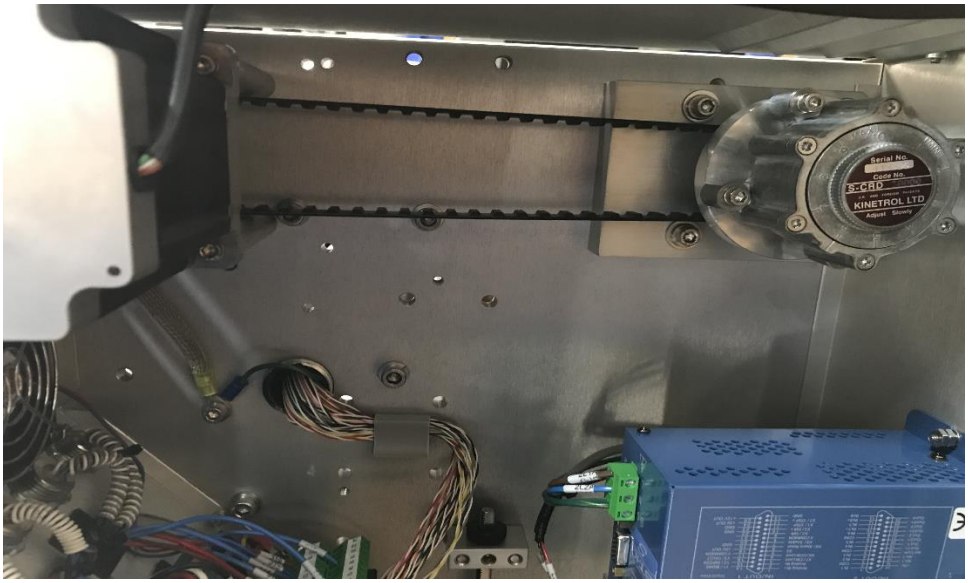
Monthly, a visual inspection of the rewind belt and timing belt, to do this depending on the labeling head you may need to remove the bottom cover on the head.

Refer to photos below.

Servo labeling head.

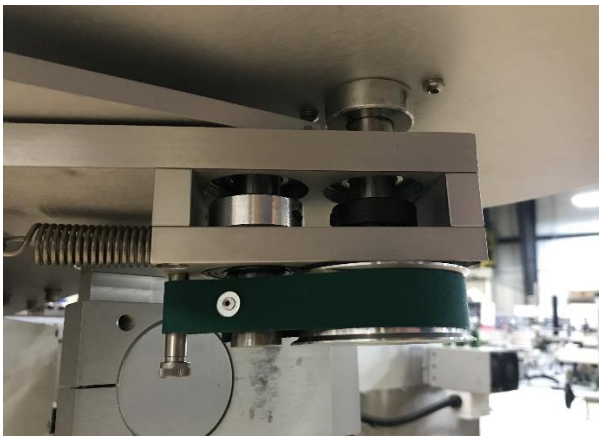


Stepping labeling head.




⚠ CAUTION DO NOT ATTEMPT doing this with the equipment under tension (with power on).

The visual inspection should consist of looking for cracks or defects in the belts. If this is the case, change the belts that are defective. Refer to the parts listing in the labeling head section of this manual.
The brake band mechanism requires a monthly visual inspection as well. Also once every 12 months you should consider replacing the belt (it is possible that you may need to change it later or earlier than 12 months depending the usage of the labeling head).
The brake band belt assembly is located at the base of the unwind assembly. See images below for reference.

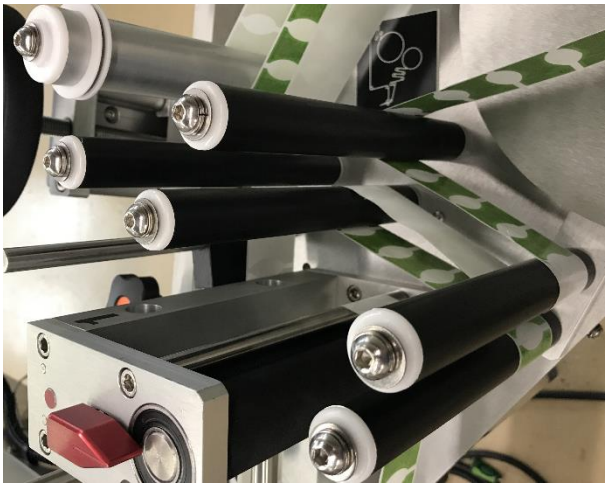


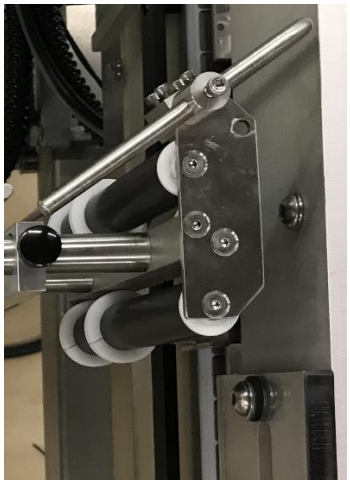
For replacement parts see the unwind assembly drawing for your labeling head in this manual.

## 9.3 ROLLERS

It is important that your labeler is as clean as possible in its environment in order for it to perform property. Daily, it is suggested to clean all the rollers including the drive roller (the rubber roller), the pressure shoe and peel plate using a damp cloth with alcohol. Make sure those parts have no glue or labels on it.

Weekly, spray a silicone base lubricant on each end of the plastic bearing.





## 9.4 SENSORS

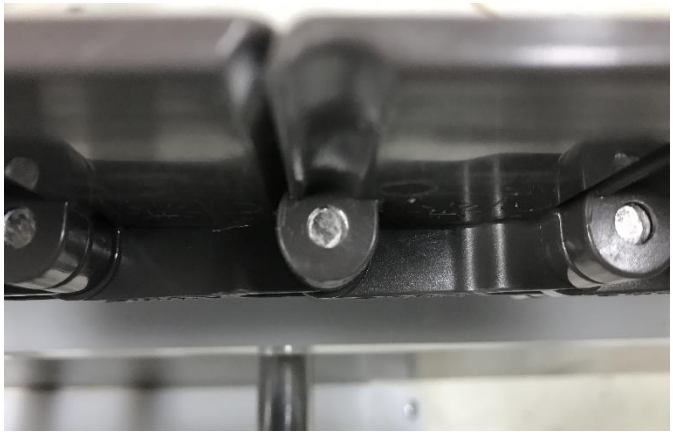
The sensors all have an electronic eye called a photocell; these must be free of lint or dirt. Since the photocells are generally made with glass or plastic lenses. They naturally attract substances which could easily trigger the sensor, use a cotton swap to gently clean the eye of the sensor as you would any lens, in a circular motion.

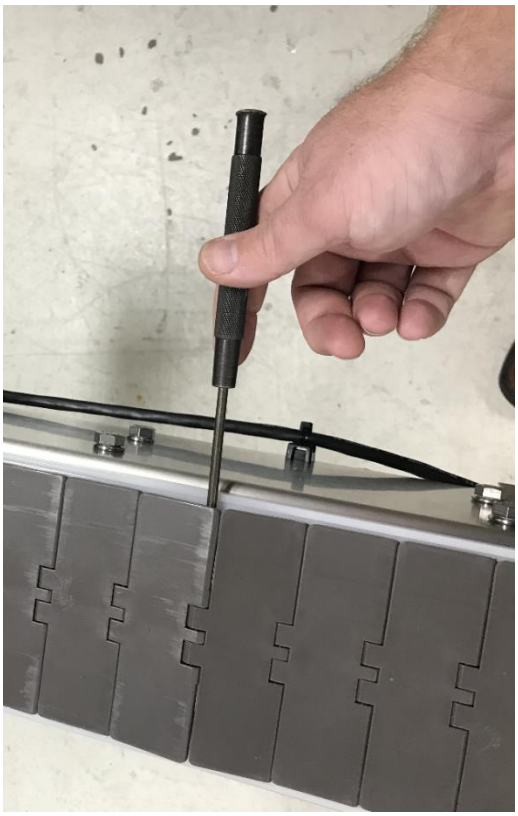
## 9.5 CONVEYOR

Always keep the belt or (chain) clean. To clean it simply use compressed air with an osha approved nozzle and/or damp wipes. If necessary, a soft cleaning agent can be used.

### 9.5.1 CLEANING

To clean the under carriage portion of the conveyor, simply remove the belt using an punch or similar tool and hammer to tap out the retaining belt link pin. (see images below, the chain has an oriention to the pins, you must tap it out from the narrow diameter) Clean the desired portion with a damp cloth and replace the pin to the belt. The pin will be tapped in the opposite side you tapped it out. *You can also lift the chain and wipe under it.





# 10 CLEARING A JAM

In the event a jam occurs on your Quadrel Labeler reference the following steps to clear.

1. Press the conveyor stop button or the emergency stop if you are unable to reach the stop button.
2. Clear the jam manually in the affected  are of the equipment where jam is located
3. Once jam is cleared reenergize the estop, if pressed, and press the reset button (where applicable) to clear faults.
4. Put equipment back into “run” and press start to turn the system back online to continue labeling

# 11 WARRANTY

The standard warranty period for Quadrel equipment is 12 months following invoicing. The warranty covers all parts with consideration taken towards reasonable use and normal wear and tear. Not covered by warranty are parts that have a limited wear factor, any required labor by Quadrel. Prior to return to Quadrel, parts must be verified defective.

## Return of defective parts

To return a defective part, you will need to get an RMA number from Quadrel. All RMA’s are issued though our parts department. Please specify the serial number of the equiptment, the client’s name, address, phone number, contact name and the nature of the problem. To get a replacment part, a purchase order is required. You will be billed for the new part and credited for the defective part after return and evaluation. If the part is determined to be defective due to improper use, no credit will be issued.

## Appropriate Use of Equipment

The equipment supplied to the end user by Quadrel are to be used for the sole purpose for which they were intended and must follow Quadrel’s specifications on usage as well as appropriate functions. Quadrel will not assume any responsibility for any inappropriate use or modifications to the said equipment other than for the use it was initially built for. The warranty will cease to apply forthwith, in Quadrel’s opinion, the equipment has been used abnormally or in an abusive manner, if it has not been properly maintained, if it has not been carried on a truck equipped with an air-ride suspension when required by Quadrel or if it has been used, or maintained contrary to the owners manual provided by Quadrel.

## Responsibility Limits

The solution put forth has been prepared with the information that has been provided to Quadrel by the end user. Subsequently, Quadrel cannot assume any responsibility for the exactitude, precision, and the validity of the information which was supplied. Moreover, Quadrel cannot be responsible for (a) any damages, direct or indirect, secondary, or

accessory, including without limitations, the loss of profit, workflow interruption, loss of production, loss of profits and other; (b) any and all damages claimed against the end user by a third party; (c) any or all damages caused to the property of end user or any other third party; (d) any or all resulting in an act from the end user or third party, major force, or act of god, unforeseen cause, or event.

With all reservation, in the eventuality where the responsibility is that of Quadrel relative to any defect of quality of said equipment or proposed solution Quadrel would be able to accept the responsibility, to its entire discretion, with the replacement of part of the said equipment or solution. By a compatible or identical equipment or solution or by a reimbursement of value agreed upon. In no case can Quadrel's responsibility exceed the total monetary sums received for the said defective equipment or solution.