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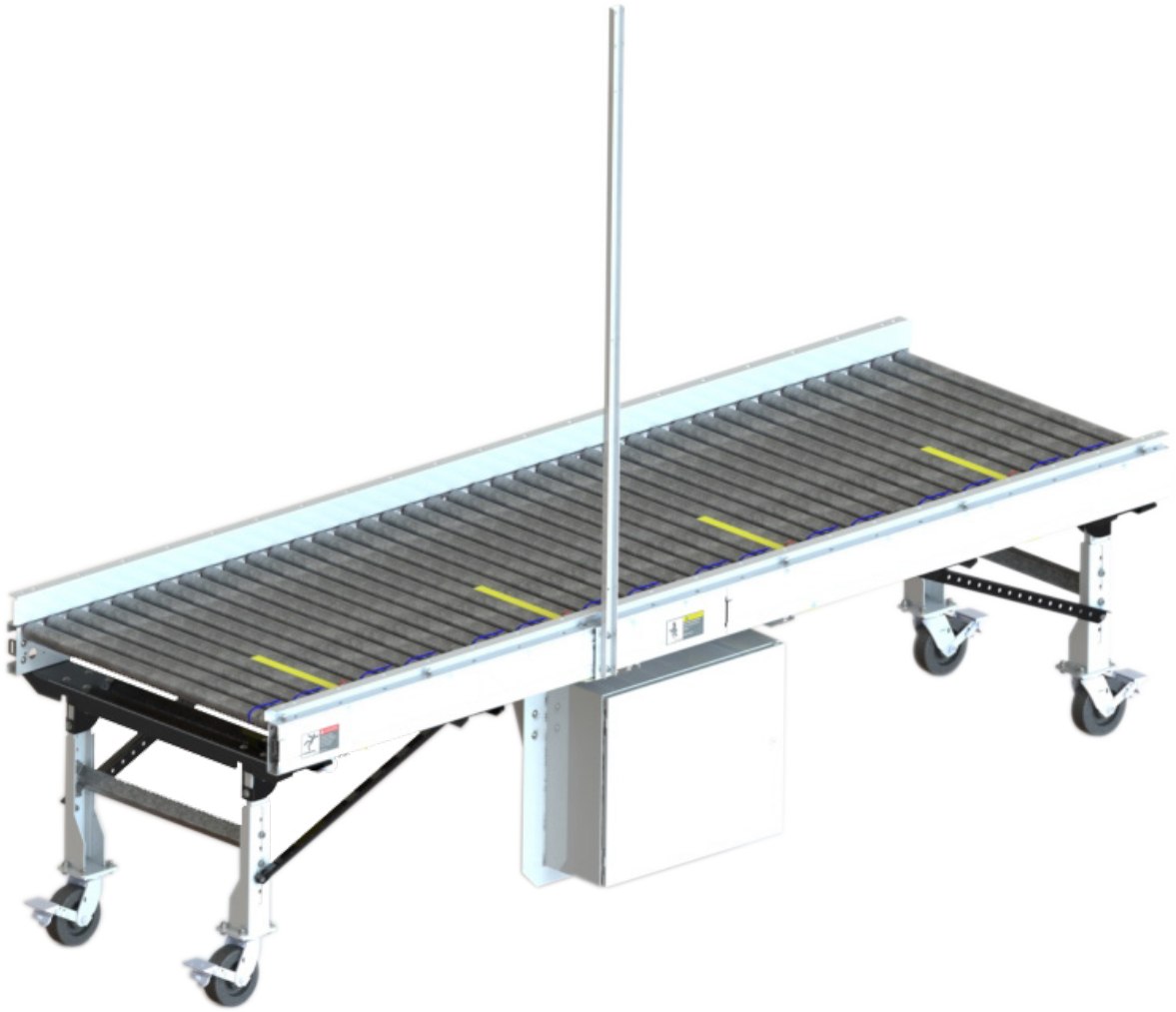
# MOVEIT-MAX™ MOBILE CONVEYOR



# INSTALLATION & MAINTENANCE MANUAL

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# OVERVIEW & SPECIFICATIONS

# MoveIT-Max™ Overview

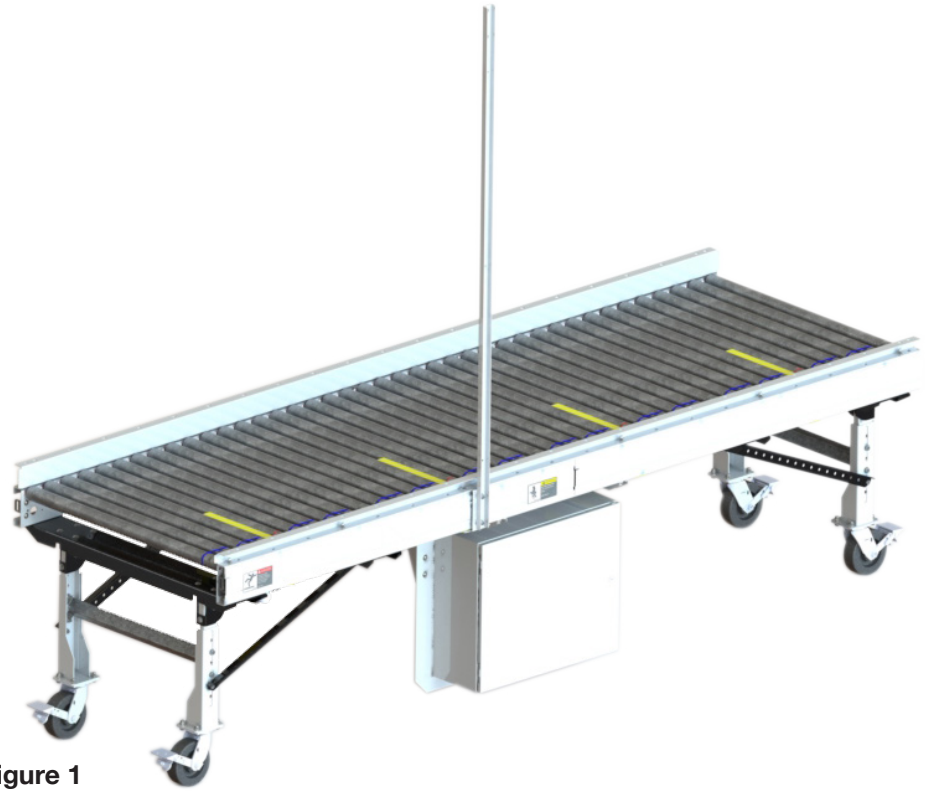

**Figure 1**

MoveIT-Max™ (Figure 1) is a quick to install, quick to re-configure, mobile modular transportation conveyor line that can expand the operational readiness and functionality of a given system.

Based on Trew's popular Series 1500 Motorized Roller, MoveIT-Max™ adds special built-in factory features that simplify and speed installation while providing flexible system layouts.

- Robust structural design.
- Wheeled leg supports for mobility.
- Quick section connects allow for rapidly assemble, disassemble, and re-assemble.
- 24VDC motors provide quiet reliable operation.
- Electrically pre-wired and connectorized for easy installation.

# Specifications

| General Conveyor | |
|---|---|
| Width (BF) | 36”, 48” |
| Length | 10’ Straights |
| Types | Powered, Gravity |
| Height | 32” Top of Roller |
| Speed | 65 FPM (45 – 175) |
| Capacity | 30 lbs. / foot |
| Supports | Attached, 6” locking swivel wheel |
| **Power** | |
| AMPS | 2 AMPS / Motor |
| Watts | 35W |
| Supply | 120VAC/30 AMP |
| Sections | 9 per Power Supply |
| Maximum | 36 Motors per Power Supply |
| **Shipping** | |
| 36” BF Straights | 2000 lbs. per Pallet, (4) 10’ Sections per Pallet |

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# WARNING & SAFETY INFORMATION

# Warning & Safety Introduction

The preventative maintenance instructions in this document contains important warning messages. To mitigate the risk of injury, critical warnings will be boxed with a warning label. An example of a critical warning message is shown below:

**⚠ WARNING**

You must read and understand these precautions completely before operating, setting up, running, or performing maintenance on the equipment. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

Failure to adhere to the instructions contained in this manual and to the warning labels on the conveyor may result in personnel injury or damage to the conveying equipment.

Special attention to all **WARNING**, **DANGER** and **CAUTION** signs is strongly recommended.

Other information on Warning and Safety information can be found in The American National Standard Institute (ANSI) website: https:/webstore.ansi.org. The Conveyor Equipment and Manufacturers Association (CEMA) also provides useful information and can be found at www.cemanet.org.

***Note: Emphasis is placed on the latest edition of the Occupational Safety and Health Standards, which is available from the Department of Labor, Washington, D.C. These standards (found in Part 1910, Title 29 of the Code of Federal Regulations) contain the current, general industry occupational safety and health regulations set forth by federal legislation. Also, some of the information contained in this section has been reprinted from ASME, B20.1--2000 by permission of The American Society of Mechanical Engineers. All rights reserved.***

The safety precautions in this manual are intended to compliment the following:

1. Federal and State safety laws, regulations, and codes.
2. Facility safety rules and practices.

# General Warning and Safety Rules and Practices

General conveyor safety rules are as follows:

- **DO NOT** touch moving conveyor parts.
- **DO NOT** walk, ride, or climb on the conveyor.
- **DO NOT** operate the conveyor with any of the protective guards removed.
- Keep jewelry, clothing, hair, etc., away from the conveyor.
- Know the location and functionality of all start/stop devices and keep those areas free from obstruction.
- Clear all personnel from the equipment before starting the conveyor.
- **DO NOT** attempt to clear any project jams while the conveyor is running.
- Allow only trained and authorized personnel to maintain or repair the equipment.
- **DO NOT** load the conveyor beyond the specified design limits.
- **DO NOT** attempt to make repairs to the conveyor while it is running.
- **DO NOT** modify the equipment without checking with the manufacturer.
- **DO NOT** operate or perform maintenance on the conveyor when taking any type of drug or sedative.
- **DO NOT** operate or perform maintenance on the conveyor when under the influence of alcohol or when over-fatigued.
- Report any unsafe condition to your supervisor or maintenance staff.

# Guards & Headroom

## Guards & Guarding

All exposed moving machinery parts that present a hazard to employees shall be mechanically or electrically guarded for personnel safety. Other guarding practices, means and exceptions can be found below:

**Interfacing of Equipment --** When two or more pieces of conveying equipment have the potential to cause injury, special attention (warning labels and physical guards) should be used to mitigate the risk of injury.

**Guarded by Location or Position –** Remoteness from frequent presence of public or employed personnel shall constitute guarding by location. Overhead conveyors, such as trolley conveyors and hanger suspended tray conveyors, for which guarding would render the conveyor unusable or would be impracticable, shall have prominent and legible warnings posted in the area or on the equipment, and, where feasible, lines shall be painted on the floor delineating the danger area.

When a conveyor passes over a walkway, roadway, or work station, it is considered guarded by location if all moving parts are at least 8 ft. (2.00 m) above the floor or walking surface or are otherwise located so that the employee cannot inadvertently come in contact with hazardous moving parts. Although overhead conveyors may be guarded by location, spill guard, pan guards, or equivalent shall be provided if the product may fall off the conveyor for any reason and endanger personnel.

**Guarding Exceptions --** Wherever conditions prevail that would require guarding under these standards, but such guarding would render the conveyor unusable, prominent warning means such as signs or warning lights shall be provided in the area or on the equipment in lieu of guarding.

## Headroom

If the conveying equipment is installed above exit passageways, aisles, or corridors, there shall be provided a minimum clearance of 6 ft. 8 in. (2.00 m) measured vertically from the floor or walking surface to the lowest part of the conveyor or guards. If the conveying functionality is impaired by the minimum clearance it is permissible to allow passage under conveyors with less than minimum standard if suitable warning indicates the low headroom space.

# Controls

## Control Stations

Control stations should be located such that the operation of the relevant equipment is visible from its operator. Control stations shall be clearly marked or labeled to indicate the function controlled.

**Start/ Stop Controls –** Conveyors with the potential of causing injury when started shall not be started until all personnel is alerted by a signal or by a designated person that the conveyor is about to start.

Where safety is adversely affected by other situations (i.e., a work area with many different conveyors using various warning devices), a clear, concise, and legible warning sign shall be provided. These additional warning measures should indicate that a known danger exits , and that personnel must keep clear. These warning signs shall be provided along the conveyor at areas not guarded by position or location.

**Remote and Automatic Controls –** Conveyors with the potential of causing injury when remotely started must have an audible and/or an optical (i.e. a flashing light) device such that personnel may be clearly warned.

Manned areas that are beyond voice or visual contact from hazardous areas such as drive areas, loading areas, transfer points, or areas not guarded by location or position, or guards, shall be furnished with emergency stop buttons, pull cords, limit switches, or similar emergency stop devices. All such emergency stop devices shall be easily identifiable in the immediate vicinity of such locations unless guarded by location, position, or by guards.

Where the design, function, and operation of such conveyor clearly is not hazardous to personnel, and emergency stop device is not required. The emergency stop device shall act directly on the control of the conveyor concerned and shall not depend on the stopping of any other equipment. The emergency stop devices shall be installed so that they cannot be overridden from other locations.

Inactive and unused actuators, controllers, and wiring should be removed from control stations and panel boards, together with obsolete diagrams, indicators, control labels, and other material which may confuse the operator.

## Safety Devices

All safety devices, including wiring of electrical safety devices, shall be arranged to operate such that a power failure or failure of the device itself will not result in a hazardous condition.

**Emergency Stops and Restarts –** Conveyor controls shall be so arranged that, in case of emergency stop, manual reset or start at the location where the emergency stop was initiated, shall be required of the conveyor(s) and associated equipment to resume operation.

Before restarting a conveyor, which has been stopped because of an emergency, an inspection of the conveyor shall be made, and the cause of the stoppage determined. The starting device shall be locked or tagged out before any attempt is made to remove the cause of the stoppage unless operation is necessary to determine the cause or to safely remove the stoppage. Refer to ANSI Z244.1--1982, American National Standard for Personnel Protection -- Lockout/Tagout of Energy Sources -- Minimum Safety Requirements, and OSHA Standard 29 CFR 1910.147, “The Control of Hazardous Energy (Lockout/Tagout)”.

# Operation Safety Precautions

Only trained personnel shall be permitted to operate a conveyor. Training shall include instruction in operation under normal conditions and emergency situations. General Safety Precautions are as follows:

1. Where safety is dependent upon stopping devices or starting devices or both, they shall be kept free of any obstructions that prevent its intended use.

2. The area around loading and unloading points shall be kept clear of obstructions that could endanger personnel.

3. No person shall ride on a conveyor unless that person is specifically authorized by the owner or employer. Under those circumstances, such employee shall only ride a conveyor which incorporates within its supporting structure, platforms or control stations specifically designed for carrying and controlling such events.

4. Personnel working on or near a conveyor shall be instructed as to the location and operation of pertinent stopping devices.

5. A conveyor shall be used to transport only material it is designed to carry.

6. Under no circumstances shall the safety features of the conveyor be altered if such alterations would endanger any personnel.

7. Routine inspections and preventive or corrective maintenance actions shall be conducted to ensure that all guards and safety features and devices are retained and function properly.

8. Personnel should be alerted to all potential entanglement hazards in the conveying equipment. Items such as long hair, loose clothing or jewelry are examples of entanglement hazards.

9. Conveyors shall not be maintained or serviced while in operation unless proper maintenance or service requires the conveyor to be in motion. In these events, personnel shall be made aware of the hazards and how the tasks may be safely accomplished.

# Maintenance Safety

Maintenance and service shall be performed only by qualified and trained personnel.

It is Important to establish a maintenance program to ensure that all conveyor components are maintained in a condition which does not constitute a hazard to personnel. Additional Maintenance Safety Precautions are as follows:

1. When a conveyor is stopped for maintenance or service, starting devices or power accessories shall be locked or tagged out in accordance with a formalized procedure designed to protect all personnel in the event of an unexpected start.

2. Personnel shall be alerted to the hazard of stored energy, which may exist after the power source is locked out. Refer to ANSI Z244.1—1982, American National Standard for Personnel Protection – Lockout/Tagout of Energy Sources – Minimum Safety Requirements, and OSHA Standard 29 CFR 1910.147, “The Control of Hazardous Energy (Lockout/Tagout).”

3. Replace all safety devices and guards before starting equipment for normal operation.

4. Conveyors shall not be lubricated while in operation unless it is impractical to shut the equipment down for lubrication. Only trained and qualified personnel who are aware of the hazards of the conveyor in motion shall be allowed to lubricate a conveyor that is operating.

5. Guards and safety devices shall be maintained in a serviceable and operational condition. Warning signs shall be maintained in a legible and operational condition. Examples of warning signs are shown later in this section.

6. It is the responsibility of the owner/user to add any additional protective components that may be needed whenever changes or modifications are made to any of the equipment or in its operational characteristics.

# Lockout / Tagout Procedure

Effective January 8, 1990, O.S.H.A. has designated the need for a 'positive, lockable' means to remove all energy sources from equipment prior to service or maintenance.

The electrical power to your equipment can be locked out at the main disconnect switch, which is normally located on the electrical cabinet. When this is done, residual energy remains for some time in the capacitors associated with the electrical system. This residual energy is automatically depleted by features built into the equipment. After locking out the main disconnect switch, wait at least 60 seconds before beginning any maintenance procedures. This allows the residual energy to diminish. If an equipment--mounted plate indicates that you should wait longer than 60 seconds, one should wait for that given time before beginning any maintenance work.

Whenever you need to perform maintenance on the equipment, or whenever you need to shut it down for any other reason, a lockout procedure must be followed. Your employer is required by O.S.H.A. to develop a written lockout/tagout procedure for this equipment. The following items should be considered in developing this procedure.

1. Notify everyone who normally operates, sets up, or performs maintenance on the equipment that it will be shut down.

2. Turn off all electric motors.

3. Turn off the main electrical disconnect switch.

4. Lock the main disconnect switch in the 'Off' position, and place a tag on the switch to indicate that work is being performed on the equipment.

5. If there is any auxiliary equipment associated with the equipment, make sure the main electrical disconnect switch is also turned off for each piece of auxiliary equipment. Then lock each disconnect switch in the 'Off' position and tag each switch to indicate that work is being performed on the equipment.

6. Lock the air supply valves to make sure no air can be supplied to the equipment.

# Lockout / Tagout Procedure (continued)

**7** Verify that no sources of residual energy (capacitors, suspended equipment components, etc.) are present on the equipment or any piece of auxiliary equipment. If any such energy sources are located, make sure they are neutralized. If necessary, manually discharge air pressure and capacitor voltage from charged components. Also, block all suspended or spring-loaded mechanical parts to prevent movement.

**8** Verify that electrical power has been disconnected from the equipment, and from any auxiliary equipment, by trying to energize the equipment and any auxiliaries with the appropriate control switches. If any piece of equipment is found to be operational, locate the electrical circuit(s) supplying the power, and disconnect all such power sources. Then lock and tag these power sources.

**9** Make sure the air system pressure is 0 PSI.

**10** Before you begin any work on the equipment or any auxiliary equipment, make sure that at least 60 seconds has elapsed since you turned off the main disconnect switch in step ‘ 3.’ (If an equipment--mounted plate indicates that you should wait longer than 60 seconds, wait the recommended period of time before beginning any maintenance work.)

**11** Verify that any equipment which may have been added, and which is not covered by steps ‘1. ’ -- ‘10. ’ above, is considered for the lockout/tagout procedure.

**12** After you have completed your work on the equipment, make sure all guards, gates and other safety related devices are in place and functioning properly.

**13** When the equipment is completely ready to resume operation, remove your lock and tag from the main electrical disconnect switch. If someone else has placed a lock and/or tag on the main disconnect, do not remove the additional lock or tag. If there is no other lock or tag on the main disconnect, turn on the main disconnect switch and the electric motors, then perform the daily safety checks.


Locate on 20ft. Centers (Both Sides)


Locate at Drive Guards and Chain/Belt Guards


Locate on Drive Section (Both Sides)


Locate at All Terminals (Both Sides)

Warning Signs

## Safety Signs

In an effort to reduce the possibility of injury to personnel working around conveying equipment, warning signs are placed at various points on the equipment to alert them of potential dangers. Please check the equipment and note all warning signs. Make certain your personnel are alerted to and obey these warnings. The following illustration shows typical signs that are attached to this equipment.

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# RECEIVING & PRE-INSTALLATION

**⚠ WARNING**

During the unpacking process, follow all facility safety procedures for lifting and moving heavy equipment and the proper use of tools for these tasks. If you find any visible damage to the conveyor upon inspection or any entanglement with crating materials, contact the factory BEFORE installing and applying power to the conveyor.

## Unstacking Shipments

1 Prior to and during the unstacking process (Figure 2), look for any damage or out of place wiring or components. Take pictures of any questionable concerns and contact Trew for support.

Figure 2

Figure 3

2 The sections of conveyor will typically be stacked with their support legs folded beneath them. There is enough space between them in the stack to safely remove one at a time using a typical fork truck. We suggest padding the fork surface to avoid damage to the finish of the equipment (Figure 3).

## Unstacking Shipments (continued)

**3** Carefully cut loose the straps containing the folded supports, be prepared to gently drop them downward. Use the supplied 3/8" x 1.00" lg hex bolts, washers and whiz nuts to secure the leg in the upright position (Figures 4–7). Make sure the height is correct, it should be 32" from floor to top of roller surface.

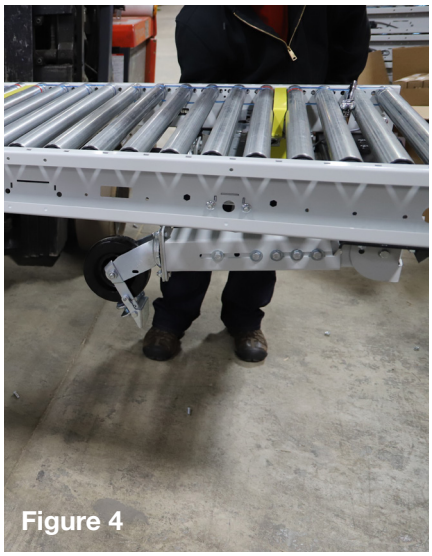
Figure 4


Figure 5


Figure 6

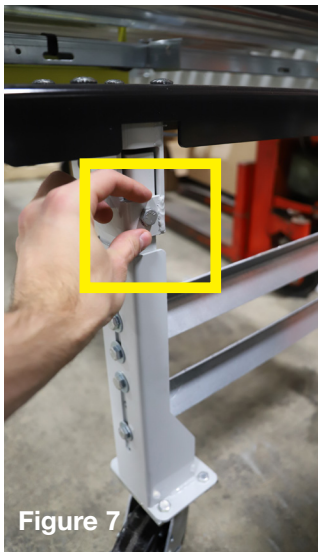
Figure 7

**4** Install the sway brace kit components (PN, 53500-058663) to the conveyor at each support leg prior to traveling in the facility on the casters (Figures 8–9).

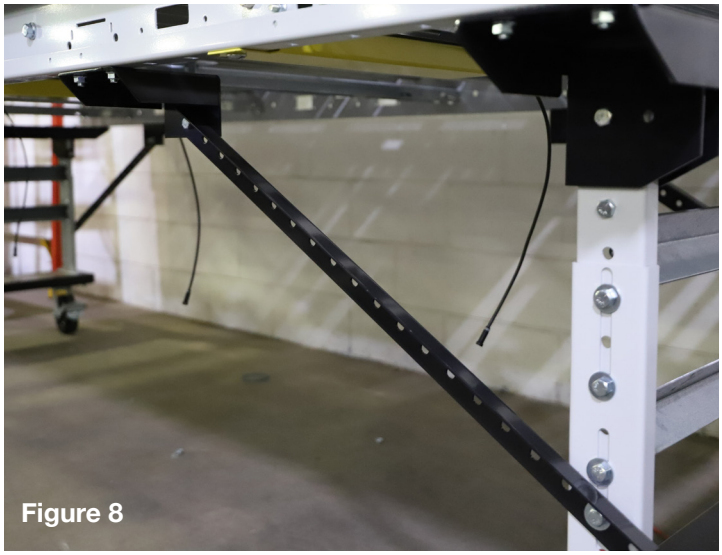
Figure 8

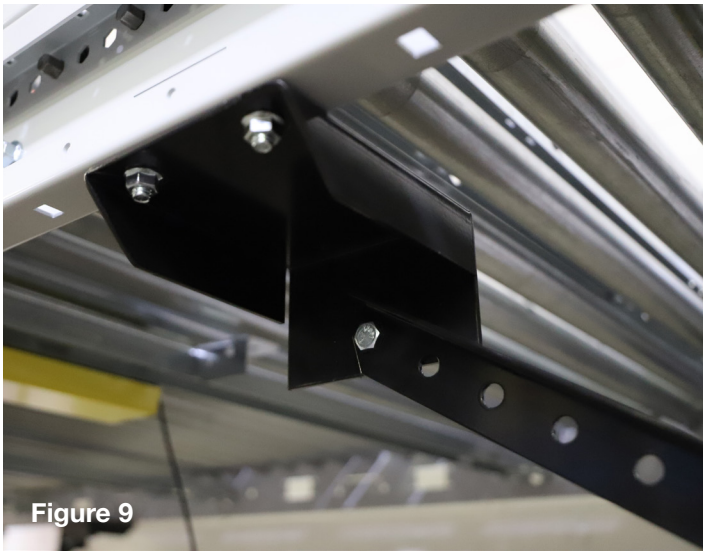
Figure 9

## Unstacking Shipments (continued)

**5** Inspect the conveyor for overall proper condition prior to placing into its service location:

**a)** Ensure the rollers are not damaged during shipping and handling. If the rollers are dented or bent they should be removed and replaced. Instructions for removal are located in **Replacing Rollers Section (6.8)**.

**b)** Visually inspect the o-belts for any damage. There are spare o-belts attached to each bed which can be used as needed for replacements.

**c)** Inspect the ZPA MOTOR CONTROL MODULES to ensure that they are properly secured and their wiring connections are not loose.

**d)** Inspect to the MDR bottom guarding and check whether or not its connections are loose. Do not apply power if any wiring or components appear to be out of place or damaged.

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# INSTALLATION & SETUP

## Parent vs. Child Conveyor Identification

Conveyor segments are either “Parent” or “Child” conveyors, where there is one Parent to several Child conveyors.

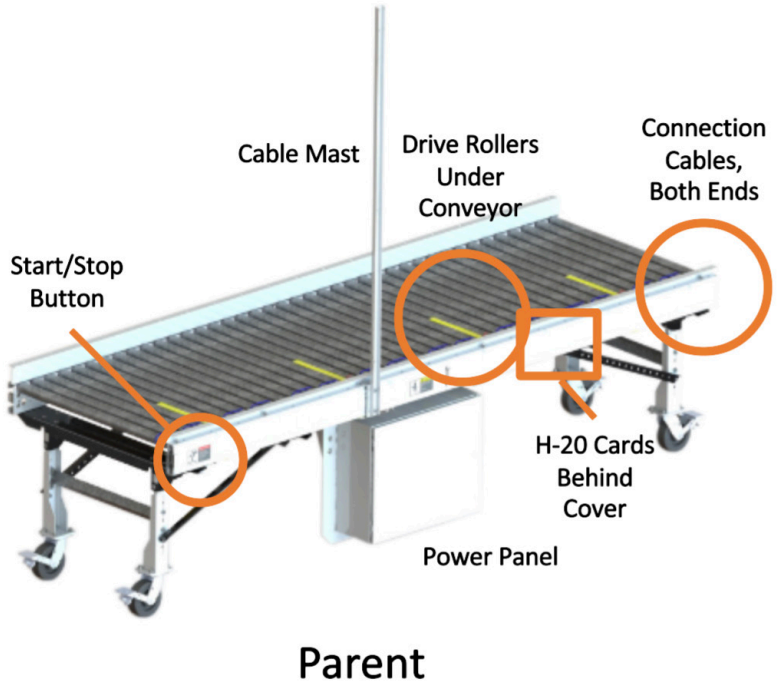
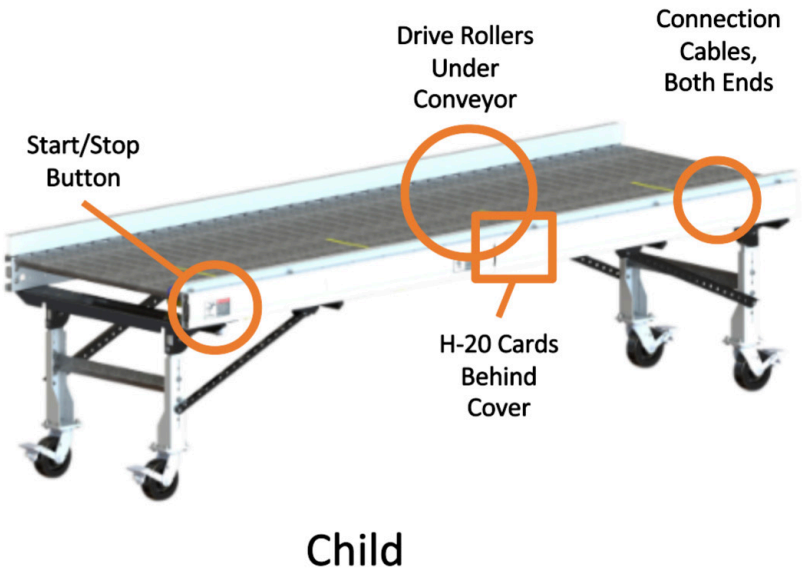



**Figure 10**




They will have many of the same components as shown in figure 10. Parent conveyors will have power supplies installed beneath them that distribute power to Child conveyors.

## Parent vs. Child Conveyor Identification (continued)

Before the power supplies and mast are field mounted to the conveyor, Parent beds can be identified by their “wire containment cord grip” found on control side of the conveyor as shown in figure 11. This is the most visible difference between a Parent and a Child conveyor as they arrive for installation.

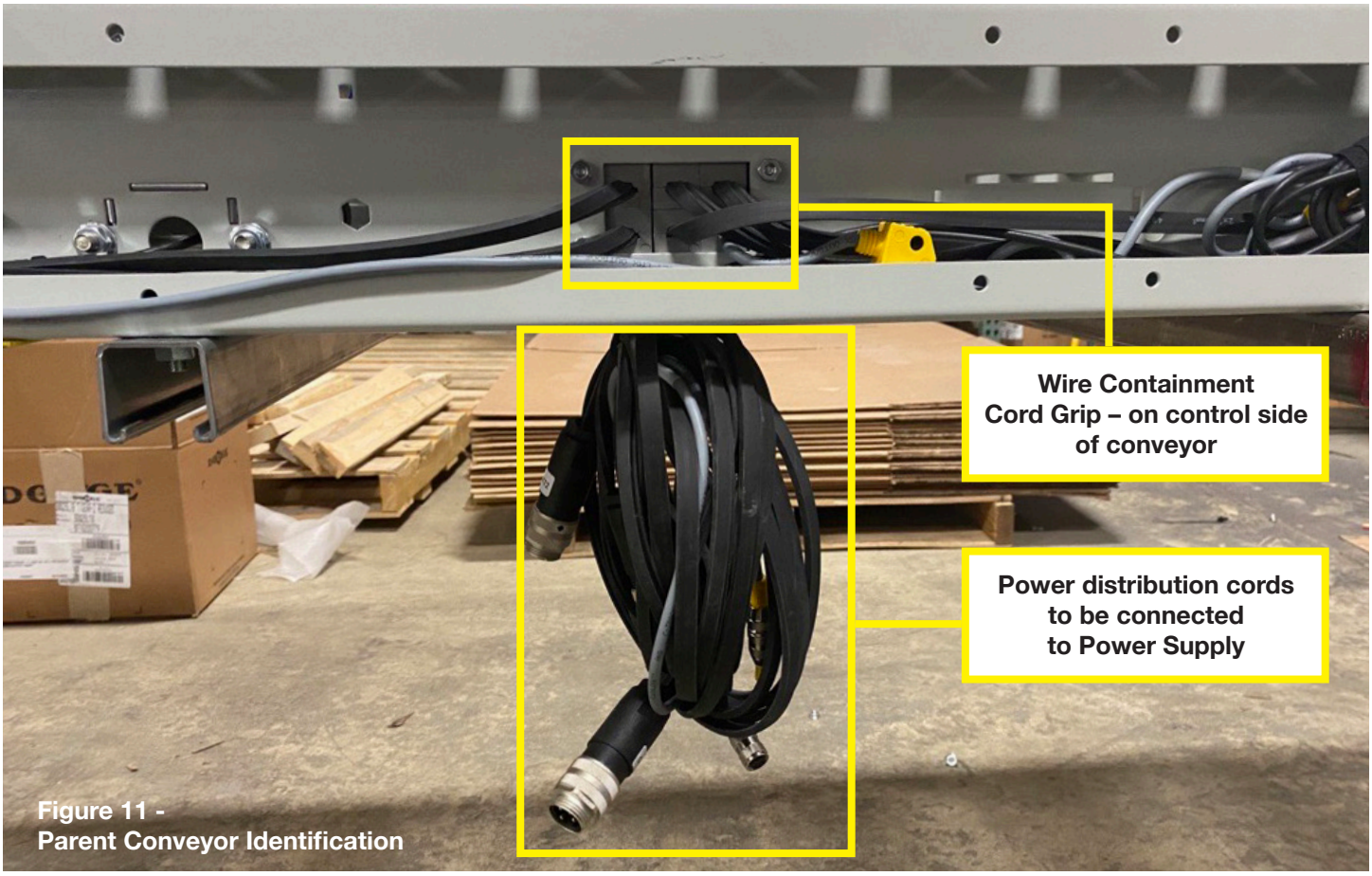



**Figure 11 -**
**Parent Conveyor Identification**

## Installation

With the caster wheels unlocked, roll the conveyor to the intended location within the system according to the project layout (Figures 12–13). Note, make sure to determine the correct direction of product flow.

## Connecting Beds

Once the conveyor is positioned into intended location, align the coupling brackets at the ends of the beds with adjoining conveyor beds, then lock all the caster wheels.

Figure 12

Figure 13

Fasten together at each corner using 3/8 x 3/4” length carriage bolts and flange nuts (Figure 14).

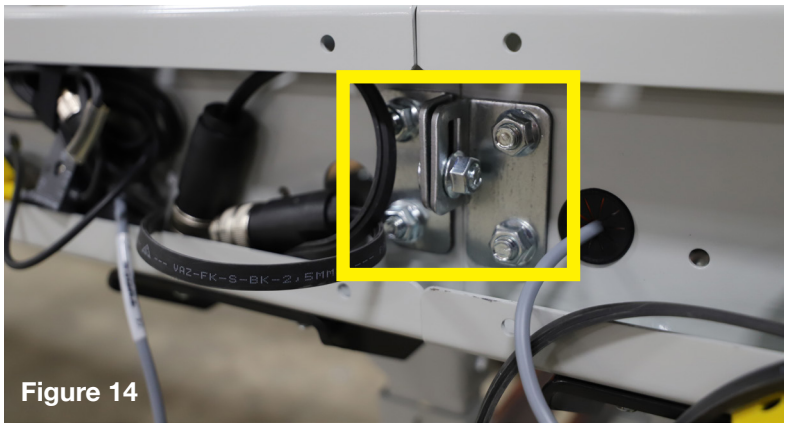


Figure 14

## Connecting Beds (continued)

Parent bed should reside in the center of the children conveyor run intended to be powered by it (Figures 15–16). A total of 8 beds (32 motors) can be powered off a single parent bed, 4 beds on either side of the parent bed. Each bed has female connections on the discharge and male connections on the infeed. The smaller connection (Figure 18) is for the control circuit, and the larger connections (Figure 17) are for the power circuit. Each bed has a power circuit connected to the cards and a bypass circuit. There is a maximum of two beds (8 motors) allowed on a single circuit. The smaller control circuit connection can be chained to multiple groupings of conveyor to stop full groups (Can't only turn off a portion of a full group, has to be the whole group).

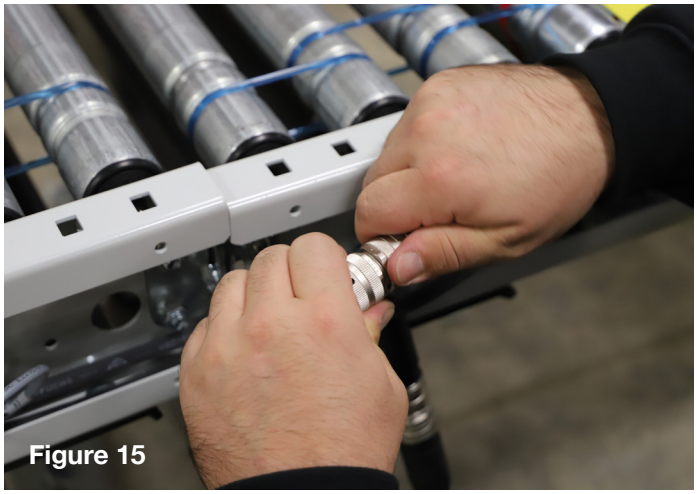


Figure 15

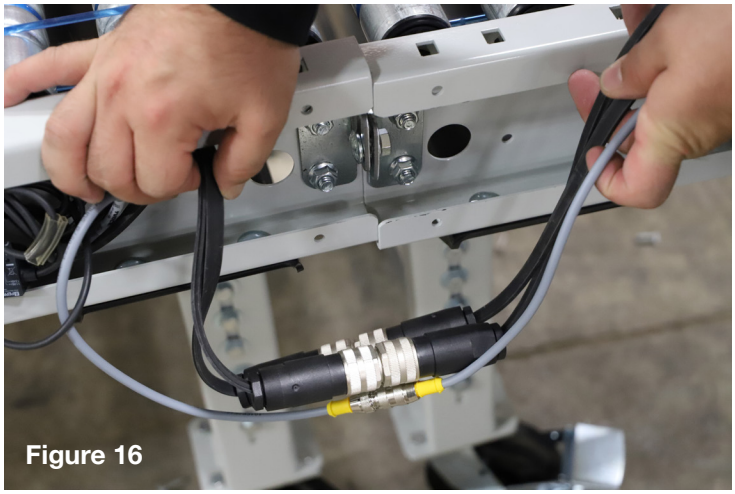


Figure 16

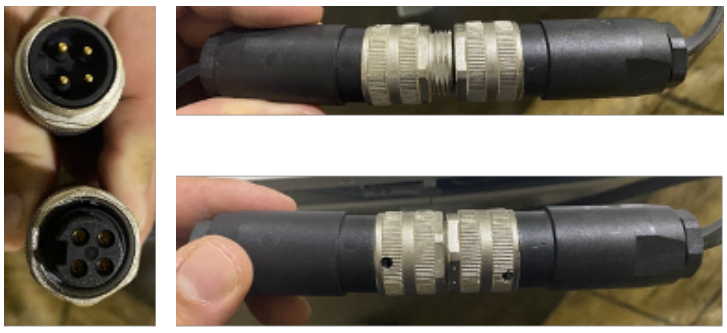


Figure 17 - Larger Connection Cables

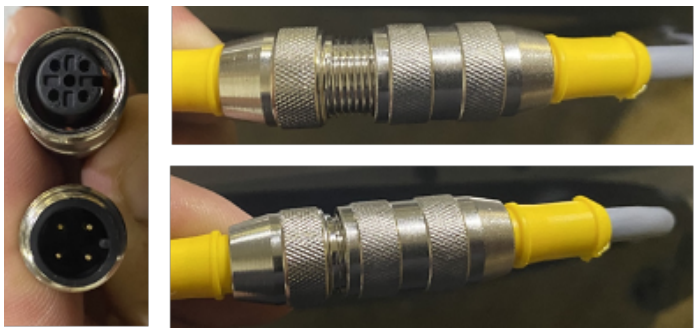


Figure 18 - Smaller Connection Cables

## Mounting Guard Rails

Install the guard rails to the top flange of the conveyor beds where indicated on the layout drawing. The guard rails are typically the same length as the conveyor section (Figures 19–20). Place the guard rail on the flange and loosely assemble 3/8” x 3/4” length carriage bolts and flange nuts in the holes provided near each of the ends of the rail (Figure 21). Position the guard rail in a shingled manner with the adjoining conveyor guard rail so that the tabs overlap in the direction that provides smooth product flow transition from conveyor to conveyor (Figure 22).

Figure 19

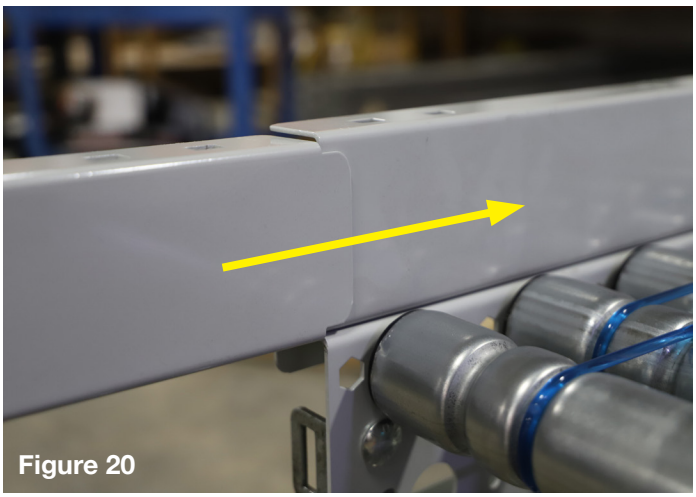


Figure 20

Place additional 3/8” x 3/4” length carriage bolts and flange nuts in the holes provided so that there are at minimum (1) per 24” of distance. Tighten the fasteners.

Figure 21

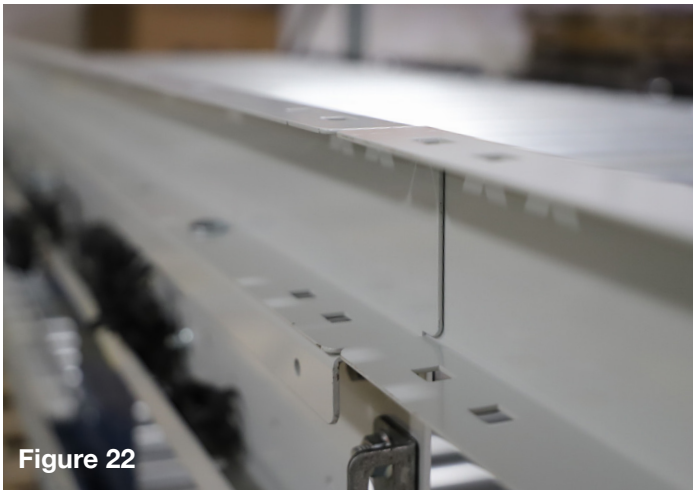


Figure 22

## Electrical Power Connections

(Figures 23–25) All parent beds will have 5 larger connection cables and 1 smaller connection cable coiled up on the backside of the conveyor rail. The larger connections will have a number label on the wire close to the connection point. These numbers are associated with the receptacles on the top of the power supply. Connect all these cables to their correct number on the power supply by aligning the pins, inserting, and twisting it down. There is a smaller connection cable that is for the control circuit. Insert this one by aligning the connector and twisting it down.

Figure 23


Figure 24

Figure 25

**⚠ WARNING**

Before performing any maintenance or lubrication services, follow the lockout/tagout procedure in the Safety section to ensure that the equipment is safe to work on. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

## Electrical Power Connections (continued)

The power cable with a twist lock is located on the left side of the power supply enclosure. A qualified person should install this to a 120VAC 30A connection (Figure 26).

### Twist Lock Connector Instructions

Align the connector blades with plug inlets

Insert blades into inlets

Twist connectors to lock in place

**Figure 26**

## Cable Mast & Power Supply Kit Instructions

Figure 27

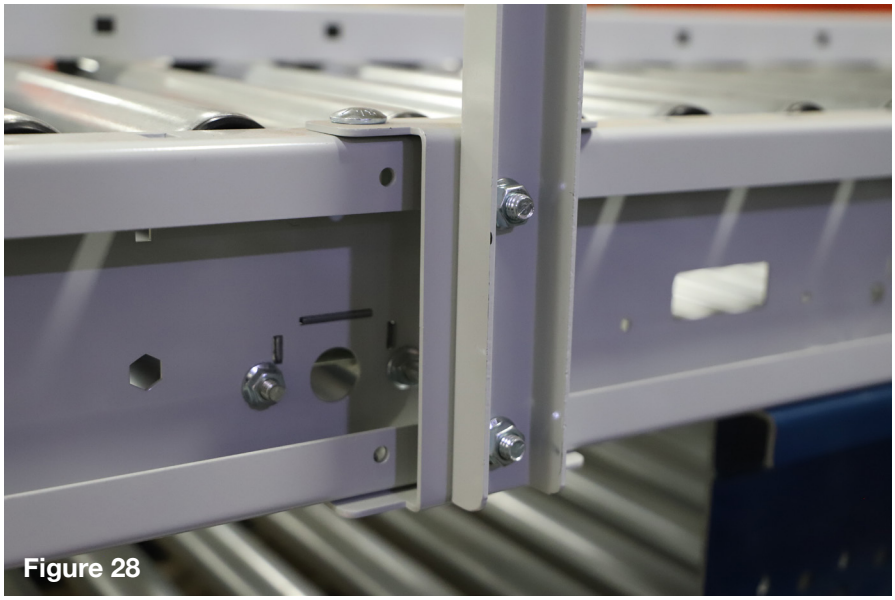


Figure 28

1 Install cable mast kit #1000533 to the left side of the power supply assembly. Use (4) 3/8” x 3/4” length carriage bolts and flange nuts to secure the mast mounting channel to the conveyor frame channel. The mast assembly should be installed after the guardrail is in place (Figures 27–28).

2 The conveyor supply cable will follow down the mast to the power supply enclosure. Fasten the power wire into the mast post using cable ties in the provided holes.

3 Power supply kit installation (Figures 29–31):

**a)** On the “Parent” style conveyors, the power supply assembly #10800-058661 should be installed beneath the conveyor near the center of the length. Securely fasten the Unistrut channels to the lower flanges of the conveyor frame channels.

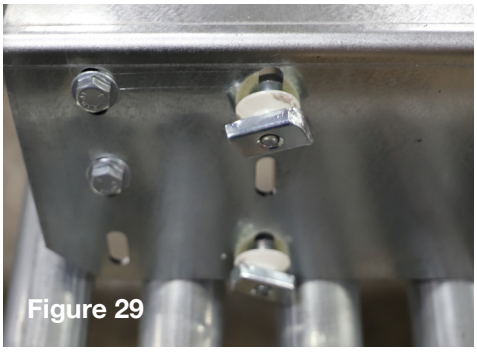


Figure 29

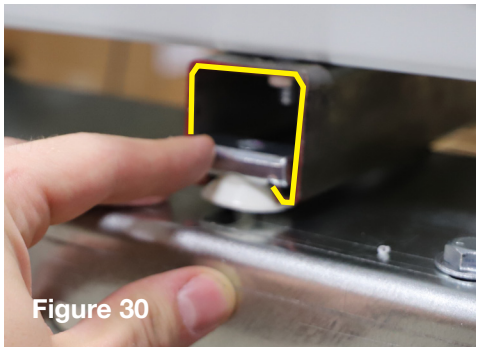


Figure 30

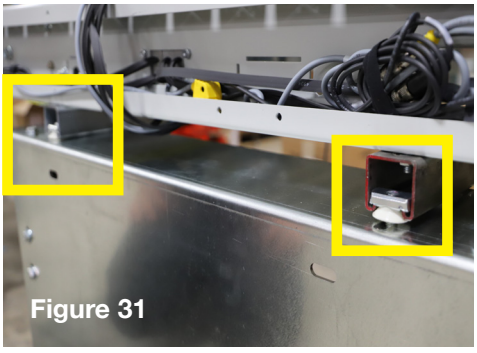


Figure 31

## Configuring Conveyor Speed

The speed setting on Figure 32 will have been preset at Trew. If the conveyor arrives to site and needs to be adjusted to meet other requirements, there is a dial located on the back of each card. This dial can be reached by looking behind the rail of the card where a cut out is located. Use the chart below and adjust the speed of each card in your system. Once this is accomplished, power will need to be removed for 30 seconds from all cards. Simply hitting a stop button in each area will accomplish this.

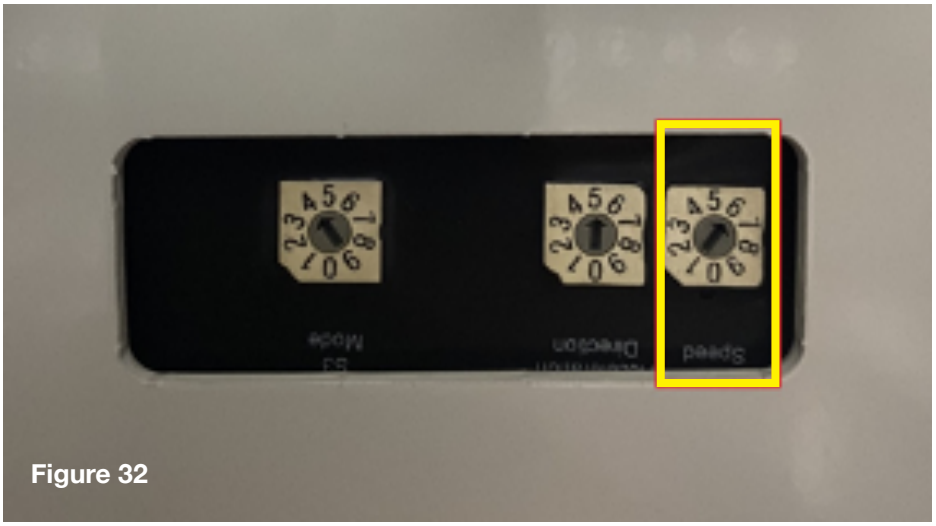


Figure 32

| Speed Chart for Interroll EC5000 18:1 35W Motor | |
|---|---|
| Dial Setting | FPM |
| 0 | 46 |
| 1 | 65 |
| 2 | 85 |
| 3 | 102 |
| 7 | 121 |
| 4 | 148 |
| 5 | 171 |
| 6 | 177 |

## First Time Power-On Checking

1. Check that all connections are fully tightened, and any unused male connections have end caps on them.
2. Remove all items from conveyor surface before first startup.
3. Plug in each power supply (twist lock connection - Figure 26) to verify all rollers start up for the parent/child group. Power supply should have the blue pilot light / illuminated on the front after plugging it in.
4. Test the functionality of each start/stop button in the group.
5. Repeat for all parent/child groups.

## Side Covers

The conveyor's side dust covers should be located on the frame rail channels on the "power" side of the MDR conveyors.

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# OPERATING INSTRUCTIONS

## Turning Power On & Off

Before working on any conveyor, the main twist lock of the power supply in the parent/child group must be disconnected. To do this simply twist the plug and pull apart. If multiple groups are connected, the M12 control cable will need to be unplugged from the power supply as well. Verify front pilot light goes out before servicing equipment.

## How To Start / Stop Conveyor (Figures 33–34)

All conveyor beds will have a switch on the discharge electrical side and infeed non-electrical side. This gives the operator the ability to start/stop conveyor from both sides. All switches in a parent/child group need to be illuminated green in order for the conveyor group to operate.

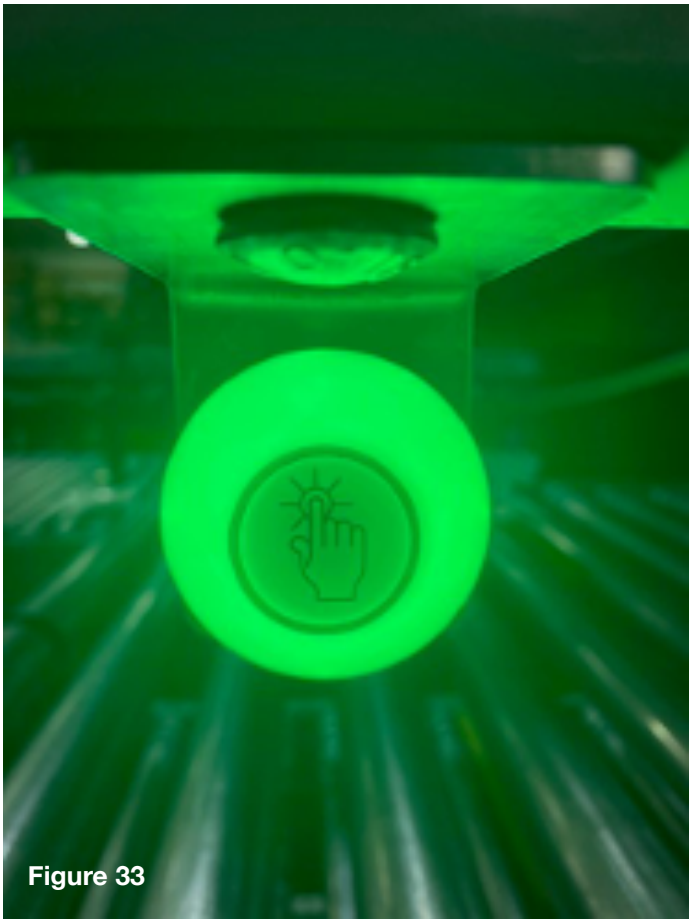

Figure 33

Switch In A Run State

Figure 34

Switch In A Stopped State

## Package Jam Clearance

For safety purposes, all product jams should only be cleared when the conveyor is powered down. In general, the following steps should be taken to clear a product jam:

1. Determine the source of the jam, clear items that may have become wedged between rollers or entangled in the o-bands.

2. If the items involved are conveyable, place them back downstream of the incident.

3. Prior to returning power to the conveyor, inspect the affected area for any damage to rollers, o-bands or other conveyor parts. Refer to maintenance area of the manual to assist if parts replacement is necessary.

4. Once the conveyor is safe to return power, turn the power on and watch the area for a few minutes to assure there is not an unfound cause for creating the jam.

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# MAINTENANCE

The performance and reliability of the equipment described in this document is dependent upon the implementation of a preventive maintenance (PM) routine and operating the equipment with the defined performance specifications.

A PM routine should consist of equipment service operations performed by qualified maintenance specialists. These service operations include periodic cleaning, lubrication and various mechanical adjustments. This program also educates and instructs specialists to identify and to correct any abnormal operating conditions such as whining or screeching sounds, burning smells, or any visual obstruction or component damage. Service operation details can be found in subsequent sections in this document.

Preventive maintenance consists of regular service (lubrication, adjustments, cleaning, etc.). and a commonsense application philosophy of ”keeping your eyes, ears, and nose open.” Use your eyes to see potential component failure. Use your ears to listen for abnormal or louder than normal noises. Use your nose to smell a motor running abnormally warm in time to prevent its burnout. These sights, noises, and smells can be indicators of lack of lubrication, misalignment, or other potential trouble.

Only qualified maintenance specialists should maintain the mechanical, electrical and pneumatic portion of the conveyor.

The likelihood of future equipment operational failures will be low if a regular maintenance program is followed. However, some failures will inevitably occur. To minimize these anticipated future issues, it is suggested that the following maintenance records be kept for each type of equipment so that Trew’s service desk can be of assistance:

**a)** Date of Inspection
**b)** Inspection Results
**c)** Equipment Services
**d)** Repair History
**e)** Part Replacement
**f)** All operational anomalies

**⚠ WARNING**

Before performing any maintenance or lubrication services, follow the lockout/tagout procedure in the Safety section to ensure that the equipment is safe to work on. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

# Maintenance Precautions

**⚠ WARNING**

You must read and understand these precautions completely before operating, setting up, running, or performing maintenance on the equipment. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

1. When testing operating performance, do not start the equipment until all operations and maintenance personnel are notified and clear of the unit being tested.
2. Be certain that required safety guards are properly installed. Never run the equipment under production conditions without the guards.
3. Do not make any equipment repairs, while the conveyor is running.
4. Keep hands, hair and clothing clear of any moving parts.
5. Never attempt to clear load jams, while equipment is running.
6. Always use appropriate tools when making repairs or adjustments.
7. Observe all warning labels and follow plant safety rules.
8. Make sure all connectors are secure and all wires are free from interference, obstruction, and any moving parts.

## Cleaning and Inspection

Proper equipment maintenance (cleaning) will allow the equipment to function properly for longer periods of time. Performing regular inspections on the equipment to identify potential problems before they occur should decrease any unexpected conveyor down times.

Cleaning schedules may be modified as experience is gained. Equipment areas that are prone to excessive debris buildup should have its cleaning frequency increased.

It is recommended that a general inspection that will ensure a thorough examination of each component and assembly contained in the system be done at least once for each thirty day period of operation. Results of these general inspections should be documented in the conveyor record of the unit inspected.

The probability of mechanical/electrical problems increase during periods of heavy usage, so an additional inspections before and after a these periods is recommended.

## Daily Inspection

Walk the entire length of conveyor system and observe the following:

1. With the conveyor running, listen for abnormal noises that could indicate:
    - Worn bearings in rollers, motors, reducers, etc.
    - O-Band making contact due to misalignment or improper adjustment.
2. With the conveyor shut down, look for the following:
    - Strings or other foreign material wrapped around bearings, shafts, or rollers. Remove all foreign material immediately.
    - Shavings or dust under conveyor that would indicate misaligned or damaged components.
    - Oil leakage that would indicate faulty bearings or seals in rollers, motors, reducers, etc.

## Weekly Inspection

1. Visually inspect rollers for wear, improper alignment, or buildup of foreign materials and repair/clean as required.
2. Visually inspect all motors.
3. Check pneumatic water traps and drain as required.
4. Inspect O-Bands for wear or damage. Repair or replace worn or damaged O-Belts.

## Inspection Every 6 Months

1. Check all set screws and tighten as necessary. These may work loose during normal operation.
2. Check all bolted connections and tighten as needed. Bolted connectors may work loose during normal operation.

**⚠ WARNING**

Before performing any maintenance or lubrication services, follow the lockout/tagout procedure in the Safety section to ensure that the equipment is safe to work on. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

# Changing O-Bands

MDR conveyor utilizes O-bands to connect individual rollers together to create a Zone.

Over time the O-bands will exhibit wear and will relax (stretch). Over time, the relaxation will cause the O-Band to slip on the roller and the conveyor speed will begin to decrease. At that time, the O-bands should be replaced. The replacement of O-bands is accomplished by following instructions:

## Replacement of O-Bands

**1** The O-Bands can become worn or damaged and need to be replaced. To replace these, first assure that the conveyor is powered off and locked out.

**a)** At the o-band end of the roller, lift out the rollers that contain the o-band. This is typically done by carefully pushing the axle end with a tool such as a screwdriver tip to shift the axle clear of the frame rail, then lift the end of the roller slightly upward. Do not force lifting the roller, as damage to the roller or side channel with the opposite end hex can occur.

**b)** Remove the o-band from the roller and replace with a new one of the same color.

**c)** Re-install the roller by depressing the axle end on the near side using a putty knife style of thin flat blade, slip the blade part way down the frame rail, while holding the roller in location of the hex hole, remove the blade to allow the axle spring force to push the axle into the hex hole.

**See Next Page 6.6 For Instruction --->**

## Replacement of O-Bands (Figures 35–42)


Figure 35


Figure 36


Figure 37

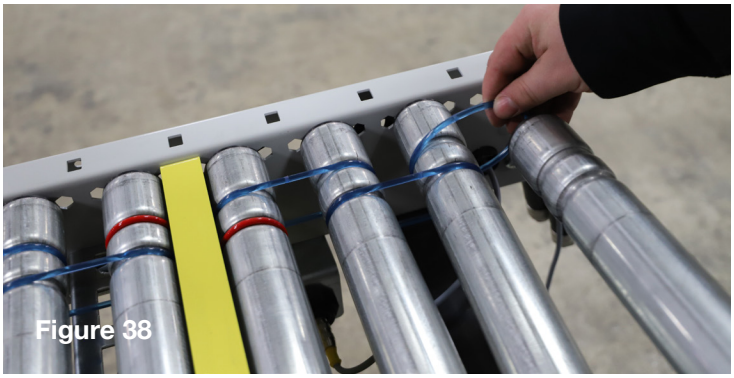
Figure 38

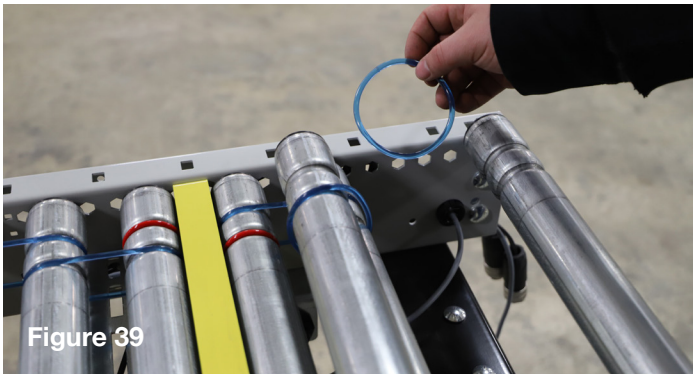
Figure 39

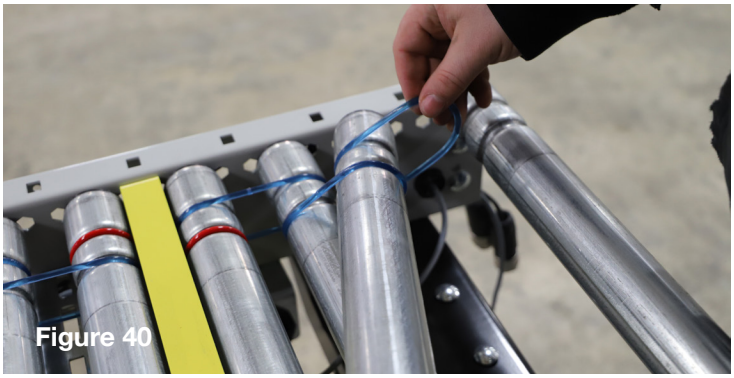
Figure 40


Figure 41


Figure 42

## Replacement of O-Bands (continued) (Figures 43–48)

**2** For o-band replacement at the MDR powered roller, first assure that the conveyor is powered off and locked out.

**a)** Remove the upper roller(s) that are belted to the powered roller.

**b)** Remove the bottom guard of the roller,

**c)** Loosen the mounting nut that contains the powered roller.

**d)** Push the opposite (spring) end axle of the powered roller to disengage from the frame channel. Lower the end of the roller enough to slip the o-band off the open end.

**e)** Replace with new o-band(s) of the same color.

**f)** Reinstall the spring end of the powered roller into the hex hole using the flat blade putty knife.

**g)** Retighten the axle mounting nut at the other end of the powered roller.

**See Next Page 6.8 For Instruction --->**

## Replacement of O-Bands (Figures 43–48)

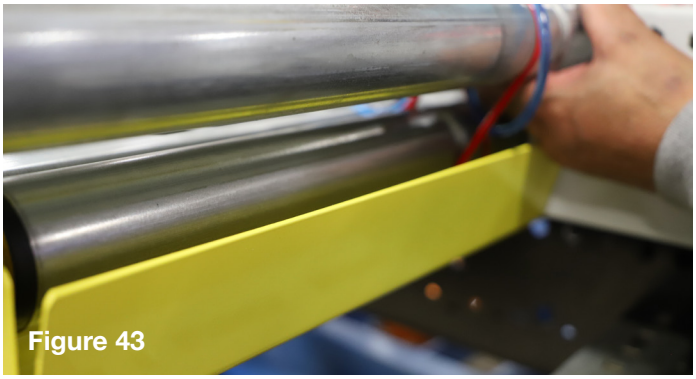

Figure 43

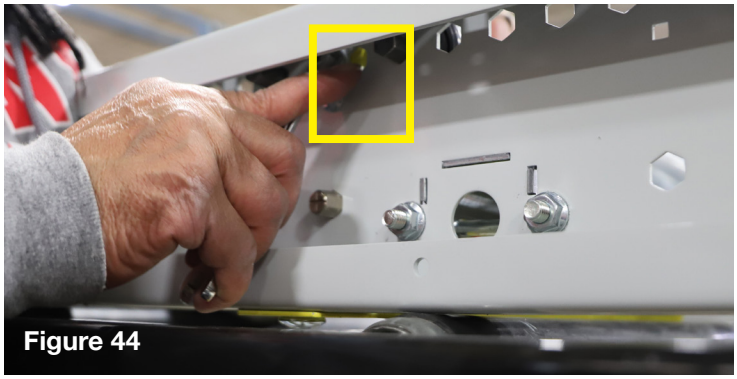

Figure 44

Figure 45

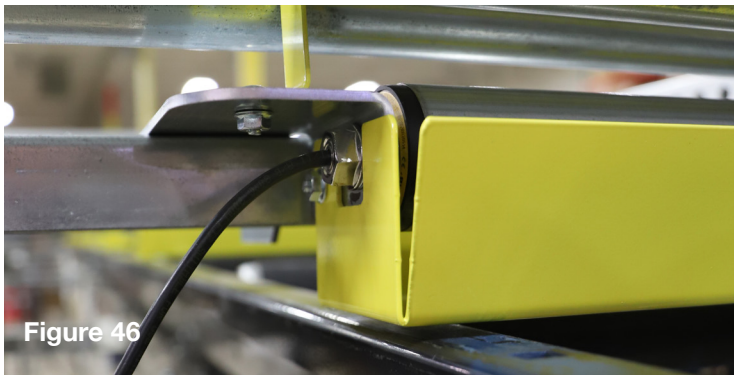

Figure 46

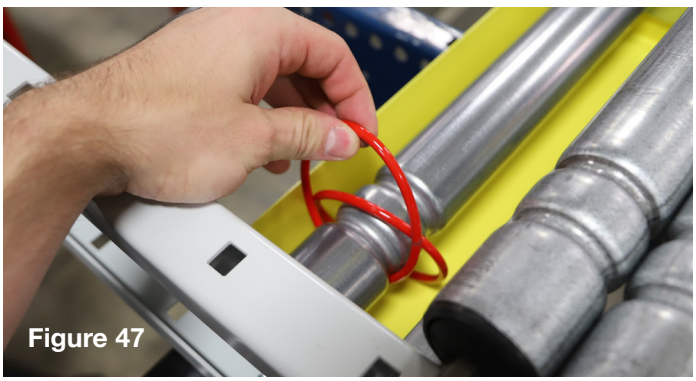

Figure 47

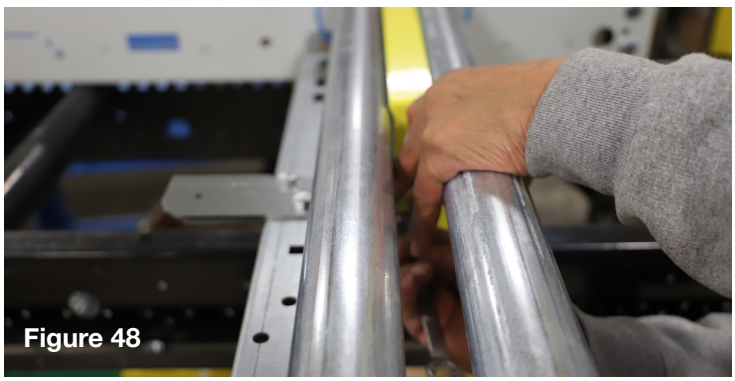

Figure 48

# Replacing Carrier Rollers (Figures 49–52)

1. Turn off and Lockout/Tagout all power to the conveyor.
2. Use a tool to push in the spring loaded axle on the roller to free one end of the axle from the frame of the conveyor.
3. Carefully disengage the opposite end of the roller from the frame and remove. Make sure the axle is not pinched on the frame causing damage during removal.
4. Insert the axle of the replacement roller through the hole on the conveyor frame.
5. Use tool to compress the spring loaded axle on the roller and lower the roller into its proper position.
6. Release the spring loaded axle and make sure it fully engages in the hole in the frame.


Figure 49


Figure 50

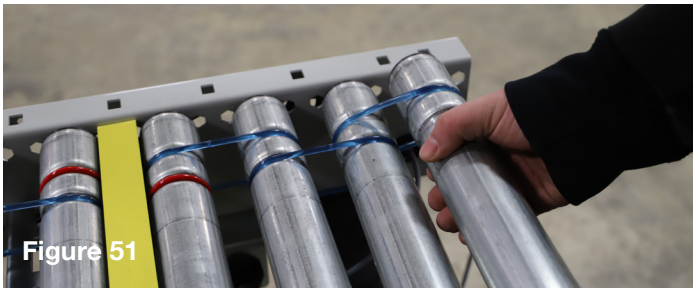
Figure 51

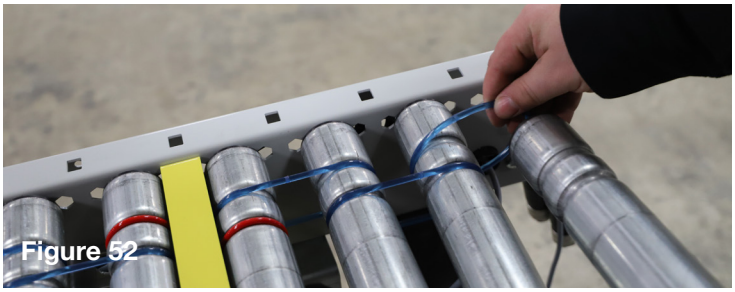
Figure 52

**⚠ WARNING**

Before performing any maintenance or lubrication services, follow the lockout/tagout procedure in the Safety section to ensure that the equipment is safe to work on. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

## Motor Control Card Replacement - H-20 Auto Motor Control Module

**⚠ WARNING**

Before attempting to repair or replace a drive roller, drive card, controller device, or any other device connected to these components, be sure that power to the controls is locked out to prevent premature or accidental start-up. Failure to follow this instruction may result in serious personal injury, and/or equipment damage.

1. Turn off and lock out the power supply to the conveyor.
2. Remove the auxilary power cable from the card.
3. Remove the drive roller cable connector and the control cable or com-link from the drive card.
4. Remove drive card and mounting bracket from the conveyor.
5. Remove drive card from mounting bracket and inspect for Red LED.
6. Inspect the original card and observe the jumper and switch settings.
7. Set the switches and jumpers on the new card to match the old one.
8. Replace old drive card with spare drive card.
9. Carefully connect the control cable or com-link and drive roller cable to the card.
10. Reconnect the auxilary power cable to the card.
11. Unlock the power supply and turn the conveyor on.

**See Next Page 6.11 For Instruction --->**

## Motor Control Card Replacement - H-20 Auto Motor Control Module (Figures 53–60)


Figure 53


Figure 54

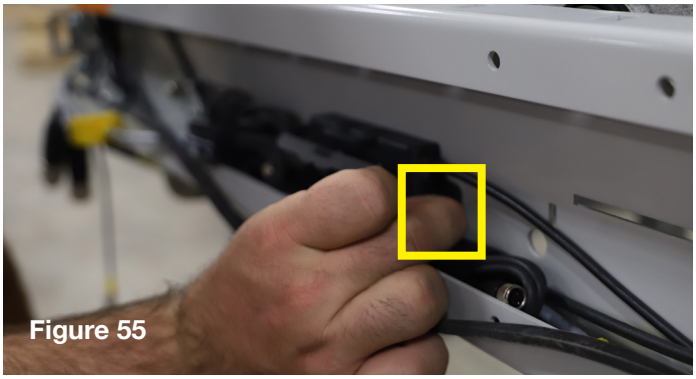
Figure 55


Figure 56


Figure 57


Figure 58

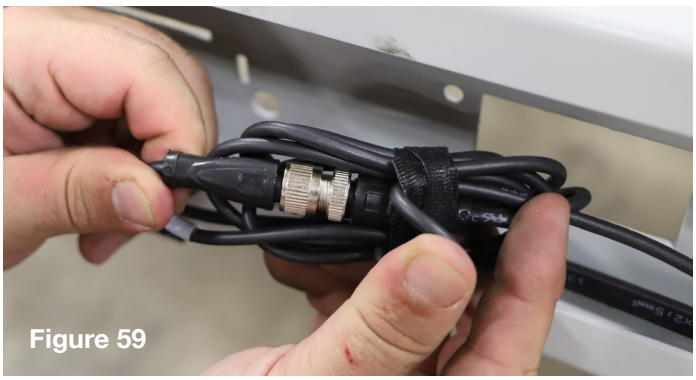
Figure 59


Figure 60

# Motorized Drive Roller (MDR)

The motorized drive roller (MDR) is the muscle of the conveyor zone. It provides the torque and speed required to move the product to the next zone. The MDR has the motor and gearing encapsulated inside the roller tube.

## Replacement of MDR

1. Turn off and Lockout / Tag-out all power to the conveyor section.

2. Remove the bottom guard of the roller.

3. Make sure that the Gear Ratio matches that of the roller that is being replaced. Standard Gear Ratios would include: 16:1, 20:1, 24:1, 36:1, 64:1, and 96:1. This is important if the conveyor system is comprised of more than one speed.

4. The replacement roller should include:
    - **a** Motorized Drive Roller
    - **b** Hardware Kit
        - **i.** star washers – Qty. 2
        - **ii.** motor nut
        - **iii.** motor instructions

5. Install a star washer on the threaded motor shaft.

6. Insert the MDR connector into the hex hole and gently pull the cable extending from the motor through.

7. Insert the threaded hex shaft into the hex hole. Push the spring loaded idler shaft inwards and line the roller up with the hole. Release the idler shaft and allow it to pop into the hole in the frame.

8. Install the outer star washer.

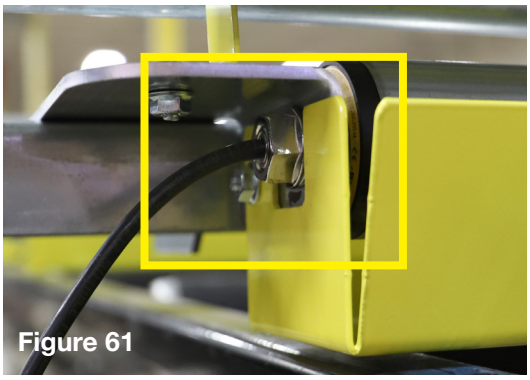

Figure 61


**EC5000:**
50 ft-lbs +/- 5 ft-lbs
(67.8 N-m +/- 6 N-m)

**9** The motor nut threads on to the motorized drive roller shaft, and should be to the proper torque as **shown above (Figure 61).**

**10** Tools required to achieve proper torque can be seen below.


**11** Plug the motor cable into the motor control card.

**12** Check to see if roller operates by passing your hand in front of the photo eye sensor of the zone that is being serviced or the photo eye sensor located upstream with respect to flow.

**13** If the MDR does not operate review the **Troubleshooting Section.**

**⚠ WARNING**

These checks must be performed with the power to the conveyor section turned "**ON**". Only qualified electricians should be allowed to perform these checks. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

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# TROUBLESHOOTING

When troubleshooting equipment problems, it is essential to completely understand how the system functions during normal operation. Thoroughly review the operational description, the circuit drawings, and the electrical diagrams sent with your equipment in order to completely understand how the equipment operates. Once the system operation is understood, it is usually best to start at the problem, and then work back to the source.

General trouble shooting instructions are as follows:

1. Locate the problem.
2. Listen and observe.
3. Identify problem as electrical, mechanical, or pneumatic.
4. Determine symptoms through observations.
5. Think and act with caution and clear thinking.
6. List short and long term solutions.
7. Select a solution or possible solutions.
8. Implement and document one solution at a time.

## Troubleshooting a Dead Zone on the Conveyor

Perform the following visual checks prior to any troubleshooting:

1. Visually check and confirm that all wires are plugged in, intact and all connectors are secure.

2. Visually check and confirm that there are no obstructions to the rollers.

**⚠ WARNING**

These checks must be performed with the power to the conveyor section turned "**ON**". Only qualified electricians should be allowed to perform these checks. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

## Controller Check

The controller typically controls 2 zones. If the 2 zones are not functional, check individual M12 cables. Unplug and plug in the MDR and PE.

Check the controller. If no voltage is detected, check the in-line fuse. If the in-line fuse is functional, check the power supply. Unplug and plug in black cable. Replace drive card.

## Power Supply Check

The power supply typically supplies voltage to multiple zones. If the power supply is defective, all zones supplied will be inoperative. If only one or two zones are inoperative, check the individual connection cables and connectors going to each card.

Check the input voltage into the power supply. Check the power supply fuse or the circuit breaker. Replace if defective.

## Motor Control Card / Motorized Drive Roller Checks

This check determines if the motor control card and the motorized drive roller are functional and must be done with power to the conveyor turned on.

## Motor Control Card / Motorized Drive Roller Checks

This check determines if the motor control card and the motorized drive roller are functional and must be done with power to the conveyor turned on.

**⚠ WARNING**

These checks must be performed with the power to the conveyor section turned "**ON**". Only qualified electricians should be allowed to perform these checks. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

1. Determine if red fault light is on the drive card.
2. Unplug and plug black auxillary cable into ZPA card.
3. Unplug and plug M8 and M12 cables.
4. Remove drive card and make sure rotary rotary dials are the same as previous card.

If the motorized drive roller rotates, the motor control card is defective. Replace the motor control card using the procedure **Motor Control Card section** of this manual. If the motorized drive roller still does not rotate, the motorized drive roller is defective. Replace the motorized drive roller using the procedure in the **Motorized Drive Roller (MDR) section** of this manual.

## No Voltage to the Motor Control Card

This check determines if there is power being supplied to the motor control card and must be done with power to the conveyor turned on.

## No Voltage to the Motor Control Card

This check determines if there is power being supplied to the motor control card and must be done with power to the conveyor turned on.

**⚠ WARNING**

These checks must be performed with the power to the conveyor section turned "**ON**". Only qualified electricians should be allowed to perform these checks. Failure to follow this instruction may result in serious personal injury and/or equipment damage.

1. Determine which motor control card is being used at the zone location.
2. If the voltage is not between 24-26VDC, check the downstream zone motor control card for voltage. If the same condition exists (voltage is not between 24-26VDC), check the Power Supply with a Multi-Meter.
3. If the voltage is between 24-26VDC, check the M12 and M8 connectors.

The Troubleshooting Appendix gives a general guide for some of the common problems that might be seen with Motorized Drive Roller Conveyor.

***Note: The troubleshooting guide does not cover issues involving zones controlled by a programmable logic controller.***

## Control Panel Troubleshooting (Figure 62)

Each power supply has a blue pilot light located on the front for quick verification that all fuses and breakers are in a proper working order. If the pilot light is out a qualified person should verify which breakers and fuses are tripped/blown or if the pilot light is burned out. If found to be tripped/blown, the qualified person should verify all wiring is in correct order before replacing/resetting the problem item.

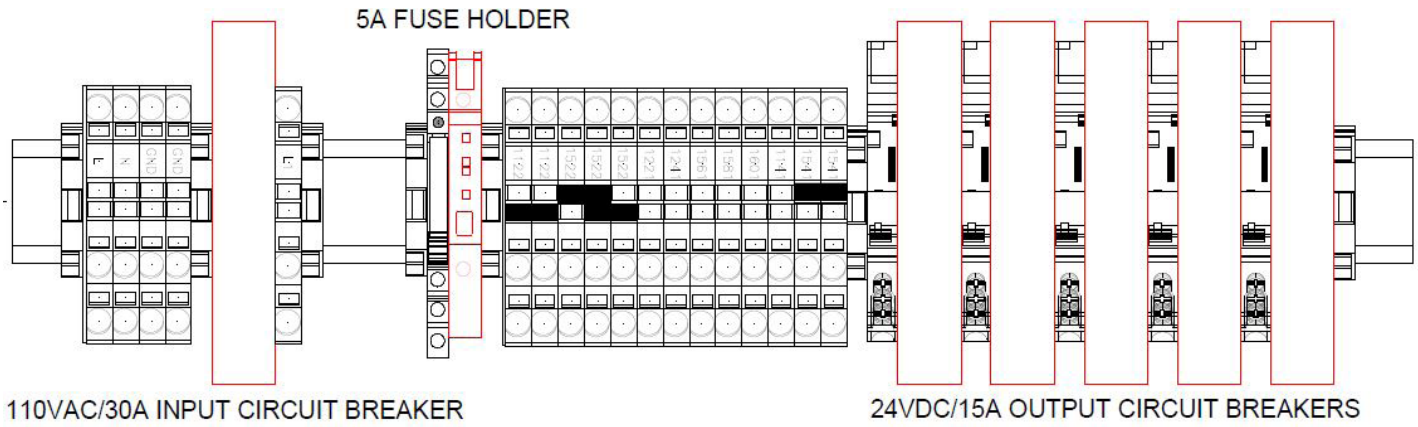


**Figure 62**

| Issue | Probable Cause | Fix |
|---|---|---|
| Single zone not running | -Motor failure<br>-Motor card failure<br>-damaged cabling | -Replace motor<br>-Replace motor card<br>-Check cabling for damage |
| Multiple zones not running | -Power supply circuit is off<br>-Damaged cabling | -Check power supply for tripped breaker<br>-Check cabling for damage |
| Start/Stop button not working | -Button has malfunctioned<br>-Damaged cabling<br>-Fuse blown in power supply enclosure | -Replace button<br>-Check cabling for damage<br>-Replace fuse in power supply enclosure |
| Grinding noise coming from motor | -Damaged motor<br>-Motor rubbing on metal | -Replace motor<br>-Clear obstructions to motor |
| PWR light is off on motor card | -No power to motor card<br>-Defective motor card | -Check power supply for tripped breaker<br>-replace motor card |
| ERR1/ERR2 illuminated on motor card | -Motor has become unplugged<br>-Motor has an internal failure | -Plug motor into motor card<br>-Replace motor |
| Light on outside of power supply enclosure (PSE) is not illuminated | -Circuit breaker has tripped<br>-No power to the PSE<br>-Fuse has blown inside PSE<br>-Pilot light has malfunctioned | -Check for tripped breaker<br>-Check incoming power from power drop<br>-Replace fuse<br>-Replace pilot light |

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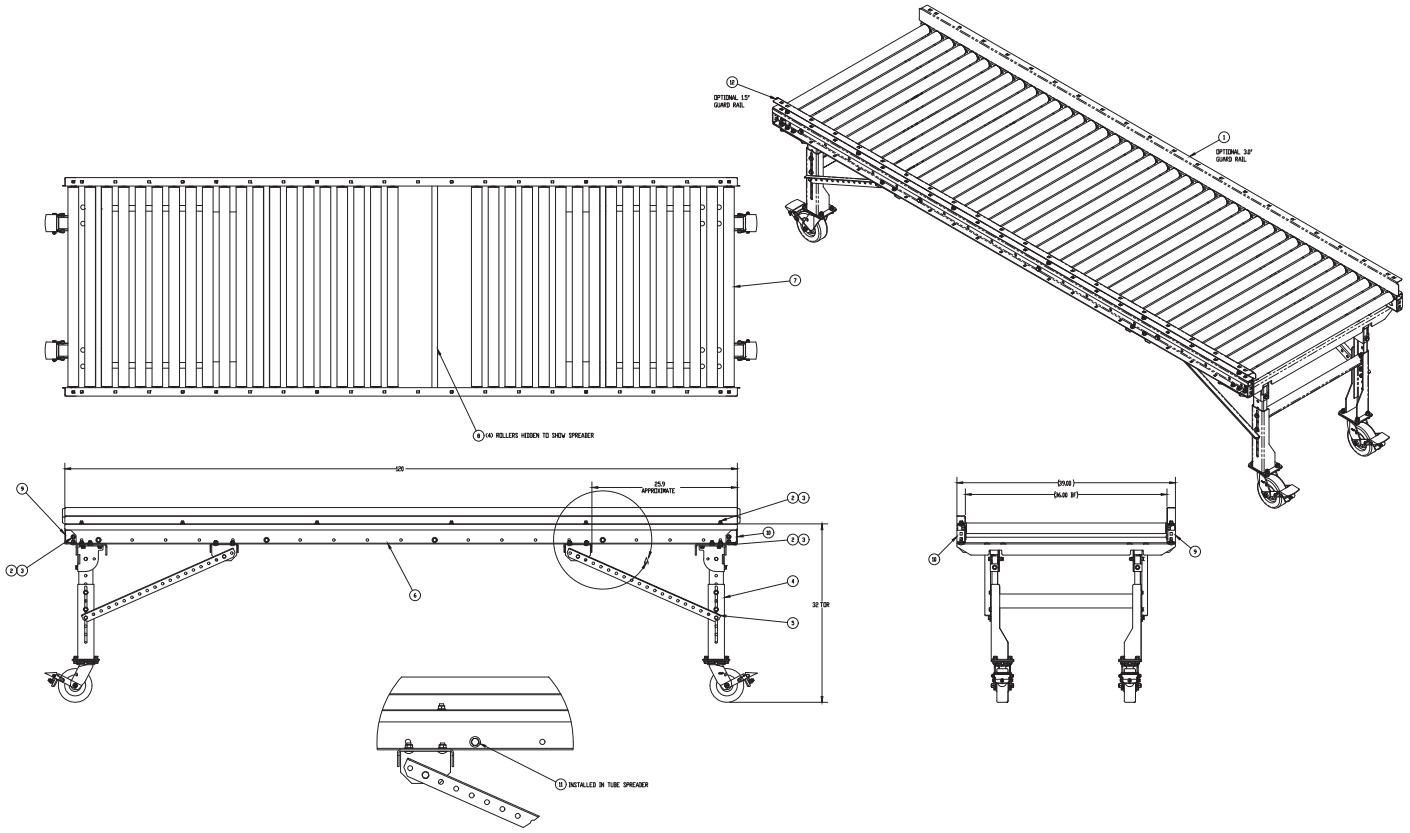
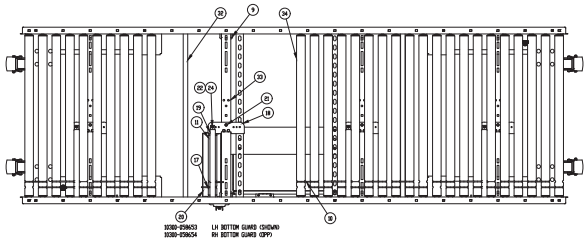
# PARTS REFERENCE

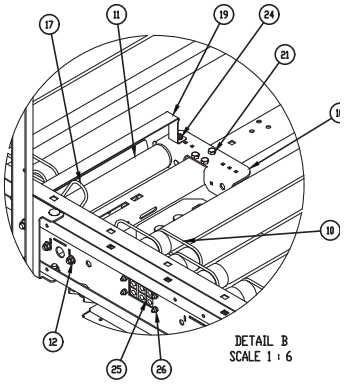
## Gravity Drawings

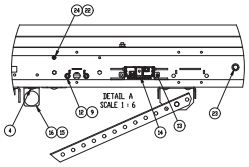


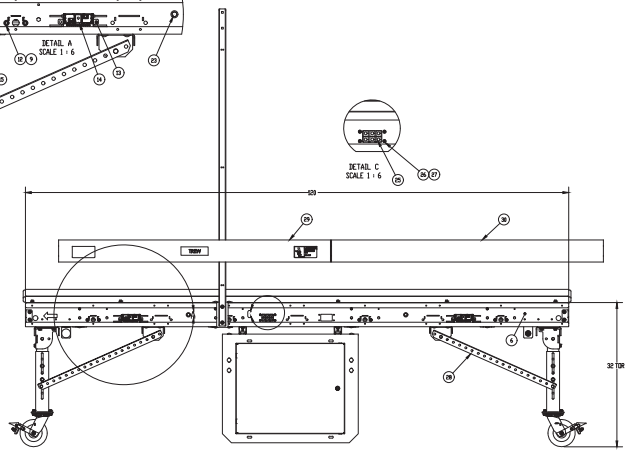

| ITEM | PART NUMBER | QTY. | DESCRIPTION |
|---|---|---|---|
| 1 | 10305-058610 | 1 | 120IN GUARDRAIL CHANNEL WITH TABS, 3IN HEIGHT, 14GA |
| 2 | 10201-010800 | 28 | 3/8-16 UNC X 0.75 CARRIAGE SCREW |
| 3 | 10201-010200 | 28 | 3/8 - 16 UNC HEX FLANGE NUT |
| 4 | 1000466-36 | 2 | SD LEG & CASTER SUPPORT ASSEM W CUSTOM TOP PLATE XXIN BF, XXIN BF LEG SUPPORT |
| 5 | 53500-058663 | 2 | SWAY BRACE KIT |
| 6 | 51301-020987 | 2 | 3.5IN x 1.5IN GRAVITY FRAME RAIL-10FT, 1.00IN FLANGE |
| 7 | 51263-001596 | 40 | 36IN BF Gravity Roller, Commercial Bearings, 1.9IN DIA, No Grooves STD, 16 GA Galvanized |
| 8 | 10200-012072 | 4 | 36"BF CROSSTIE TUBE |
| 9 | 51300-003200 | 2 | 3.5" GRAVITY BOLTED BUTT COUPLER - LH |
| 10 | 51300-003201 | 2 | 3.5" GRAVITY BOLTED BUTT COUPLER - LH |
| 11 | 10201-010010 | 8 | 7/16-14 UNC X 1.00 HEX FLANGE BOLT, SERRATED |
| 12 | 10305-058609 | 1 | 120IN GUARDRAIL CHANNEL WITH TABS, 1.50IN HEIGHT, 14GA |

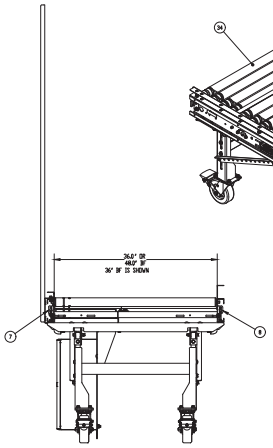
## Intermediate (Parent) Drawings

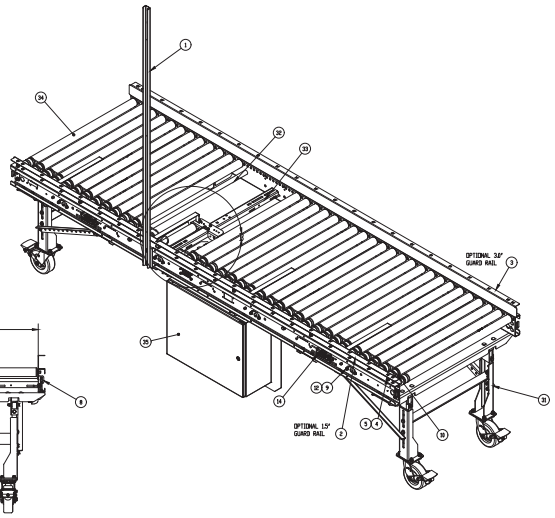




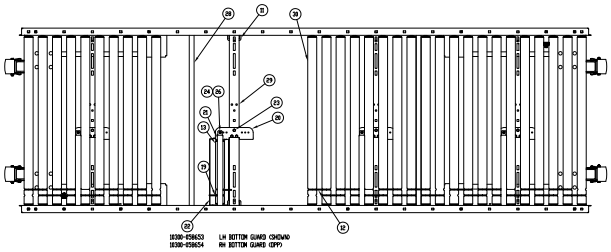


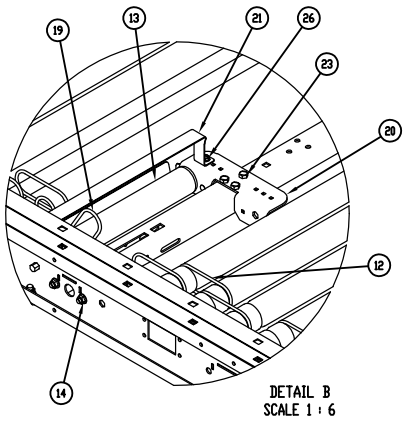
| ITEM | PART NUMBER | QTY. | DESCRIPTION |
|---|---|---|---|
| 1 | 1000533 | 1 | CABLE MAST KIT |
| 2 | 10305-058609 | 1 | 120IN GUARDRAIL CHANNEL WITH TABS, 1.50IN HEIGHT, 14GA |
| 3 | 10305-058610 | 1 | 120IN GUARDRAIL CHANNEL WITH TABS, 3IN HEIGHT, 14GA |
| 4 | 10201-010800 | 27 | 3/8-16 UNC X 0.75 CARRIAGE SCREW |
| 5 | 10201-010200 | 27 | 3/8 - 16 UNC HEX FLANGE NUT |
| 6 | 25301-058635 | 2 | 120IN INTERMEDIATE, SERIES 1500, 30IN ZONE, RSH 5.25IN, 12GA |
| 7 | 10300-005199 | 2 | COUPLER BRACKET (SM) - LH |
| 8 | 10300-005198 | 2 | COUPLER BRACKET (SM) - RH |
| 9 | 10201-001546 | 8 | UBOLT, 5/16IN - 18 UNC X 2.50IN (STD.) |
| 10 | 11212-001541 | 35 | HT BLUE ⊡BANDS, 3IN C-C, 3/16IN x 9.50IN, 85A HT BLUE |
| 11 | 20250-057175-1400 | 4 | MDR, EC5000, 14IN BF, 1.9IN DIA, 18:1, 35W, 2 GROOVE, 7/16IN HEX, IP54, GALVANIZED |
| 12 | 10201-010204 | 28 | 5/16 - 18 UNC HEX FLANGE NUT |
| 13 | 10201-001545 | 4 | REMOVABLE RIVET, NYLON, BLACK, FOR 0.25IN HOLE |
| 14 | 10714-037753 | 2 | H20 ZPA LOGIC MOTOR CONTROL MODULE |
| 15 | 10704-058237 | 2 | BANNER K50 PUSH BUTTON |
| 16 | 10300-058331 | 2 | BANNER K50 SWITCH BRACKET |
| 17 | 11212-049123 | 9 | SUPER RED ⊡BAND, 5mm X 10.00 IN 90A |
| 18 | 10300-058655 | 4 | UNDER ROLLER MDR BRACKET |
| 19 | 10300-058652 | 4 | INTERMEDIATE TOP FINGER GUARD |
| 20 | 10300-058653 | 4 | INTERMEDIATE, BOTTOM FINGER GUARD, LH |
| 21 | 10201-010404 | 12 | 5/16-18 UNC X 0.75 HEX HEAD CAP SCREW |
| 22 | 10201-010818 | 16 | 10 - 24 UNC X 0.50 CARRIAGE SCREW |
| 23 | 10201-010010 | 4 | 7/16-14 UNC X 1.00 HEX FLANGE BOLT, SERRATED |
| 24 | 10201-010203 | 16 | 10 - 24 UNC HEX FLANGE NUT |
| 25 | 10800-058666 | 1 | Raymond Specific Rail Cord Grip Gland |
| 26 | 10201-010225 | 4 | 10 - 24 UNC HEX NYLON LOCK NUT |
| 27 | 10201-029788 | 4 | SL-RHMS 0.19-24x1.00x1.00-N |
| 28 | 53500-058663 | 2 | SWAY BRACE KIT |
| 29 | 10500-059059 | 1 | 60IN COVER, NON-HINGED, 5.25IN HEIGHT, EXTRUDED RIGID PVC, RAL 9022 PEARL LIGHT W/ TREW LOGO |
| 30 | 10204-041050 | 1 | DUST COVER, NON-HINGED, 60IN, 5.25IN HEIGHT, EXTRUDED RIGID PVC, PEARL LIGHT GREY |

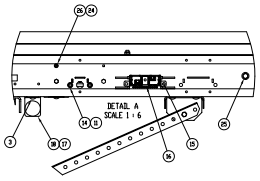
WIDTH COMPONENTS

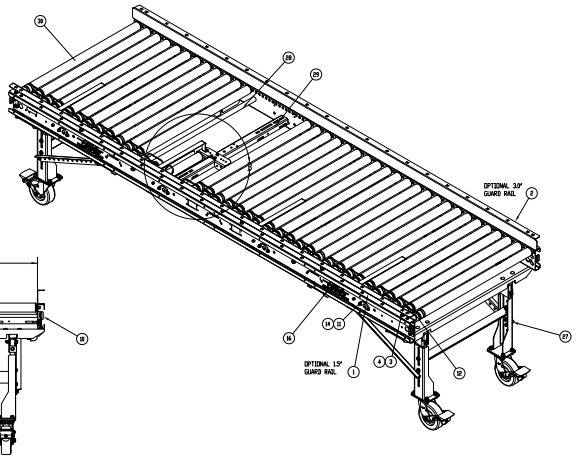
| ITEM | 36.0" WIDTH PN | 48.0" WIDTH PN | QTY. | DESCRIPTION |
|---|---|---|---|---|
| 31 | 1000466-36-F7035 | 1000466-48-F7035 | 2 | SD LEG & CASTER SUPPORT ASSY W CTM TOP PLATE __BF |
| 32 | 10200-012072 | 10200-015172 | 2 | CROSSTIE TUBE, __IN BF, 1IN DIA |
| 33 | 10300-057345-3600 | 10300-057345-4800 | 4 | __IN BF STANDARD CROSSMEMBER |
| 34 | 20560-051185-3600 | 20560-051185-4800 | 40 | CARRIER ROLLER, __" BF, 1.9" OD, 16GA, GALV, 7/16" HEX |
| 35 | 10800-058661 | 10800-059048 | 1 | POWER SUPPLY KIT, __BF |

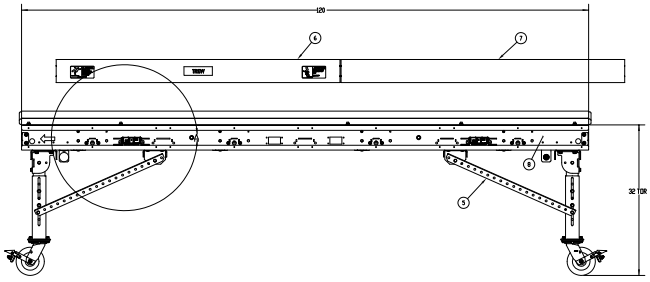
## Intermediate (Child) Drawings

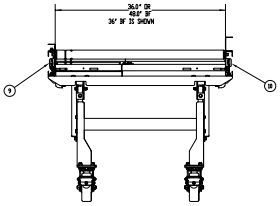






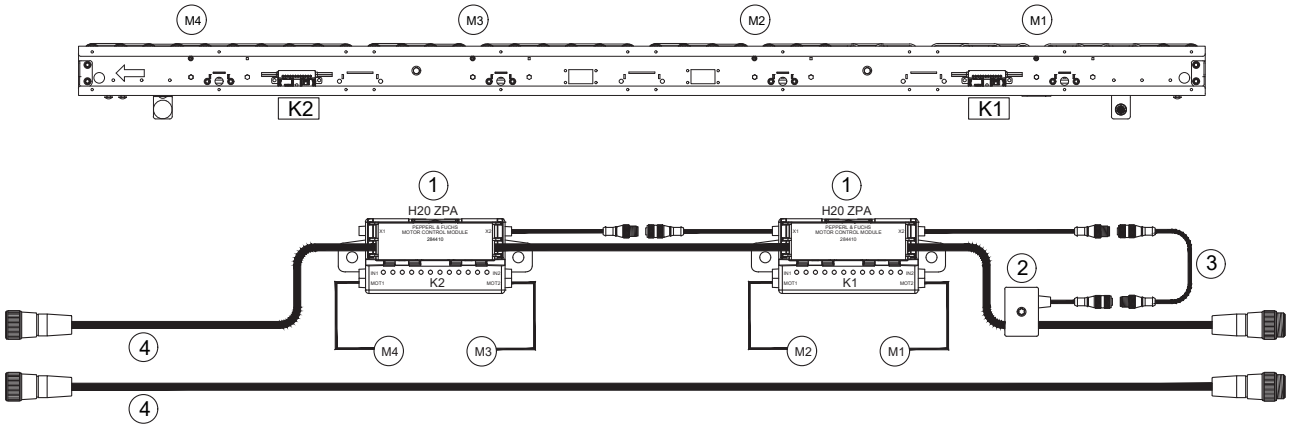


| ITEM | PART NUMBER | QTY. | DESCRIPTION |
|---|---|---|---|
| 1 | 10305-058609 | 1 | 120IN GUARDRAIL CHANNEL WITH TABS, 1.50IN HEIGHT, 14GA |
| 2 | 10305-058610 | 1 | 120IN GUARDRAIL CHANNEL WITH TABS, 3IN HEIGHT, 14GA |
| 3 | 10201-010800 | 27 | 3/8-16 UNC X 0.75 CARRIAGE SCREW |
| 4 | 10201-010200 | 27 | 3/8 - 16 UNC HEX FLANGE NUT |
| 5 | 53500-058663 | 2 | SWAY BRACE KIT |
| 6 | 10500-059059 | 1 | 60IN COVER, NON-HINGED, 5.25IN HEIGHT, EXTRUDED RIGID PVC, RAL 9022 PEARL LIGHT W/ TREW LOGO |
| 7 | 10204-041050 | 1 | DUST COVER, NON-HINGED, 60IN, 5.25IN HEIGHT, EXTRUDED RIGID PVC, PEARL LIGHT GREY |
| 8 | 25301-058635 | 2 | 120IN INTERMEDIATE, SERIES 1500, 30IN ZONE, RSH 5.25IN, 12GA |
| 9 | 10300-005199 | 2 | COUPLER BRACKET (SM) - LH |
| 10 | 10300-005198 | 2 | COUPLER BRACKET (SM) - RH |
| 11 | 10201-001546 | 8 | UBOLT, 5/16IN - 18 UNC X 2.50IN (STD.) |
| 12 | 11212-001541 | 35 | HT BLUE OBANDS, 3IN C-C, 3/16IN x 9.50IN, 85A HT BLUE |
| 13 | 20250-057175-1400 | 4 | MDR, EC5000, 14IN BF, 1.9IN DIA, 18:1, 35W, 2 GROOVE, 7/16IN HEX, IP54, GALVANIZED |
| 14 | 10201-010204 | 28 | 5/16 - 18 UNC HEX FLANGE NUT |
| 15 | 10201-001545 | 4 | REMOVABLE RIVET, NYLON, BLACK, FOR 0.25IN HOLE |
| 16 | 10714-037753 | 2 | H20 ZPA LOGIC MOTOR CONTROL MODULE |
| 17 | 10704-058237 | 2 | BANNER K50 PUSH BUTTON |
| 18 | 10300-058331 | 2 | BANNER K50 SWITCH BRACKET |
| 19 | 11212-049123 | 9 | SUPER RED OBAND, 5mm X 10.00 IN 90A |
| 20 | 10300-058655 | 4 | UNDER ROLLER MDR BRACKET |
| 21 | 10300-058652 | 4 | INTERMEDIATE TOP FINGER GUARD |
| 22 | 10300-058653 | 4 | INTERMEDIATE, BOTTOM FINGER GUARD, LH |
| 23 | 10201-010404 | 12 | 5/16-18 UNC X 0.75 HEX HEAD CAP SCREW |
| 24 | 10201-010818 | 16 | 10 - 24 UNC X 0.50 CARRIAGE SCREW |
| 25 | 10201-010010 | 4 | 7/16-14 UNC X 1.00 HEX FLANGE BOLT, SERRATED |
| 26 | 10201-010203 | 16 | 10 - 24 UNC HEX FLANGE NUT |

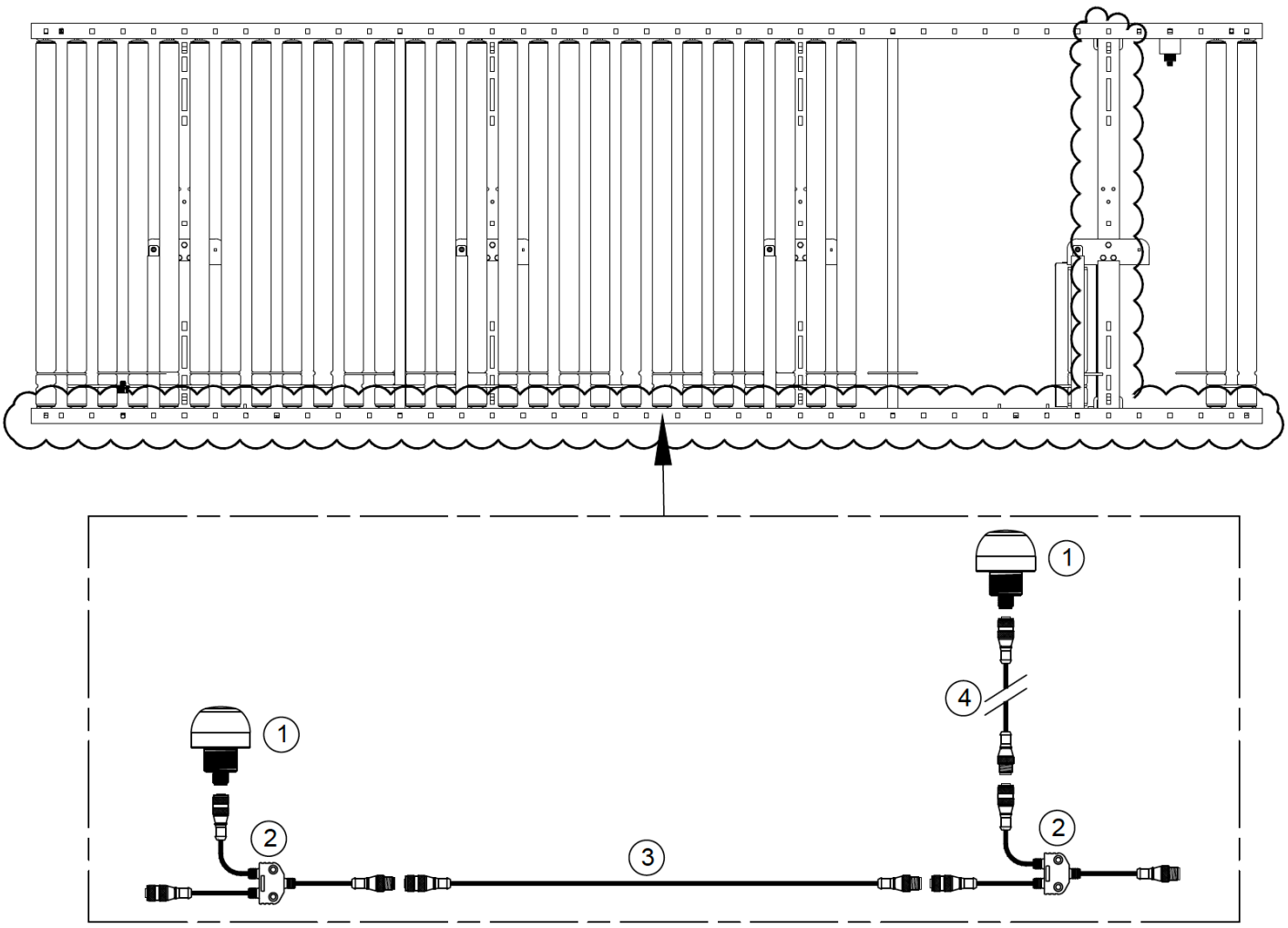
WIDTH COMPONENTS

| ITEM | 36.0" WIDTH PN | 48.0" WIDTH PN | QTY. | DESCRIPTION |
|---|---|---|---|---|
| 27 | 1000466-36-F7035 | 1000466-48-F7035 | 2 | SD LEG & CASTER SUPPORT ASSY W CTM TOP PLATE __BF |
| 28 | 10200-012072 | 10200-015172 | 2 | CROSSTIE TUBE, __IN BF, 1IN DIA |
| 29 | 10300-057345-3600 | 10300-057345-4800 | 4 | __IN BF STANDARD CROSSMEMBER |
| 30 | 20560-051185-3600 | 20560-051185-4800 | 40 | CARRIER ROLLER, __" BF, 1.9" OD, 16GA, GALV, 7/16" HEX |

## Electrical Drawings

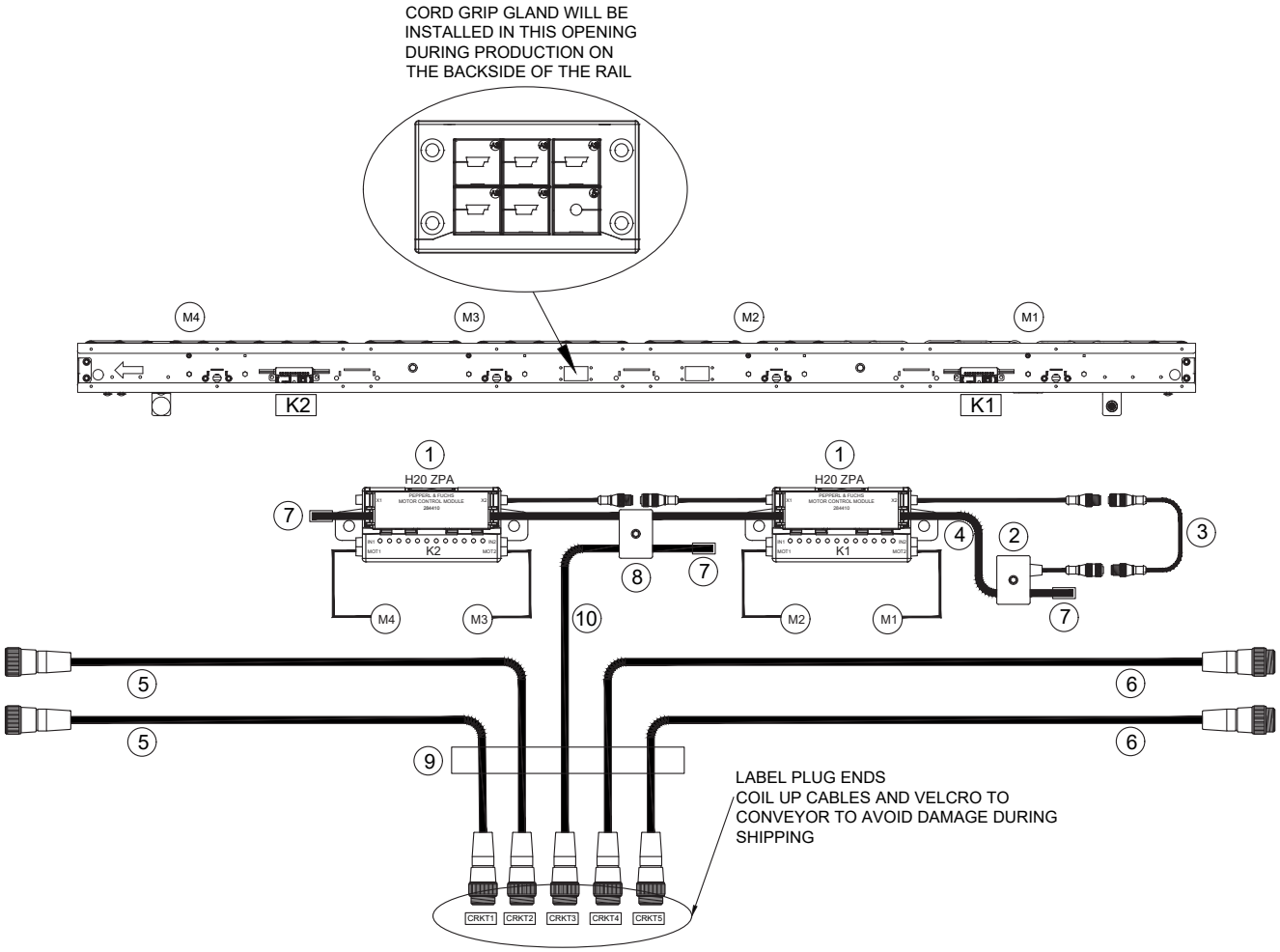



| ITEM | QTY | MANUFACTURER | HILMOT PART NUMBER<br>MANUFACTURER PART NUMBER | DESCRIPTION |
|---|---|---|---|---|
| 1 | 2 | PEPPERL & FUCHS | 10714-037753<br>284410 | H20 ZPA Logic Motor Control Module |
| 2 | 1 | PEPPERL & FUCHS | 10707-044329<br>VAZ-T1-FK-G10-0,3M-PUR-V1-G | Splitter Box G10, AS-Interface to M12 Female Straight Connector |
| 3 | 1 | TURCK | 10707-058596<br>RK4.21T-0.2-RS4.22T/CS*** | X2 Connection Cable From P&F G10 Block |
| 4 | 2 | | 10802-058989 | Raymond AMZL MEM3 Male to Female Power Cable |

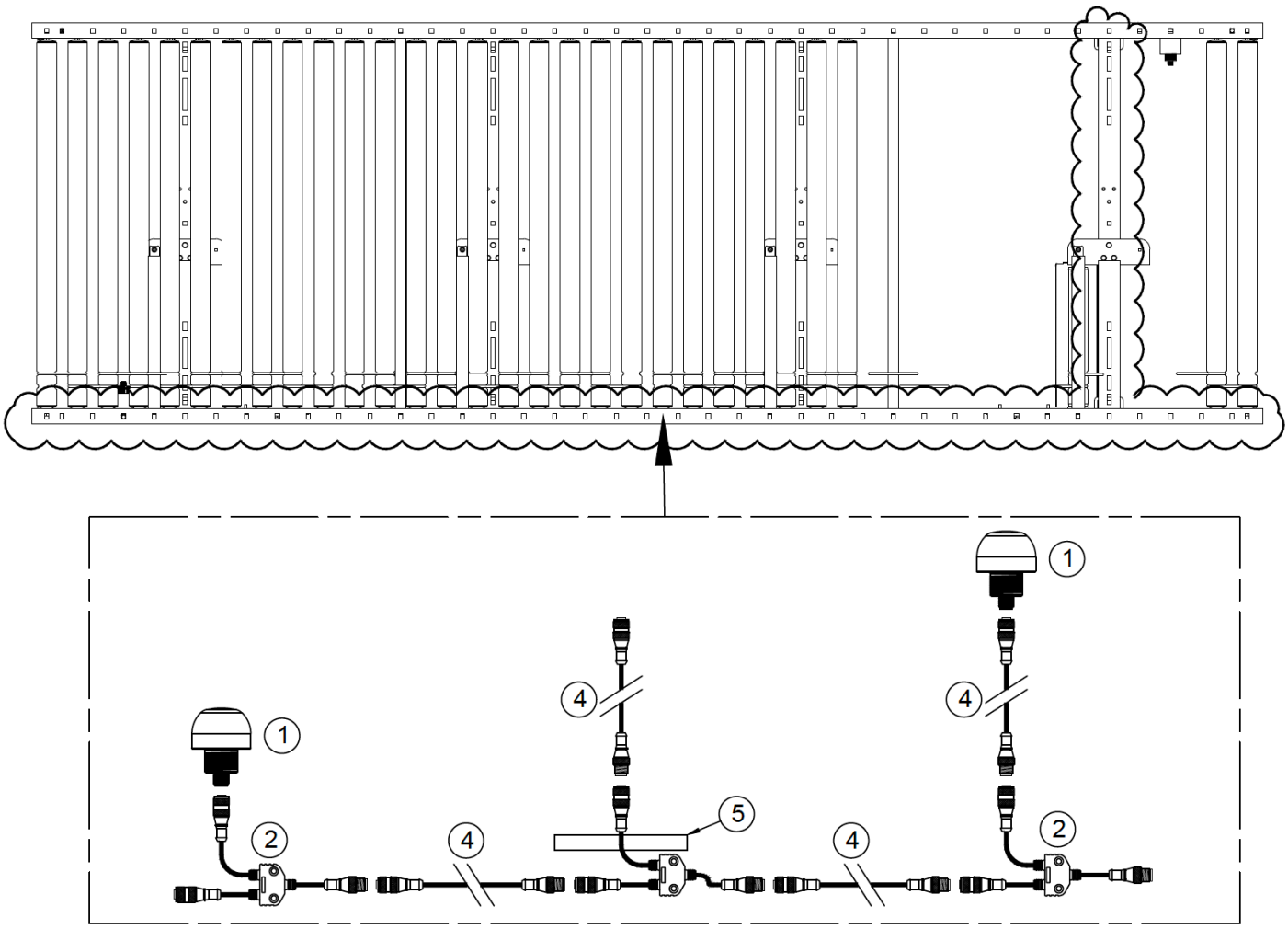



| ITEM | QTY | MANUFACTURER | HILMOT PART NUMBER<br>MANUFACTURER PART NUMBER | DESCRIPTION |
|---|---|---|---|---|
| 1 | 2 | BANNER | 10704-058237<br>K50ALBT2GRHQ | K50 Series EZ-LIGHT |
| 2 | 2 | TURCK | 10707-058573<br>VB2-RS4.4T-0.5/2RK4.4T-0.5/0.5/S651 | 2-Branch Splitter, M12, Straight Through, Male to (2) Female M12 |
| 3 | 1 | TURCK | 10707-057765<br>U2167-12 | M12, Straight Female to Straight Male, 3m length, Gray |
| 4 | 1 | TURCK | 10707-057763<br>RK4.4T-1-RS4.4T | M12, Straight Female to Straight Male, 1m length, Gray |

## Electrical Drawings (continued)

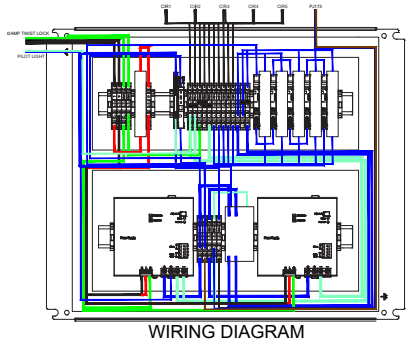



| ITEM | QTY | MANUFACTURER | HILMOT PART NUMBER<br>MANUFACTURER PART NUMBER | DESCRIPTION |
|---|---|---|---|---|
| 1 | 2 | PEPPERL & FUCHS | 10714-037753<br>284410 | H20 ZPA Logic Motor Control Module |
| 2 | 1 | PEPPERL & FUCHS | 10707-044329<br>VAZ-T1-FK-G10-0,3M-PUR-V1-G | Splitter Box G10, AS-Interface to M12 Female Straight Connector |
| 3 | 1 | TURCK | 10707-058596<br>RK4.21T-0.2-RS4.22T/CS*** | X2 Connection Cable From P&F G10 Block |
| 4 | 8" | PEPPERL & FUCHS | 10715-046538<br>VAZ-FK-S-BK-2.5MM | Black AS-Interface Power Flat Cable; 2 Conductor 14AWG Cable; Rubber Compound Outer Coating |
| 5 | 2 | | 10802-058989 | Raymond AMZL MEM3 Male to Female Power Cable |
| 6 | 2 | | 10802-058991 | Raymond AMZL MEM3 Male to Male Power Cable |
| 7 | 3 | PEPPERL & FUCHS | 10716-034891<br>VAZ-FK-ED3 | AS-Interface end seal for flat cable |
| 8 | 1 | PEPPERL & FUCHS | 10710-033467<br>VAZ-2FK-G10-BRIDGE | Splitter box G10, flat cable to flat cable |
| 9 | 1 | ICOTEK | 10800-058666 | Raymond Specific Rail Cord Grip Gland |




| ITEM | QTY | MANUFACTURER | HILMOT PART NUMBER<br>MANUFACTURER PART NUMBER | DESCRIPTION |
|---|---|---|---|---|
| 1 | 2 | BANNER | 10704-058237<br>K50ALBT2GRHQ | K50 Series EZ-LIGHT |
| 2 | 2 | TURCK | 10707-058573<br>VB2-RS4.4T-0.5/2RK4.4T-0.5/0.5/S651 | 2-Branch Splitter, M12, Straight Through, Male to (2) Female M12 |
| 3 | 1 | TURCK | 10707-057765<br>U2167-12 | M12, Straight Female to Straight Male, 3m length, Gray |
| 4 | 1 | TURCK | 10707-057763<br>RK4.4T-1-RS4.4T | M12, Straight Female to Straight Male, 1m length, Gray |
| 5 | 1 | ICOTEK | 10800-058666 | Raymond Specific Rail Cord Grip Gland |

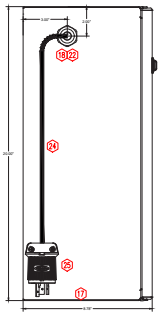
# Electrical Drawings (continued)



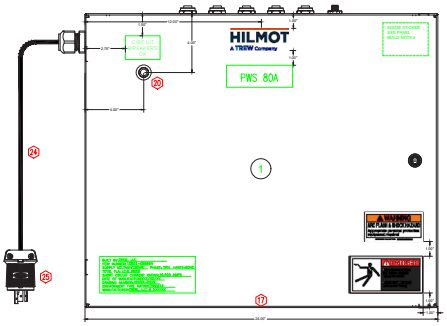
WIRING DIAGRAM

| | |
|---|---|
| INTPUT VOLTAGE RANGE | 100–240 VAC/1PH |
| INPUT CURRENT | 17.2 FLA AT 120VAC |
| INPUT PHASE / WIRE | 1PH |
| INPUT FREQUENCY | 60 Hz |
| SCCR | 10 kA |
| OUTPUT VOLTAGE | 24.0 VDC |
| OUTPUT CURRENT | 80 A |

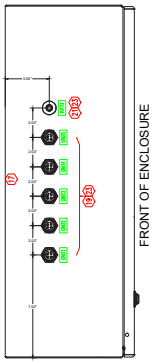
LEFT VIEW

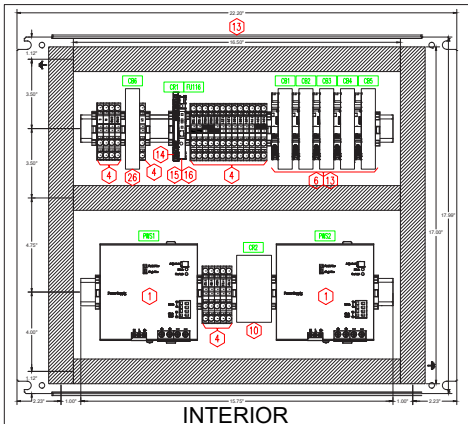


FRONT VIEW




TOP VIEW

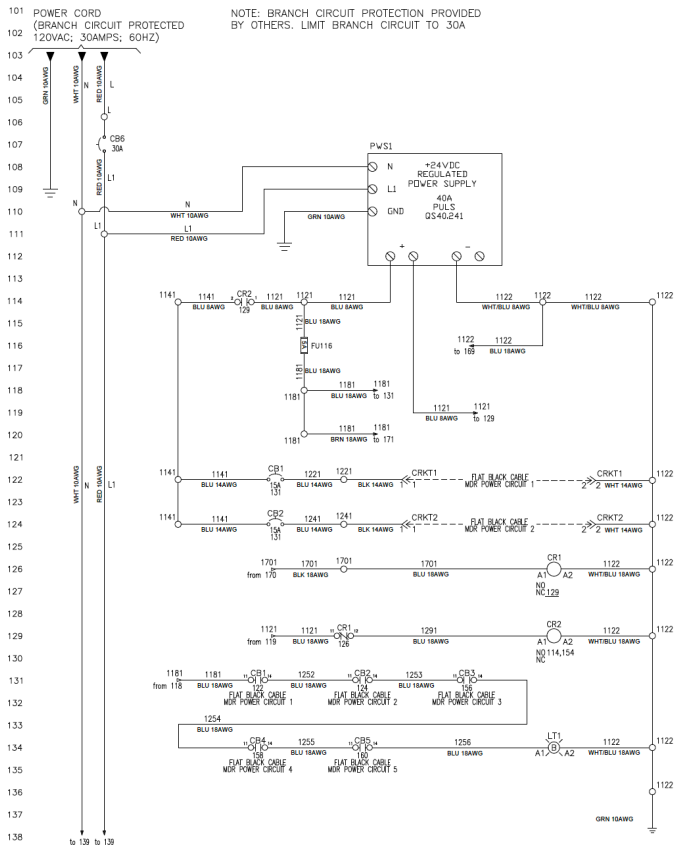


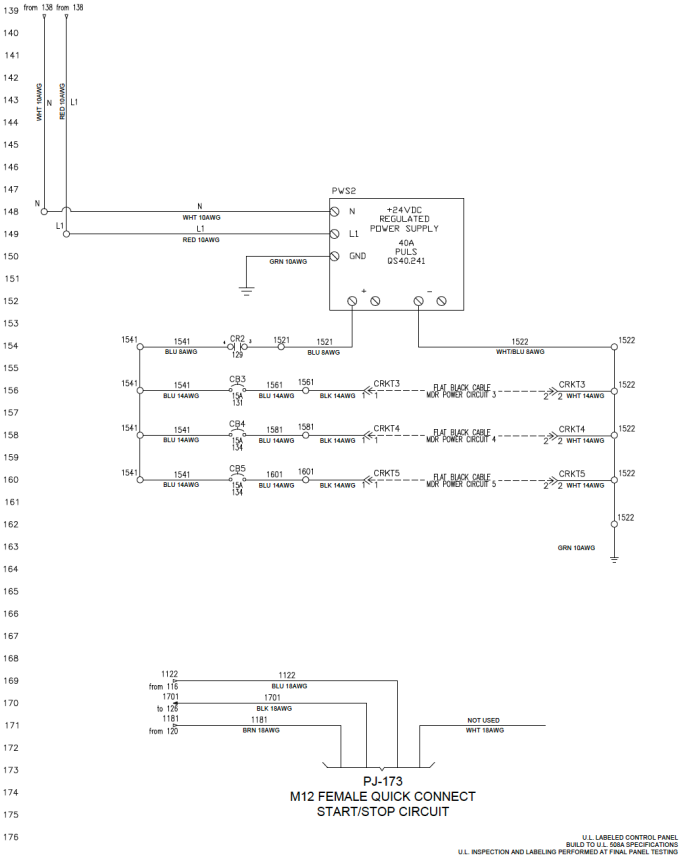



INTERIOR

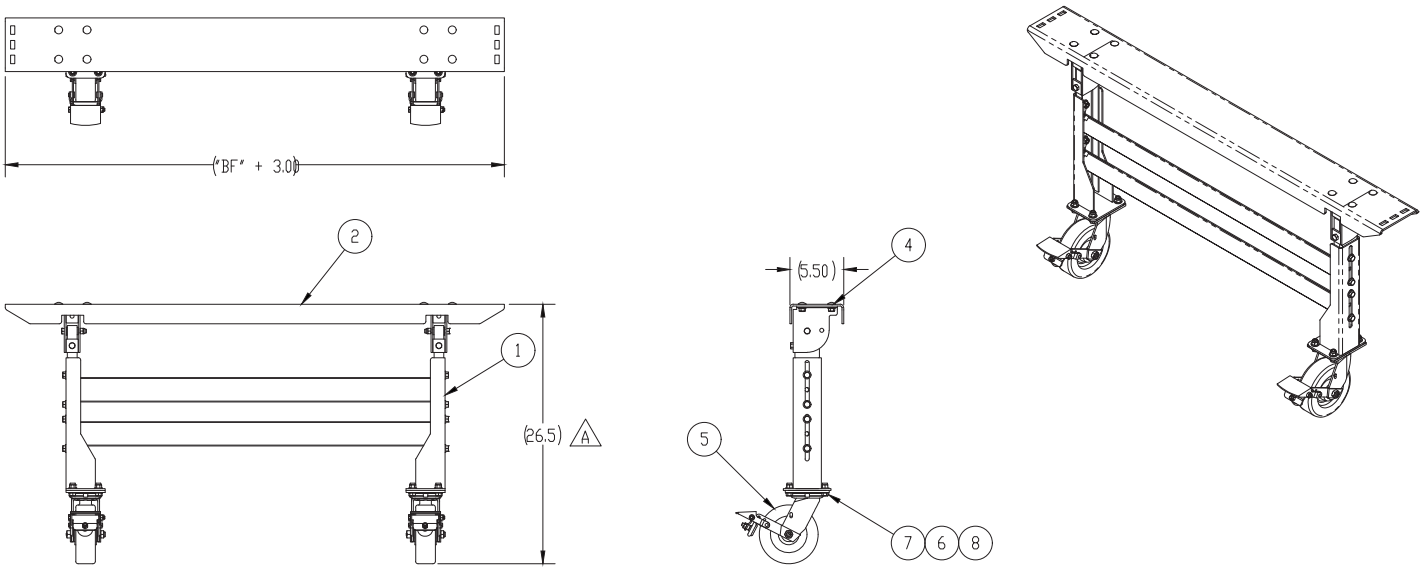
| ITEM | QTY | MANUFACTURER | HILMOT PART NUMBER MANUFACTURER PART NUMBER | DESCRIPTION | PRINT ITEM NUMBER | NOTES |
|---|---|---|---|---|---|---|
| 1 | 2 | PULS | 10701-026004 QS40.241 | 100-240VAC Single Phase input; 24VDC 40A High efficiency power supply | PWS1, PWS2 | |
| 2 | 31.5" | WAGO | 10709-009425 210-112 | TERMINAL, MOUNTING RAIL, 35mm DIN RAIL, NOT HIGH RISE, 2 METER STRIP | | |
| 3 | 12 | WAGO | 10710-000445 249-116 | SCREWLESS END STOP; 6 MM / 0.236 IN WIDE; CARRIER RAIL DIN 35 | | |
| 4 | 2 | WAGO | 10710-029589 2006-1307 | 3 Conductor Top Job Terminal Block; Green/Yellow; Center Marking; Top Entry; Cage Clamp Connection | | |
| 5 | 23 | WAGO | 10710-000493 2006-1301 | 3 Conductor Top Job Terminal Block; Center Marking; Top Entry; Cage Clamp Connection | | |
| 6 | 5 | SCHNEIDER | 10702-053396 M9F42115 | CIRCUIT BREAKER,15 AMP 1 POLE, MULTI 0 C60 MINIATURE, 120/240 VAC, 60VDC MAX | CB1, CB2, CB3, CB4 CB5 | |
| 7 | 3 | WAGO | 10710-057054 2006-1391 | TOPJOB End and intermediate plate; 1 mm thick, GRAY | | |
| 8 | 83.5" | PANDUIT | 10709-058595 G1X2LG6 | Wire Duct 1" x 2", Gray, Wide Slot, 6' length, PVC | | |
| 9 | 4 | WAGO | 10710-000494 2006-402 | Push-In type Jumper; 2 Way; 41A Max. | | SHALL BE INSTALLED IN THE EXACT LOCATION, AS SHOWN ON THE LAYOUT |
| 10 | 1 | ABB | 10712-058931 AF26-30-11-11 | Contactor, 20-60VDC Coil, 3 N/O Poles, Max 690VAC-220VDC, 45A, Din Rail | CR2 | |
| 11 | 19 | | | ENGRAVING, ENGRAVED SELF ADHESIVE LABEL | | |
| 12 | 1 | HOFFMAN | 10700-051627 CP2420 | Sub Panel: 22.20"H x 18.20"W | | |
| 13 | 5 | SCHNEIDER | 10702-058594 M9A26924 | Circuit Breaker - Side Mount Auxiliary Contacts for M9F42115 - 1 N.O.; 1 N.C. | | |
| 14 | 1 | ALLEN BRADLEY | 10712-054569 700-HLT1Z24 | RELAY, TERMINAL BLOCK RELAY 24VDC COIL, SPDT, SCREW TERMINALS | CR1 | |
| 15 | 1 | WAGO | 10702-058999 2002-1611 | Fuse, Terminal Block, Wago | FU134 | |
| 16 | 1 | BUSSMANN | 10702-059001 GMA-5 | 5A 5 mm x 20 mm Fast-acting glass tube fuse | | |
| 17 | 1 | HOFFMAN | 10700-058607 CSD20248 | ENCLOSURE, HOFFMAN CONCEPT, 24"W X 20"H X 08" D | | |
| 18 | 1 | HUBBELL | 10716-025351 SEC75BA | CORD GRIP - 0.45IN TO 0.71IN CABLE RANGE, 3/4IN K.O., NON-METALLIC | | |
| 19 | 5 | TURCK | 10716-048673 RKF44-0.3M/NPT | Receptacle, 4 Pole, Female Straight, 1 FT 14AWG Premolded Wires, 15A, .5-NPT, Panel Mount | | |
| 20 | 1 | BANNER | 10704-040094 S22LBXXPT | Pilot Light, Blue; S22 EZ; 22 mm; IP67; 10-30 VDC PNP Input; 4-screw Terminal Wiring | | |
| 21 | 1 | TURCK | 10715-058987 FS 4.4-1/14.5/NPT/S613 | M12 Male Receptacle, Front Mount, 1M, 18AWG, 1/2" NPT | | |
| 22 | 1 | HUBBELL | 10716-025317 NN-21-BK | CORD GRIP PLASTIC NUT, 3/4IN K.O. | | |
| 23 | 6 | CROUSE HINDS | 10716-000678 11 | 1/2IN Conduit Locknut | | |
| 24 | 3' | IEWC | 10715-057750 SO1003OW-0/90C | UL SOOW Portable Cord, 10 AWG, 104 Strand, 3C, CPE, Black | | |
| 25 | 1 | HUBBELL | 10707-057751 HBL2611 | Locking Devices, Twist-Lock®, Industrial, Male Plug, 30A 125V, 2-Pole 3-Wire Grounding | | |
| 26 | 1 | SCHNEIDER | 10702-053399 M9F42130 | □ CIRCUIT BREAKER,30 AMP 1 POLE, MULTI 0 C60 CB6 MINIATURE, 120/240 VAC 60 VDC MAX | | |

*PANEL BUILDER TO SUPPLY ALL REQUIRED HARDWARE INCLUDING WIRE, HARDWARE, TERMINAL MARKING STRIPS, ENGRAVINGS, PANEL STICKERS, ETC.
*PANEL STICKERS SHOWN INCLUDE TREW STICKER, BRADY #101519, AND BRADY #96157


POWER CORD
(BRANCH CIRCUIT PROTECTED
120VAC; 30AMPS; 60HZ)
NOTE: BRANCH CIRCUIT PROTECTION PROVIDED
BY OTHERS. LIMIT BRANCH CIRCUIT TO 30A
PWS1
+24VDC
REGULATED
POWER SUPPLY
40A
PULS
QS40.241
CB6
30A
FU116
CR1
CR2
CB1
CB2
CB3
CB4
CB5
LT1
CRKT1
CRKT2
FLAT BLACK CABLE
MDR POWER CIRCUIT 1
MDR POWER CIRCUIT 2
MDR POWER CIRCUIT 3
MDR POWER CIRCUIT 4
MDR POWER CIRCUIT 5
to 139
to 139


PWS2
+24VDC
REGULATED
POWER SUPPLY
40A
PULS
QS40.241
CR2
CB3
CB4
CB5
CRKT3
CRKT4
CRKT5
FLAT BLACK CABLE
MDR POWER CIRCUIT 3
MDR POWER CIRCUIT 4
MDR POWER CIRCUIT 5
NOT USED
PJ-173
M12 FEMALE QUICK CONNECT
START/STOP CIRCUIT
U.L. LABELED CONTROL PANEL
BUILD TO U.L. 508A SPECIFICATIONS
U.L. INSPECTION AND LABELING PERFORMED AT FINAL PANEL TESTING

## Supports Drawings




| ITEM | PART NUMBER | QTY. | DESCRIPTION |
|---|---|---|---|
| 1 | 1000467-XX | 1 | STANDARD DUTY LEG SUPPORT ASSEMBLY, XXIN BF |
| 2 | SEE TABLE | 1 | LEG SUPPORT TOP MOUNTING CHANNEL, FOR XXIN BF BED W/ XXIN BF LEG SUPPORTS |
| 3 | 10201-010200 | 8 | 3/8 - 16 UNC HEX FLANGE NUT |
| 4 | 10201-010800 | 8 | 3/8-16 UNC X 0.75 CARRIAGE SCREW |
| 5 | 10200-058341 | 2 | CASTER, SWIVEL PLATE, WHEEL SIZE 6INX2IN, WHEEL MATERIAL PHENOLIC, ROLLER BEARING, TECH LOCK BRAKE |
| 6 | 10201-010600 | 16 | 3/8 WASHER-A |
| 7 | 10201-010402 | 8 | 3/8 - 16 UNC X 1.00 HEX HEAD CAP SCREW |
| 8 | 10201-010221 | 8 | 3/8 - 16 UNC HEX NYLON LOCK NUT |

| PART NUMBER | "BF" | ITEM 1 | ITEM 2 |
|---|---|---|---|
| 1000466-36 | 36.00 | 1000467-36 | 1000528 |
| 1000466-48 | 48.00 | 1000467-48 | 10300-058292 |

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# SUPPORT

# Support

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Availability:
**24x7 Technical Support**