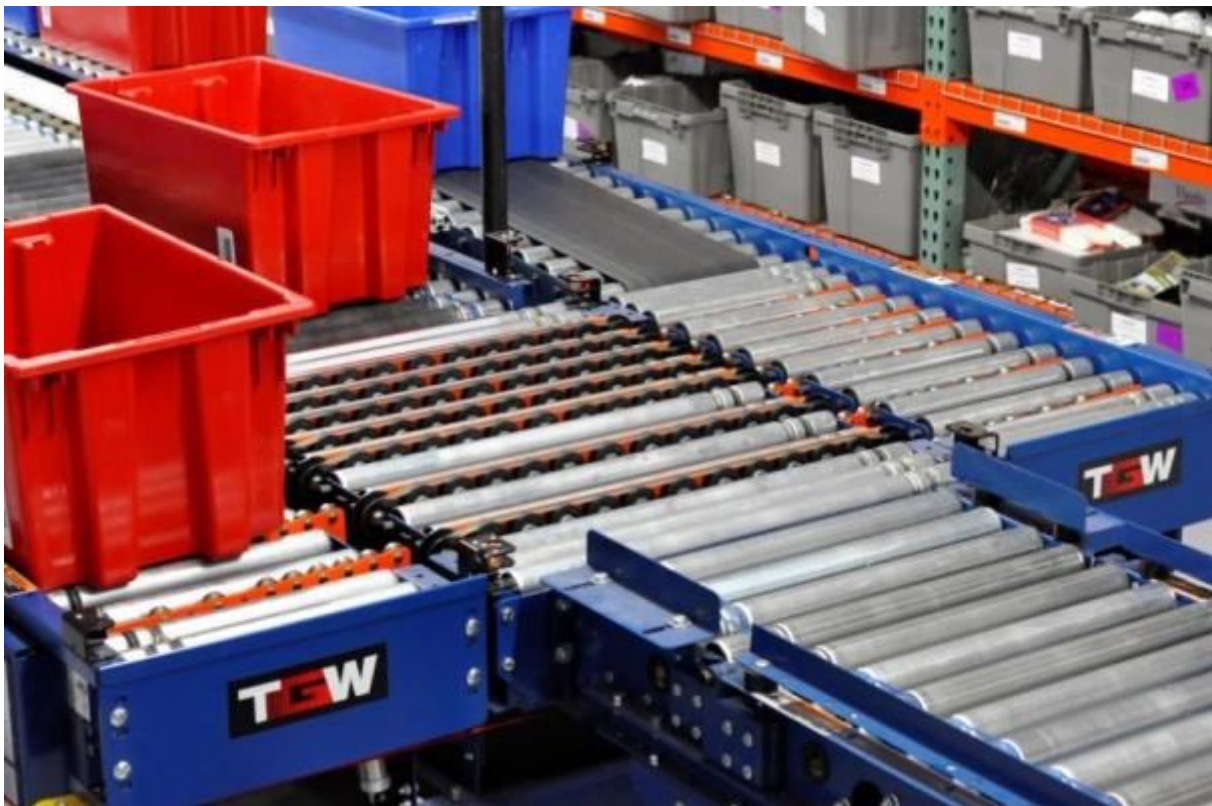


# INSTALLATION, OPERATION, MAINTENANCE MANUAL



## IntelliROL® (PZM) Pick Zone Module PN 1167035 Revision Date: November 26, 2014



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## Purpose

It is the intent of MHS Conveyor, through this manual, to provide information that acts as a guide in the installation, operation and maintenance of MHS Conveyor IntelliROL conveyors.

This manual describes basic installation practices, assembly arrangements, preventive maintenance and assists in replacement parts identification.

This service manual is intended for use by personnel who are knowledgeable of installation and safe working practices on conveyor systems.

Not all applications and conditions can be covered; therefore, this manual is to be used ONLY as a guide.

If additional copies of this manual are needed or if you have any question concerning the conveyor please contact your MHS Conveyor Distributor or MHS Conveyor Lifetime Services at 231-798-4547 or Fax 231-798-4549.

## MHS Conveyor Equipment Warranty

MHS Conveyor warrants that the material and workmanship entering into its equipment is merchantable and will be furnished in accordance with the specifications stated.

MHS Conveyor agrees to furnish the purchaser without charge any part proved defective within 2 years from date of shipment or before the equipment has forty-one hundred (4100) hours of running use, whichever period is shorter, provided the purchaser gives MHS Conveyor immediate notice in writing and examination proves the claim that such materials or parts were defective when furnished. For drive components specific to XenoROL® (i.e. Xeno belts, slave Xeno belts, drive spools, standard and speed-up, and spacers), this warranty shall be extended to five years or ten thousand (10,000) hours of running use, whichever period is shorter, provided the conveyors are applied, installed and maintained in accordance with MHS Conveyor published standards. Other than the above, there are no warranties which extend beyond the description on the face hereof. Consequential damages of any sort are wholly excluded.

The liability of MHS Conveyor will be limited to the replacement cost of any defective part. All freight and installation costs relative to any warranted part will be at the expense of the purchaser. Any liability of MHS Conveyor under the warranties specified above is conditioned upon the equipment being installed, handled, operated, and maintained in accordance with the written instructions provided or approved in writing by MHS Conveyor.

The warranties specified above do not cover, and MHS Conveyor makes no warranties which extend to, damage to the equipment due to deterioration or wear occasioned by chemicals, abrasion, corrosion or erosion; Purchaser's misapplication, abuse, alteration, operation or maintenance; abnormal conditions of temperature or dirt; or operation of the equipment above rated capacities or in an otherwise improper manner.

### IMPORTANT

*All equipment and components not manufactured by MHS Conveyor carry only such warranty as given by the manufacturer thereof, which warranty MHS Conveyor will assign or otherwise make available to Purchaser without recourse to MHS Conveyor, provided that such warranty is assignable or may be made available.*

*For service on motors, reduction units, electrical components, controls, air or hydraulic cylinders, contact the local authorized sales and service representative of respective manufacturer. If none is available in your locality, contact the MHS Conveyor representative. MHS Conveyor will not be responsible for units that have been tampered with or disassembled by anyone other than the authorized representative of the respective manufacturer.*

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXTENDING BEYOND THOSE SET FORTH IN THIS STATEMENT OF WARRANTY.

Rev 08/22/2011

## **MHS Conveyor Environment Standards**

MHS Conveyor equipment is designed to be installed in a clean, dry warehouse environment. Exposure to extreme humidity, direct sunlight, blowing dirt or rain can permanently damage some components of MHS Conveyor. In particular, the curing agents in concrete are known to attack and degrade the urethane conveyor components.

When installing conveyor on a new construction site, be sure that the concrete is properly cured before setting conveyor on it. In addition, if conveyors are stored in the proximity of curing concrete, proper ventilation must be used to direct the curing agent fumes away from the conveyor.

Failure to comply with these guidelines will void the MHS Conveyor warranty on any failed components that result from these environment tissues.

## Conveyor Design and Safety Guidelines

A safety risk evaluation is required for all of our standard equipment. The safety risk evaluation considers every potential hazard on the conveyor, weighs the probability and the severity of the potential injury, and addresses methods of mitigation to make the risk of injury either low or negligible. We use the ANSI B11 TR3 standards for all of our risk evaluation.

In addition, all of our equipment is designed to comply with the following national and industry standards:

CEMA Safety Standards and Labels - (CEMA is the Conveyor Equipment Manufacturers Association)

ASME B20.1- Safety standard for Conveyors and Related Equipment

ASME B15.1 – Safety standard for Mechanical Power Transmission Apparatus

OSHA 1910.147 – The Control of Hazardous Energy

OSHA 1910.212 - General Requirements for all Machines

OSHA 1910.95 – Occupational Noise Exposure

ANSI 2535 – Safety Color Code

Product Life Cycle Testing Criteria:

- 10,800 hours (one shift for five years) or 20,000,000 cycles for transfers before replacement parts are required.



## MHS Conveyor Safety Recommendation

For additional safety information: MHS Conveyor agrees to the following safety instruction or guidelines listed within this manual. This is not to conflict with your state or legal requirements.

MHS Conveyor Recommends for maintenance or repair purposes, to incorporate a lock out or tag procedure. To ensure all starting devices, prime movers, or powered accessories are off before attempting to maintenance or repair.

The procedures below are designed to protect everyone involved with the conveyor against an unexpected restart. To include understanding of potential hazard of stored energy, which can exist after the power source is locked out.

For additional information, refer to the latest issue of ANSI Z244.1, American National Standard for Personnel Protection – Lockout/Tagout of Energy Sources– Minimum Safety Requirements. <http://www.ansi.org/>

OSHA 29CRF Part 1910.147 “*Control of Hazardous Energy Sources (Lockout/Tagout)*”, which includes requirements for release of stored energy and OSHA Safety and Health Regulations for Construction 1926.555 Conveyors <https://www.osha.gov/>

## ANSI Standards for Conveyors

It is essential for safe and efficient system operation that safety information and guidelines presented here are properly understood and implemented.

MHS Conveyor recognizes American National Standard Institute (ANSI) booklet entitled *Safety Standards for Conveyors and Related Equipment B20.1*. For more information go <http://webstore.ansi.org/default.aspx>

With any piece of industrial equipment, conditions exist that might cause injury to you or your co-workers. Because it is not possible to describe each potentially hazardous situation that might develop, you must be alert at all times for unsafe conditions. To avoid injury, use maximum possible care and common sense and adhere to all safety standards.

Take special care while maintaining and inspecting electrical equipment and devices. All personnel working on or around the system should be aware of, and adhere to, all **CAUTION**, **DANGER**, and **WARNING** signs.

Labels or signs are posted to reduce the risk of injury to all personnel. Never assume that the signs and notices are applicable only to inexperienced personnel. Maintain signs in a legible condition. Contact your supervisor to post additional safety signs if you feel they are necessary. <http://www.ansi.org/>



### **ANSI Conveyor Safety Rules**

Conveyor safety rules, as well as specific regulations and guidelines listed in this publication:

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

## Conveyor Equipment Manufacturers Association (CEMA)

The Conveyor Equipment Manufacturers Association (CEMA) provides safety information related to conveyor systems. There are [Conveyor Safety Video](#) and [Conveyor Safety Poster](#) produced by CEMA.



MHS Conveyor recommends these video for training and education purposes for a safe working environment around conveyor equipment. The video introduces awareness of operation personnel maintenance technicians, and management to safety hazards commonly associated with the automated material handling conveyor equipment.

Safety poster reviews the important safety labels and is intended to be posted in public places as a day-to-day reinforcement of good safety practices. These posters can be downloaded from the CEMA Web Site at <http://cemanet.org/safety/posters.htm> or for more information on the CEMA Safety Program visit the CEMA Web Site's Safety Page at <http://cemanet.org/safety/index.html>.

Both the safety poster and the video can be purchased from CEMA. Visit their web site – [www.cemanet.org](http://www.cemanet.org) for additional information or contact them at:



Conveyor Equipment Manufacturers Association  
6724 Lone Oak Blvd. Naples FL 34109  
Phone (941) 514-3470

### **CEMA Safety Label Meanings**

The word or words that designate a degree or level of hazard seriousness. The signal words for product safety signal are: DANGER, WARNING, and CAUTION.



- **DANGER** -Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.
- **WARNING** – Indicates potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.
- **CAUTION** – Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

## Warnings and Safety Instructions

Failure to follow the instructions and cautions throughout this book, and warning labels on the conveyor, may result in injury to personnel or damage to the equipment.

Your MHS Conveyor is powered by a motor and can be stopped only by turning off electrical power to the motor. As with all powered machinery, the drive-related components – including sprockets, chains, shafts, universal joints and pneumatic devices – can be dangerous. We have installed or provided guards to prevent accidental contact with these parts, along with warning labels to identify the hazards.

Special attention must be paid to the following areas of this manual:



 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</li></ul>

<b>CAUTION</b>	
<ul style="list-style-type: none"><li>Indicates a situation which, if not avoided, could result in property damage.</li></ul>	

### NOTE

This is where you will be notified of helpful information.

## Warnings and Safety Instructions Continued

 <b>WARNING</b>	
	<ul style="list-style-type: none"> <li>• After maintenance, REPLACE guards immediately.</li> <li>• Keep ALL warning labels clean and clear of any obstructions.</li> <li>• Never remove, deface or paint over WARNING or CAUTION labels. Any damaged label will be replaced by MHS Conveyor at no cost by contacting Lifetime Services.</li> <li>• It is very important to instruct personnel in proper conveyor use including the location and function of all controls.</li> <li>• Special emphasis must be given to emergency stop procedures.</li> <li>• It is important to establish work procedures and access areas which do not require any part of a person to be under the conveyor.</li> <li>• It should be required that long hair is covered by caps or hair nets.</li> <li>• Loose clothing, long hair and jewelry must be kept away from moving equipment.</li> <li>• Maintain enough clearance on each side of all conveyor units for safe adjustment and maintenance of all components.</li> <li>• Provide crossovers or gates at sufficient intervals where needed to eliminate the temptation for personnel to climb over or under any conveyor.</li> <li>• Walking or riding on a moving conveyor must be prohibited.</li> <li>• Before performing maintenance on the conveyor, make sure the start-up controls are locked out and cannot be turned on by any person other than the one performing the maintenance.</li> <li>• If more than one crew member is working on the conveyor, EACH CREW MEMBER MUST HAVE A LOCK ON THE POWER LOCKOUT.</li> <li>• All pneumatic devices must be de-energized and air removed to prevent accidental cycling of the device while performing general maintenance.</li> <li>• Make sure all personnel are clear of all conveyor equipment before restarting the system.</li> <li>• Before servicing or performing any work in the motor control panel, disconnect and lock out the main incoming service. If only the panel disconnect is off, the incoming side will still be hot.</li> </ul>

**Warnings and Safety Instructions Continued**

 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>• Before servicing or performing any work in the motor control panel, disconnect and lock out air and the main incoming service. If only the panel disconnect is off, the incoming side will still be hot.</li></ul> <div style="text-align: center;"></div>

## CEMA Safety Labels

### Product: Unit Handling

#### Equipment: Motor Driven Live Roller Conveyors

To be placed along both sides of these conveyors since these conveyors provide surfaces and profiles attractive, but hazardous, for climbing, sitting, walking, or riding.



"A"

SPACE UP TO A MAXIMUM OF 20 FT.  
CENTERS ( BOTH SIDES )

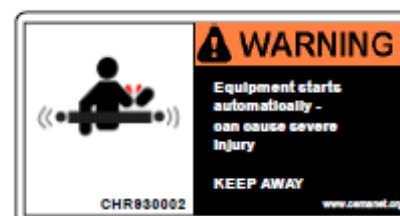
Optional Label to be placed either on the side or top of rails when space available does not permit application of the larger label



"B"

SPACE UP TO A MAXIMUM OF 20 FT.  
CENTERS (Sides or top surface of both rails)

To be placed along the sides of these conveyors to warn personnel that the conveyor can start automatically



"C"

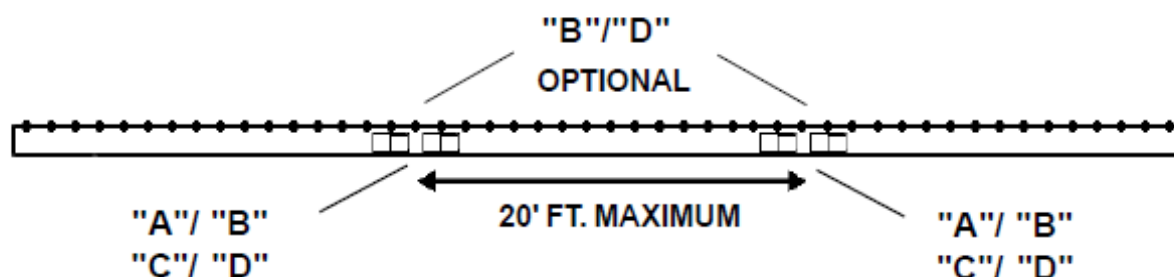
SPACE UP TO A MAXIMUM OF 20 FT.  
CENTERS ( BOTH SIDES )

Optional Label to be placed either on the side or top of rails when space available does not permit application of the larger label



"D"

SPACE UP TO A MAXIMUM OF 20 FT.  
CENTERS (Sides or top surface of both rails)



**NOTE:** Due to the design of these conveyors, there may not be room on the side rails to place the larger labels. In that case, the smaller labels may be used. Optionally, they may also be placed on the top surface of both rails. The key is the space available and visibility by operators and maintainers.



## CEMA Safety Labels



# Package Conveyors



 <p>Do Not Climb, Sit, Stand, Walk, Ride, or Touch the Conveyor at Any Time</p>	 <p>Do Not Perform Maintenance on Conveyor Until Electrical, Air, Hydraulic and Gravity Energy Sources Have Been Locked Out and Blocked</p>	 <p>Operate Equipment Only With All Approved Covers and Guards in Place</p>
 <p>Do Not Load a Stopped Conveyor or Overload a Running Conveyor</p>	 <p>Ensure That All Personnel Are Clear of Equipment Before Starting</p>	 <p>Allow Only Authorized Personnel To Operate or Maintain Material Handling Equipment</p>
 <p>Do Not Modify or Misuse Conveyor Controls</p>	 <p>Keep Clothing, Body Parts and Hair Away from Conveyors</p>	 <p>Remove Trash, Paperwork and Other Debris Only When Power is Locked Out</p>
 <p>Ensure That ALL Controls and Pull Cords are Visible and Accessible</p>	 <p>Know the Location and Function of All Stop and Start Controls</p>	 <p>Report All Unsafe Conditions</p>

POST IN PROMINENT AREA



## Introduction to the Pick Zone Module

### ***ITR Pick Zone Concepts***

The ITR Pick Zone Module utilizes motorized roller to convey and transfer product much easier than Line Shaft conveyor.

This rapidly advancing technology uses a self-contained 24 volt DC motorized roller to power a segment or zone of the conveyor. Rollers adjoining the motorized roller are slave-driven with the same components MHS Conveyor developed in the '60s.

### ***Operation***

The product-carrying rollers are slave-driven by a series of pre-tensioned belts to the motorized roller in each zone. The rollers and urethane belts transfers are activated by a series of photo eyes. The photo eyes are already in place and factory tested

### ***Feature/Benefits***

- Flexible Modular design / easy to reconfigure
- Run on demand / less noise, wear, and energy consumption
- Non-contact zero-pressure / product protection
- Compact low profile / multi-level usage
- Reversible / less electrical hardware cost
- No scheduled maintenance / lower operating cost
- Low voltage / safety and lower cost
- Simple installation / lower cost
- Soft start/stop / low G-forces
- Variable speed / versatility to suit each requirement
- Intelligent control capabilities / cost no greater than need

## ITR Pick Zone Application Options

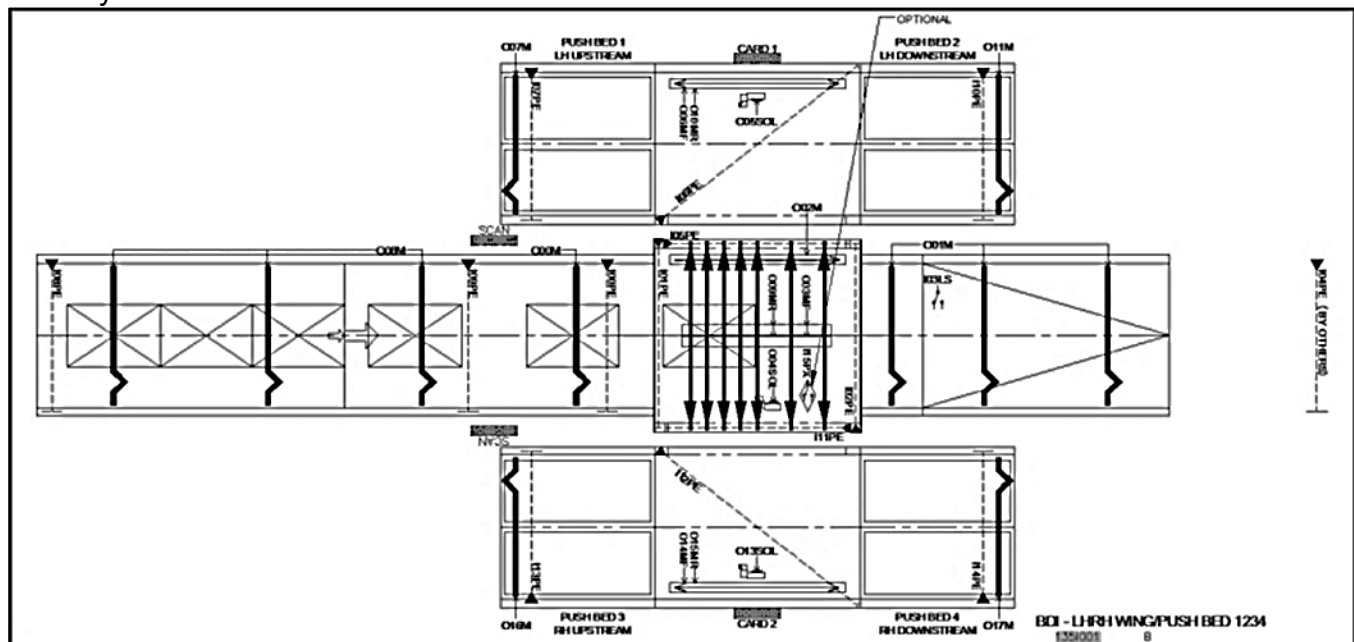
The ITR Pick Zone Module has many standard sizes.

Application Specific Modules may be used to solve certain requirements within a system at a most cost-effective manner using IntelliROL conveyor.

ITR Pick Zone Standard Sizes					
MODEL	ITEM #	BF (CTR-WINGS)	CONTROLS	SCANNER GAP (A)	TRANSFER GAP (B)
MOD, ERS 22BF ITRCB, 6 GAP	1155289	16-22-16	TERM. STRIP	6"	3"
MOD, ERS 28BF ITRCB, 6 GAP	1155290	22-28-22	TERM. STRIP	6"	3"
MOD, ERS 34BF ITRCB, 6 GAP	1155291	28-34-28	TERM. STRIP	6"	3"
MOD, ERS 22BF ITRCB, 3.5 GAP	1155292	16-22-16	TERM. STRIP	3-1/2"	1/2"
MOD, ERS 28BF ITRCB, 3.5 GAP	1155293	22-28-22	TERM. STRIP	3-1/2"	1/2"
MOD, ERS 34BF ITRCB, 3.5 GAP	1155294	28-34-28	TERM. STRIP	3-1/2"	1/2"
MOD, ERS 22BF ITRER, 6 GAP	1155295	16-22-16	1799 ER	6"	3"
MOD, ERS 28BF ITRER, 6 GAP	1155296	22-28-22	1799 ER	6"	3"
MOD, ERS 34BF ITRER, 6 GAP	1155297	28-34-28	1799 ER	6"	3"
MOD, ERS 22BF ITRER, 3.5 GAP	1155298	16-22-16	1799 ER	3-1/2"	1/2"
MOD, ERS 28BF ITRER, 3.5 GAP	1155299	22-28-22	1799 ER	3-1/2"	1/2"
MOD, ERS 34BF ITRER, 3.5 GAP	1155300	28-34-28	1799 ER	3-1/2"	1/2"

Reference Dwg. 135A012

## Conveyor Flow



## Definition of Terms

Carrying Roller - The conveyor roller upon which the object being transported is supported. It has circumferential grooves near one end to allow the slave belts to ride below the carrying surface.

Coefficient of Friction - A numerical expression of the ratio between the force of contact between two surfaces and the resistant force tending to oppose the motion of one with respect to the other.

Conveyor Width - The dimension outside to outside of frame rails. For the inside dimension, the abbreviation "BF" (between frames) is used.

Crossmember - Structural member which is assembled between two side channels of a conveyor bed.

Frame - The structure which supports the components of a conveyor bed consisting of formed channel rails bolted together with crossmembers.

Indexing Control - Maintains non-contact accumulation and functionality of gates, transfers, curves, etc. by not allowing accumulation in these areas.

Roller Centers - Distance between center lines of adjacent rollers.

Roller Groove - The groove that is fabricated into the carrying roller to provide a seat for the slave belts below the carrying surface.

Singulation Release - A method of individual zone release that spaces product approximately one zone length apart.

Slave Belt - An endless round belt manufactured from elastic material, typically urethane, connecting a motorized roller or carrying rollers or other carrying rollers within a zone.

Slug Release - Simultaneous release of several products.

Zone - A portion of conveyor activated by a motorized roller that may be controlled by a photoeye.

Zone Length - The distance between sensing devices (typically containing one motorized roller).

## Typical Bed Description

### ***Straight Bed:***

BED, (i.)BF ITR (ii.)-C (iii.) - (iv.) - (v.) X (vi.) (vii.), (viii), (ix.)MR, (x.)

\_\_BF Width (16, 22, 28, 34)  
 ITR\_\_ ITR Variation (HB, CB)  
 C\_ Channel (Z or 6)  
 \_\_ Rollers/Belt (R or B) and centers (3", 2", etc.)  
 \_\_ Zone (24", 30", etc.) Do not use with ITRCB  
 \_\_' \_\_" OAL  
 \_\_ Hand (RH/LH)  
 F\_ \_ Roller type & speed code (FE-60 standard)  
 \_\_MR Number of motorized rollers

Example: BED, 22BF ITRHB-CZ-R3-30 X 10'-0" RH, FE-60 4MR  
 (22BF, HB-510 card, Cruz channel with 3" Roller Centers  
 30" zone, 10'-0" OAL, Right Hand Flow, Roller Model, 4 motors)

### ***UBT/Transfer:***

UBT, (i.)BF ITR (ii.)-C6X (iii.) BD (v.)S LH/RH, (vi.)MR

\_\_BF Width (16, 22, 28, 34)  
 ITR\_\_ ITR Variation (CB)  
 \_\_' \_\_" OAL (standard 3'-4", but 3'-0" available as a special)  
 \_\_S Number of strands (normally 6 (4"RC) or 5/7 (3.25"RC))  
 F\_ \_ Roller type & speed code (FE-60 standard)  
 \_\_MR Number of motorized rollers

Example: UBT, 22BF ITRCB-C6 X 3'-4" BD 6S LH/RH FE-60 3MR  
 (22BF, CB-016 card, C6 channel, 3'-4" OAL, bi-directional, 6-strands, roller model FE-60, 3 motors in unit)

### ***Drive and Slave O-rings For the ITR Pick Zone Module***

Driver & Slave O-Rings for ITR Pick Zone		
PN/ITEM #	DESCRIPTION	Application
1148786	ORING 3/16 DIA X 22-3/16	
1136169	ORING 3/16 DIA X 7-1/2	Straight Slave
1144848	ORING 3/16 DIA X 9-1/2 HT BLUE	Straight Slave

## Receiving & Site Preparation

### **General Shipping / Packaging Information**

IntelliROL conveyor is shipped in subassemblies. These subassemblies are packaged to guard against damage in shipment when handled properly.

Examination immediately following unloading will show if any damage was caused during shipment. If damage is evident, claims for recovery of expenses to repair damage or replace components must be made against the carrier immediately. While unloading, a check must be made against the Bill of Lading, or other packing lists provided, to confirm full receipt of listed items.

### **CAUTION**

- TAKE CARE DURING THE REMOVAL OF EQUIPMENT FROM THE CARRIER.
- Remove small items and boxes first.
- Pull and lift only on the skid, not on the frame, crossmember or any part of the equipment.
- Be sure the skid is free of other materials which may be on top of or against the side of the skid to be removed.

### **Preparation of Site**

After the conveyor is received, move it to the installation site or designated dry storage area as soon as possible. Clean up all packing material immediately before parts get lost in it. Loose parts should remain in the shipping boxes until needed.



Prior to starting assembly of the conveyor, carefully check the installation path to be sure there are no obstructions that will cause interference. Check for access along the path needed to bring in bed sections and components closest to the point where they are needed. It is often necessary to give the area along the system path a general cleanup to improve installation efficiency, access and accuracy.

## Part Inventory & Identification

### Label Identification

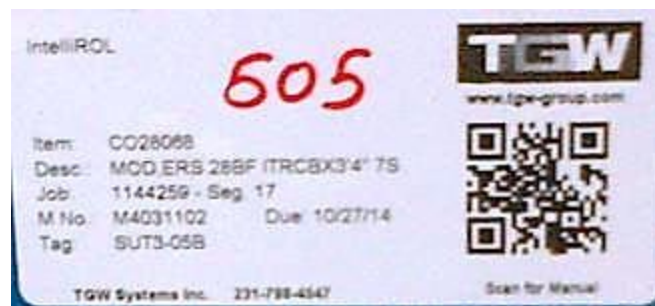
Each subassembly is shipped completely assembled except typical loose parts, which are in boxes with the subassemblies. Segregate the conveyor subassemblies by types for inventory and ease of locating during installation.



An identification label is attached to the charged end of the center Bed of each ITR Pick Zone Module.

Labels contain the following information:

- Job number
- Part number
- Order number
- Tag number (if specified)
- Assembler's clock number
- Date of manufacture
- QR (Quick Retrieval) Label
  - Scan Code For IOM Manual



On the supports, the tag is located on the bottom side of the foot.  
 On special devices it is located on a convenient flat surface that is not offensive to the appearance of the equipment but is still accessible for viewing.  
 These numbers can be cross-referenced against the packing list.  
 Loose parts are boxed and shipped separately.

You should have all conveyor sections and supports for a particular conveyor prior to installation.

It is cost-effective to identify and procure any missing parts before they are needed for assembly.

Small items like nuts and bolts are weigh-counted and packaged by size and type.

 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>• The Installation Supervisor must be experienced with conveyor and qualified in the mechanics of the equipment and enforce safe working procedures for the protection of the crew, customer, and customer's property.</li></ul>

### ***Dimensional Reference Points***

The path of each conveyor in the system is determined by establishing a reference point at each end. The center line of the conveyor is established and a chalk line is snapped between these points.

Conveyors should be installed with the center line of the bed matching the center line of the conveyor path within 1/8" of true center. Locate and mark the center of the crossmembers at each end of the conveyor. Use a plumb line or other acceptable means to ensure accuracy to the chalk line.

Always carry out a thorough check for any obstructions such as building columns, manholes, etc. It may be necessary to reroute the conveyor to avoid the obstruction. In this case it would be advisable to begin installation at this point, using the obstruction as a reference point (Datum), and install the sections in either direction as required.

All conveyor sections must be checked for squareness prior to installation as "racking" or being knocked out of square may have occurred during shipping and handling.



## Basics of the ITR Pick Zone Module

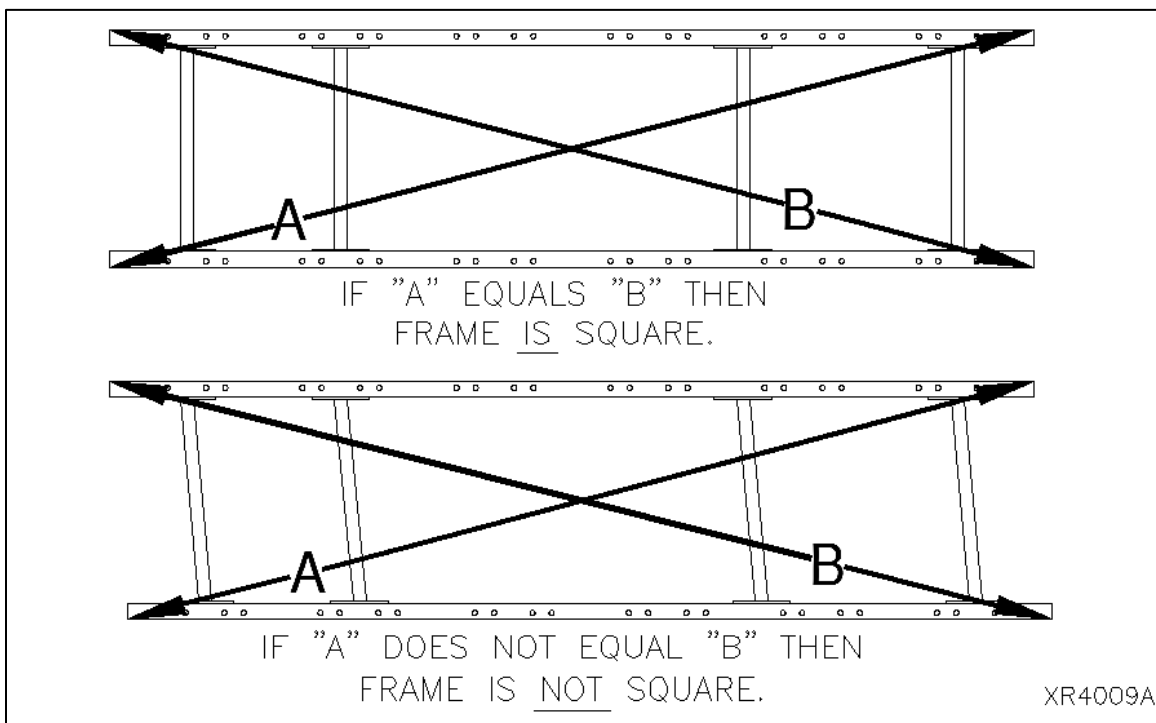
### General Installation

The ITR Pick Zone Module may be installed using any of the supporting arrangements described under Support Arrangements in this manual. As each bed is installed in the system, level the conveyor from side to side using a bubble level on the roller at each support.

The bubble location should be within the level indicator lines of the level. The center line of the conveyor should not bow to the right or left more than  $\frac{1}{8}$ " in either direction from a center line drawn between the centers of the conveyor end assemblies.

A simple way to check this is to tie a nylon string around the center of the end roller, pull it taut, and tie it to the center of the roller at the opposite end. Put a wood spacer under the string at each end so it does not rest on the rollers. With the taut string centered on each end and suspended above the rollers, check the center of the rollers at each support relative to the string and adjust accordingly. (Note that this must be done after side-to-side leveling of the conveyor at each support.)

All bed frames should be checked for squareness. To check, measure diagonally from corner to corner. Measure the opposite corners in the same manner. If the bed is square, the two measurements will be the same within  $\frac{1}{16}$ ".



### NOTE

Conveyor frames must always be installed in a straight line from end to end. After a number of sections have been installed to the chalk line and leveled, check the alignment of each conveyor assembly.



## Elevations

All conveyors should be installed in accordance with the elevations shown on the drawings. In addition, all conveyors must be level across the frame width and length (if horizontal). Leveling of the frames is best done using a rotating laser level or a builder's level.

After the first elevation is established at a critical point, the elevation of all other points shall be relative to this first point. Normal practice is to dimension the layout and measure elevations from the floor at each point of support.

As the conveyor system proceeds onto another floor or into another building or room, a new elevation will be measured from the floor at that point. This new elevation will then become the reference for subsequent elevations.

When installing an overhead system, the first elevation is measured from the floor and becomes the reference elevation point until a change in elevation is shown on the layout. Any new elevation is also measured from the floor and becomes the new reference point. The process is repeated each time an elevation change occurs.

### CAUTION

- Consult the building architect or a structural engineer regarding ceiling loading or structural limitations of the building if any conveyor section is ceiling hung.

### Component Orientation

Using your conveyor system layout drawing and the numbers on the I.D. tags on each component, position and orients the conveyor sections. You must know:

- The direction of product flow
- The elevation height
- Charge and discharge end beds

**IMPORTANT!** Do not make alterations to the equipment without consulting with user's representative and MHS Conveyor.

Unauthorized modifications to the equipment may impair its function, create a hazardous condition, affect its useful life and/or void the warranty.

Example: Product In Feed  
Must Be At This End





## Supporting Arrangements

### **Anchoring**

Anchoring in concrete floors is accomplished by drilling into the floor and inserting the suitable anchor bolt. The hole diameter and depth must be in accordance with the anchor bolt manufacturer's instructions.

Anchor intermediate floor supports with two anchor bolts, one through each support foot plate using minimum 3/8" diameter anchor bolts. For floor supports over 5' high or when supporting drives, use 1/2" diameter anchor bolts. Stagger anchors from front hole on one side to rear hole on opposite side. Anchor bolts for equipment subject to impact loads should be a minimum of 1/2" diameter.

 <b>WARNING</b>	
	<ul style="list-style-type: none"> <li>Place a bolt through the frame and support immediately with finger tight nut. This will prevent the frame from falling off the support, if bumped, and causing injury.</li> </ul>

### **Floor Supports**

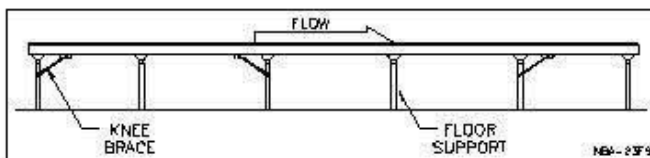
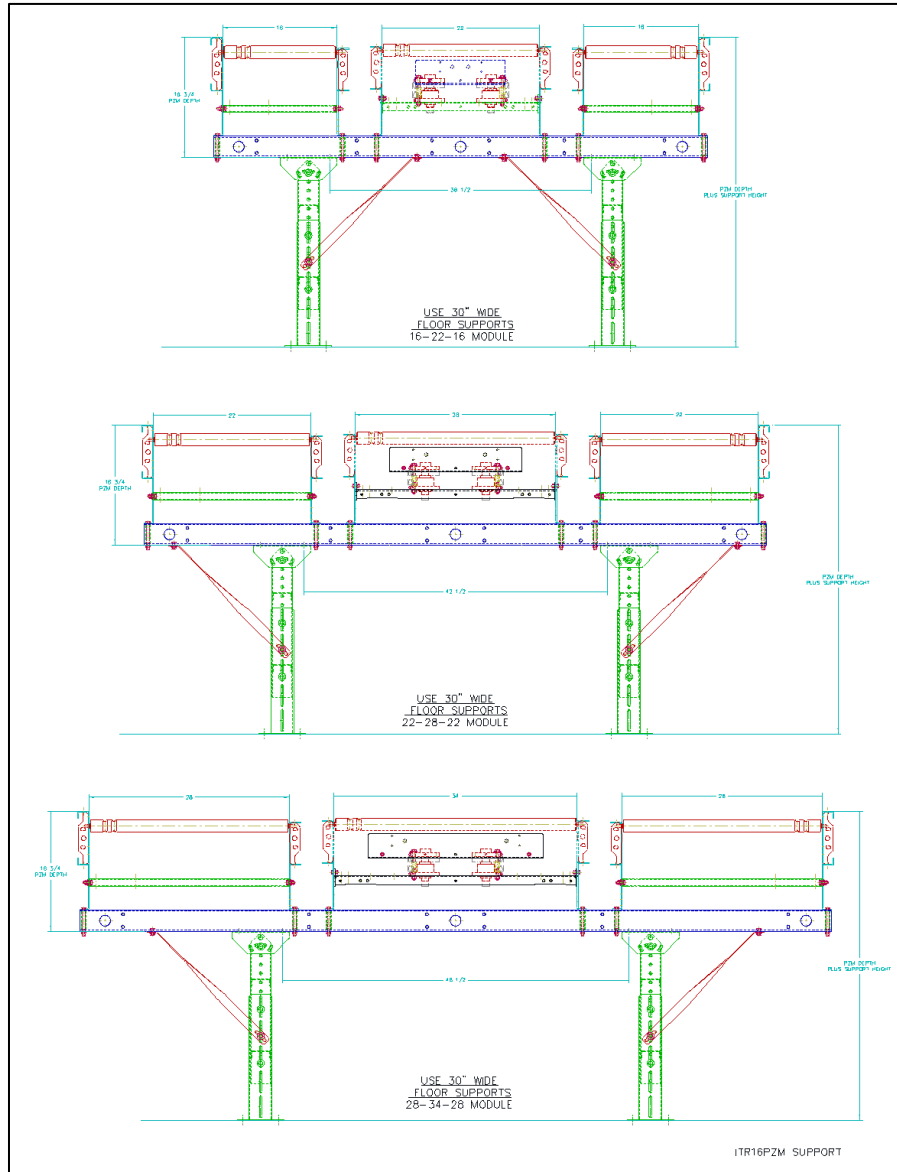
The Supports mount to the Support channel of the ITR Pick Zone Module. Install bolts used to attach the standhead the Support Channel so that the nut is on the bottom. Standhead bolts should be left finger tight while the conveyor is being assembled and aligned.

Floor supports are ordered by nominal height range, which is the dimension from the floor to top of the support. Conveyor elevations are shown on the layout by top-of-roller elevations. This difference must be recognized when setting the support elevations. IntelliROL conveyor is 6 5/16" from top-of-support to top-of-rollers with a 7 1/2" deep channel. (Rollers mounted low in frame.)

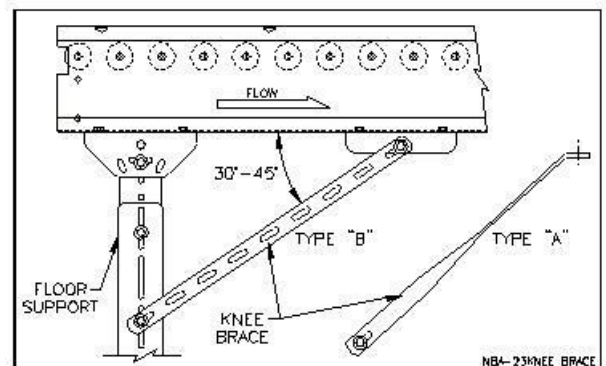
It is important that conveyor frames be installed level. Floor supports will accommodate normal irregularities in the floor surface. Adjustment for elevation in floor supports is accomplished with metal-on-metal bolt clamping force. To achieve the support's stated load rating, it is necessary to tighten the elevation adjustment bolts (3/8" diameter) to 23 lbs. of torque.

Supports should always be installed in the vertical position, and any variations due to conveyor pitch or floor slope will be compensated for in the pivoting standhead of the support.

## Supporting ITR Pick Zone Module



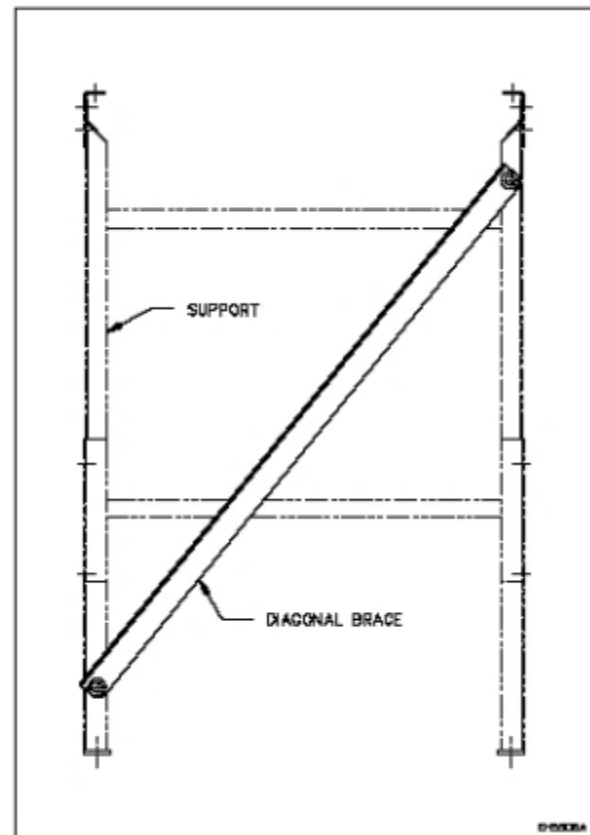
Type "C" braces (not shown) use two type "B" braces overlapped and bolted together for extended length when conveyor height is 48" or more.



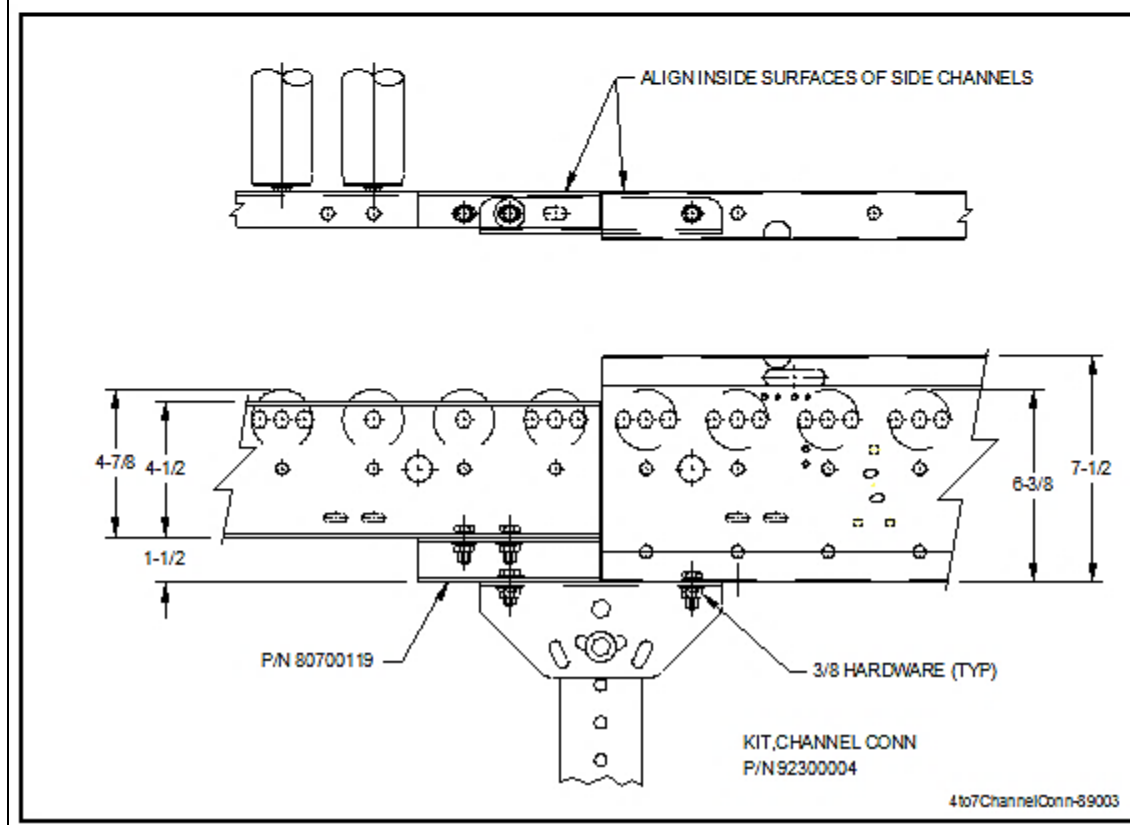
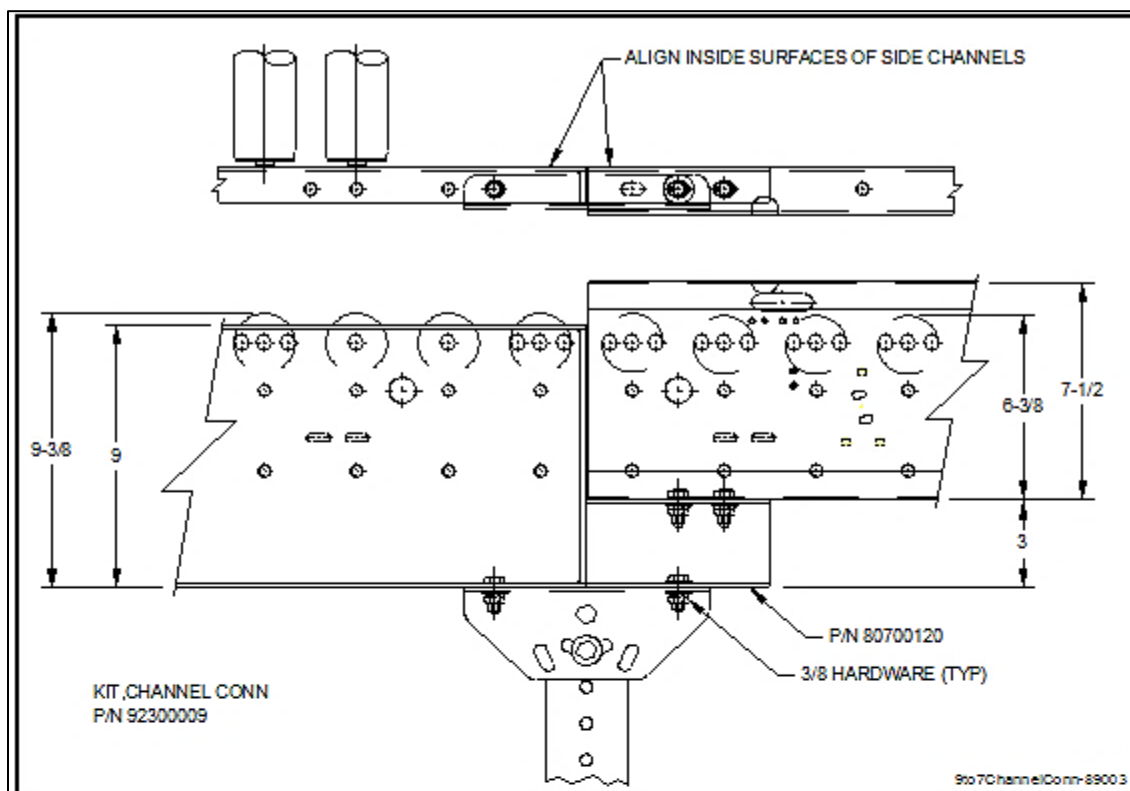
***Diagonal Sway Brace (floor support)***

Floor support sway bracing consists of one 1-1/2" x 1-1/2" structural angle and mounting hardware.

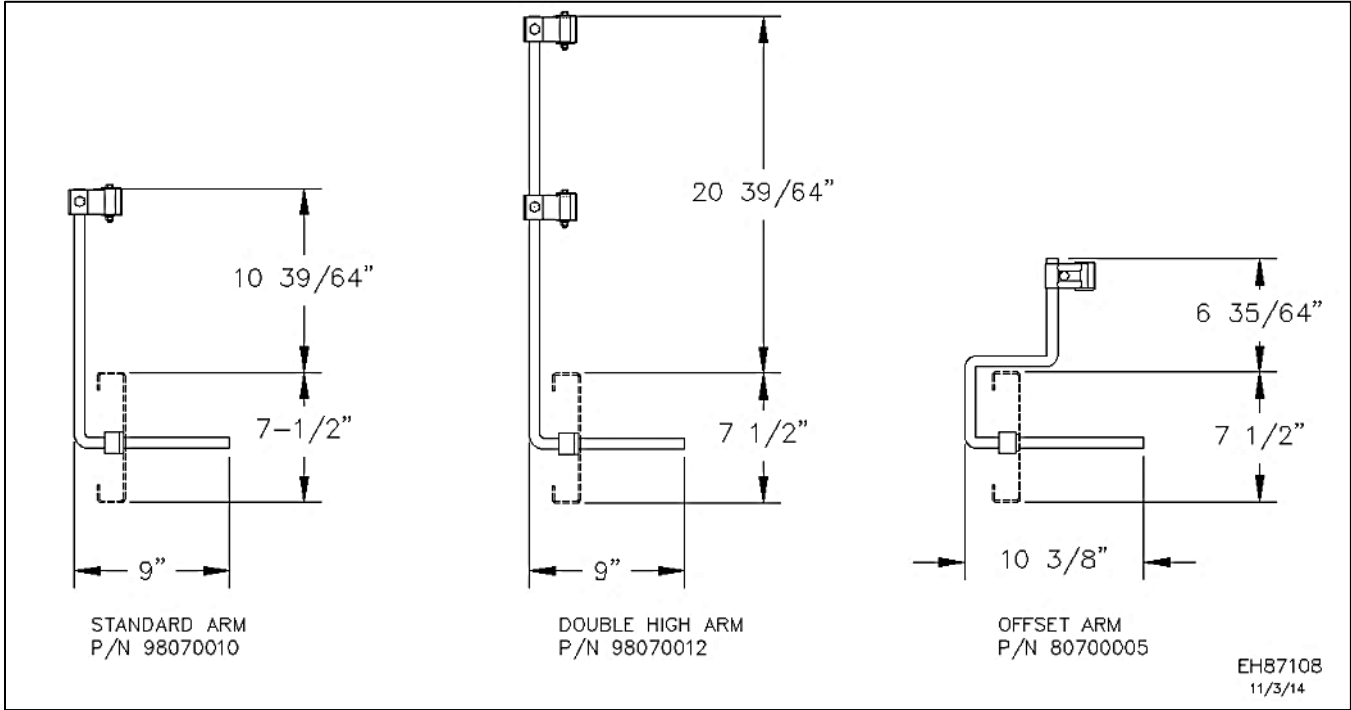
Side movement is most prevalent in long straight lines which are not side braced by adjoining conveyors, curves, etc. or, where they cannot be braced to columns, machinery, or other conveyors. This is more noticeable when the conveyor elevation is greater than its width. One brace can be mounted to every third or fourth support diagonally across the support with the low end on the opposite side of every other brace (alternate orientation). The holes in the support uprights need to be field drilled.



## CRUZ®channel to XenoROL® Channel Connections



Adjustable Channel Guard Rail to CRUZ®channel Options

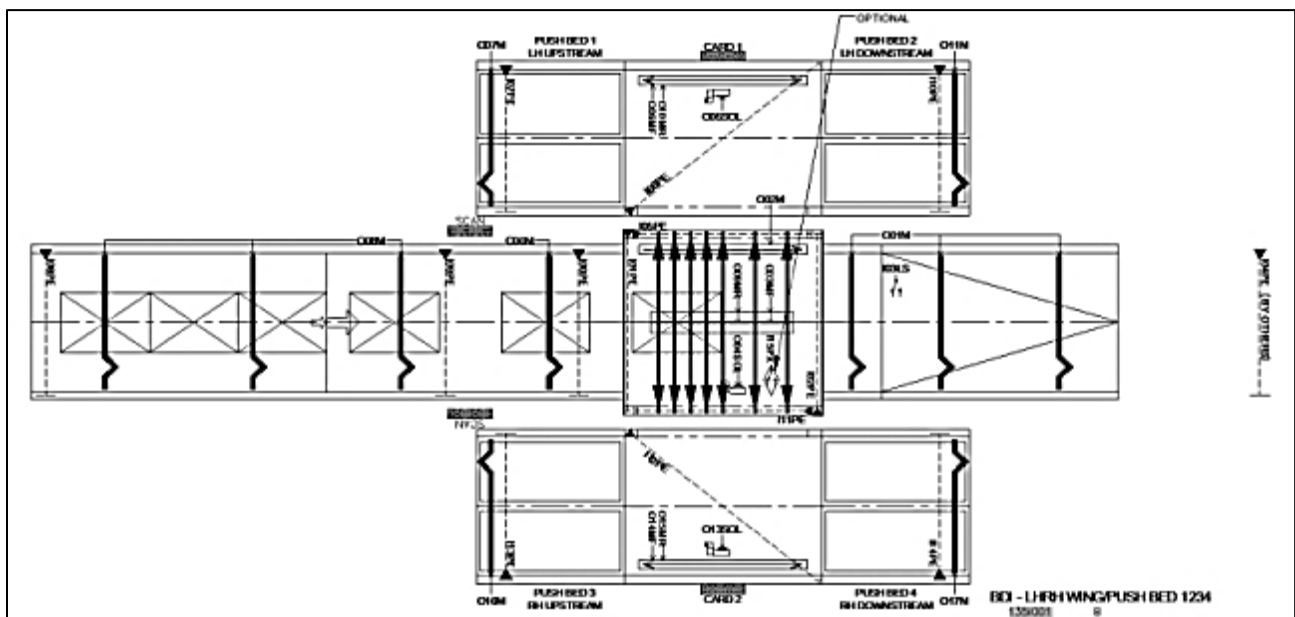


## Establishing Conveyor Flow

The center bed carrier rollers of the ITR Pick Zone Module run in one direction while the Wing beds can be Bi-directional. The ITR Pick Zone Module has a label on the charge end of the center bed of the Module. This label indicates the direction of flow.

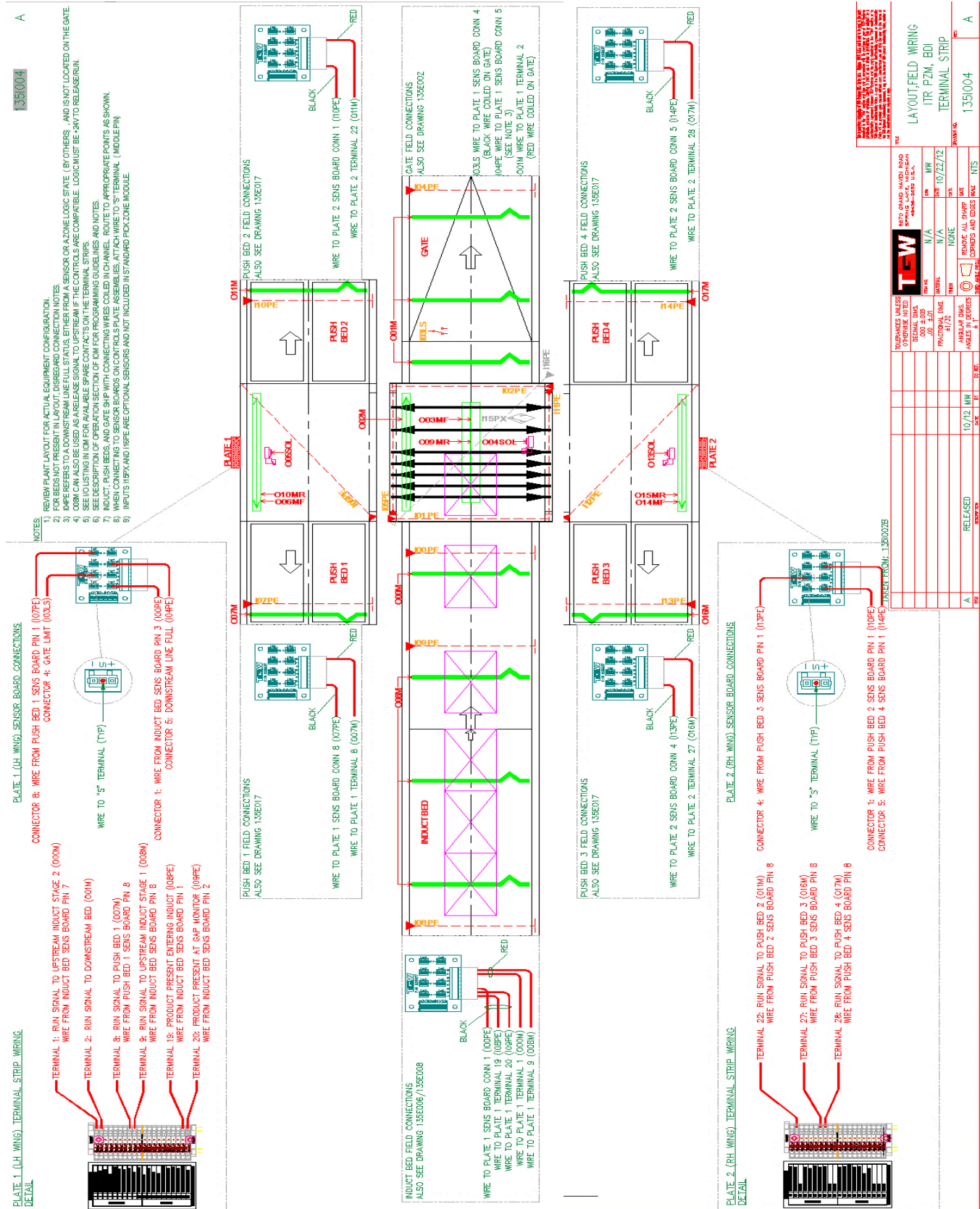


## Conveyor Flow



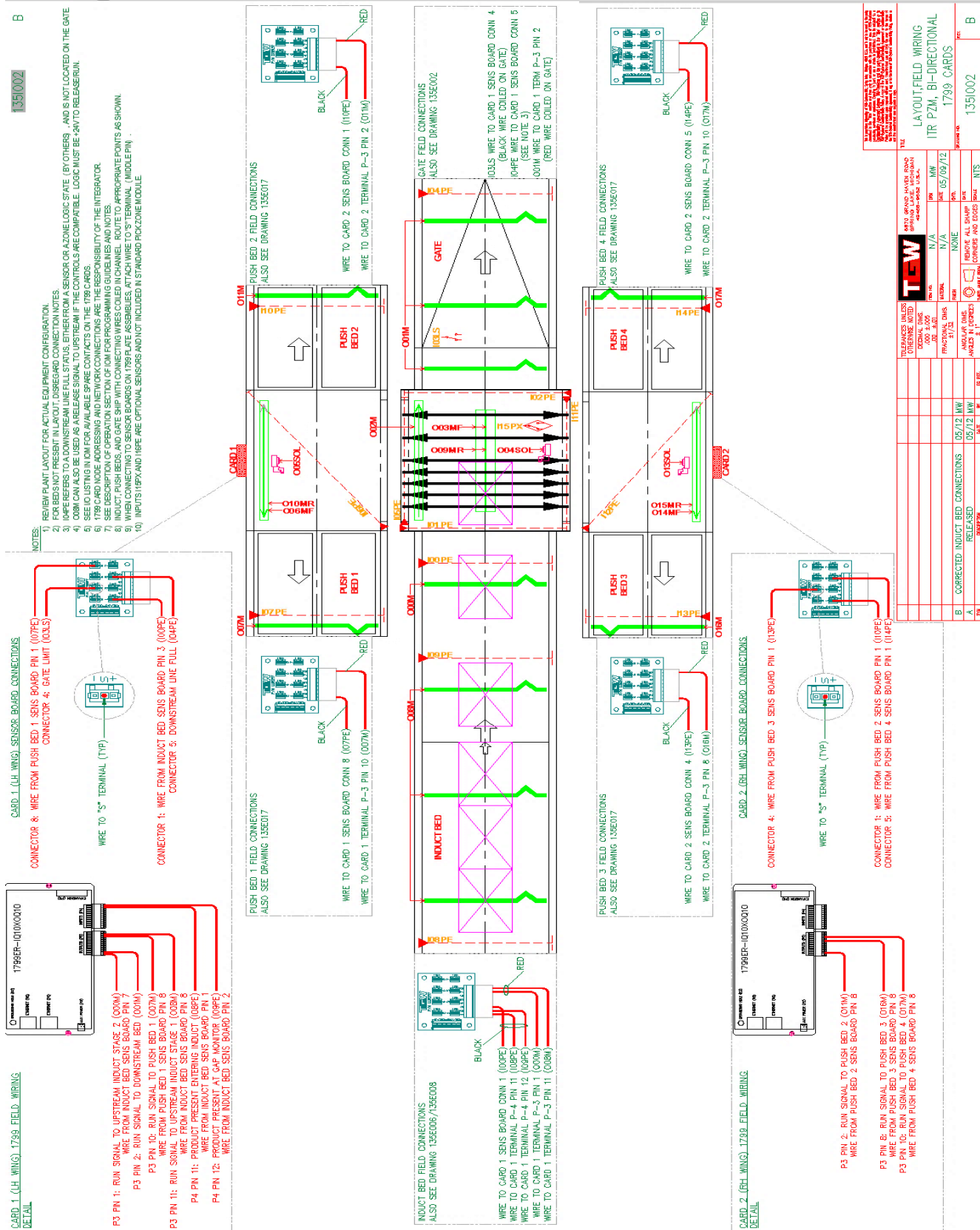


### ***Layout Field Wiring ITR PZM BDI Terminal Strip***





# Layout Field Wiring ITR PZM, Bi-Directional 1799 Cards



## Wing Bed LH & RH Push Beds 1234 (1799)

1799 Inputs (Terminal P4)			
Device Tag	Pin #	Description	Wired At:
I00PE	1	Product Present Upstream of Transfer	Field
I01PE	2	Product Present Entering Transfer	Bench
I02PE	3	Product Present Exiting Transfer Straight	Bench
N/A	4	0V	Bench
I03LS	5	Downstream Gate Closed	Field
I04PE	6	Downstream Conveyor Full	Field
I05PE	7	Product Present Entering Wing Bed 1 (LH)	Bench
I06PE	8	Product Present On Wing Bed 1 (LH)	Bench
N/A	9	0V	Bench
I07PE	10	Product Present On Push Bed 1 (LH Upstream)	Field
I08PE	11	Product Present Entering Induct	Field
I09PE	12	Product Present At Gap Monitor	Field
I10PE	1	Product Present On Push Bed 2 (LH Downstream)	Field
I11PE	2	Product Present Entering Wing Bed 2 (RH)	Bench
I12PE	3	Product Present On Wing Bed 2 (RH)	Bench
N/A	4	0V	Bench
I13PE	5	Product Present On Push Bed 3 (RH Upstream)	Field
I14PE	6	Product Present On Push Bed 4 (RH Downstream)	Field
I15PX	7	Transfer Lowered (Optional)	Bench
I16PE	8	Product Present On Transfer (Optional)	Bench
N/A	9	0V	Bench
I17	10	Spare	
I18	11	Spare	
I19	12	Spare	
1799 Outputs (Terminal P3)			
Device Tag	Pin #	Description	Wired At:
O00M	1	Run Upstream Induct Stage 2	Field
O01M	2	Run Downstream	Field
O02M	3	Run Transfer Rollers	Bench
N/A	4	0V	N/C
O03MF	5	Run Transfer Belts	Bench
O04SOL	6	Raise Transfer	Bench
O05SOL	7	Raise Wing Bed 1 (LH)	Bench
O06MF	8	Run Wing Bed 1 (LH)	Bench
N/A	9	24V	N/C
O07M	10	Run Push Bed 1 (LH Upstream)	Field
O08M	11	Run Upstream Induct Stage 1	Field
O09MR	12	Reverse Direction Transfer Belts	Bench
O10MR	1	Reverse Direction Wing Bed 1 (LH)	Bench
O11M	2	Run Push Bed 2 (LH Downstream)	Field
O12	3	Spare	
N/A	4	0V	N/C
O13SOL	5	Raise Wing Bed 2 (RH)	Bench
O14MF	6	Run Wing Bed 2 (RH)	Bench
O15MR	7	Reverse Direction Wing Bed 2 (RH)	Bench
O16M	8	Run Push Bed 3 (RH Upstream)	Field
N/A	9	24V	N/C
O17M	10	Run Push Bed 4 (RH Downstream)	Field
O18	11	Spare	
O19	12	Spare	

3/6/2014

## Description of Operation

When the system is first started, the following conditions should exist:

- Upstream induct conveyor running (O00M and O08M)
- Downstream gate conveyor running (O01M)
- Pick zone module transfer rollers running (O02M)
- Pick zone module transfer in down position (I15PX, O04SOL)
- All wing beds in down position (O05SOL, O13SOL)
- All other pick zone module conveyors not running (O03MF, O06MF, O07M, O09MR, O10MR, O11M, O14MF, O15MR, O16M and O17M)

As product appears on the induct conveyor, a gap will be created between each package. This facilitates barcode scanning and sensing of individual products prior to entering the transfer. As gapped packages travel along the induct conveyor, the customer-supplied barcode scanner can read the barcode on each package. This information is then used to determine what to do with each package at the decision point of the pick zone module. Specifically, the decisions needed at the pick zone module are as follows:

- Whether or not to divert the package
- If the transfer is bi-directional, which direction to divert the package
- If the wing bed is bi-directional, which direction to send the package

As I00PE senses a package upstream of the transfer, O00M and O08M will continue to run the induct conveyor if the transfer is clear and down (as detected by I15PX, if included.)

Otherwise, O00M and O08M will stop the induct conveyor until the transfer is ready to accept another package.

Once the package has completely entered the transfer, as detected by I01PE, if the package is to be diverted and the wing bed is clear, up to three things will occur as follows:

1. O03MF will run the transfer belts
2. O04SOL will raise the transfer
3. O05SOL or O13SOL will raise the wing bed
4. If the transfer is bi-directional, O09MR will set the transfer divert direction (OFF=forward, ON=reverse)

Once the package is present on the wing bed, as detected by I06PE or I12PE, up to four things will occur as follows:

1. O06MF or O14MF will run the destination wing bed
2. O07M, O11M, O16M or O17M will run the destination push bed
3. If the wing bed is bi-directional, O10MR or O15MR will set the wing bed direction (OFF=forward, ON=reverse)

Again, these decisions are based upon the data associated with the barcode on the package. Once the trailing edge of the package enters the wing bed, as detected by I05PE or I11PE, O03MF will stop the transfer belts, O04SOL will lower the transfer and O05SOL or O13SOL will lower the wing bed. Once the package is present on the push bed, as detected by I07PE,

I10PE, I13PE or I14PE, O06MF or O14MF will stop the wing bed. Once the trailing edge of the package clears the push bed, as detected by I07PE, I10PE, I13PE or I14PE, O07M, O11M, O16M or O17M will stop the push bed. If the package is not supposed to be diverted, then the transfer will remain down and the package will travel straight through the pick zone module.

If the package is not being diverted, the next package does not have to wait for the transfer to be clear before being released by the induct conveyor. After a short delay, the next package can be inducted to the transfer. The amount of this delay needs to be long enough to allow the trailing edge of the first package to exit the transfer, as detected by I02PE, prior to the trailing edge of the second package completely entering the transfer, as detected by I01PE. If the package is being diverted, the next package must wait until the trailing edge of the current package enters the wing bed, as detected by I05PE or I11PE. Once this occurs, and the transfer is down, the transfer is considered clear and ready for the next package.

The gate conveyor motors are controlled by O01M. The status of the gate is monitored by I03LS. If the gate is opened, the run signal to the gate conveyor motors will be interrupted, stopping the rollers. Do not turn off O01M. In addition to running the gate conveyor rollers, the signal is also passed through the I03LS limit switch contacts, and then to the input. Also, if the gate is opened when a package is on the transfer, it can be allowed to continue if it is being diverted. Otherwise, it should not be sent straight through the transfer. If a package is stopped on the transfer due to the gate being opened, the induct conveyor should not release additional product to the transfer. This should only be an issue if the package on the transfer was going straight through, since normally a timer would allow another package to be released to the transfer without the transfer being clear.

In addition to the functionality described above, the O01M run signal is also used to power the I04PE photoeye. The O01M run signal should not be turned off when the downstream conveyor is full. The status of product on the downstream conveyor is monitored by I04PE. If the downstream conveyor is full, a package on the transfer can be allowed to continue if it is being diverted. Otherwise, it should not be sent straight through the transfer. If a package is stopped on the transfer due to the downstream conveyor being full, the induct conveyor should not release additional product to the transfer. This should only be an issue if the package on the transfer was going straight through, since normally a timer would allow another package to be released to the transfer without the transfer being clear.

If desired, the entire pick zone module can be stopped, including the induct conveyor, transfer rollers and gate conveyor, due to inactivity. If the pick zone module does not sense any product for a period of time, the system can be stopped. When product begins entering the induct conveyor, as detected by I08PE, the system can be restarted and function as described above.

As described previously in this document, the induct conveyor creates a gap between packages as they travel toward the barcode scanner and transfer. This gapping occurs due to the speed differential between the first two zones and the second two zones of the induct

conveyor. If the barcode scanner is a top scanner, the induct conveyor may need to create a larger gap between packages prior to them arriving at the scanner. This can be accomplished by splitting the run signal between the third and fourth zones of the induct conveyor. The first three zones share a run signal (O08M) so that they start and stop together. The fourth zone has its own run signal (O00M) so that it can continue to run while the first three zones are stopped. This should be done for a period of time long enough to create the desired minimum gap between each package. A photoeye (I09PE) is positioned in the third zone to monitor the gap between packages. This photoeye is used to determine if the first three zones need to be stopped to create the desired minimum gap.



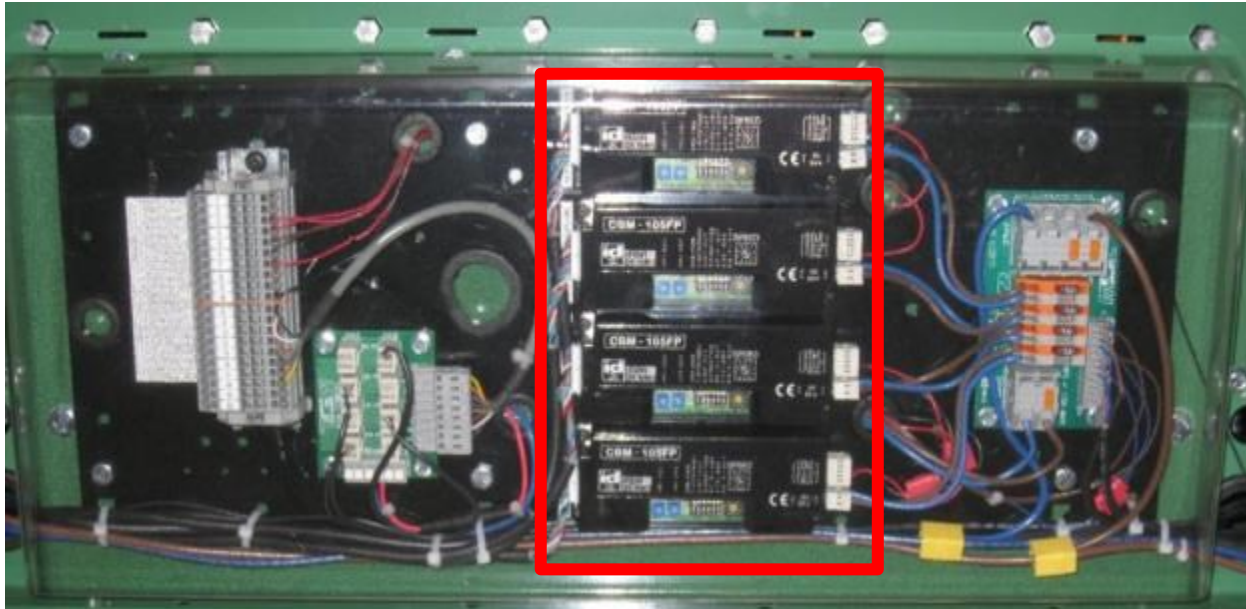
## Installation Arrangements

### ***PZM General Size***

The ITR Pick Zone Module has 3 standard sizes with the center bed being 22BF 28BF and 34BF. The Wing bed standard sizes are 16BF 22BF and 28BF. Special sizes may be available.

### ***PZM Driver Cards***

The Driver Cards are mounted on a plate that's attached to the channel of each Wing Bed. All Driver Cards are pre wired and tested before shipping.



### ***Drive / SLAVE Belt Break-in Time Requirements***

The roller to roller round drive belts are installed under tension with predetermined initial tension. After a time of static and running conditions, there is an initial tension drop in the belt.

Run all IntelliROL conveyors 48 hours empty before running product. This will ensure motorized rollers are not overloaded under the higher initial belt tension. This run time is best accomplished during installation as soon as the power supplies are wired and during the commissioning phase.

### ***Commissioning of Equipment***

Commissioning of the equipment can best be defined as the final adjustments and test of the installed equipment required for its proper operation. The need for commissioning is inherent, since the individual components of equipment are brought together at the installation site to operate as a system.

Mechanical and electrical commissioning is most often carried out simultaneously. Commissioning must simulate the actual operation of the system as close as possible to demonstrate its ability to perform reliably at the specified rate in the prescribed operational sequence.

During the Commissioning Phase, it is necessary to load the equipment with product to be conveyed, which provides the means of detecting those areas requiring adjustment. Personnel will be required to support operational functions and may serve as part of operator training and familiarity with the system.

During the commissioning activity, special attention should be directed toward personnel safety. No unnecessary risks should be taken that would endanger the safety of any commissioning personnel. All personnel must familiarize themselves with all safety features of the system such as emergency stops and motor disconnects.

After commissioning, conduct operator training on all safety and operational aspects of the system. This must include systems start-up, location of emergency stops and familiarity with all operator controls.

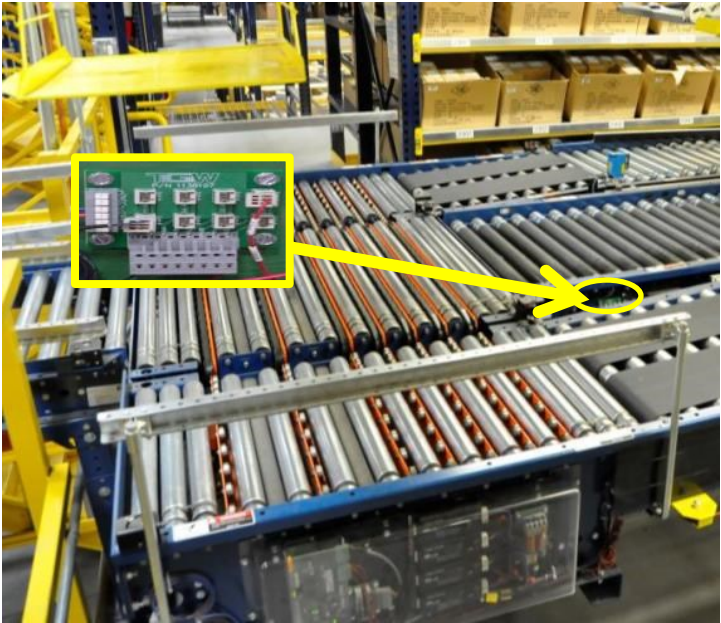
### ***Precautions***

ULTRAVIOLET RAYS of sunlight will weaken polyurethane slave belts.

OILY OR WET CONDITIONS impair frictional drive characteristics between polyurethane slave belts and roller grooves.

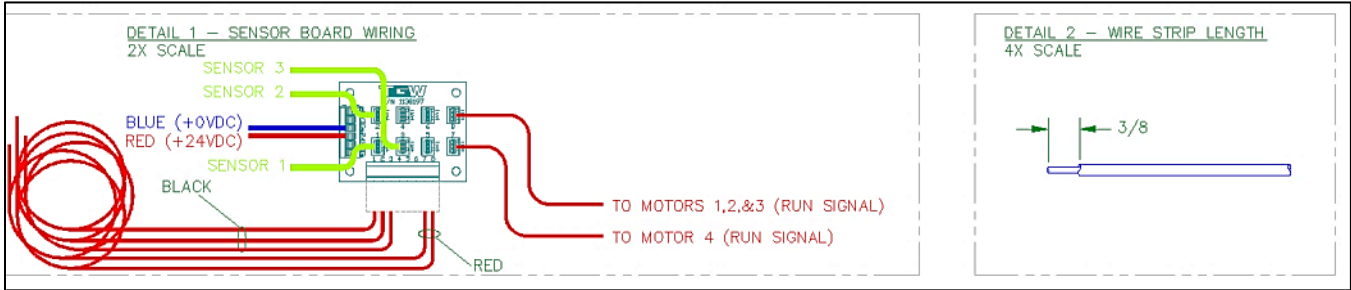
CORROSIVE SUBSTANCES will adversely affect various components, voiding the warranty.

Induct Bed Field Connections



PCB Connector General Location on Induction Bed.

Induct Bed Sensor Board Wiring





## Electrical and Mechanical

### ***General Features and Concepts***

The ITR product line is based on the following features and concepts:

- Itoh Denki motorized rollers and drivercards (CB-016 or CBM-105) are standard.
- Cables are pre-engineered with the appropriate connectors.
- All channels are designed to accommodate any of the electrical variations.
- All CRUZ® channels including C6 channels have welded connectors and CRUZbelt tube crossmembers.
- AutoCAD blocks for the ITR product lines are available upon request.

### ***ITR Variations***

ITRCB – CB-016 and CBM-105

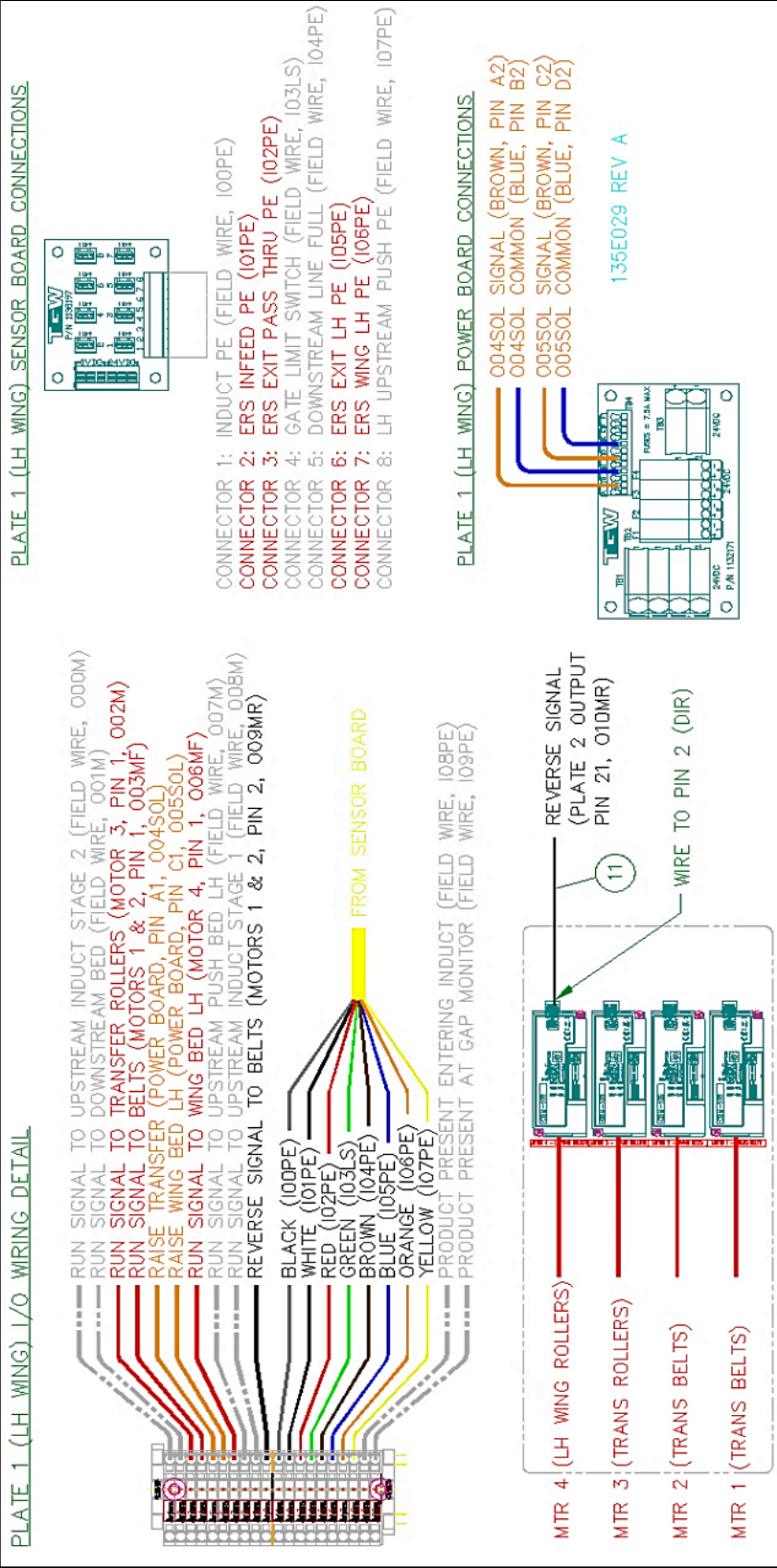
- Standard product offered in Core Technologies.
- Transportation conveyor based on the Itoh CB-016 drivercard and FE-60 motorized roller.
- Each drivercard is wired to power, but requires a 24VDC run signal (provided by others) to run each card.
- C6 channel with welded bed connectors.
- 30" roller groups with 3" centers are standard.

### ***UBT Construction***

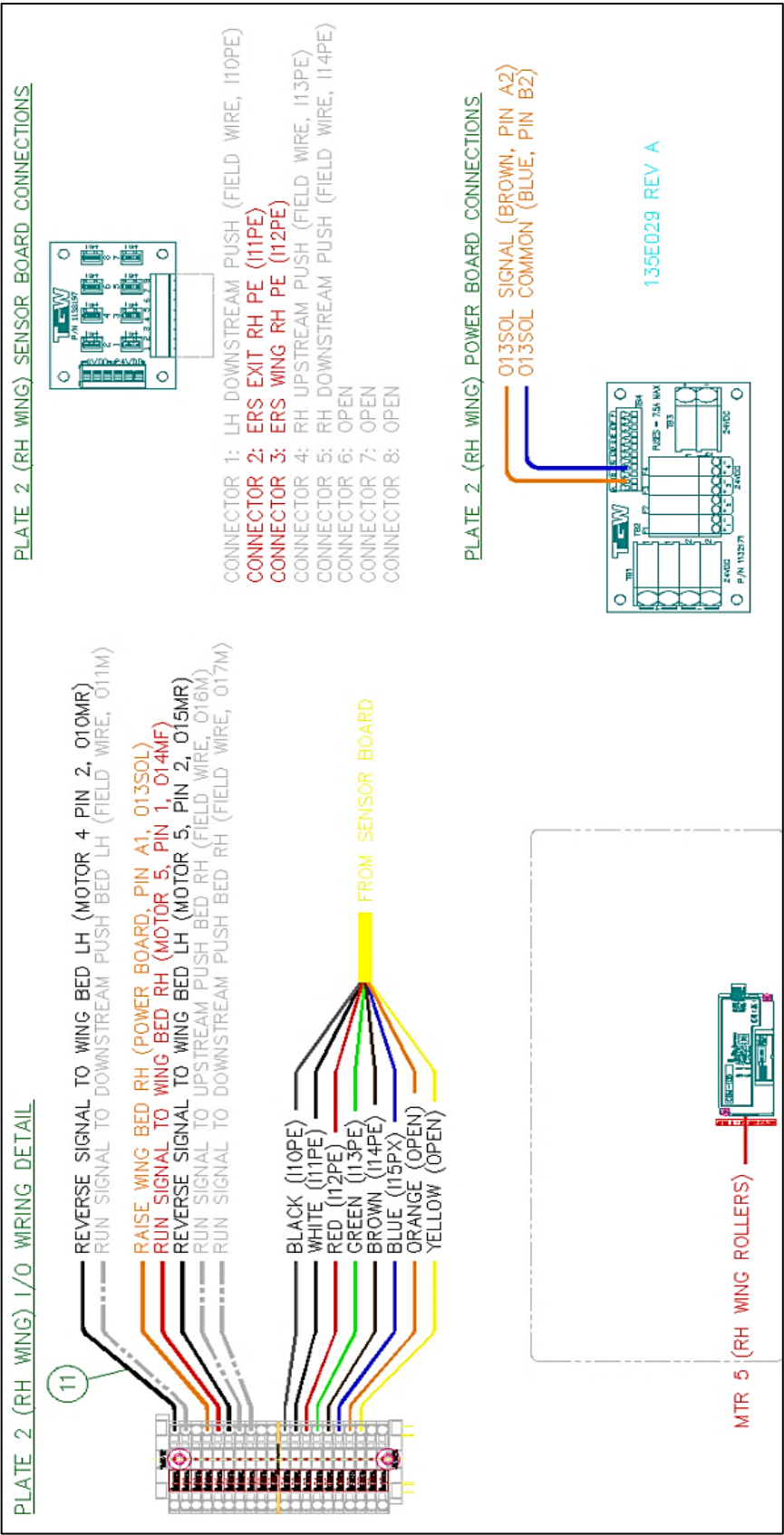
- ERS or Pick Zone Module transfer belt centers are standard 3.25".
- ERS or Pick Zone Module transfers require 1.75 diameter carrier rollers.
- For UBT's with sensors, PE's (ZL2) & reflectors are mounted in brackets at corners of the transfer. As a standard, there will always be four PE's and reflectors. See Figure 8.1 for a view of the basic 4-sensor (bi-directional) UBT.
- UBT's are universal LH/RH. The power harness is installed for LH flow, but can be reversed by cutting two wire ties and flipping cable end for end at installation.

Use

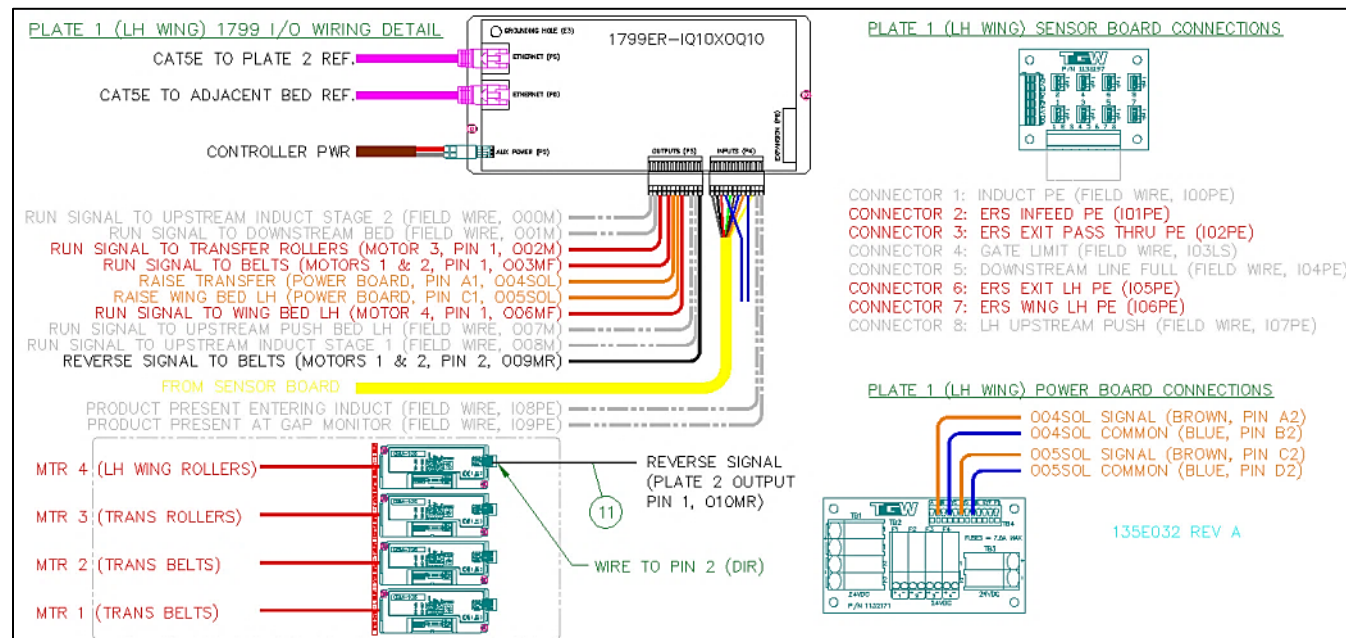
Electrical Plate 1(LH WING) I/D Wiring Detail Terminal Strip



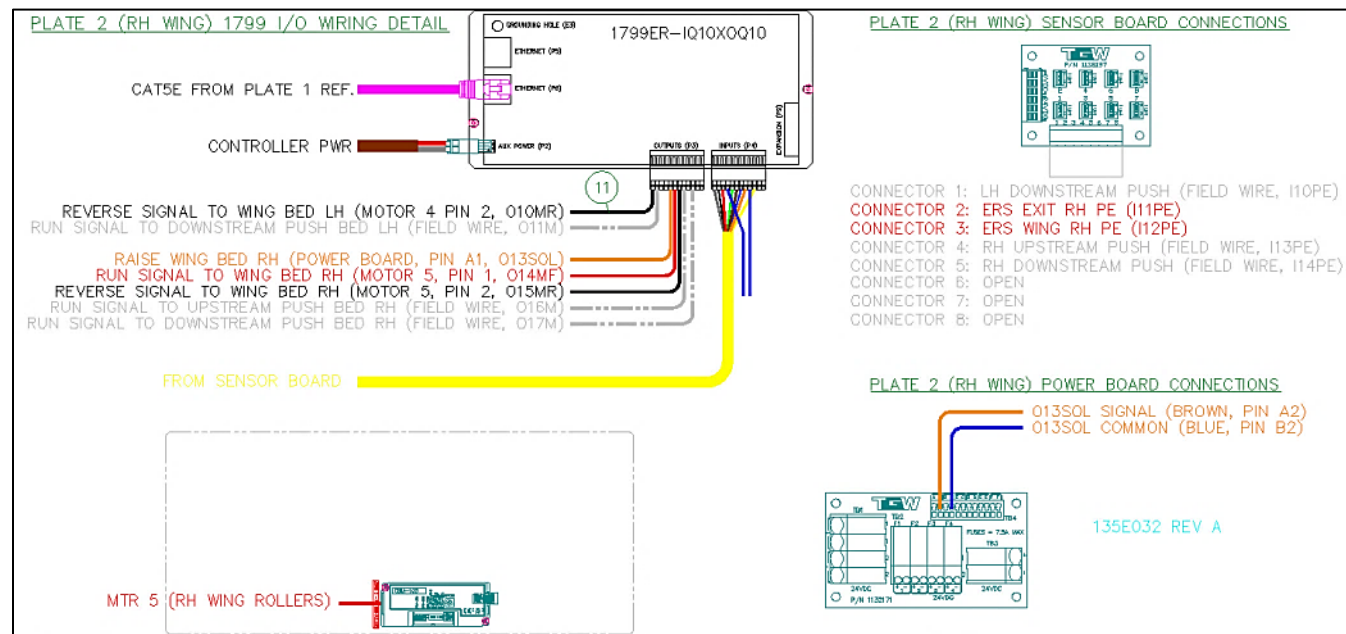
Electrical Plate 2 (RH WING) I/D Wiring Detail Terminal Strip



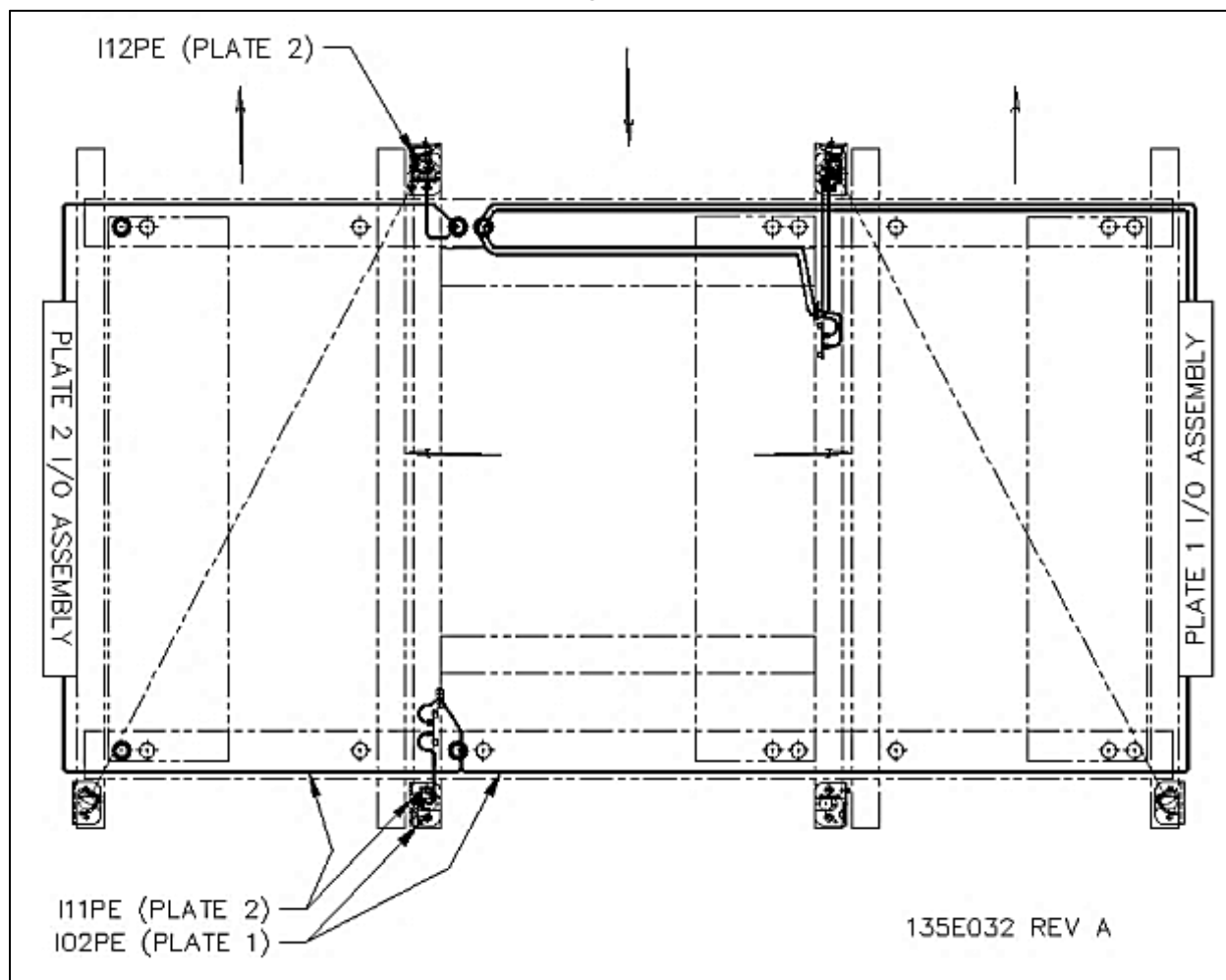
### Plate 1 (LH Wing) 1799 I/O Wiring Details





### Plate 2 (RH Wing) 1799 I/O Wiring Details





## Photo Eye locations



## Electrical Safety Guidelines



 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>• All electrical controls must be installed, wired and connected by a licensed electrician only.</li><li>• All motor controls and wiring must conform to the National Electrical Code as published by the National Fire Protection Association and approved by the American National Standards Institute, Inc. Since specific electrical codes vary from one area to another, be sure to check with proper authorities before starting.</li></ul>

The electrical voltage of motorized rollers will be stamped on a metal name plate affixed to one end of the roller. This voltage should be checked to see that it matches the output voltage of your power supply. Consult the appropriate MHS Conveyor wiring diagram for the proper connections. If a single speed three phase motorized roller runs the wrong direction, two leads must be switched to reverse rotation.

 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>• Do not connect the driver card to any other voltage than the one listed on its name plate.</li></ul>

### NOTE:

All controls equipment is covered by the original manufacturer's equipment warranty.

 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>• All safety devices, including wiring of electrical safety devices, shall be arranged to operate in a “fail safe” manner. That is, if power failure or failure of the device itself would occur, a hazardous condition must not result.</li></ul>

## Conveyor Controls - Safety Guidelines

The following are basic conveyor controls safety guidelines for common controls equipment.

**START-UP WARNING HORN** - If all conveyors being started cannot be seen from the start pushbutton location, then an audible warning device is required. It could be a horn, buzzer or bell. It must be loud enough to be heard at any point on the conveyor being started. It should sound for the duration of five seconds after the start pushbutton is pushed, prior to the conveyor starting. Any auxiliary equipment such as vertical lifts, turntables, etc. must be included in the warning circuitry.

**START PUSHBUTTON** - Start pushbutton should be the flush type or guarded such that inadvertently leaning against them will not actuate them. They should be provided with a legend plate clearly defining which conveyors will be started.

**STOP PUSHBUTTON** - Stop pushbutton should be the extended type such that any contact with it is sufficient to stop the conveyor. They should have a legend plate defining which conveyors will be stopped.

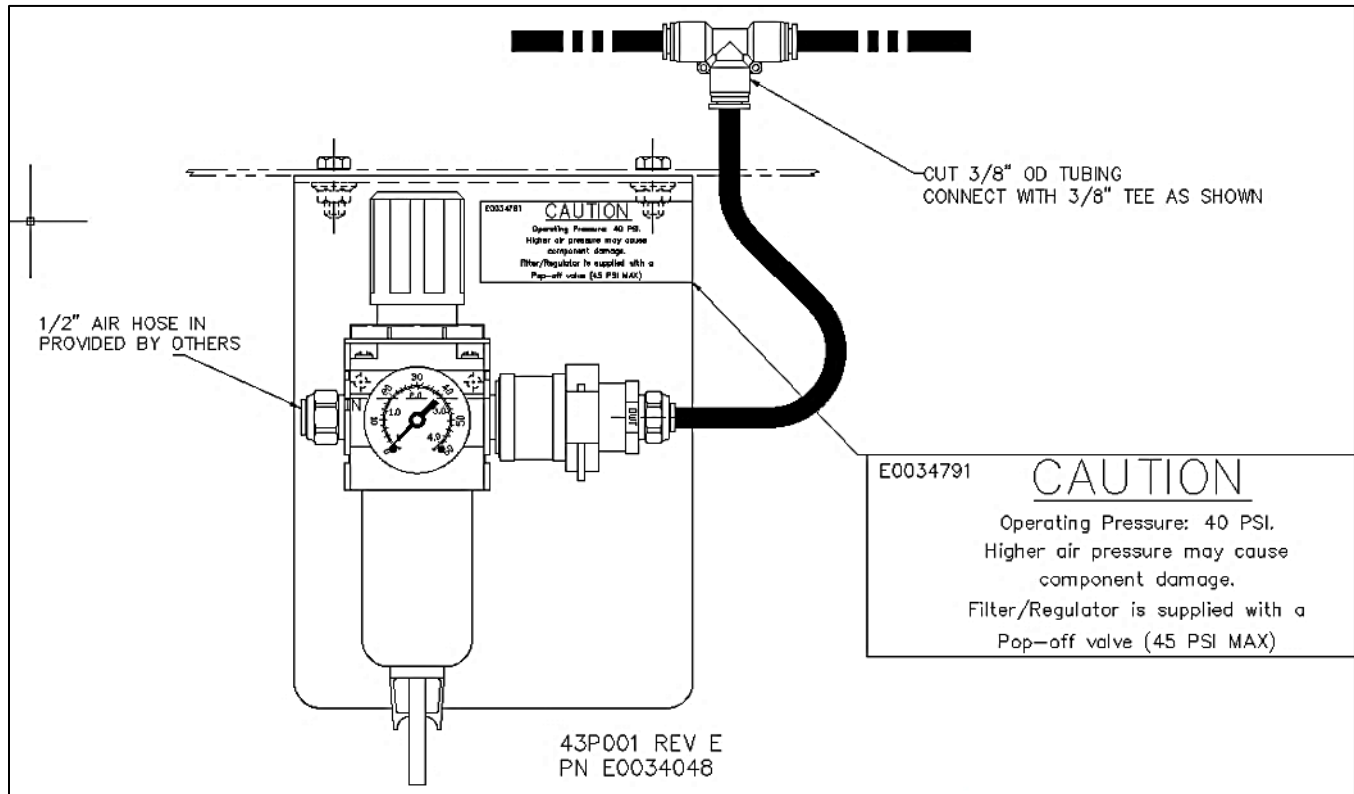
**EMERGENCY STOPS** - All locations where high voltage motors are used and an operator is working must be protected by an emergency stop.

Emergency stop devices should also protect high pedestrian areas where high voltage motors are used. Actuating an emergency stop must dropout the start circuit and all electrical power, requiring restarting the system using the start pushbutton provided.

All locations where low voltage motors are used (under 50 volts) and an operator is working all require an emergency stop circuit. This requirement also applies to high pedestrian areas.



## Air Supply Requirements



### General Guide

Every conveyor system is unique, with its own specific requirements. Therefore, the following is a general guide.

### Main Feeder

Air velocity through the main feeder piping can be kept smooth with lower losses using large diameter pipe with minimum bends and restrictions. Standard weight black pipe or copper is suitable for plumbing the compressed air overhead to all points of use.

### Air Drops

MHS Conveyor recommends using 3/4" pipe on air drops for high flow and low pressure loss. The drop is terminated with a drain at the bottom. A tee located prior to the drain branches off to the conveyor. This branch line must contain a lockout/shutoff. A shutoff must also be located in the drop before the branch tee. OSHA Rule 29, CFR1910.147 requires energy sources (air drops) be turned off and capable of being locked or labeled with a warning tag.

**IMPORTANT!** If your air compressor uses synthetic oil, a coalescing filter plus a regular filter of 5 micron is required. Synthetic oils will shrink the seals in pneumatic devices and valves.

### Low Pressure Switch

An air pressure switch is recommended to be installed into the pneumatic circuit to detect a drop in air pressure below required levels. If pressure drops below approximately 35 PSI, the conveyor system will shut off.



***Pneumatic Requirements***

- Regulator pressure set at 40-45 PSI.
- Maximum conveyor length each way from regulator is 100'. Locate regulator in center of conveyor for maximum length.
- MHS Conveyor supplied low pressure regulator is required.
- Low pressure switch to be set at 35 PSI.
- In high humidity or low temperature, use air dryer.
- Use 5 micron filter.
- Lockout/shutoff valve to be provided by air system installer.

## **Replacement Parts Identification**

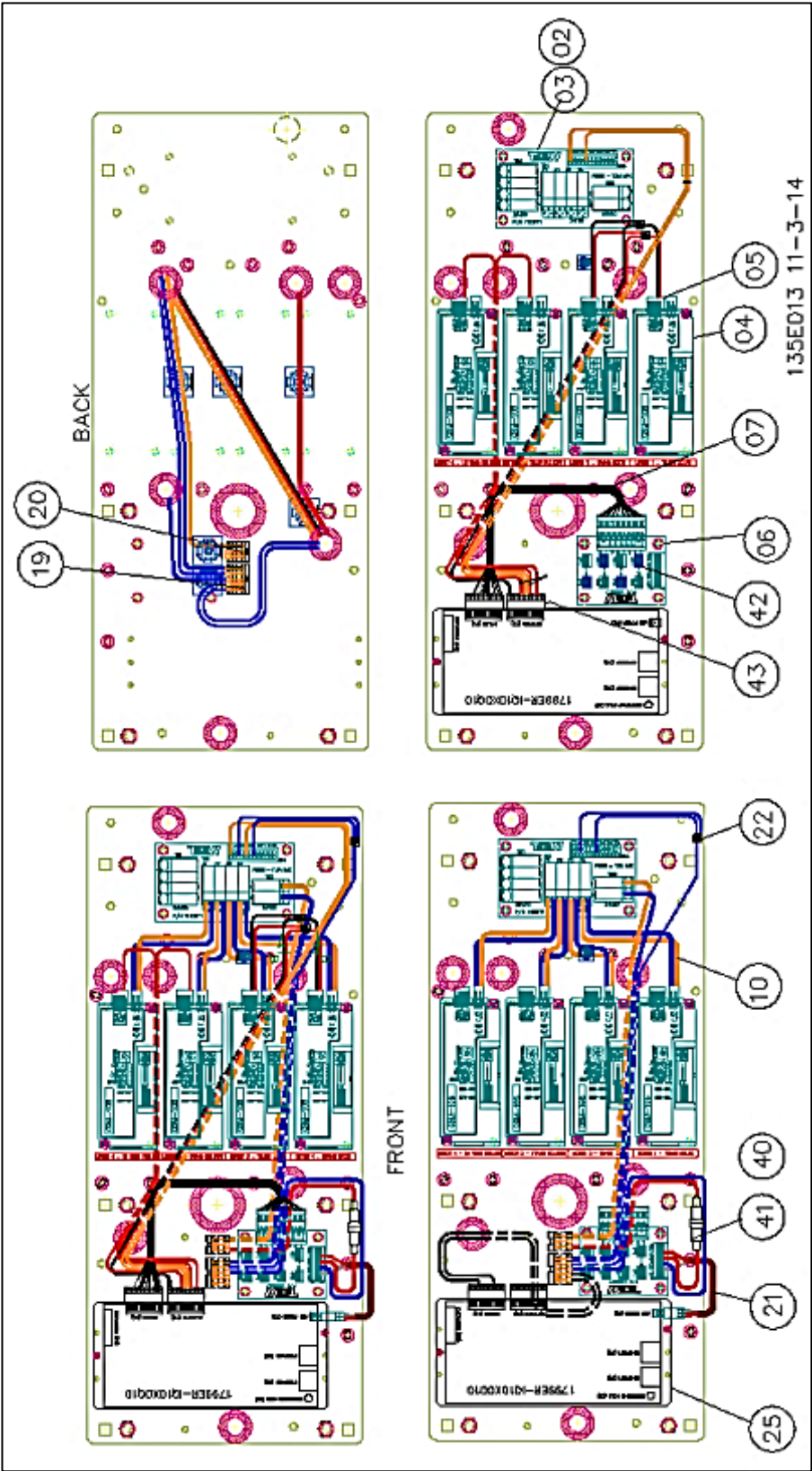
This section is used to identify parts that may require replacement during the life of the conveyor.

Parts which specifically pertain to IntelliROL are included with illustrations.

A "Recommended Spare Parts List" is published for all conveyor orders of \$20,000 or more. This spare parts list is sent to the purchaser approximately (2) weeks after the order is received. It includes part numbers, description, pricing and recommended quantities to be kept on hand for maintenance.

If you are unable to locate this document another may be obtained by contacting the MHS Conveyor Lifetime Services at 231-798-4547 or Fax 231-798-4549.

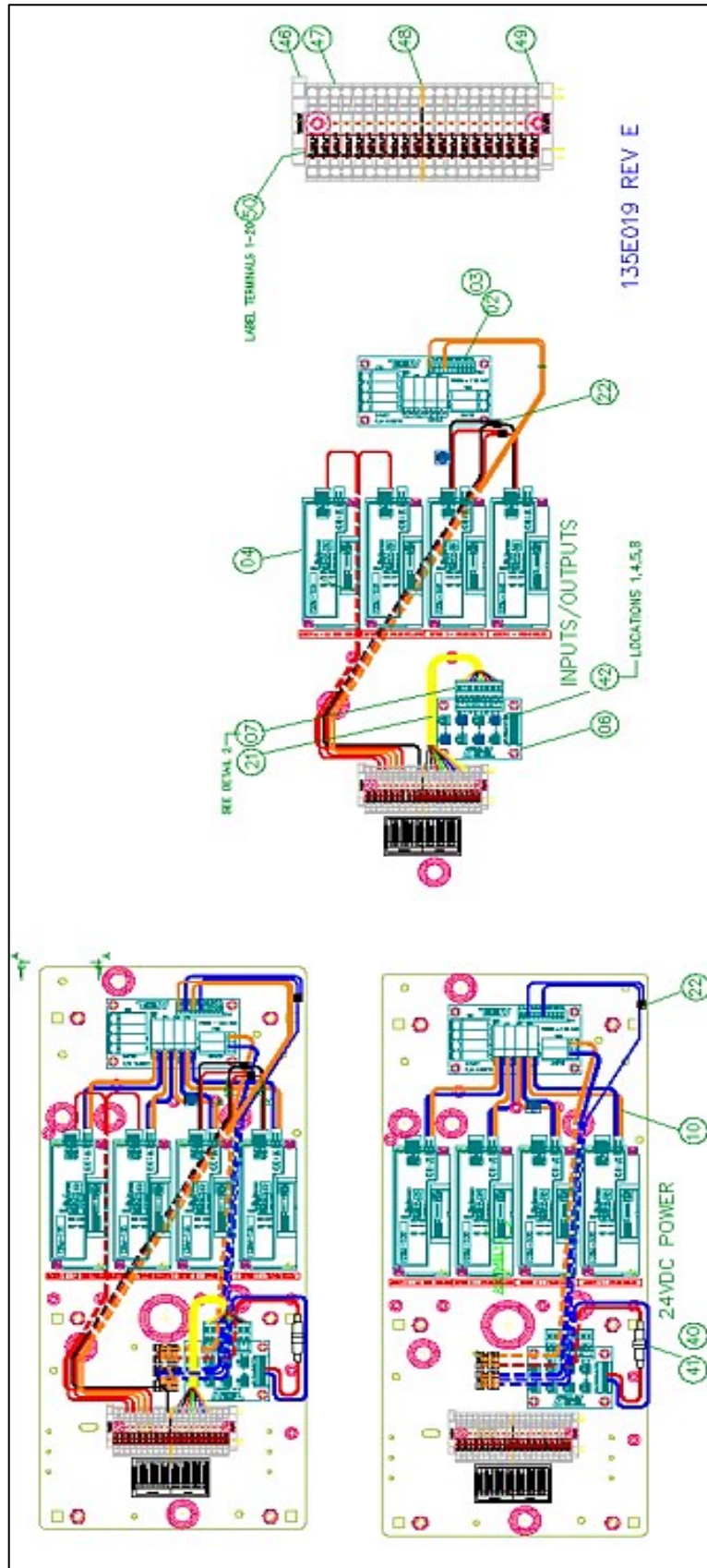
ITR Driver Cards with 1799 I/O Card



**Replacement Parts ITR Driver Cards with 1799 I/O Card**

<b>Replacement Parts for 1799 Driver Card</b>			
<b>BALLOON</b>	<b>ITEM #</b>	<b>DESCRIPTION</b>	<b>QTY</b>
02	1132171	PCB, DB FUSED 7.5AMP	1
03	1132721	FUSE, 7.5AMP 32V ATO	4
04	1153930	DRIVERCARD, ITOH CBM-105	4
05	733105	CONN, WAGO # 733-105	4
06	1138197	PCB, DB PE 4AMP 8-STATION	1
07	1144918	CABLE, 5-COND W/LEVERS	1
10	1144897	CABLE, POWER CB-016 PZM	4
19	1137437	CONN, 5-COND W/LEVERS	1
20	1102816	CONN, 3-COND W/LEVERS	1
21	1144899	CABLE, POWER 4INCH ITR 1799	1
22	1120174	CONNECTOR, RED SCOTCHLOK 558	3
25	1142334	MODULE, I/O 10IN / 10OUT 1799	1
40	1102221	FUSE, 4AMP 125V CARTRIDGE GMA	1
41	1102222	FUSE HOLDER, IN-LINE CARTRIDGE	1
42	1139780	CONN, FRMALE 3-POLE PIN	4
43	1140805	CONN, PHOENIX 1881422	4
<i>Reference Dwg: 135E013</i>			

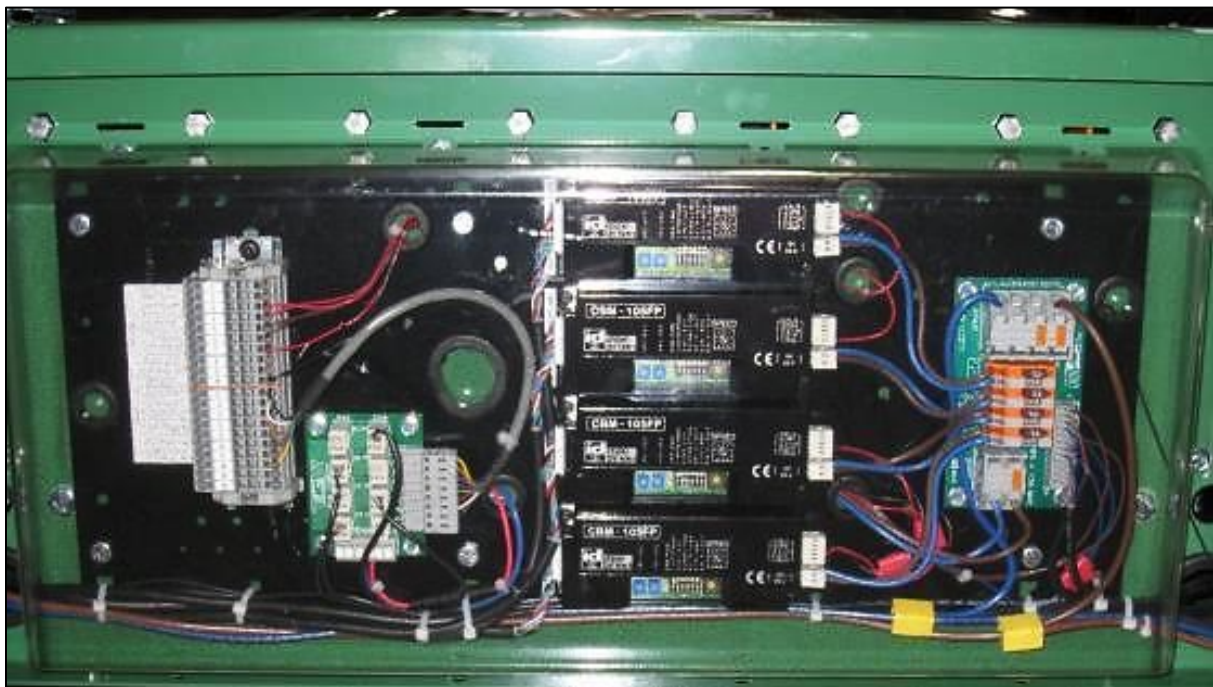
## ITR Driver Cards with Terminal Strip



### Replacement Parts for ITR Terminal Strip

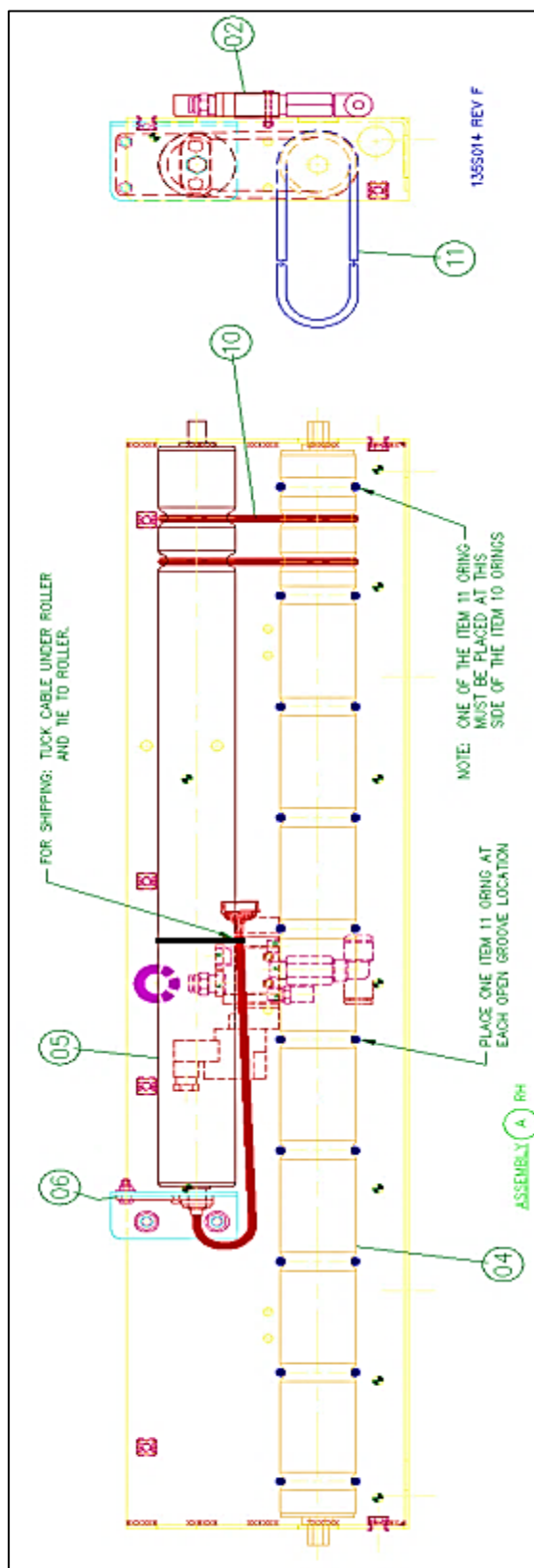
Replacement Parts ITR Terminal Strip			
BALLOON	ITEM #	DESCRIPTION	QTY
02	1132171	PCB, DB, FUSED, 7.5A	1
03	1132721	FUSED, 7.5A, 32V, ATO	4
04	1153930	DRIVERCARD, ITOH CBM-105	4
06	1138197	PCB, DB,PE, 4A, 8 STATION WAGO, 51247797	1
07	1138668	CONN., WAGO 231-108 / 026-000	1
10	1144897	CABLE, POWER, CB-016 PZM	4
20	1102816	CONN., 3 COND, W / LEVERS	2
21	1140038	CABLE, BELDEN 9421 OR EQUIV.	1 FT
22	1120174	CONNECTOR, IDC SCOTCHLOK 558 (RED)	3
40	110221	FUSE, 4A, 125V, CARTRIDGE, GMA	1
41	1102222	FUSE, HOLDER IN-LINE, CARTRIDGE	1
42	1139780	CONN., FEMALE 3 POLE PIN	4
46	1132919	TERM, END STOP WAGO 249-116	2
47	1114381	TERM 2 COND, WAGO 2002-1201	20
48	1132918	TERM, INTRMED PLT, WAGO 2002-1292	1
49	1114382	TERM, INTRMED PLT, WAGO 2002-1291	1
50	1142173	WMB-MLT-MARK 1-50, WAGO 793-666	1

Reference Dwg: 135E019





## Pan, Asy Bottom ITR ERS



### Replacement Parts for Pan Asy Bottom ITR ERS LH & RH

Part Replacement Pan,ASY Bottom ITR ERS For LH & RH			
BALLOON	ITEM #	DESCRIPTION	QTY
02	1139102	VALVE,SMC 4WAY 24VDC W/FITT & DIN CORD	1
04	1132732	ROLLER,CARRIER DRIVE,	1
05	1138723	ROLLER,ITR 22BF 2G ITOH	1
06	1132447	BRKT,MOUNTING ITOH,FLATS UP	1
10	1144848	ORING,1/4"DIA X 9.5" HT BLUE	2
11	1148786	ORING,83A ST TRNS 3/16X22-3/16	10

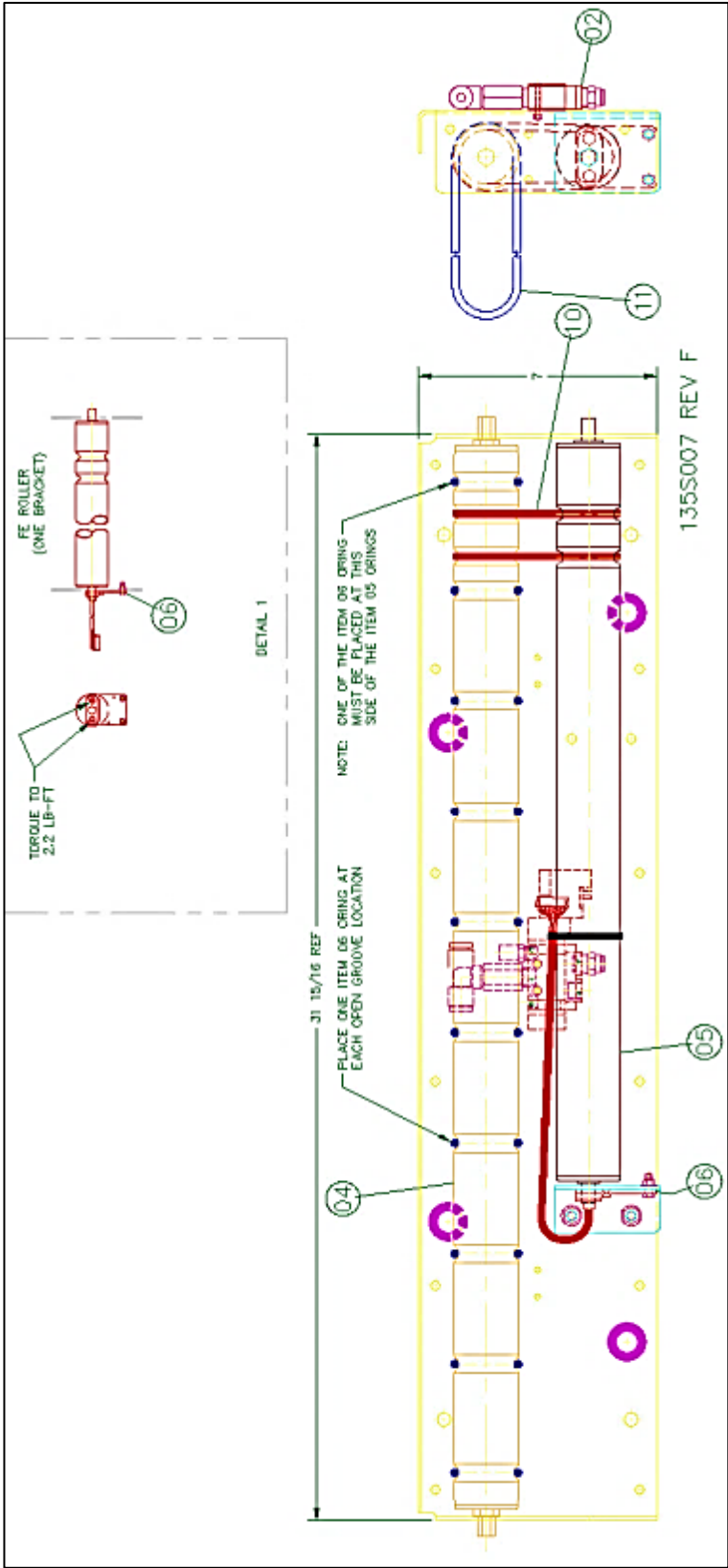
Dwg# 135S014 Rev F



Ref PN 1139098



Pan Asy Bottom ITR ERS WING (FE ROLLER)



### Replacement Parts Pan Assembly

Part Replacement Pan,ASY Bottom ITR ERS WING (FE ROLLER) For LH & RH			
BALLOON	ITEM #	DESCRIPTION	QTY
02	1139102	VALVE,SMC 4WAY 24VDC W/FITTS & DIN CORD	1
04	1132732	ROLLER,CARRIER DRIVE,	1
05	1138723	ROLLER,ITR 22BF 2G ITOH	1
06	1132447	BRKT,MOUNTING ITOH,FLATS UP	1
10	1144848	ORING,1/4"DIA X 9.5" HT BLUE	2
11	1148787	ORING,83A ST TRNS 3/16X15-7/32	10
Dwg# 135S007 Rev F			



Ref PN 1138811



Ref PN 1138810

## ITRCB Electrical Components Replacement Parts

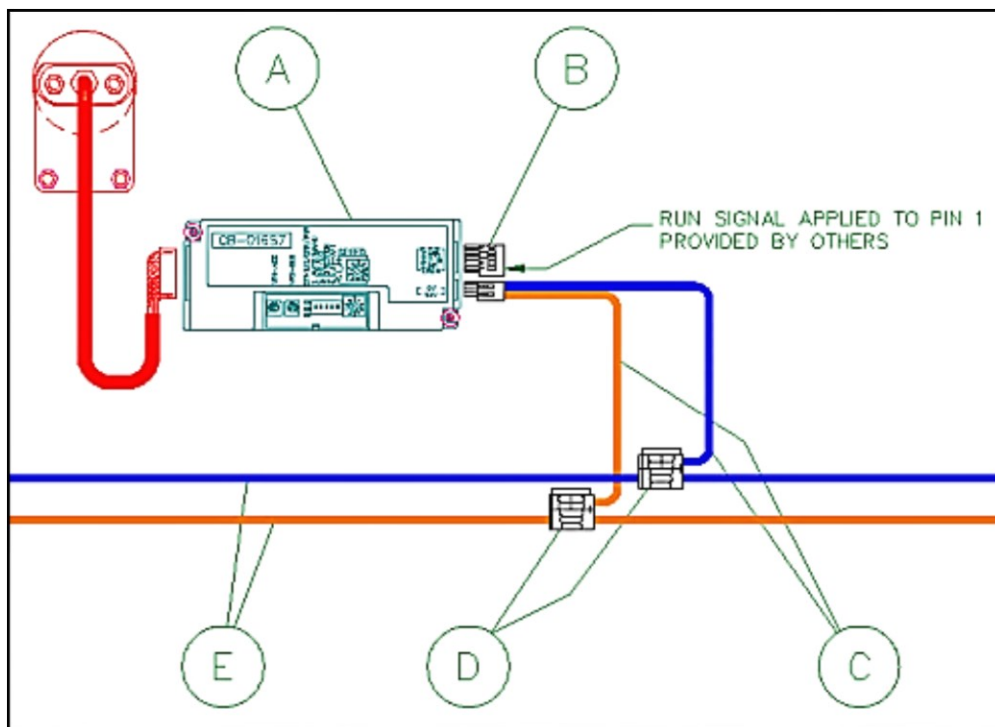


Figure 1 – CB-016 Drivercard


- Ⓐ CB-016 and CBM-105 item (with hardware): 1139716 CB-016 / 1153930 CBM-105
- Ⓑ 5-Pin connector (for run signal connection): 733105
- Ⓒ Power tap cable (for short distances < 6"): 1139543
- Ⓓ Scotchlok connectors (connect power tap to power harness): 3M567
- Ⓔ Power harness – see power harness table

### Replacement Parts for Motor extension cables


Item No.	Description	Description 2
1138704	CABLE,MOTOR EXTENSION,600MM	ITOH M-F-EXT 9-PIN-600mm
1138705	CABLE,MOTOR EXTENSION,1200MM	ITOH M-F-EXT 9-PIN-1200mm
1138706	CABLE,MOTOR EXTENSION,2700MM	ITOH M-F-EXT 9-PIN-2700mm

Replacement Parts for Photoeye Assemblies

ORIENT PHOTO EYE SO THAT THE WIRES ARE TOWARDS THE BACK OF THE PHOTO EYE BRACKET.

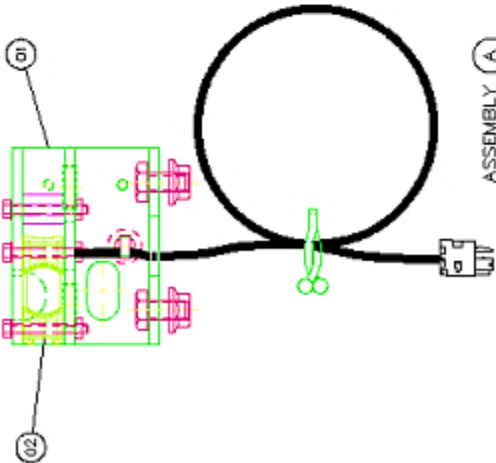


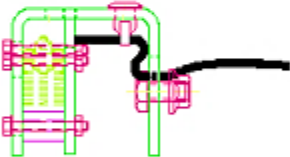
ORIENT PHOTO EYES SO THAT THE WIRES ARE TOWARDS THE BACK OF THE PHOTO EYE BRACKET.

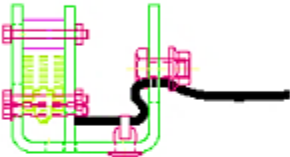


BAL.	QTY	ITEM NO.	DESCRIPTION
01	1	1136976	BRKT,PE MOUNT ITR (1.875"HIGH)
01	1	1136975	BRKT,PE MOUNT ITR (1.875"HIGH)
02	1	1138113	PE,REFLEX TYPE ZL2-P2465S12 PNP LO 2M CABLE W/733-103 CONNECTOR

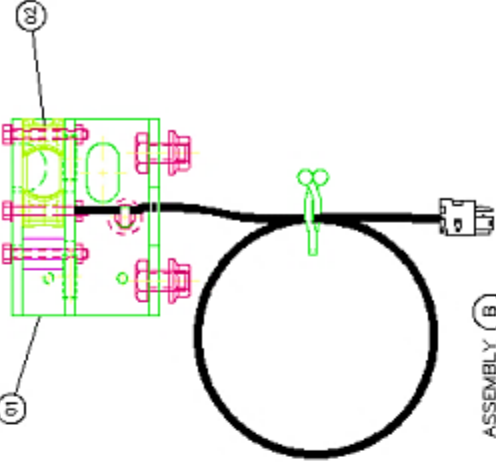
ASSEMBLY (A)  
P/N: 1144875







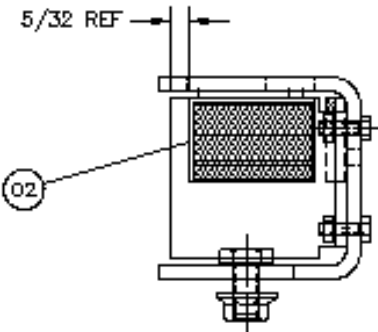
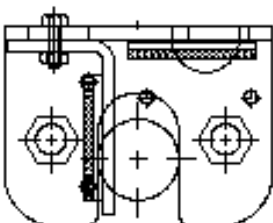
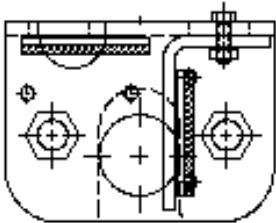
ASSEMBLY (B)  
P/N: 1144876



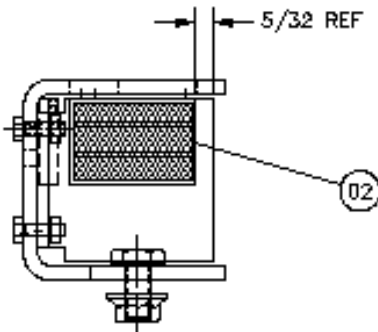
Dwg # 1355019-PZM

Replacement Parts for Reflector Assembly

	BAL.	QUAN	ITEM NO.	DESCRIPTION	DWG.
ASSEMBLY (A)	02	2	1136359	PE,REFLECTOR 20MM X 30MM	
ASSEMBLY (B)	02	2	1136359	PE,REFLECTOR 20MM X 30MM	



ASSEMBLY (A)  
P/N: 1136982



ASSEMBLY (B)  
P/N: 1136983

130S008

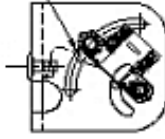
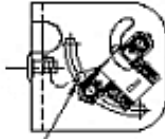
Replacement Parts for Photoeye

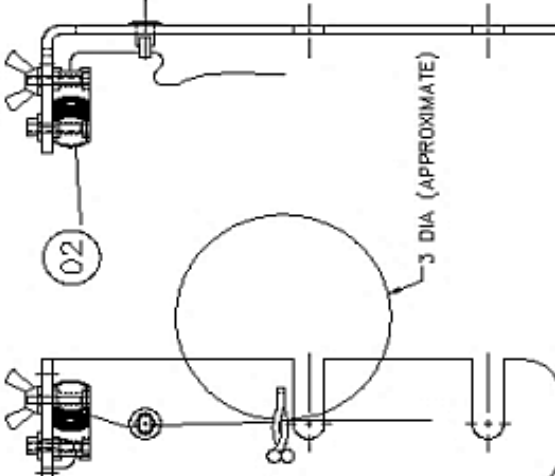
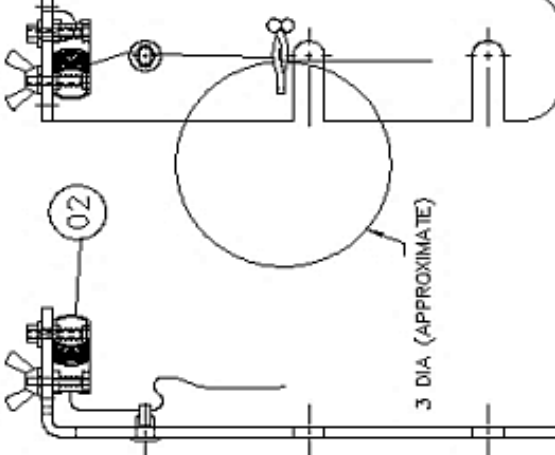
ASSEMBLY A

BAL.	QUAN.	ITEM NO.	DESCRIPTION	DWG.
02	1	1138113	PE_REFLEX TYPE ZL2-P246SS12,PNP,LO, 2M CABLE W/733-103 CONNECTOR	

ASSEMBLY B

02	1	1138113	PE_REFLEX TYPE ZL2-P246SS12,PNP,LO, 2M CABLE W/733-103 CONNECTOR	
----	---	---------	---	--





NOTES:

1. TIGHTEN PHOTO EYE SCREWS (ITEM 04)  
USING CDI RIVER P/N 151SP FACTORY  
SET TO 3.0 IN-LB.

2. COIL PHOTO EYE WRES AND SECURE  
WITH A TIE (ITEM 09).

3. PLACE PHOTO EYE ASSEMBLY INTO A  
BAG AND LABEL WITH THE PHOTO EYE  
ASSEMBLY PART NUMBER.

4. PHOTO EYE SHOULD BE ORIENTED WITH  
CABLE EXITING NEAREST TO THE BACK  
OF THE BRACKET.

ASSEMBLY A

P/N: 1155232

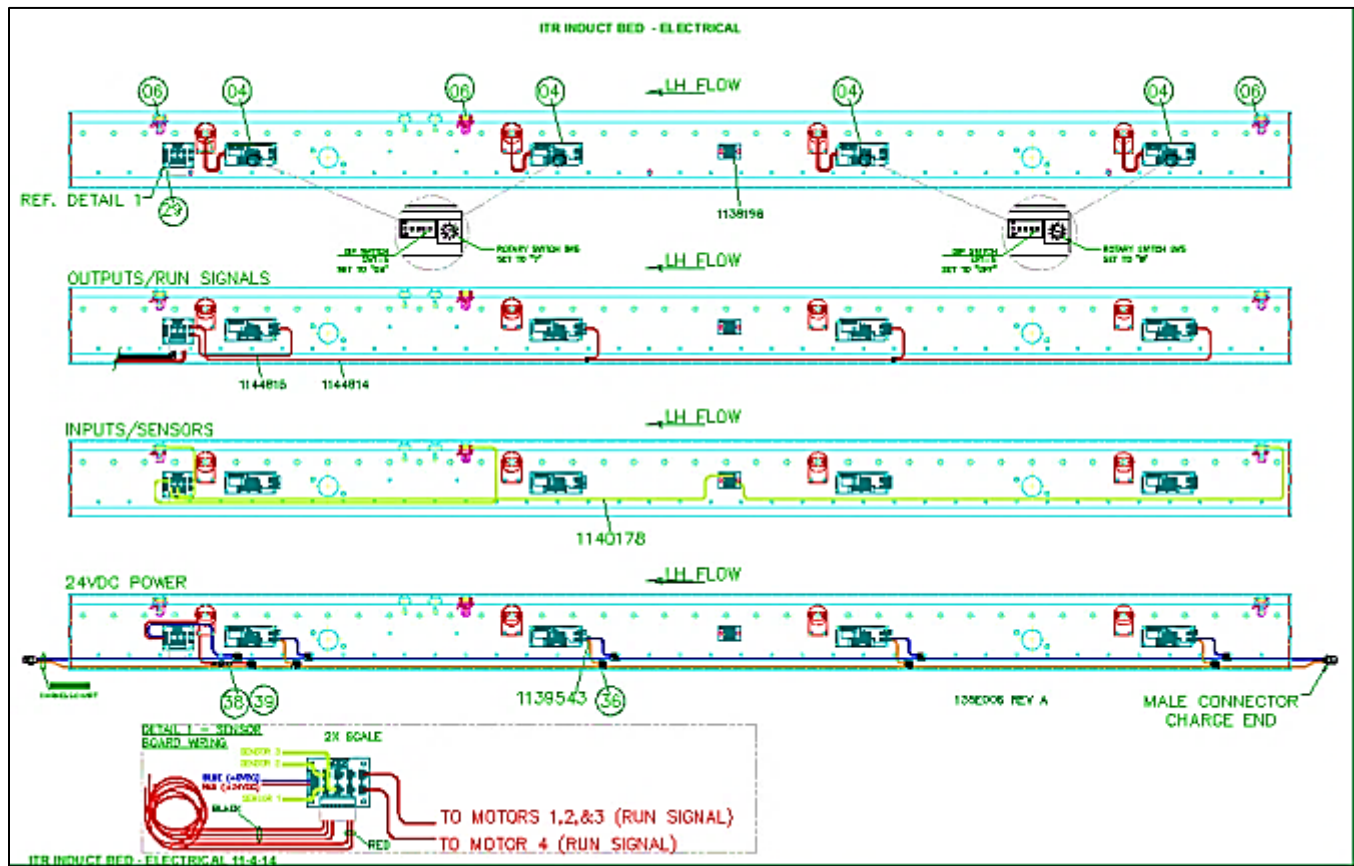
ASSEMBLY B

P/N: 1155233

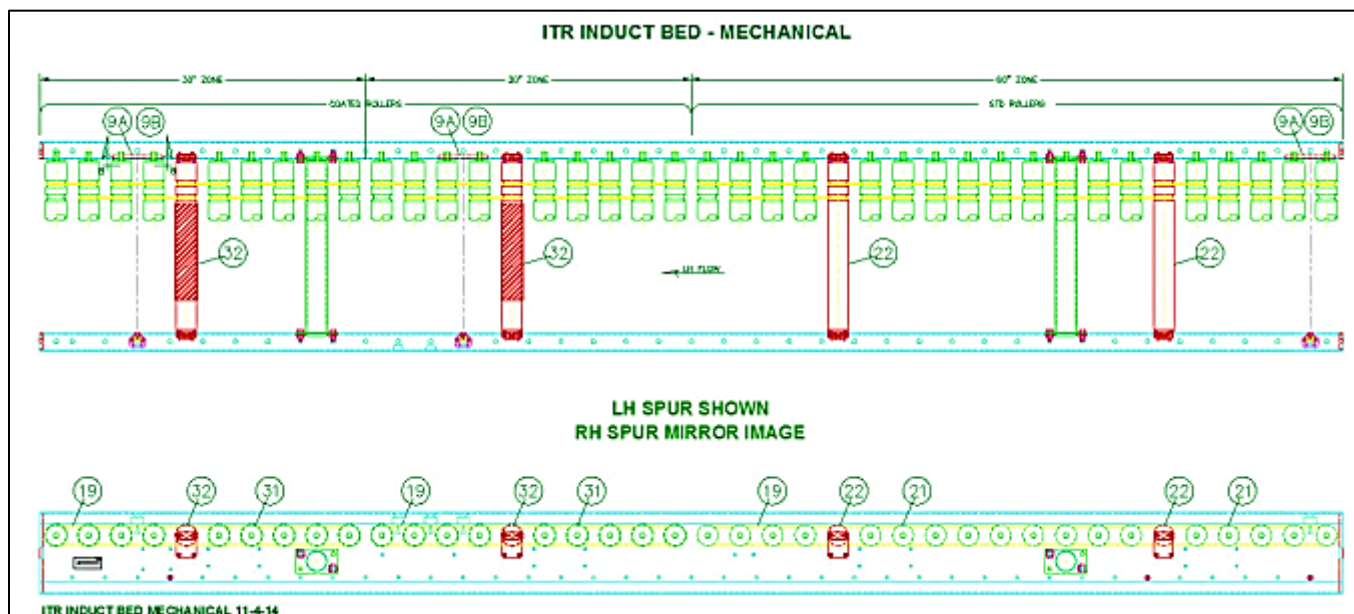
135S027



## ITR INDUCT Bed Electrical



## ITR Induct Bed Mechanical



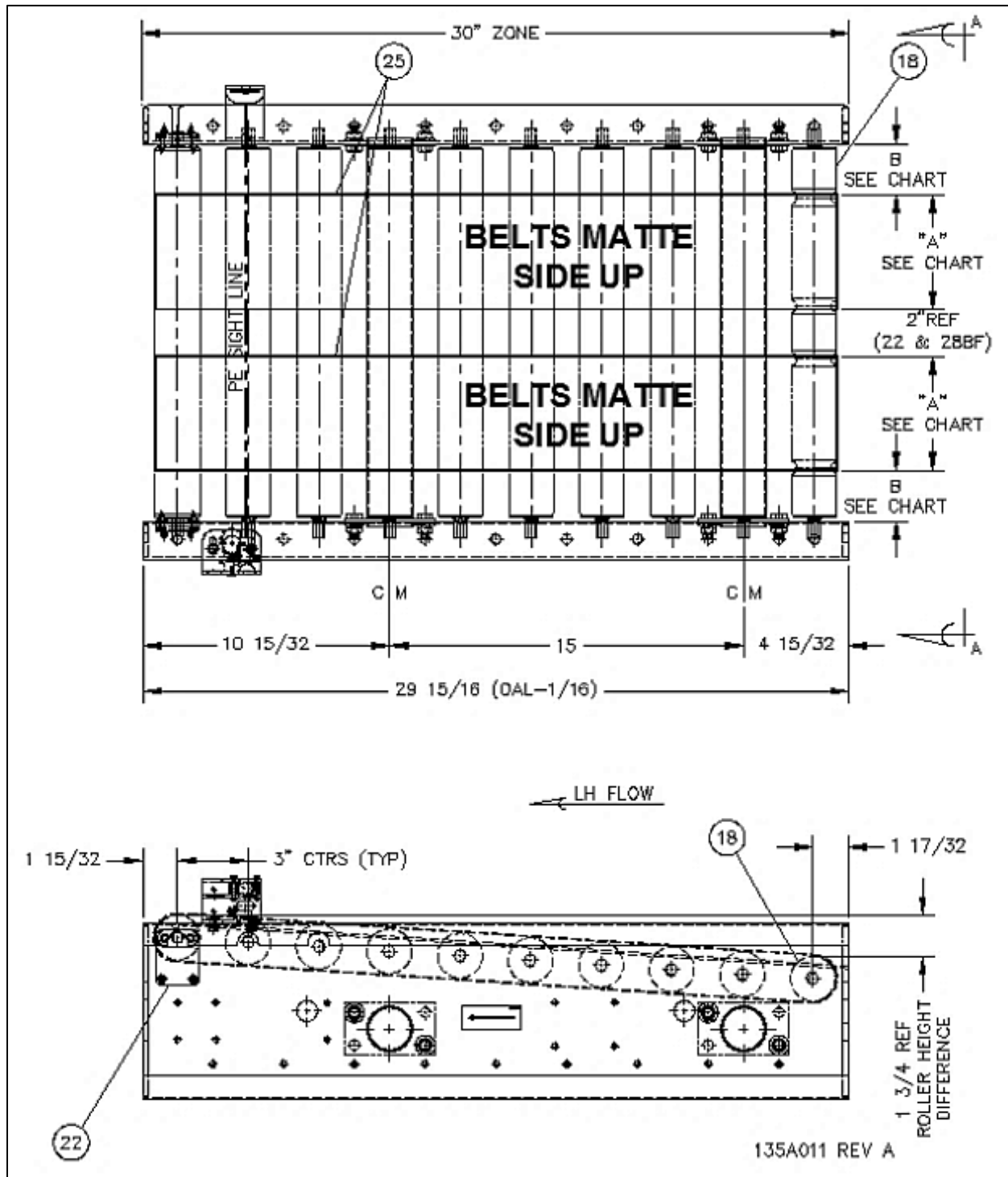
The IntelliROL Pick Zone Module starts with the Induction Bed. The Induct Bed gaps the product so it can be transferred.



## Replacement Parts for Induction Bed

INDUCT BED					
Balloon	Description	Width & Item #			
		16 BF	22 BF	28 BF	34 BF
4	DRIVERCARD, ITOH CB-016S7	1116036			
---	HARNESS, POWER BROWN & BLUE 14 AWG WITH MALE/FEMALE CONN (NOT BF SPECIFIC)	3'-0" L	5'-6" L	8'-0" L	10'-6" L
		1102289	1102288	1102287	1102286
---	CABLE, MOTOR EXTENSION ,600, 1200, OR 2700 MM LONG	REFERENCE MOTOR EXTENSION CABLE TABLE			
6	PE, REFLEX TYPE ZL2-P2465S12	1138113			
	PNP, LIGHT OPERATE, 2M CABLE				
9A	PE, REFLECTOR 4-3/8" X 1-1/8"	400004			
9B	TAPE, FOAM DBL SIDED 1" SQUARE	E0005429			
	POLYETHYLENE				
36	BROWN CONNECTOR, IDC SCOTCHLOK 567	3M567			
	10-12AWG RUN, 14-18AWG TAP				
19	ORING, 3/16 DIA X 9.5" HT BLUE	E0005536			
29	PCB, DB, PE, 4A	1138197			
	8 STATION				
38	FUSE, HOLDER IN-LINE, CARTRIDGE	1102222			
	5X15MM AND 5X20MM FUSES, HHT				
39	FUSE, 4A, 125V, CARTRIDGE, GMA	1102221			
	5 X 20MM, BUSSMANN, GMA-4A				
22	ROLLER, ITR __ BF 2G ITOH	1138722	1138723	1138724	1138725
32	ROLLER, ITR __ BF 2G CTD ITOH	1140375	1140376	1140377	1140378
21	ROLLER, __ ITR 1.9PLTD PRBG	E0002412	E0002413	E0002414	E0006220
31	ROLLER, __ ITR 1.9CTD PRBG	1134693	1132204	1131724	1140369
	1/16" PVC SLV				

## ITR Push Bed & Rollers

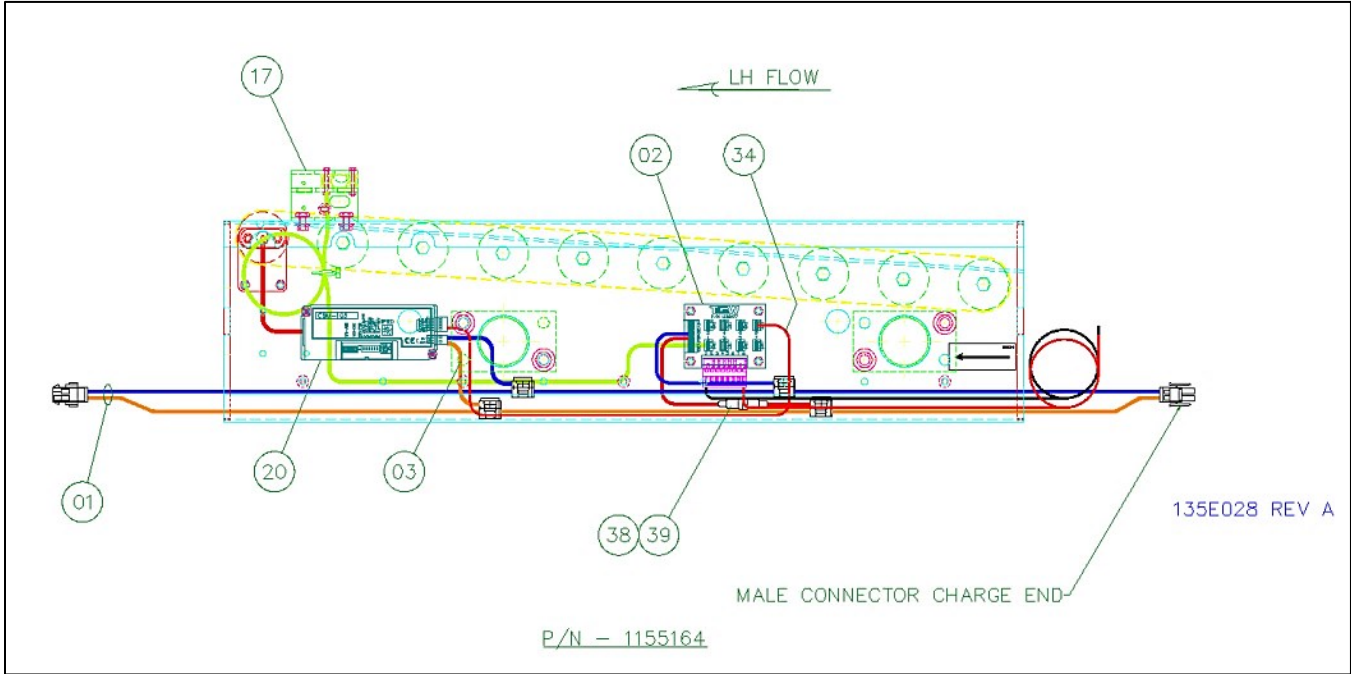


## Replacement Parts for ITR Push Bed

BED __ BF ITR - CZ-B3-30 x 2'-6" PUSH LH/RH ANGLED RF CHANNEL						
			WIDTH	16"	22"	28"
ITR BUSH BED LH Replacement Parts			LH	1154978	1154979	1154980
ITR BUSH BED RH Replacement Parts			RH	1154981	1154982	1154983
BALLOON	ITEM #	DESCRIPTION	QTY			
18	1138664	ROLLER,22BF ITR, 1.9PLTD PRBG W/TRACKING GRVS			1	
18	1135830	ROLLER,16BF ITR,1.9PLTD PRBG W/TRACKING GRVS		1		
18	1139691	ROLLER,28BF ITR, 1.9PLTD PRBG W/TRACKING GRVS				1
22	1138743	ROLLER,ASY ITR 16BF NG, ITOH FE-60-FB,(1) FIXING BRKT		1		
22	1138745	ROLLER,ASY ITR 28BF NG, ITOH FE-60-FB,(1) FIXING BRKT				1
22	1138744	ROLLER,ASY ITR 22BF NG, ITOH FE-60-FB,(1) FIXING BRKT			1	
25	1134004	BELT,TRACTION 8"X58.75"X.063, 83A, BLACK, 2.4 STRETCH			2	
25	1135832	BELT,TRACTION 11"X58.75"X.063 ,83A, BLACK, 2.4 STRETCH		1		2
Ref Dwg 135A011 REV A						



Electric ITR Push Bed



Replacement Parts for Electrical Push Bed

Electrical ITR Push Bed LH/RH 2'-6"			
BALLOON	ITEM #	DESCRIPTION	QTY
02	1138667	PCB,ASY, DB, PE, 4A	1
03	1139543	CABLE,POWER,CB-016/HB-510	1
17	1144876	PE,ASY ITR UBT/ERS 1PE	1
20	1153931	DRIVERCARD,ASY ITOH CBM-105FP	1
34	1144815	HARNESS,RUN,ITR,1 ZONE	1
38	1102222	FUSE,HOLDER IN-LINE,CARTRIDGE	1
39	1102221	FUSE,4A,125V,CARTRIDGE,GMA	1
Ref Dwg 135E028 REV A			

## Preventive Maintenance

### General PM

Preventive maintenance will save expensive downtime, wasted energy costs and increase life of components. An accurate record keeping system will track component servicing history.



Periodic maintenance intervals may vary with load, speed, hours of operation, ambient temperature, humidity, etc. Intervals can be established by fairly frequent maintenance at first, and then lengthens the intervals as justified by observation of need based on history. The following schedule is based on 5 days per week, 8 hours per day operation under normal conditions.

### Daily

- Listen to everything for unusual noises or vibration.
- Visually inspect to see that conveyor sections are clear and free of debris.
- Check to see that all safety guards are in place.
- Check for loose bolts or parts.
- Listen for air leaks.

### Weekly

- Check for proper PSI on air regulators.
- Check air filter bowls for accumulated water.

 <b>WARNING</b>	
	<ul style="list-style-type: none"> <li>• Prohibit walking or riding on conveyor by anyone.</li> <li>• Care should be taken when servicing any conveyor to prevent accidental injury.</li> <li>• All moving parts are potentially dangerous.</li> </ul>

### Air Systems

The best preventive maintenance for any air operated device is clean air. Dirty air will make pneumatic devices sticky, and they will not operate properly. To ensure the continued performance of filters, monitor filter / regulator bowl drain every week. To manually drain the bowl, push the push button at the bottom of the bowl. Let all accumulated liquid drain until you hear air escaping.



## WARNING



- Do not perform maintenance on the conveyor until the start-up controls, including motor safety switches, are locked out and cannot be turned by any person other than the one performing the maintenance.
- If more than one member of a crew is working on the conveyor, **EACH CREW MEMBER MUST HAVE A LOCK ON THE POWER LOCK OUT**. The air pressure must be turned off to the work area. All pneumatic devices must be de-energized to prevent accidental cycling of the device.
- Check the loosened parts have been retightened and all guards reinstalled.
- Make sure personnel are clear of all conveyor equipment before restarting the system.

*Blank page for placement*



## Troubleshooting Guide

IntelliROL Troubleshooting Guide			
#	Problem	Possible Cause	Remedy
1	Power Roller does not turn	ITR roller not properly installed	Check that the Power Moller is properly inserted into the frame. Adjust as necessary
			Check the tube and end caps are not contacting the frame, side rails or other parts. Power Moller should be allowed to move freely
		Too many slave rollers connected to drive roller	Inspect MDR zone to ensure proper number of idlers is adequate related to the Powered Roller. Refer to IOM Manual for additional information
		Power Cable extensively twisted	Inspect cable for kinks or cracks in wiring.
		Check that the Power Moller's shafts are properly mounted with the applicable bracket(s). Proper mounting is required for tube rotation.	
			For FE series motors one bracket securing the cable side shaft.
			For FS / FP / FH series motors two brackets securing both cable side and spring loaded shafts
		When slave driving idler rollers check that the number of idlers driven is adequate for the particular model of Power Moller being used.	Check air pressure on take up assembly. Make sure belt tension is proper.
		Check that the power cable is in good condition, with no twisting or severe kinks in the cable that would indicate broken wires. Also check for any cuts in the power cable or wires near the connector end.	
			Locate and correct interference
2	LED status	Red LED OFF,	Install belt properly
		Green LED OFF,	Check that the power supply is on.
		Orange LED OFF	Check that the card is correctly wired. Reference IOM manual.
			Measure the voltage, stable 24V DC is required.
		Red LED ON,	Check that the motor connector is properly plugged into the card then cycle the run / sensor signal.
		Green LED ON,	
		Orange LED ON	
			Thermal protection active – motor or card reached thermal limit, motor will not operate until one minute after the card or motor has cooled down below thermal limit. Consider possible causes of why the Power Moller is reaching thermal limit; cycle times, ambient temperature, load changes, roller not turning freely, etc. Do not remove power to the card to reset the error, damage may occur
		If sensor is blocked	Check that the sensor is properly wired in the correct position and is the proper voltage. Reference IOM manual.
		Red LED OFF,	
3	Flashing LED Rollers "dancing" or spinning uncontrollably		If the run signal is coming from a device on a separate power supply check that the 0V lines are connected between the device's power supply and the driver cards power supply.
		Green LED ON,	
		Orange LED ON	If using a run signal check the wiring to CN2 is in the correct position and wired correctly, see page 4 of the manual. Also check that dip switch 2-8 is ON for run.
			If card is set to zone begin, dip switch 2-6 ON and the downstream zone is stopped and occupied then the roller will not run. If card is set to zone end, dip switch 2-6 OFF, zone will accumulate product at the sensor. Reference IOM manual.
		If sensor is blocked	Replace roller
			Refer to IOM Manual for detailed information OR refer to appropriate ITOH Denki driver card manuals for additional options.
		Many options	
4		Too many zones on one ITR control circuit	Set direction blocking dip switch setting. Refer to IOM Manual for additional information.
		Power Supply not centered within the string of zones	Locate and Adjust Power Supply to correct current supply issue
		Supply of power not equally distributed	Set card to Basic Accumulation. Refer to IOM Manual for additional information.
		Mixture of driver cards	Within the ITR transportation product line you can only use FP or FN cards within a string. Reference IOM Manual for additional information
		Power Supply Issue	If power supply is not purchased from TGW, please consult manufactures operation directions.
		Multiple connected Power Supply units	0V line of all power supplies connected within a conveyor "unit" need to be connected. Reference IOM for additional detailed information

## Troubleshooting Guide Continued

IntelliROL Troubleshooting Guide			
#	Problem	Possible Cause	Remedy
5	Infeed zone not activating or running	Need input signal	Install TGW start eye kit, or provide 24V run signal
		Loose connection between driver cards	Inspect, and adjust, connection cables as necessary
6	Discharge zone not releasing	Down flow sending not providing "release" signal	Make sure photo eye and reflector are in alignment
		No "release" signal being provided	Use PLC connection, or Photo Eye & Reflector to provide zone with discharge open signal.
7	One Zone not turning	Loose wire connection	Check all stranded wires to ensure they are inserted properly
		Loose connector cable	Check all quick connection within power harness to ensure they are properly connected.
8	Driver Card continuously faulting	Poor supply of power	Inspect to see if power supply is transmitting correct voltage
		Power Supply unit not wired correctly to the 24V supply line	Inspect termination points to ensure proper wiring. Adjust accordingly. Reference IOM Manual for additional information.
		Bad bearing in wheel bracket or slave roller	Replace worn out component to relieve the extra stress on ITR roller.
9	Rollers are turning slowly	Too many zones are connected to the Power Supply unit	Consult IOM Manual to ensure the proper configuration between Driver Cards and Power Supply unit.
		Wrong dip switch setting on driver card	Check dip switch setting of 1-6 is properly set to OFF for internal speed (rotary switch control) Refer to IOM Manual for additional settings.
10	Driver cards faulting regularly in UBT	Programming issue. Transfer belt rollers running 24/7	ITR rollers driving the transfer bands only need to run when signal is provided to UBT to divert product.
11	Thermal Limit reached	Driver Card or Roller are over heating	Check the ambient temperature. Consult IOM Manual for acceptable temperature ranges
		Back plate of driver card not touching conveyor frame	Inspect mounting plate/conveyor surface to ensure complete surface connection for maximum heat dissipation.
		Excess friction or drag on motorized roller	Inspect area around roller to ensure nothing is rubber or lodged by the roller causing extra friction.

## CBM-105 and CB-016 Drivercard

### ***Push Bed Belted Information***

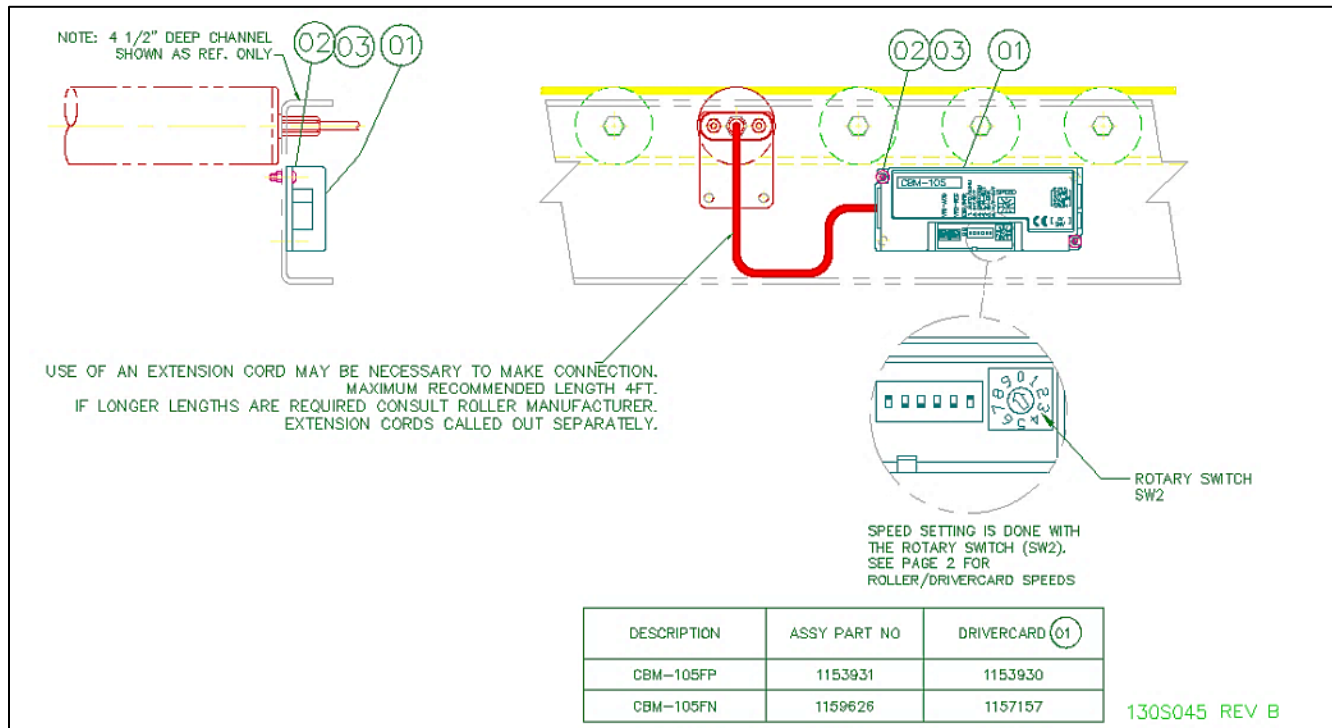
The push bed comes with one or two belts, depending on the conveyor BF. These belts provide the positive tractions to move the product downstream away from the transfer module.

The belted zone transports the product from the rollers low position up to a rollers high position. This allows the product to be moved from the wing conveyor across the top of the CRUZ®channel to the center conveyor.

To maintain the integrity of the induction conveyor feeding the transfer module, product should always be moved across upstream of the induction.

Use the Speed Change Table for CBM-105 or CB-016 to determine the belt configuration based on the conveyor BF dimension.

## CBM-105 Driver Card



## CBM-105 Speed Chart

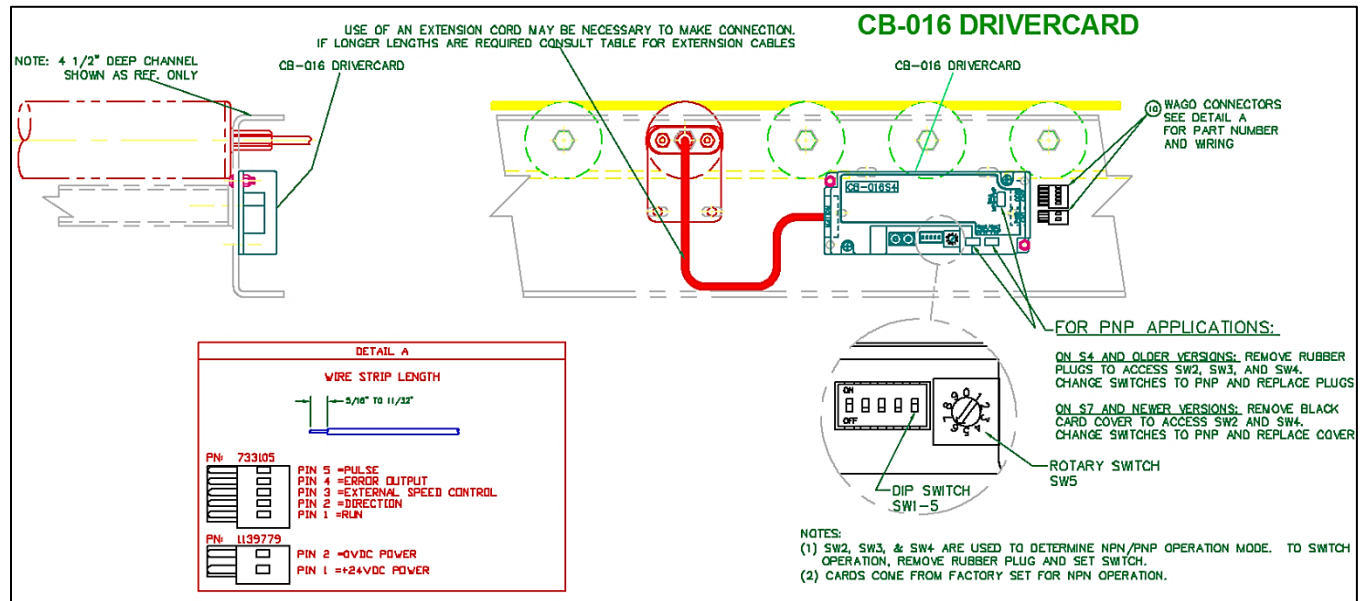
CBM-105 DRIVERCARD / FE-__ ROLLER								
ROLLER: FE-17			ROLLER: FE-60			ROLLER: FE-100		
TGW NOMINAL SPEED	ROTARY SWITCH	ACTUAL SPEED ±5% (fpm)	TGW NOMINAL SPEED	ROTARY SWITCH	ACTUAL SPEED ±5% (fpm)	TGW NOMINAL SPEED	ROTARY SWITCH	ACTUAL SPEED ±5% (fpm)
6	0	6.9	25	0	24.6	85	0	87.5
9	1	9.2	30	1	32.8	115	1	116.6
13	2	13.8	45	2	49.2	170	2	174.9
18	3	18.4	65	3	65.6	230	3	233.2
25	4	27.7	95	4	98.4	285	4	349.7/(285.7)
35	5	36.9	130	5	131.2		5	466.3/(408.2)
40	6	41.5	145	6	147.6		6	524.7/(408.2)
45	7	46.1	160	7	164.0		7	566.2/(408.2)
50	8	50.7/(48.0)	180	8	180.4/(170.6)		8	
	9	55.3/(48.0)		9	196.6/(170.6)		9	
Notes:								
Speeds with two numbers are "NO-LOAD/(RATED)". Rated numbers are what the roller is capable of doing under a continuous duty full load condition.								

CBM-105 DRIVERCARD / FP-__ ROLLER								
ROLLER: FP-55			ROLLER: FP-100			ROLLER: FP-140		
TGW NOMINAL SPEED	ROTARY SWITCH	ACTUAL SPEED ±5% (fpm)	TGW NOMINAL SPEED	ROTARY SWITCH	ACTUAL SPEED ±5% (fpm)	TGW NOMINAL SPEED	ROTARY SWITCH	ACTUAL SPEED ±5% (fpm)
25	0	26.7	120	0	121.7	120	0	121.7
35	1	35.6	160	1	162.3	160	1	162.3
50	2	53.4	240	2	243.4	240	2	243.4
70	3	71.2	305	3	324.5/(306.3)	320	3	324.5
105	4	106.8		4	446.0/(306.3)	470	4	486.6/(470.7)
140	5	142.4		5			5	
160	6	160.2		6			6	
175	7	178.0/(175.5)		7			7	627.1/(470.7)
180	8	195.8/(175.5)		8			8	
	9	213.7/(175.5)		9			9	
Notes:								
Speeds with two numbers are "NO-LOAD/(RATED)". Rated numbers are what the roller is capable of doing under a continuous duty full load condition.								

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## CB-016 Driver Card



## CB-016 Driver Card Speed Change Table

SPEED CHANGE TABLE										
20 DISCREET SPEED CHANGE STEPS FOR EXTERNAL CONTROL VIA 0-10V SIGNAL	20 DISCREET SPEED CHANGE STEPS FOR INTERNAL CONTROL VIA DIP SWITCH AND ROTARY SWITCH		FP ROLLERS (FPM)			FE ROLLERS (FPM)			FS ROLLERS (FPM)	
VOLTAGE INPUT	DIP SW1-5	ROTARY SW5	100,140 190,255	20,30, 45,55	5,8, 10,15	70,100,1 40180,2 10	20,30,4 5 55,60	5,8,10, 15,17	20,30, 45,55	5,8, 10,15
9.55-9.95	ON	9	971.9	214.1	56.8	698.9	197.5	55.4	214.1	56.8
9.05-9.45	ON	8	890.9	196.3	52.1	640.6	181.0	50.8	196.3	52.1
8.55-8.95	ON	7	850.4	187.3	49.7	611.5	172.8	48.5	187.3	49.7
8.05-8.45	ON	6	809.9	178.4	47.3	582.4	164.5	46.2	178.4	47.3
7.55-7.95	ON	5	769.4	169.5	45.0	553.3	156.3	43.9	169.5	45.0
7.05-7.45	ON	4	728.9	160.6	42.6	524.1	148.1	41.6	160.6	42.6
6.55-6.95	ON	3	647.9	142.7	37.9	465.9	131.6	36.9	142.7	37.9
6.05-6.45	ON	2	607.4	133.8	35.5	436.8	123.4	34.6	133.8	35.5
5.55-5.95	ON	1	566.9	124.9	33.1	407.6	115.2	32.3	124.9	33.1
5.05-5.45	ON	0	526.4	116.0	30.8	378.5	106.9	30.0	116.0	30.8
4.55-4.95	OFF	9	485.9	107.0	28.4	349.4	98.7	27.7	107.0	28.4
4.05-4.45	OFF	8	445.4	98.1	26.0	320.3	90.5	25.4	98.1	26.0
3.55-3.95	OFF	7	404.8	89.2	23.7	291.1	82.3	23.1	89.2	23.7
3.05-3.45	OFF	6	364.3	80.3	21.3	262.0	74.0	20.8	80.3	21.3
2.55-2.95	OFF	5	324.0	71.4	18.9	233.0	65.8	18.5	71.4	18.9
2.05-2.45	OFF	4	283.5	62.5	16.6	203.9	57.6	16.2	62.5	16.6
1.55-1.95	OFF	3	243.0	53.5	14.2	174.8	49.4	13.9	53.5	14.2
1.05-1.45	OFF	2	202.5	44.6	11.8	145.6	41.1	11.5	44.6	11.8
0.55-0.95	OFF	1	162.0	35.7	9.5	116.5	32.9	9.2	35.7	9.5
0.05-0.45	OFF	0	121.5	26.8	7.1	87.4	24.7	6.9	26.8	7.1

CB-016 DRIVERCARD

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## MHS Conveyor Information

### Mission

To meet or exceed all customer expectations by providing the highest quality products and services, on time, at exceptional value, in an environment which promotes safety and personal development.



MHS Conveyor  
1300 E Mount Garfield Road  
Norton Shores MI 49441-6097 USA  
231.798.4547  
Email: [us-info@mhs-conveyor.com](mailto:us-info@mhs-conveyor.com)  
Web Site: [mhs-conveyor.com](http://mhs-conveyor.com)

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