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# **IntelliQ<sup>®</sup> Accumulation Conveyor Design Manual**

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<b>Revision</b>	<b>Date</b>	<b>Initials</b>	<b>Description</b>
Rev 1	07/08/12	RB	Updated information on Photo-eyes and Reflectors in the Specifications and Controls chapters. Corrected graphic in the Accessories chapter Skate Wheel Side Guides

## **Use of Manual**

This manual contains important information. Please read this manual before attempting to operate or perform installation or maintenance on this Conveyor.

This manual is designed for operator personnel who have a substantial knowledge of mechanical operations and who have basic knowledge of typical mechanical operations. Failure to comply with the instructions and warnings contained in this manual, and the warnings posted on the Conveyor can result in serious injury to personnel and/or damage to the equipment.

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This manual contains a generalized description of the Conveyor and its operation available at the time this manual was approved for printing. Intelligrated reserves the right to make changes in design and specifications and to make additions to, or improvements in, the product without imposing any obligations upon it to install them on previously manufactured products.



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# 1 General Description

The IntelliQ® Accumulation Conveyor is a horizontal, zero-pressure, belt-driven live roller conveyor that provides:

- Quiet and efficient transportation of product in straight sections,
- Gentle, zero-pressure accumulation of product (cartons, cases, totes, etc.),
- Multiple operational modes to meet a variety of application requirements.

## Conveyor Sections

An IntelliQ® Accumulation Conveyor typically contains the following sections: Infeed Idler, Center Drive, Intermediate Section, and Discharge Idler, see Figure 1 - 1.

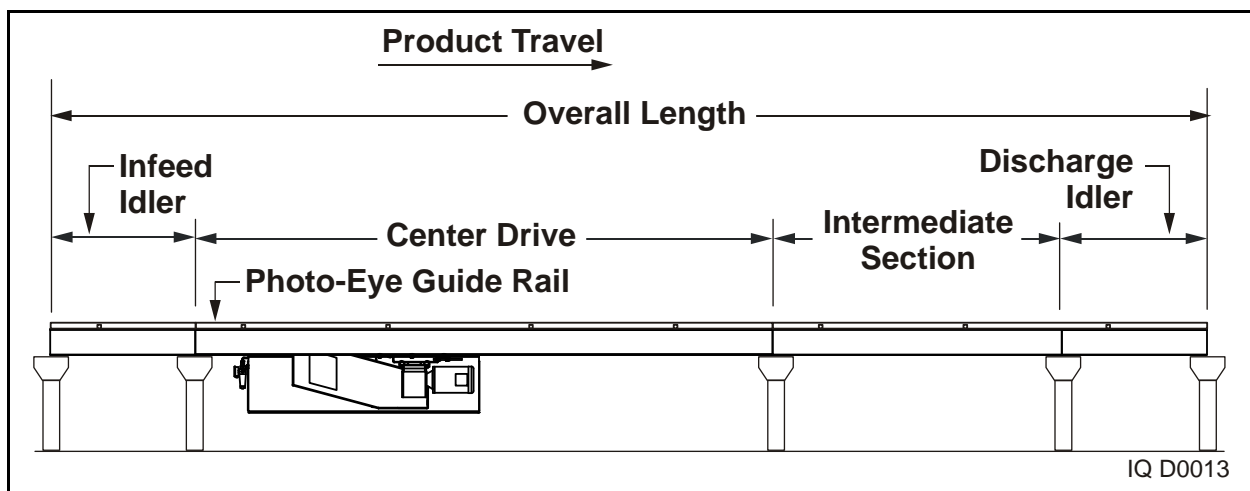


Figure 1 - 1 Typical Conveyor Sections

## Conveyor Section Components

Each conveyor section contains:

- Carrier Rollers, see Figure 1 - 2,
- Photo eye sensors on side guides or between rollers,
- At least one 3-foot-long Pressure Shoe Assembly containing Pressure Rollers. When the Pressure Shoe is raised, the Pressure Rollers push the V-Backed Belt against the Carrier Rollers with enough force to drive the rollers,
- Pressure Shoe Supports, each containing an Air Diaphragm. The Air Diaphragms inflate to raise the Pressure Shoe Assembly.

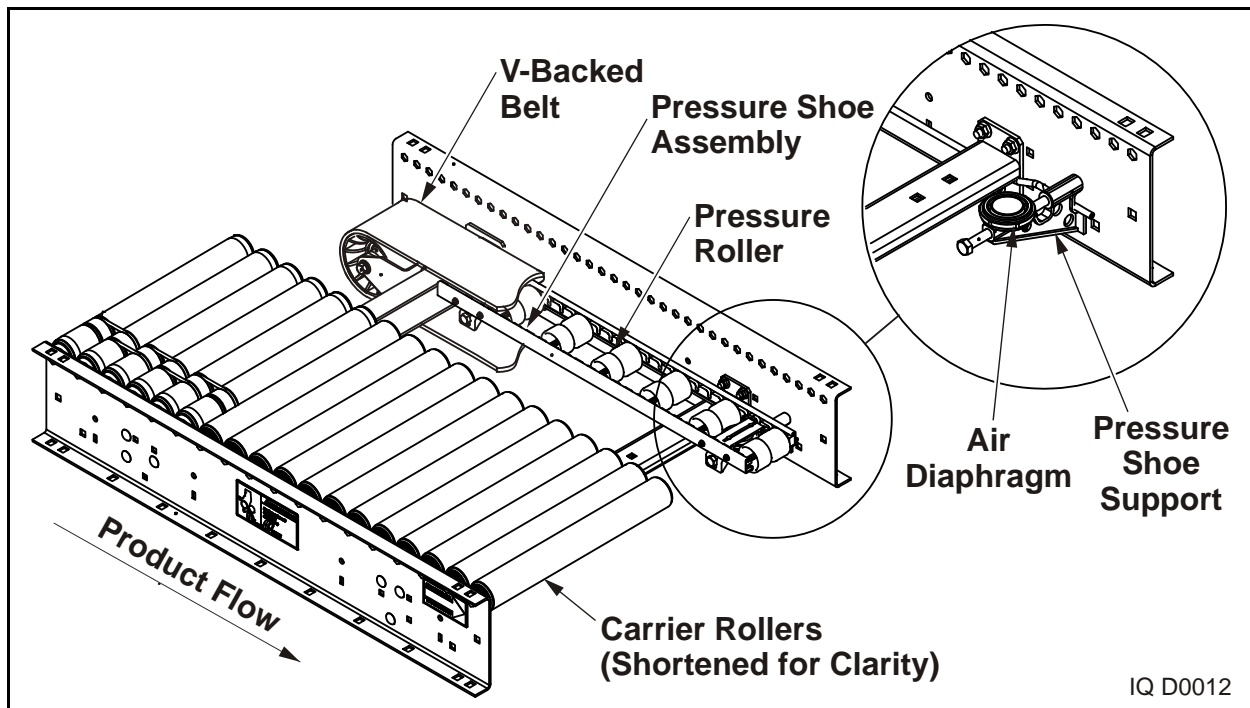


Figure 1 - 2 Conveyor Section Components

## **Infeed Idler**

Product enters the conveyor on the Infeed Idler. It contains one Pressure Shoe Assembly and an End Idler. The continuous-loop V-Back Belt wraps around the End Idler.

## **Center Drive**

The Center Drive is always the first or second section after the Infeed Idler. It is pre-assembled to an Intermediate Section, and contains the motor, the drive pulley, and the pneumatic belt tensioner.

## **Intermediate Section**

Intermediate Sections are typically the most common conveyor section. Belt return supports on the undersides of the crossmembers support the belt and keep it in the correct position. An optional pop-up stop is available.

While not recommended, a field-assembled skew kit can be provided as an Intermediate section. The recommended method for aligning product to one side of the conveyor is the placement of a V-Belt conveyor with a hard skew immediately upstream from the IntelliQ® Accumulation Conveyor.

## **Discharge Idler**

Product leaves the conveyor from the Discharge Idler. Like the Infeed Idler, it contains one Pressure Shoe Assembly and an End Idler. An optional brake assembly, end guard, and pop-up stop are available.

## Product Flow Control

The conveyor is divided into three-foot-long zones for controlling product flow. Each zone is equipped with one retro-reflective photo eye or one diffused photo eye, which senses the presence of product on the conveyor. Typically, the photo eye in Zone #1 controls the state of the components (logic modules, carrier rollers, air diaphragms) in Zone #2; the photo eye in Zone #2 controls the state of the components in Zone #3; and so on, see Figure 1 - 3.

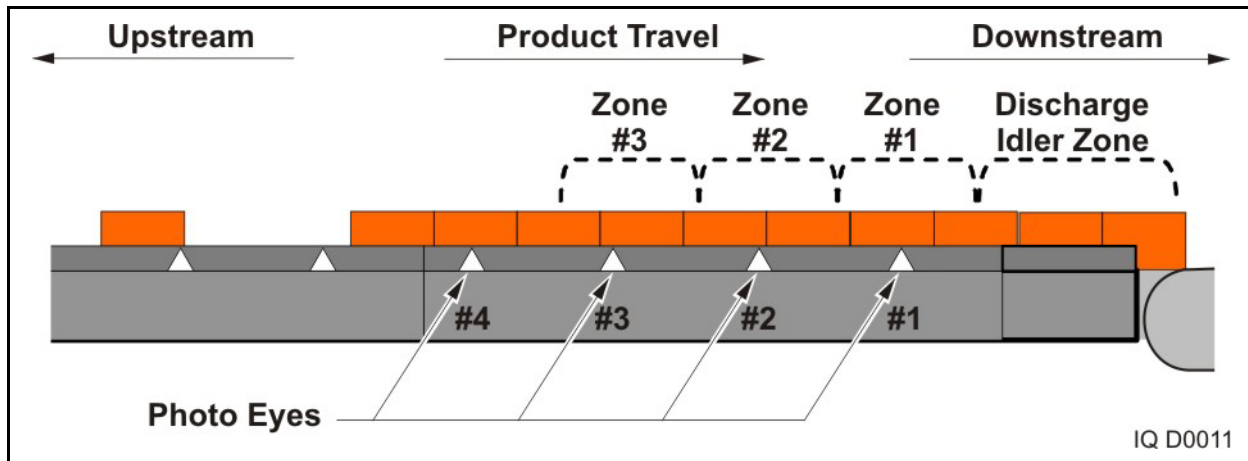


Figure 1 - 3 Photo Eye/Zone Diagram

When a photo eye senses that the zone has product and is not able to accept more, it sends a signal to a specially-designed logic module with an integrated pneumatic valve. The logic module then de-energizes the solenoid on the pneumatic valve, removing air from the air diaphragms in the adjacent upstream zone according to a pre-programmed pattern. As the air diaphragms deflate, the pressure shoe lowers, which removes upward pressure on the belt. The belt lowers until it is not in contact with the carrier rollers, see Figure 1 - 4.

When a zone is cleared of product and ready to accept more, the photo eye sensor sends a signal to the logic module that there is no product present. If the logic module is programmed to release product upon a “no product present” signal, it will energize the solenoid on the pneumatic valve. This supplies air to the air diaphragms in the adjacent upstream zone. As the air diaphragms inflate, they raise the pressure shoe and pressure rollers against the belt, and the belt against the rollers to drive them.

See “Product Acceptance Modes” on page 6 for the specific operation of each type of logic module.

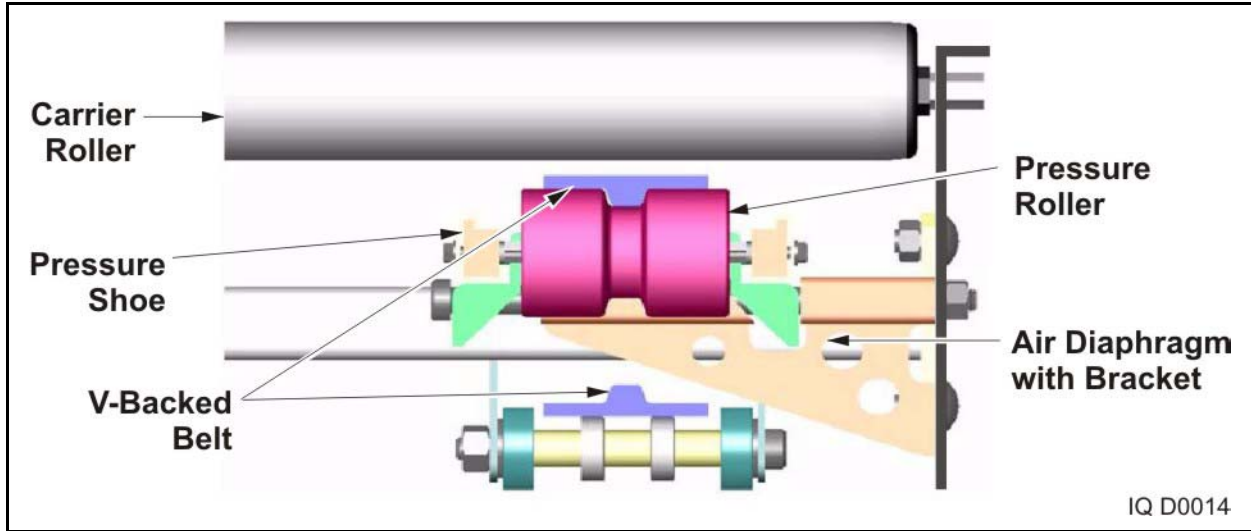


Figure 1 - 4 Carrier Roller Control Components

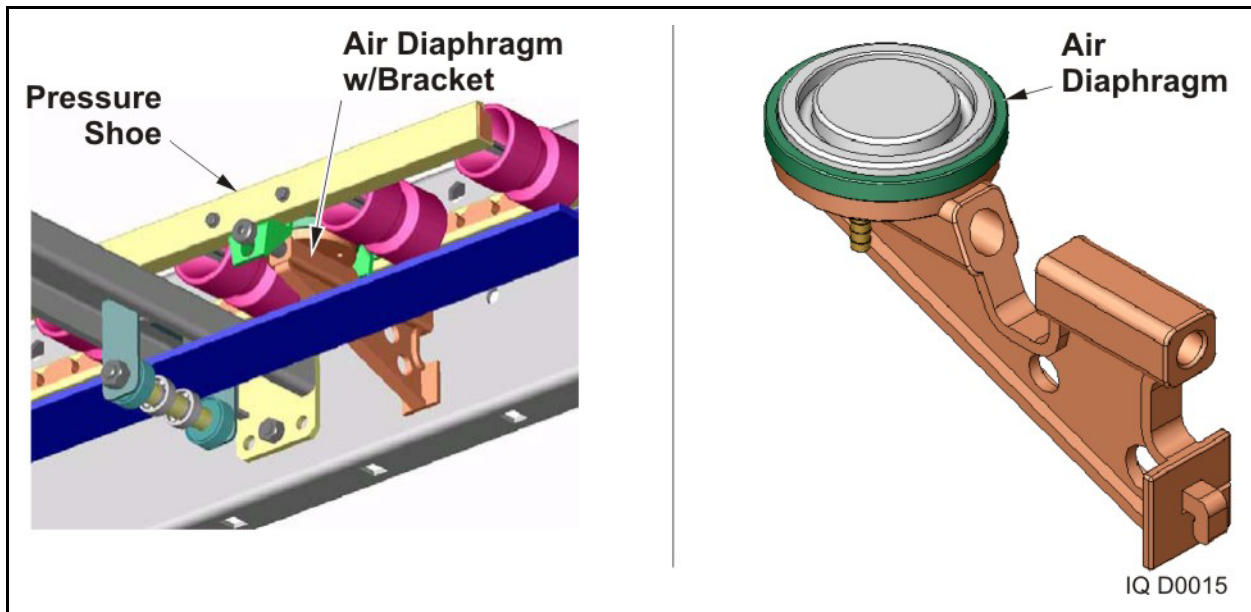


Figure 1 - 5 Air Diaphragm and Shoe Support (Underside View)

## Product Acceptance Modes

The product acceptance modes control the movement of product into a zone. They follow rules for activating zones based on the blocked/unblocked status of specific downstream photo eyes. When a zone is activated, its carrier rollers rotate to move product downstream into the next control zone.

### Singulation Acceptance (Accumulation)

#### *Standard*

As product moves down the conveyor, it continually blocks and unblocks the photo eyes. As long as two consecutive photo eyes are not blocked, all zones will remain energized and the product will continue moving down the conveyor. If two consecutive zones detect product, the next upstream zone is deactivated and begins to accumulate. In other words, if the photo eyes in Zone #4 and Zone #5 are blocked, Zone #6 is deactivated, see Figure 1 - 6. This is to prevent conveying product into a zone that is already full of product. When one of the photo eyes is cleared, the upstream zone is activated again. If a long block, or slug, of product is moving down the conveyor, the zones will continually activate and deactivate in this manner, introducing gaps into the slug of product. By controlling the zones in this manner, the gaps will be smaller than when using mechanical sensors and throughput will actually be higher.

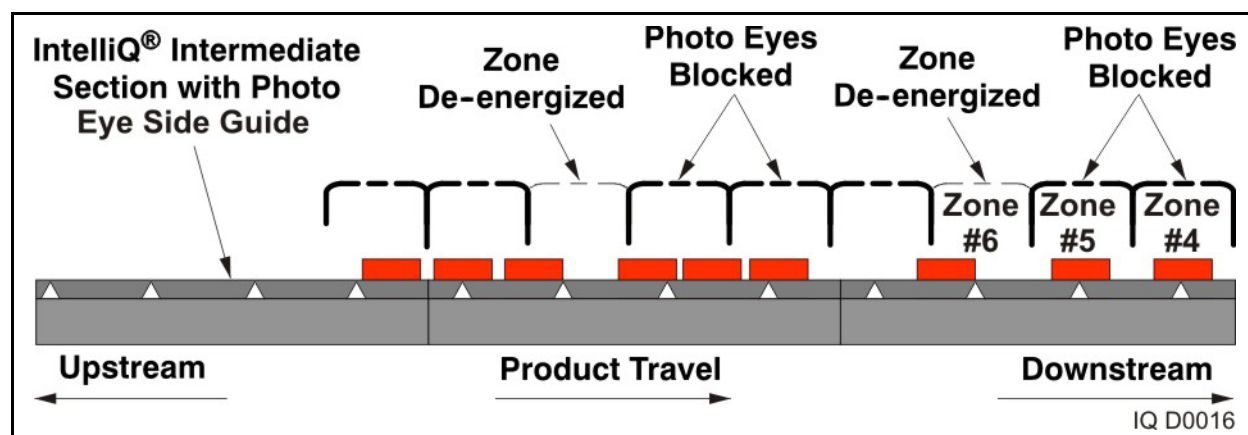


Figure 1 - 6 Photo Eye Sensor Operation

In typical applications of the IntelliQ® Accumulation Conveyor conveyor, a Belt Conveyor is installed at the discharge end of the conveyor to control the release of product. In some applications, some other type of stopping device, such as a package stop, may be used. The Discharge End Idler Zone of the IntelliQ® Accumulation Conveyor is equipped with a solenoid valve controlled in conjunction with the Belt Conveyor. When the Belt Conveyor is stopped, the electrical signal is removed from the solenoid valve, which deactivates the Discharge Idler Zone. The solenoid valve in the Discharge Idler also controls the next upstream zone (Zone #1 in Figure 1 - 7), so Zone #1 is deactivated as well.



As the product moves down the conveyor and coasts into the deactivated Discharge Idler Zone, and then accumulates into the deactivated Zone #1, it blocks Photo Eye Sensor #1. Since two upstream photo eyes (Discharge Idler Zone and Zone #1) are now blocked, Zone #2 becomes deactivated. As product moves into Zone #2, it blocks Photo Eye Sensor #2. With Photo-Eye Sensors #1 and #2 blocked, Zone #3 becomes deactivated. Product will continue accumulating in this manner as long as the belt conveyor is stopped. Also, since the zones are up to three feet long, it is possible to have more than one product accumulate in a zone.

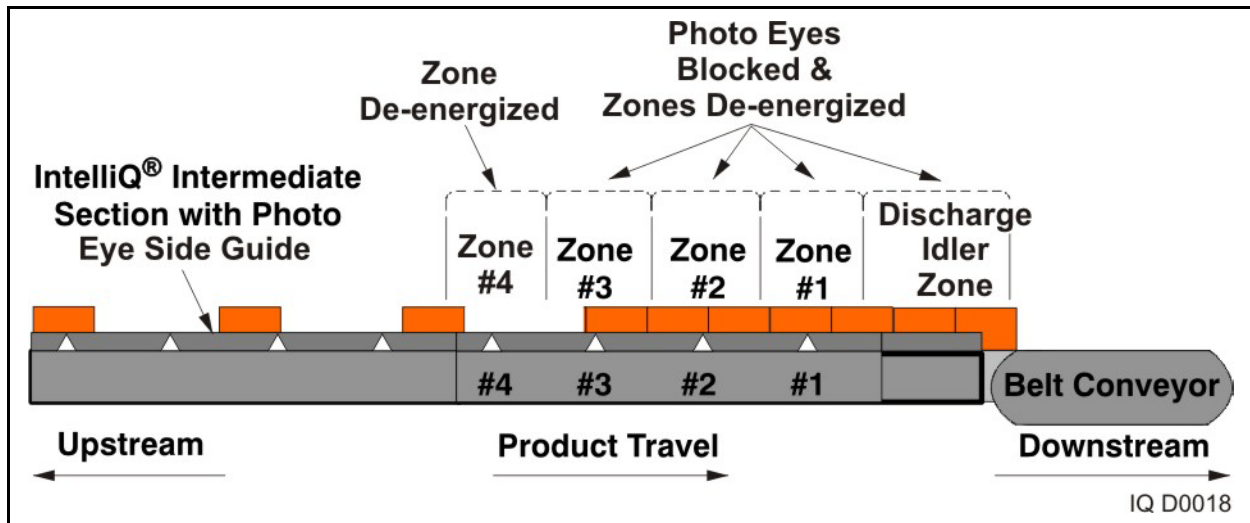


Figure 1 - 7 Singulation Acceptance (Accumulation) - Standard

**Run-Up Acceptance (Accumulation)**

When the conveyor is in Run-Up Acceptance mode, if two consecutive photo eyes are blocked, the zone containing the second (upstream) photo eye is deactivated. In Figure 1 - 8, Photo Eyes #4 and #5 are blocked, causing Zone #5 to deactivate; Photo Eyes #7 and #8 are blocked, causing Zone #8 to deactivate. This mode is used for lightweight cartons that do not coast well.

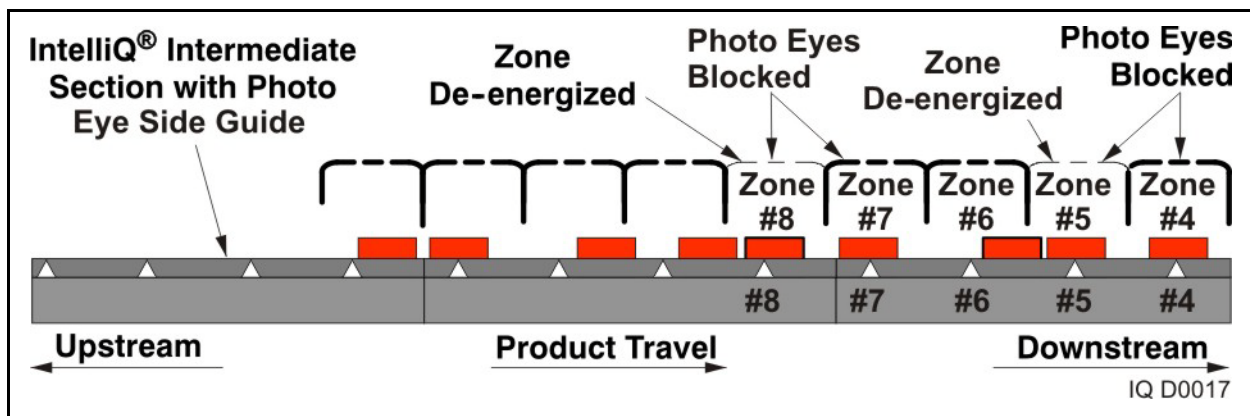


Figure 1 - 8 Singulation Acceptance (Accumulation) - Run-Up

**True Singulation Acceptance (Accumulation)**

As product moves down the conveyor, it continually blocks and unblocks the photo eyes. Each photo eye controls the previous (upstream) zone. When a photo eye sensor is blocked, it deactivates its upstream zone. When it is unblocked, the zone is activated again. This is to prevent conveying product into a zone that is already full of product. If a long block, or slug, of product is moving down the conveyor, the zones will continually activate and deactivate in this manner, introducing gaps into the slug of product.

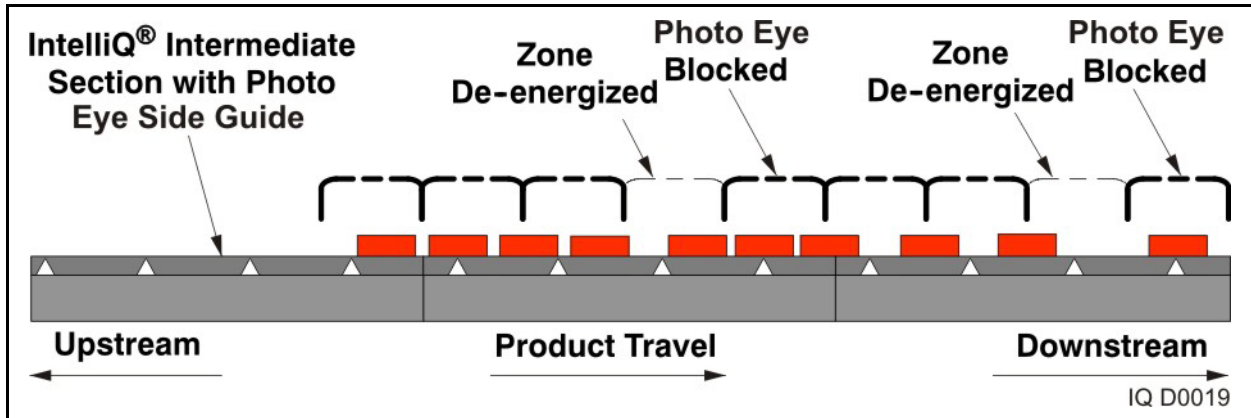


Figure 1 - 9 Photo Eye Sensor Operation

In typical applications of the IntelliQ® Accumulation Conveyor conveyor, a belt conveyor is installed at the discharge end of the IntelliQ® Accumulation Conveyor to control the release of product. (In some applications, some other type of stopping device, such as a package stop, may be used.) The discharge end idler zone of the IntelliQ® Accumulation Conveyor is equipped with a solenoid valve that is controlled in conjunction with the belt conveyor. When the belt conveyor is stopped, the electrical signal is removed from the solenoid valve which deactivates the discharge idler zone. The solenoid valve in the discharge idler is also used to control the next upstream zone (Zone #1 in the illustration).

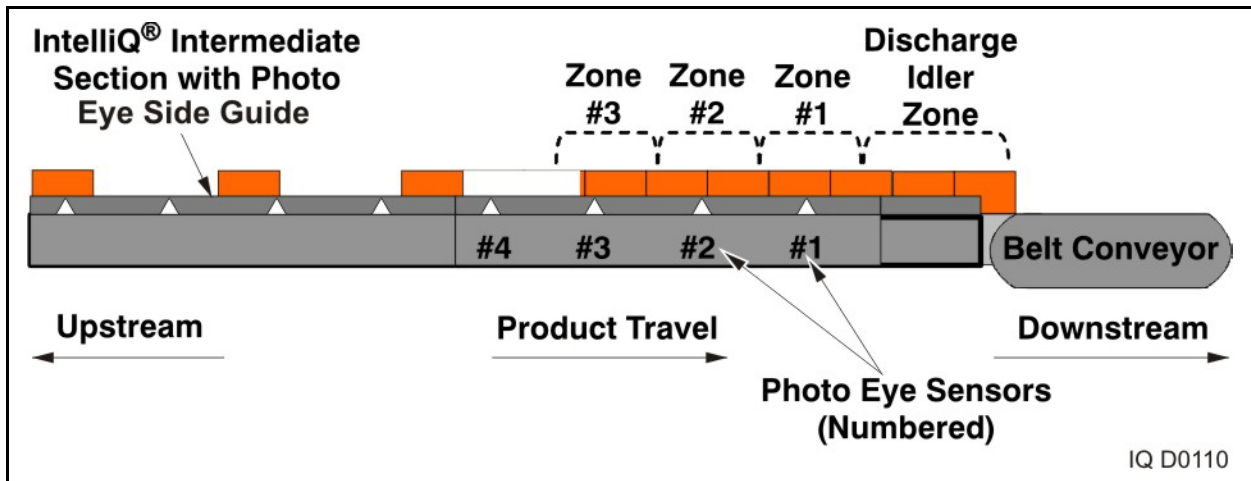
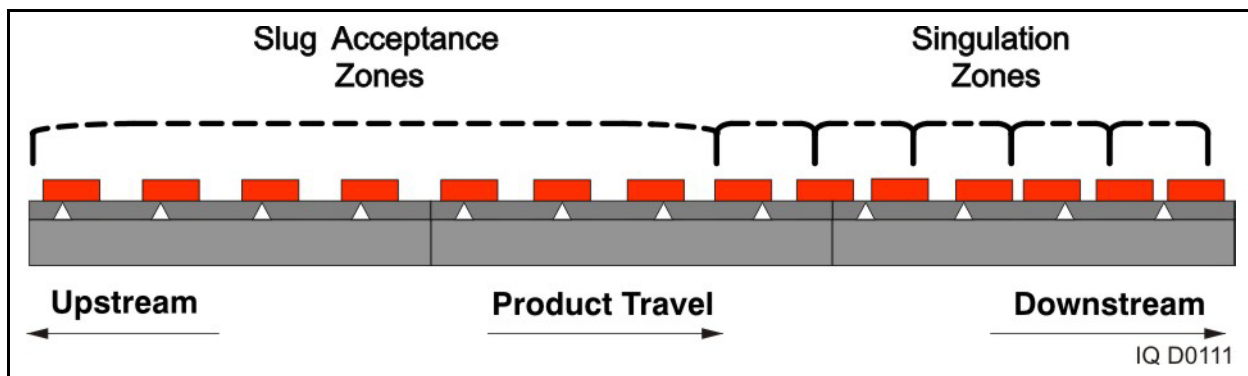


Figure 1 - 10 Singulation Acceptance (Accumulation)

As the product moves down the conveyor and coasts into Zone #1 (the discharge idler and Zone #1 are deactivated), it blocks Photo Eye Sensor #1. This deactivates Zone #2. As product moves into Zone #2, it blocks Photo Eye Sensor #2 causing Zone #3 to deactivate. Product will continue accumulating in this manner as long as the belt conveyor is stopped. Also, since the zones are three feet long, it is possible to have more than one product accumulate in a zone.

### **Slug Acceptance (Accumulation)**

Slug Acceptance is used at the infeed end of an accumulation conveyor to make sure product is positively conveyed away from the upstream conveyor. A common usage is when the accumulation conveyor is downstream from the divert lane of a sorter. Since the sorter diverts the product at a high rate of speed, the accumulation conveyor must be able to accept the product at a high rate of speed to prevent jams and to keep the product moving. Slug Acceptance allows product to be conveyed onto the accumulation conveyor without the interruption that would occur when Singulation is used. The number of zones used for Slug Acceptance is directly dependent on the application.



*Figure 1 - 11 Slug Acceptance with Downstream Singulation Zones*

Slug Acceptance basically turns the infeed end of the accumulation conveyor into a transportation conveyor. Product is allowed to travel uninterrupted down the conveyor until it reaches the furthest downstream Slug Acceptance Zone. The product will then begin to accumulate according to the type of logic modules installed in the remaining downstream zones.

If accumulated product backs up to the furthest downstream Slug Acceptance Zone, that zone will accumulate, effectively shortening the Slug Acceptance Zone. If product is allowed to continue accumulating, the zones that make up the Slug Acceptance Zone will continue to convert to accumulation zones until the entire conveyor is full. A control mechanism must be in place to prevent this from occurring.

## Product Release Modes

The product release modes control the movement of product out of a zone. They follow rules for activating zones based on the blocked/unblocked status of specific downstream photo eyes. When a zone is activated, its carrier rollers rotate to move product downstream and out of the zone.

### Singulation Release

In Singulation Release mode, product is not released until the downstream zone is cleared. When the belt conveyor is started, an electrical signal is also sent to the solenoid valve in the Discharge Idler. This activates both the Discharge Idler Zone and Zone #1. Product in those zones will now begin to move forward.

When Photo Eye Sensor #1 is clear, Zone #2 and Zone #3 will activate and product will move toward Zone #1. As each upstream photo eye sensor is cleared, its corresponding zone will activate and release product.

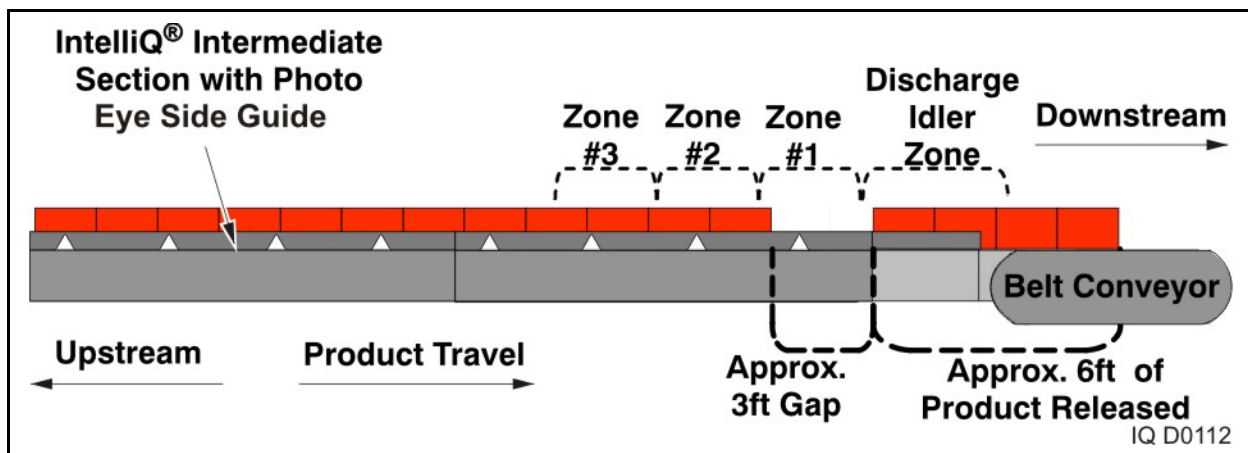


Figure 1 - 12 Initial Singulation Release

Since the zones are three feet long, releasing the Discharge Idler Zone and Zone #1 will release approximately six feet of product. The remaining product will be released in three-foot groups. Also, the groups of product will be separated by three-foot gaps. The length of the product groups and gap lengths may not be exact. They may fluctuate depending on the size or weight of the product and the speed of the conveyor.

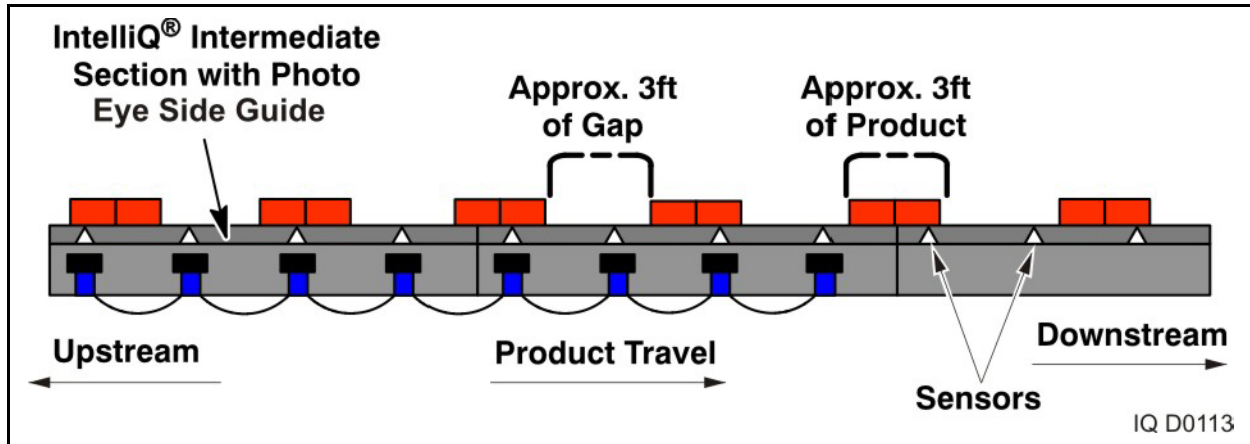


Figure 1 - 13 Singulation Release

### True Singulation Release

In True Singulation Release mode, product is not released until the downstream zone is cleared. When the belt conveyor is started, an electrical signal is also sent to the solenoid valve in the Discharge Idler. This activates both the Discharge Idler Zone and Zone #1. Product in those zones will now begin to move forward.

When Sensor #1 is released, Zone #2 will activate and product will move toward Zone #1. As each upstream photo eye sensor is cleared, its corresponding zone will activate and release product. A zone will not release until its immediate downstream zone has cleared.

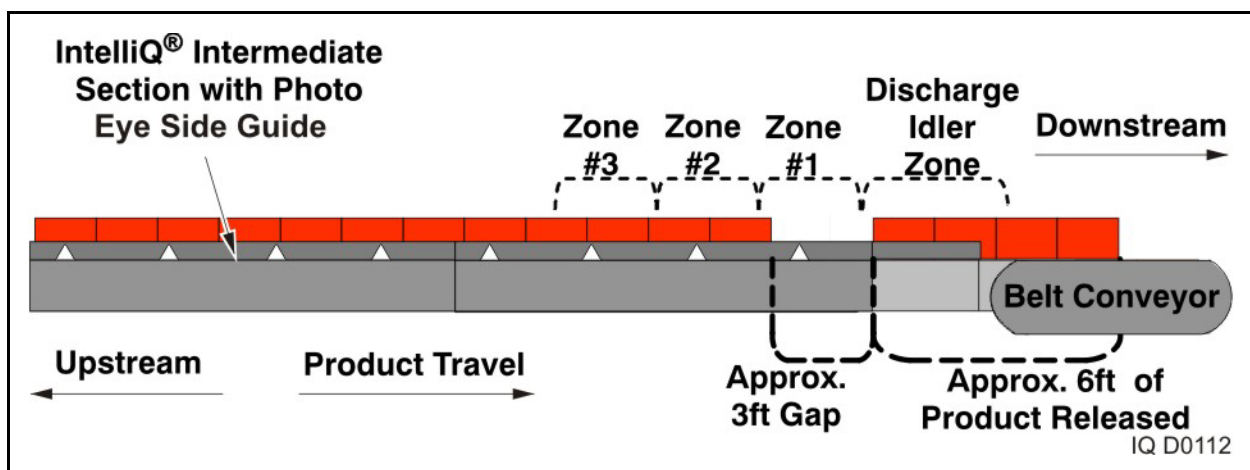


Figure 1 - 14 True Singulation Release



## Slug Release

Slug Release requires a Zone Interface Module (ZIM) or other device to provide a signal to the logic modules. Slug Release allows all zones to be activated simultaneously, releasing all the product on the conveyor at one time. The number of zones activated is determined by the placement of the Slug Terminator Cable. The Slug Terminator Cable blocks the slug signal from being sent to the logic modules. If a twenty-one foot slug is desired, the Slug Terminator Cable is installed between the logic modules in Zone #6 and Zone #7. (6 zones x 3 ft. + 3 ft. Discharge Idler = 21 ft.) If no Slug Terminator Cable is installed, the product on the entire conveyor will be released as one slug.

When the belt conveyor is started, an electrical signal is sent to the solenoid valve in the Discharge Idler and the ZIM. This activates the Discharge Idler Zone and the ZIM sends a signal to all the logic modules between the ZIM and the Slug Terminator Cable to activate their zones simultaneously. Product in the discharge idler and the slug release zones will now begin to move forward as one slug of product. The zones following the Slug Terminator Cable will begin to release as soon as the photo eye sensor in the first downstream zone (the last slug release zone) is cleared. Their release mode is based on the logic module installed.

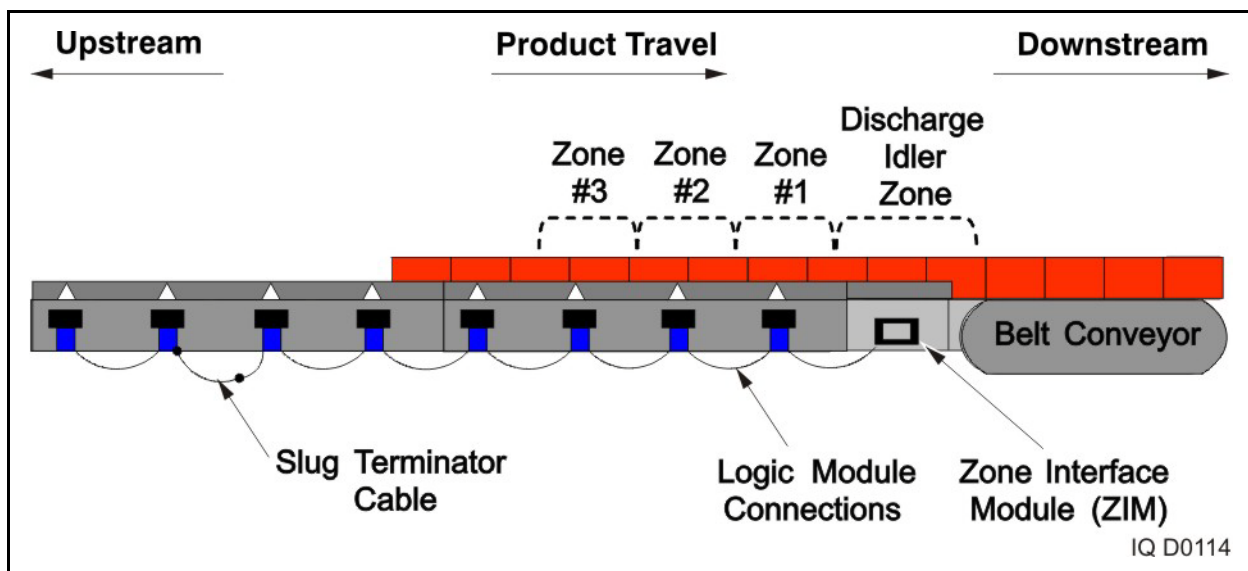


Figure 1 - 15 Slug Release

## Product Summary

<b>Applications:</b>	<ul style="list-style-type: none"> <li>• High-speed transportation,</li> <li>• Zero-pressure accumulation,</li> <li>• High rate of release.</li> </ul>
<b>Widths (Conveyor):</b>	<p>Module width is define as the distance between the inside surface of the frame rails on the product side of the frame. These widths follow the general convention set for the Intelligrated Case Conveyor family:</p> <p>16 inches                  22 inches                  28 inches                  34 inches                  40 inches</p>
<b>Maximum Conveyor Length</b>	Length varies and is determined by the belt pull. Maximum belt pull is 300 pounds.
<b>Speeds</b>	<p>60, 90, 120, 150, 180, 210, 240, 270*, 300*, 350*, 400*</p> <p>* Consult product engineer for applications above 240 fpm.</p>
<b>Drive Belt</b>	2-inch drive V-backed drive belt, thermal-welded or mechanically-laced.
<b>Capacity Live Load:</b>	100 lbs./ft. Live Load (item weight: <.5 lbs. to 200 lbs.)
<b>Carrier Rollers:</b>	<p>AB - ABEC                  HS - High Speed                  PR - Premium</p> <p>See the Rollers Specifications Table in Chapter 2 - Specifications for more information.</p>
<b>Infeed Idlers:</b>	<p>Required at the charge end of conveyor</p> <p><b>Length</b>                  3 feet</p> <p><b>Roller Centers</b>                  2 inches w/fixed-type mounting</p> <p><b>Pressure Spools</b>                  One 3-foot-long accumulation zone, solenoid-controlled</p> <p><b>Designations</b>                  Right Hand                  Left Hand</p>

**Center Drive Section** Second or third section of the conveyor. Drive is pre-assembled for **Standard and Low** to an Intermediate Section.

**Profile:**

**Length of Drive**

58 inches

**Lengths of Intermediate Section**

9 feet

12 feet

**Roller Centers of Intermediate Section**

2 inches w/fixed-type mounting

3 inches w/fixed-type mounting

**Pressure Spools**

3-foot long operational zones

**Maximum Effective Pull**

300 pounds

**Belt Tensioner**

Pneumatic

**Designations**

Right Hand

Left Hand

**Power Units:**

**Motors**

3/4 to 5 HP

Underhung C-Face (Baldor)

230/460/575 VAC, 3-phase, 60 Hz.,

380 VAC, 3-phase, 50 Hz.

Standard and premium-efficiency motors

Chain drive

**Reducer**

C-Face, right-angle (Dodge)



**Intermediate Section** - "Accumulation" type standard.

**Straight:**

**Lengths**

- 6 feet (2 zones of pressure spools)
- 9 feet (3 zones of pressure spools)
- 12 feet (4 zones of pressure spools)

**Roller Centers**

- 2 inches w/fixed-type mounting
- 3 inches w/fixed-type mounting

**Pressure Spools**

- 3-foot long operational zones
- Low-pressure air actuators

**Zone Control**

- Trailing-zone control
- Solenoid Control Module and photo eye sensor (on P.E. rail or under rollers\*)
- 24VDC, 3.7A output. Zone control power supply accommodates up to 50 zones - 25 in either direction (upstream/downstream).
- One supply included per conveyor.

\*Photo Eye Under Roller is not standard. Consult product engineer.

Common piping for all operational modes (SICK singulation, SICK true singulation, and SICK slug).

**Designations**

- Right Hand
- Left Hand

**Sensor Type/Modes:** **No Sensor:** Transportation Mode

**P.E. (Photo Eye) Sensor mounted on P.E. Guide Rail**

- SICK Singulation
- SICK TS (True Singulation)
- SICK Slug

**P.E. (Photo Eye) Sensor mounted under Rollers\***

- SICK Single Zone
- SICK TS (True Singulation)
- SICK Slug

\*Photo Eye Under Roller is not standard. Consult product engineer.

---

<b>Discharge Idlers:</b>	Required at the end of conveyor. <b>Length</b> 3 feet  <b>Roller Centers</b> 2-inches w/fixed-type mounting  <b>Pressure Spools</b> One 3-foot-long accumulation zone  <b>Zone Control</b> Solenoid Control Module Remote 120VAC or 24VDC Common piping for all operational modes (SICK singulation, SICK true singulation, and SICK slug)  <b>Designations</b> Right Hand Left Hand  <b>Options</b> Brake Assembly
<b>Power Requirement:</b>	<b>For Power Unit</b> 230/3/60 VAC, 460/3/60 VAC, 575/3/60 VAC, or 380/3/50 VAC  <b>For Zone Control/Actuation Components</b> 24V DC  <b>For Component Solenoid Valves</b> 120 VAC or 24 VDC
<b>Control Components</b>	<b>Solenoid Valves</b> 110 VAC 24 VDC
<b>Finish:</b>	Powder-coated

**Accessories /  
Options:**

- Drip Pan
- Power Supply
- 9.75/6.5 Transition Bracket Field Kit
- Belt Cutter/Welder Kit
- Knee Brace
- End Guard
- Brake Assembly
- Pop Up Stop (120VAC and 24VDC)
- Head-to-Tail Logic Kit
- Slug Release Zone Interface Module (ZIM)
- Splice Plate Kit
- Filter/Regulator
- Spacer Splice Channel
- Racking Tool - 16 to 22 inch BF
- Side Guides
  - Straight
  - Photo Eye/Reflector
  - Skate Wheel Side Guide
  - Transition - Photo Eye to Straight
  - Transition - End



## 2 Specifications

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This chapter expands upon the information found in the General Description chapter. It contains detailed itemization of individual components of the IntelliQ® Accumulation Conveyor. For information on how these components are used, see Chapter 5 - Application Guidelines. For technical information, such as calculations, see Chapter 3 - Engineering Data.

The following conveyor sections are covered in this chapter:

- Infeed Idler
- Intermediate Assemblies (6, 9, and 12 feet long)
- Center Drives - Standard and Low Profile (9 and 12 feet long)
- Discharge Idler

The following standard items are covered in this chapter:

- Frames
- Rollers

The following accessories are covered in this chapter:

- Brake Assembly
- Pop-Up Stop Assembly
- Photo-eyes and Reflectors

## Standard Items

The following items are used on all sections of the conveyor system.

### Frames and Rollers

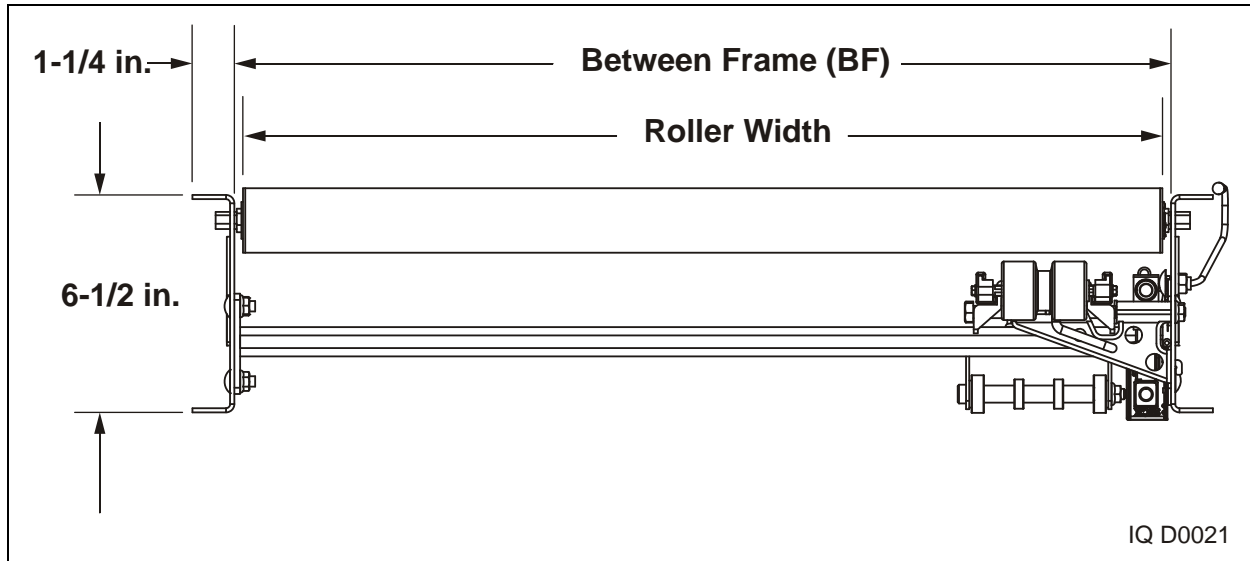


Figure 2 - 1 Frame and Roller Specifications

Table 2 - 1 Roller Specifications

Type	ABEC	High Speed	Premium High Speed
Designation	AB	HS	PR
Tubing	1.9-inch diameter galvanized		
Bearing	Intelligrated B2006 - ABEC-1 rated		SST RC190 6203 - ABEC-1 rated
Lubrication	Grease packed and sealed (no re-lubrication necessary)		
Axle	7/16-inch double-sprung hexagonal steel axle	7/16-inch nylon sleeve over 5/16-inch steel core (steel core is thru shaft)	
Roller Capacity	100 lbs		
Environment	-20° F to 150° F		0° F to 150° F
Application Notes	Intelligrated standard Use up to 300 fpm	Low noise. Eliminates frame wear. Standard for speeds 300 fpm and above	Nominal noise and aesthetic improvement over standard High Speed

## Standard Specifications

The following specifications are standard for all conveyor sections:

<b>Widths</b>	Standard - 16, 22, 28, 34, and 40 inches (BF: Between Frame)
<b>Minimum Elevation</b>	26 inches to Top of Rollers
<b>Maximum Pitch</b>	3 degrees
<b>Belting</b>	2-inch drive V-backed belting, thermal-welded or mechanically-laced.
<b>Capacity Live-Load</b>	100 lbs./ft. Live Load (item weight: <.5 lbs. to 200 lbs.). Limiting factor is the deflection of the side frames and the performance of the accumulation.
<b>Operating Environments</b>	+40° to +140° F (+4° to +60° C)
<b>Paint</b>	Powder-coated

## Infeed Idler Section

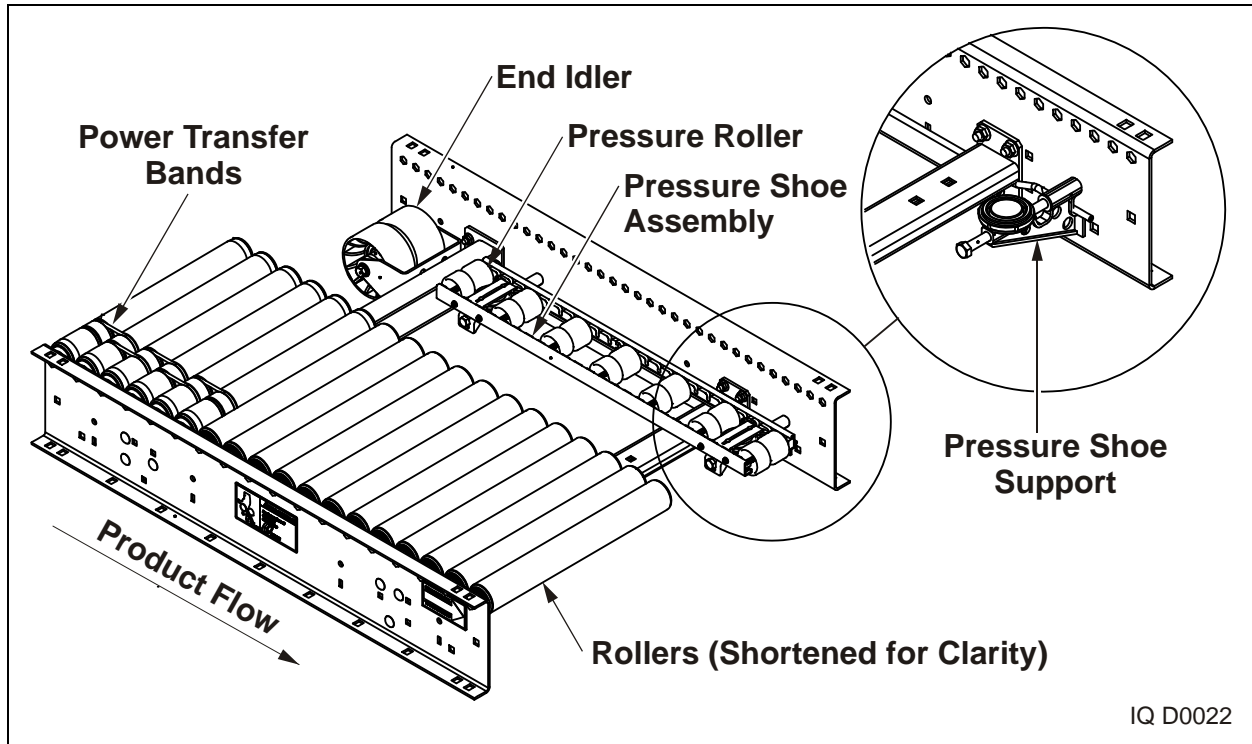


Figure 2 - 2 Infeed Idler Specifications



<b>Frame / Construction</b>	Right-Hand, Left-Hand orientations available. Left-Hand orientation shown. 3 feet long x 6-1/2 inches deep with 1-1/4 inch formed steel rails. End Pulley. Mounting holes for 7/16-inch hex axles punched at 2-inch centers.
<b>Rollers Mounting</b>	Axle mounting holes for fixed mounting of 1.9-inch diameter Carrier Rollers, bolted cross members. Rollers are shipped with unit.
<b>Roller Centers</b>	2-inch only. No finger guards supplied for rollers on 2-inch centers.
<b>Operational Zone</b>	One 3-foot-long zone.
<b>Sensor Type / Modes</b>	No sensor: Transportation mode Photo Eye (SICK) on PE Rail or between rollers: True Singulation, Singulation or Slug mode
<b>Operational /Release Control</b>	The zone's powered/non-powered state is determined by a signal from the photo eyes located in the first operational zone of the adjoining downstream section. When the zone is powered, pneumatically actuated diaphragms push the pressure shoe assembly up until the drive belt contacts the rollers. Rollers in first 12 inches are driven by power transfer bands.
<b>Accessories / Options</b>	Pop-Up Stop Assembly (customized piping required)

## Center Drive - Standard

The Center Drive is always the second or third section of the conveyor.

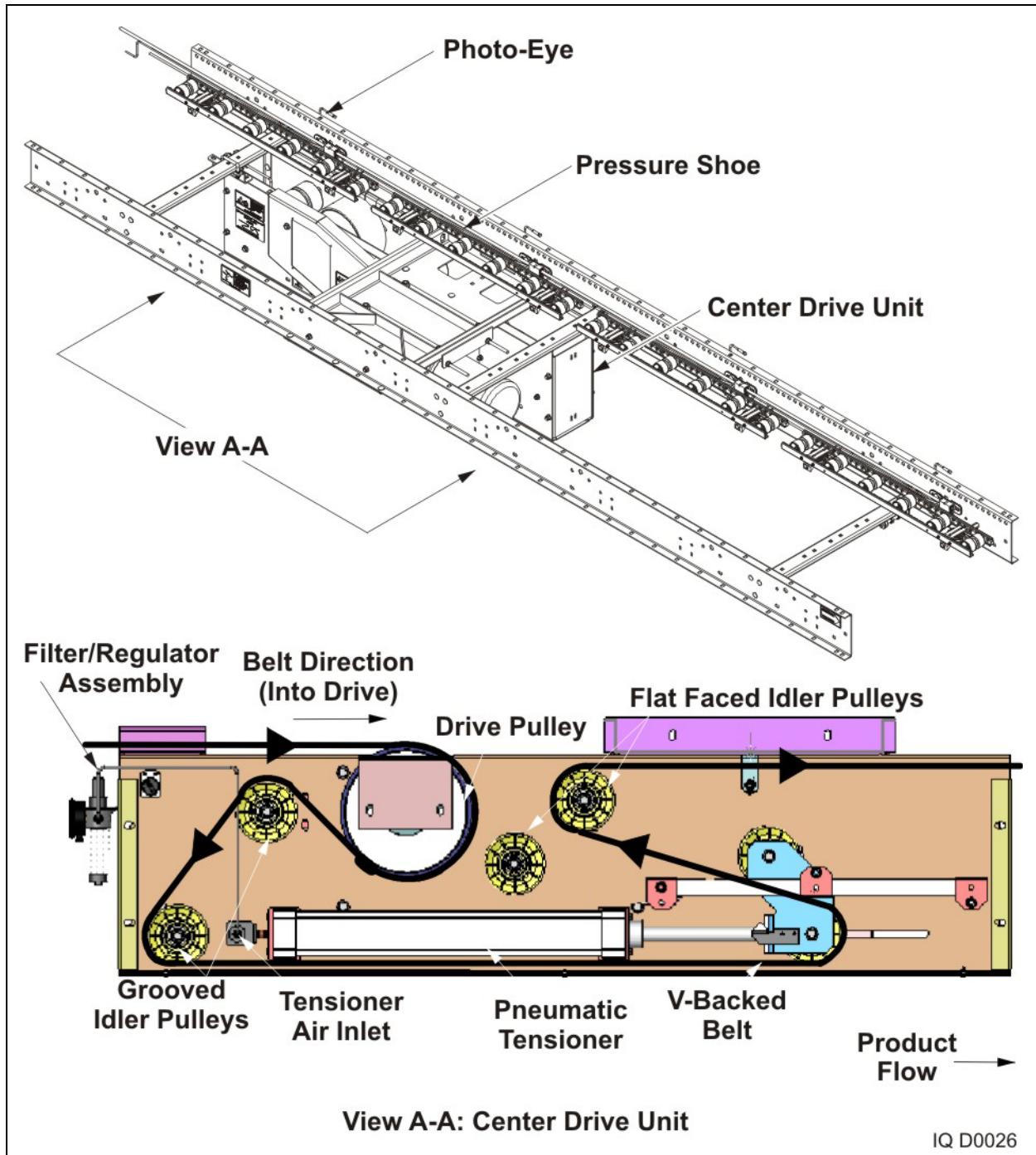


Figure 2 - 3 Center Drive - Standard Specifications

<b>Frame</b>	Installed into an Intermediate Section. Right-Hand, Left-Hand orientations available. Left-Hand orientation shown. 9 or 12 feet long x 6-1/2 inches deep with 1-1/4 inch formed steel rails. Bolted cross-members. Mounting holes punched for 7/16-inch hex axles.
<b>Power Unit</b>	3/4 to 5HP Underhung C-Face motor (Baldor), 1750 rpm, Totally-Enclosed, Fan-Cooled. C-Face, right-angle reducer (Dodge); direct drive in: <ul style="list-style-type: none"> <li>• 230V, 460V/,3-phase 60 Hz., standard/premium efficiency</li> <li>• 575V, 3-phase 60 Hz., premium efficiency</li> <li>• 380V, 3-phase 50 Hz., standard/premium efficiency.</li> </ul>
<b>Speeds</b>	60, 90, 120, 150, 180, 210, 240, 270*, 300*, 350*, 400* (all speeds are not available in all horse-powers) * Consult product engineer for applications above 240 fpm
<b>Rollers Mounting</b>	Axle mounting holes for fixed mounting of 1.9-inch diameter carrier rollers, bolted cross members. Rollers are shipped loose with unit.
<b>Roller Centers</b>	2-inch or 3-inch. Finger guards supplied with rollers on 3-inch centers.
<b>Belt Tensioner / Take-Up</b>	Pneumatic, telescoping tensioner maintains belt tension and compensates for wear.
<b>Operational Zone</b>	9-foot long frame: three 3-foot-long zones. 12-foot long frame: four 3-foot-long zones.
<b>Sensor Type / Modes</b>	No sensor: Transportation mode Photo Eye (SICK) on PE Rail or between rollers: True Singulation, Singulation or Slug mode
<b>Operational /Release Control</b>	Each zone's powered/non-powered state is determined by a signal from the photo eyes located in the zone immediately downstream. When the zone is powered, pneumatically actuated diaphragms push the pressure shoe assembly up until the drive belt contacts the rollers.
<b>Accessories / Options</b>	Pop-Up Stop Assembly (customized piping required)

## Center Drive - Low Profile

The Center Drive is always the second or third section of the conveyor.

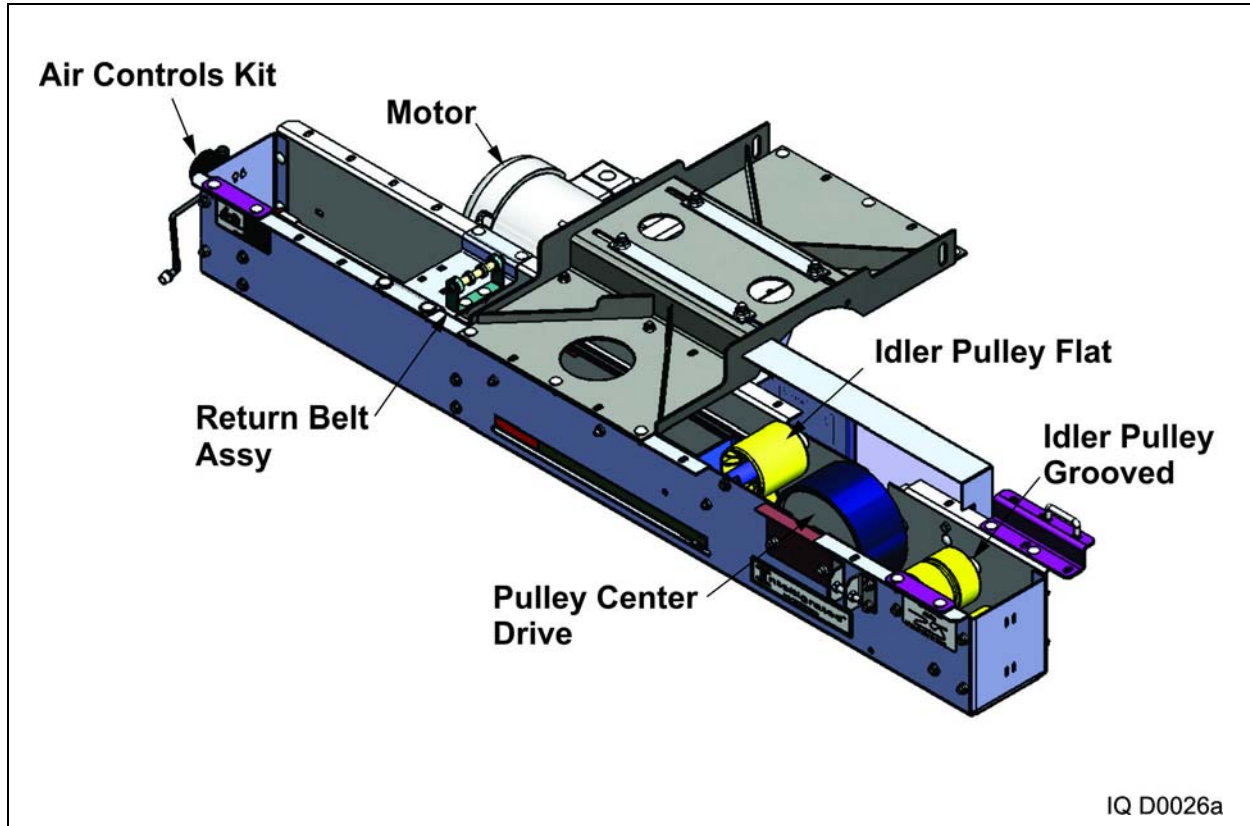


Figure 2 - 4 Center Drive - Low Profile Specifications

<p><b>Frame</b></p>	<p>Installed into an Intermediate Section. Right-Hand, Left-Hand orientations available. Left-Hand orientation shown. 9 or 12 feet long x 6-1/2 inches deep with 1-1/4 inch formed steel rails. Bolted cross-members. Mounting holes punched for 7/16-inch hex axles.</p>
<p><b>Power Unit</b></p>	<p>3/4 to 5HP Underhung C-Face motor (Baldor), 1750 rpm, Totally-Enclosed, Fan-Cooled. C-Face, right-angle reducer (Dodge); direct drive in:</p> <ul style="list-style-type: none"> <li>• 230V, 460V/,3-phase 60 Hz., standard/premium efficiency</li> <li>• 575V, 3-phase 60 Hz., premium efficiency</li> <li>• 380V, 3-phase 50 Hz., standard/premium efficiency.</li> </ul>
<p><b>Speeds</b></p>	<p>60, 90, 120, 150, 180, 210, 240, 270*, 300*, 350*, 400* (all speeds are not available in all horse-powers) * Consult product engineer for applications above 240 fpm</p>

<b>Rollers Mounting</b>	Axle mounting holes for fixed mounting of 1.9-inch diameter carrier rollers, bolted cross members. Rollers are shipped loose with unit.
<b>Roller Centers</b>	2-inch or 3-inch. Finger guards supplied with rollers on 3-inch centers.
<b>Belt Tensioner / Take-Up</b>	Pneumatic, telescoping tensioner maintains belt tension and compensates for wear.
<b>Operational Zone</b>	9-foot long frame: three 3-foot-long zones. 12-foot long frame: four 3-foot-long zones.
<b>Sensor Type / Modes</b>	No sensor: Transportation mode Photo Eye (SICK) on PE Rail or between rollers: True Singulation, Singulation or Slug mode
<b>Operational /Release Control</b>	Each zone's powered/non-powered state is determined by a signal from the photo eyes located in the zone immediately downstream. When the zone is powered, pneumatically actuated diaphragms push the pressure shoe assembly up until the drive belt contacts the rollers.
<b>Accessories / Options</b>	Pop-Up Stop Assembly (customized piping required)

## Intermediate Section

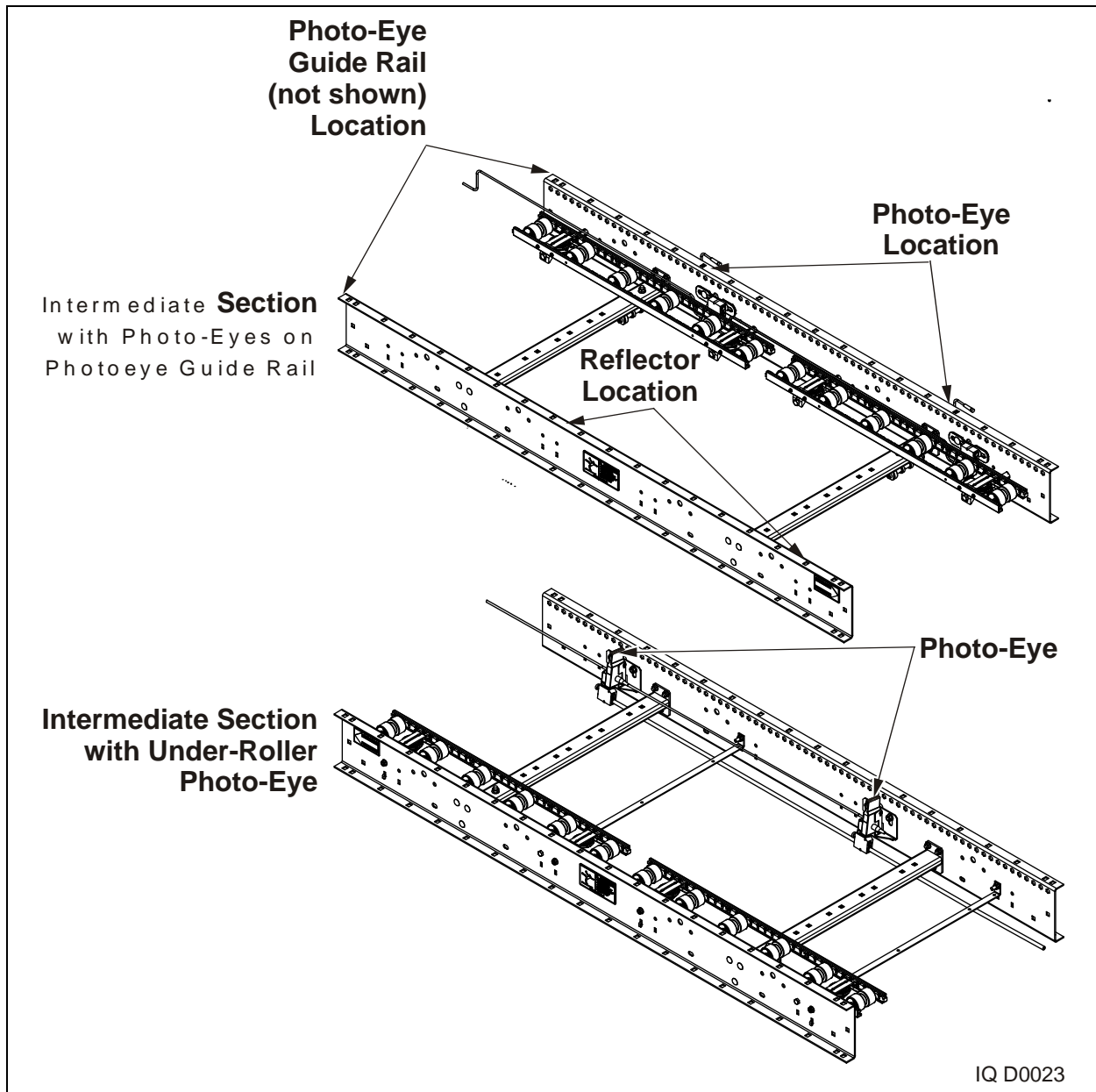


Figure 2 - 5 Intermediate Section Specifications

<b>Frame</b>	Right-Hand, Left-Hand orientations available. Left-Hand orientation shown. 6, 9 or 12 feet long x 6-1/2 inches deep with 1-1/4 inch formed steel rails. Bolted cross-members. Mounting holes punched for 7/16-inch hex axles.
<b>Rollers Mounting</b>	Axle mounting holes for fixed mounting of 1.9-inch diameter Carrier Rollers, bolted cross members. Rollers are shipped loose with unit.
<b>Roller Centers</b>	2-inch or 3-inch. Finger guards supplied with rollers on 3-inch centers.
<b>Operational Zone</b>	6-foot long frame: two 3-foot-long zones. 9-foot long frame: three 3-foot-long zones. 12-foot long frame: four 3-foot-long zones.
<b>Sensor Type / Modes</b>	No sensor: Transportation mode Photo Eye (SICK) on PE Rail or between rollers: True Singulation, Singulation or Slug mode
<b>Operational /Release Control</b>	Each zone's powered/non-powered state is determined by a signal from the photo eyes located in the zone immediately downstream. When the zone is powered, pneumatically actuated diaphragms push the pressure shoe assembly up until the drive belt contacts the rollers.
<b>Accessories / Options</b>	Pop-Up Stop Assembly (customized piping required)  Skew-available in 3-foot field-assembled kits. (This option is not recommended. The recommended method for aligning product to one side of the conveyor is the placement of a V-Belt conveyor with a hard skew immediately upstream from the IntelliQ® Accumulation Conveyor).



# Discharge Idler

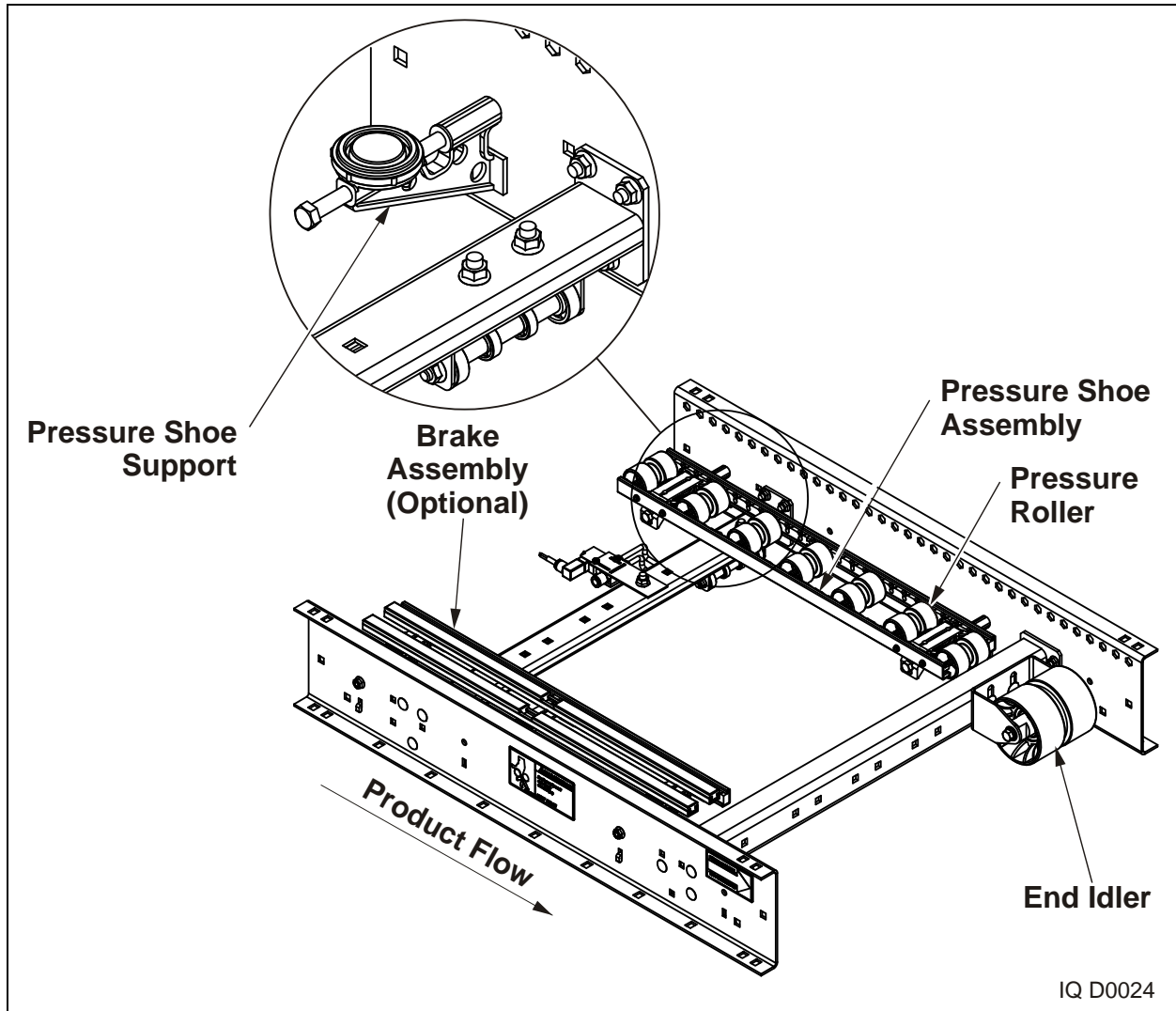


Figure 2 - 6 Discharge Idler Specifications



<b>Frame / Construction</b>	Right-Hand, Left-Hand orientations available. Left-Hand orientation shown. 3 feet long x 6-1/2 inches deep with 1-1/4 inch formed steel rails. End Pulley. Mounting holes for 7/16-inch hex axles punched at 2-inch centers.
<b>Rollers Mounting</b>	Axle mounting holes for fixed mounting of 1.9-inch diameter Carrier Rollers, bolted cross members. Rollers are shipped with unit.
<b>Roller Centers</b>	2-inch only. No finger guards supplied for rollers on 2-inch centers.
<b>Operational Zone</b>	One 3-foot-long zone.
<b>Operational /Release Control</b>	The zone's powered/non-powered state is determined by a signal from the photo eyes located in the first operational zone of the adjoining downstream equipment. When the zone is powered, pneumatically actuated diaphragms push the pressure shoe assembly up until the drive belt contacts the rollers. Rollers in last 12 inches are driven by power transfer bands.
<b>Sensor Type / Modes</b>	No sensor: Transportation mode Photo Eye (SICK) on PE Rail or between rollers: True Singulation, Singulation or Slug mode
<b>Accessories / Options</b>	Head-to-Tail Logic Kit; Brake Assembly; Pop-Up Stop Assembly

## Brake Assembly

IntelliQ® Accumulation Conveyor Discharge Idlers may be equipped with a brake assembly (Figure 2 - 7) that provides a positive braking action to the rollers on the conveyor. This prevents products from coasting on the rollers.

The assembly is identical to the pressure shoe assembly, with the exception of the brake pads and brake pad mounting channels. It is activated in the same manner as the normal pressure shoe assembly and is easily repaired, removed or replaced.

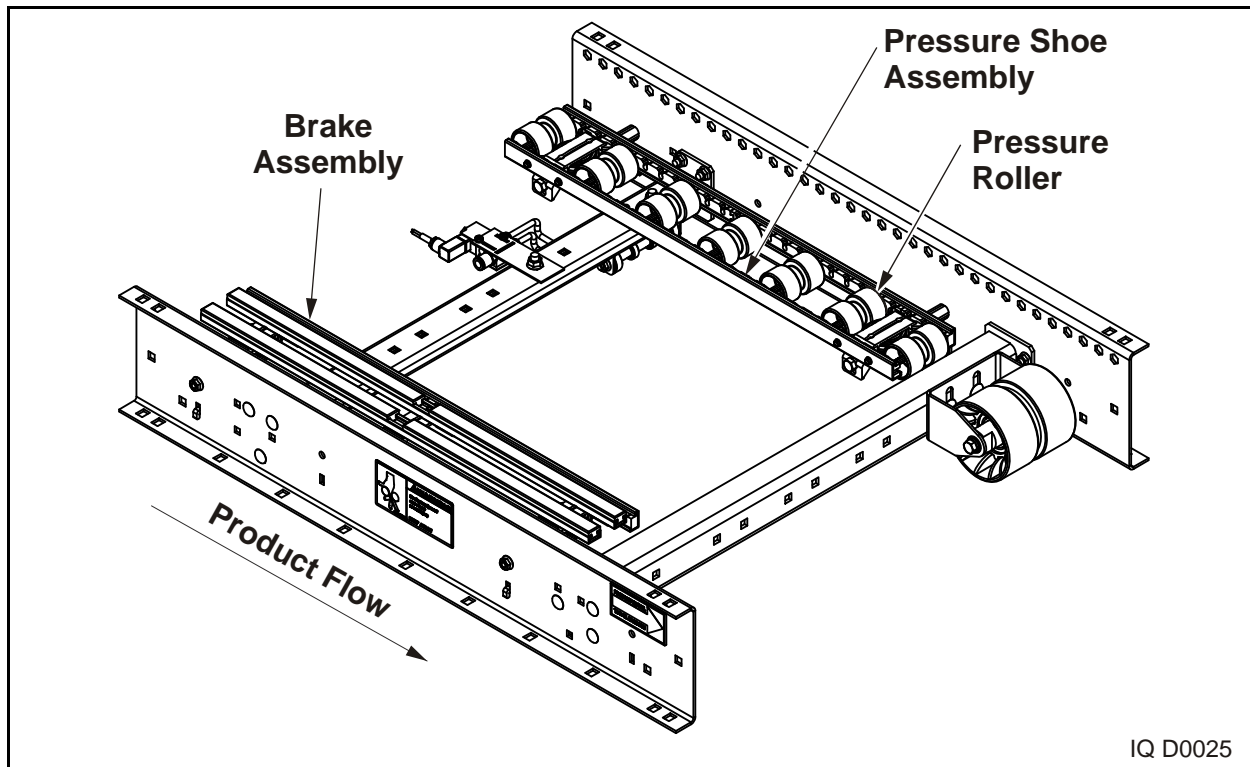


Figure 2 - 7 IntelliQ® Accumulation Conveyor Brake Assembly

## Photo-Eyes and Reflectors

### Retro-Reflective Photo-Eye

<b>Application</b>	Standard photo-electric sensor used to detect product within the zone.
<b>Voltage</b>	24 VDC
<b>Output</b>	PNP, dark-operated.
<b>Mounting</b>	Mounted to integral brackets in the side guide using a ball mount. Mounting protects the photo-eye from passing product, and allows for easy adjustment for alignment with reflector. Extended flanges on the side guide channel protect the photo-eye from passers-by.
<b>Cord / Connector</b>	Four (4) pin male PICO QD connector; connects to the Solenoid Control Module's 25 inch cable with female connector.
<b>Cord Length</b>	NA
<b>Voltage Range</b>	10-30 VDC
<b>Sensing Range</b>	12 feet
<b>Temperature Range</b>	-4° to +158°F
<b>LED Indicators</b>	Amber LED "ON" indicates photo-eye is aligned with the reflector and is unblocked. Green LED "ON" indicates sensor has power.
<b>Reflector</b>	Mounted with screws to integral brackets in the side guide. Locating stud correctly aligns reflector.



Figure 2 - 8 Retro-reflective Photo-Eye (Ball Mount)

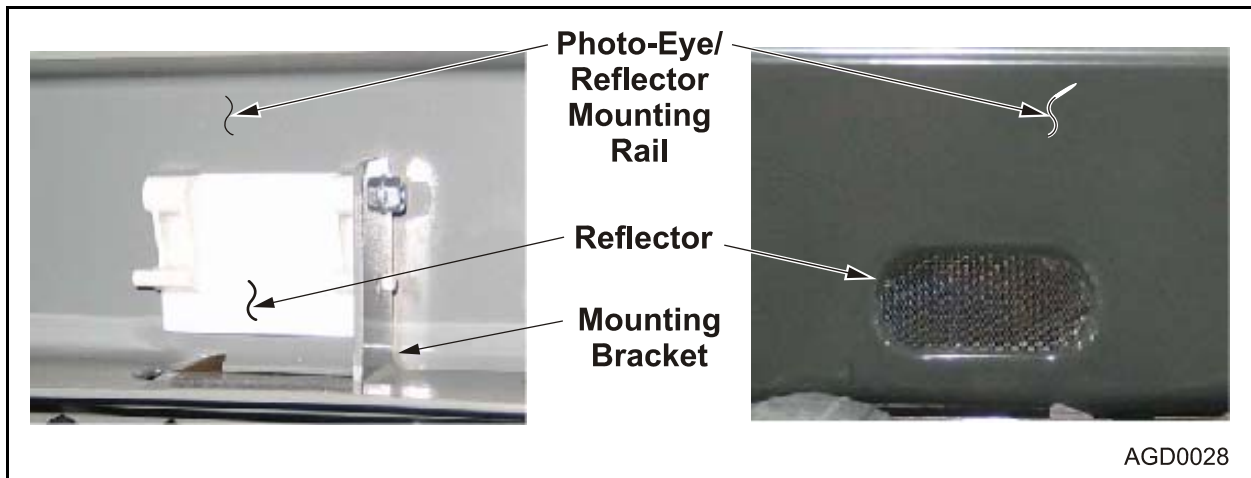
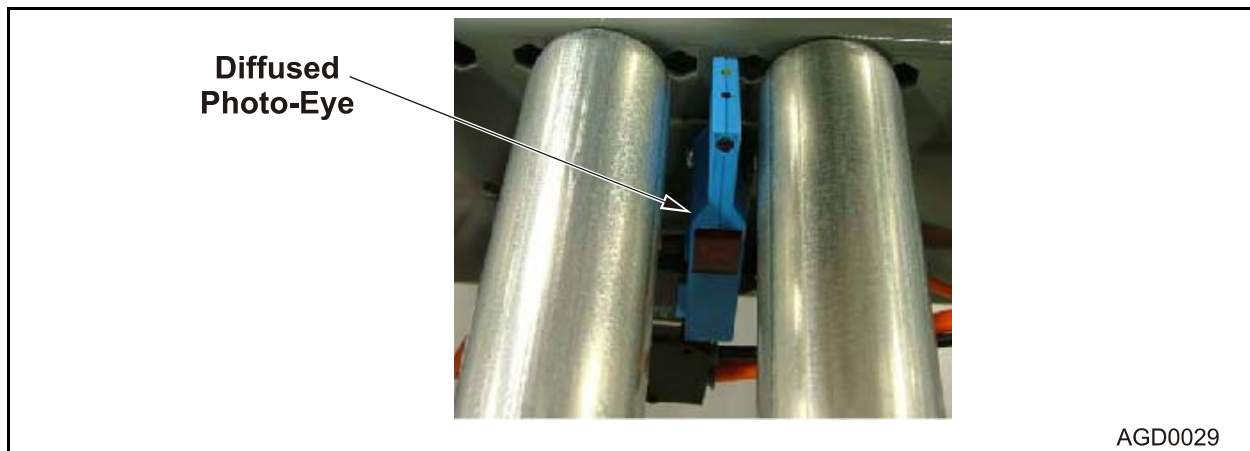


Figure 2 - 9 Reflector

**Diffused Photo-Eye with Integral Valve**

<b>Application</b>	Used in applications where side guide cannot be installed.
<b>Voltage</b>	10-30 VDC
<b>Output</b>	PNP, light-operated.
<b>Mounting</b>	Mounted below the rollers so that the top of the sensor is at least 1/4 inch below the high point of the adjacent rollers.
<b>Cord / Connector</b>	Photo-eye mounted directly to zone control valve (no cable or connector).
<b>Cord Length</b>	NA
<b>Voltage Range</b>	10-30 VDC
<b>Sensing Range</b>	Variable, up to 900 mm. Adjust gain using black dial on top of sensor.
<b>Temperature Range</b>	-4° to +158°F
<b>LED Indicators</b>	White LED on top of sensor. Brightness increases when product is sensed.
<b>Reflector</b>	None



*Figure 2 - 10 Diffused Photo-Eye*



# 3 Accessories

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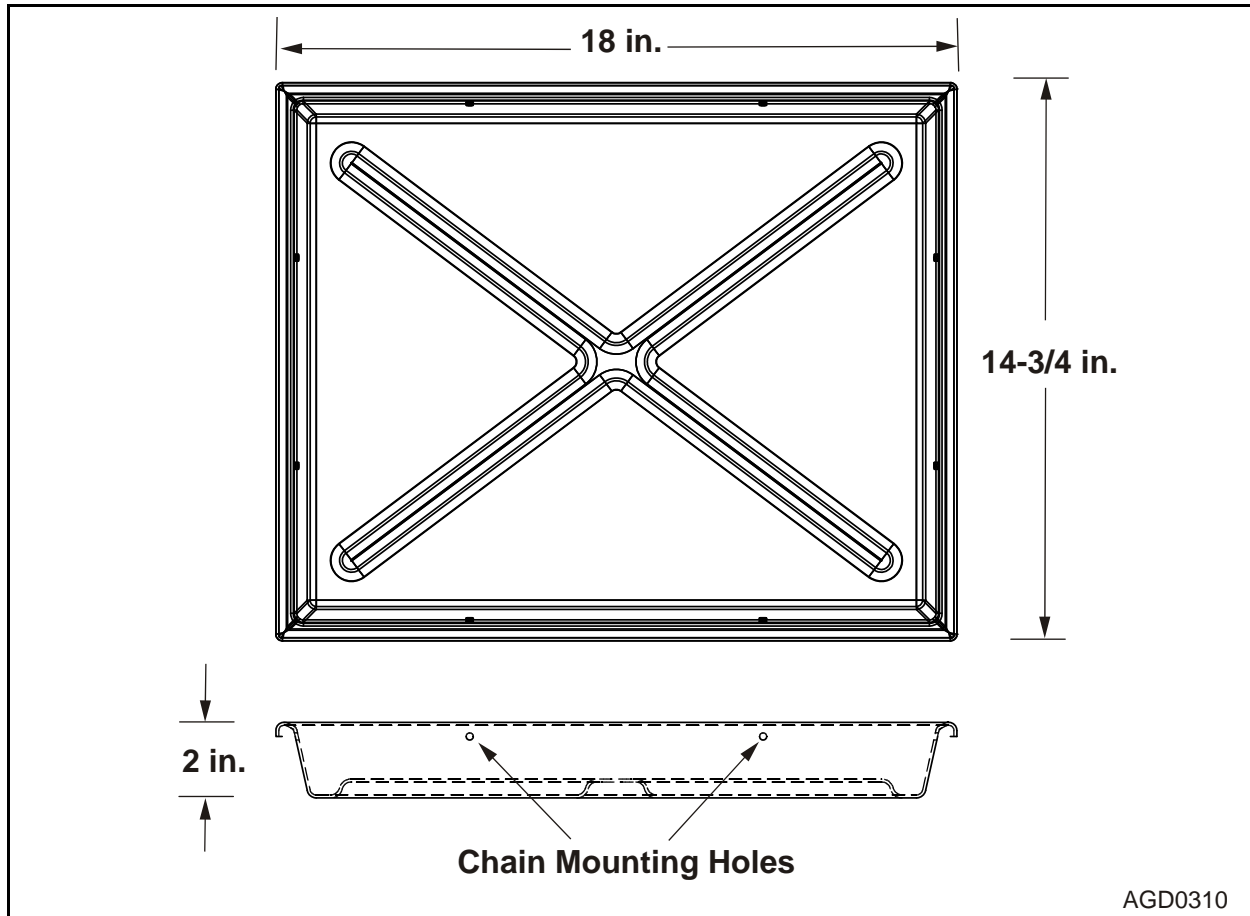
This chapter contains standard and optional accessories available for the IntelliQ® Accumulation Conveyor product line.

## Standard Accessories

- Drip Pan
- Power Supply

## Optional Accessories

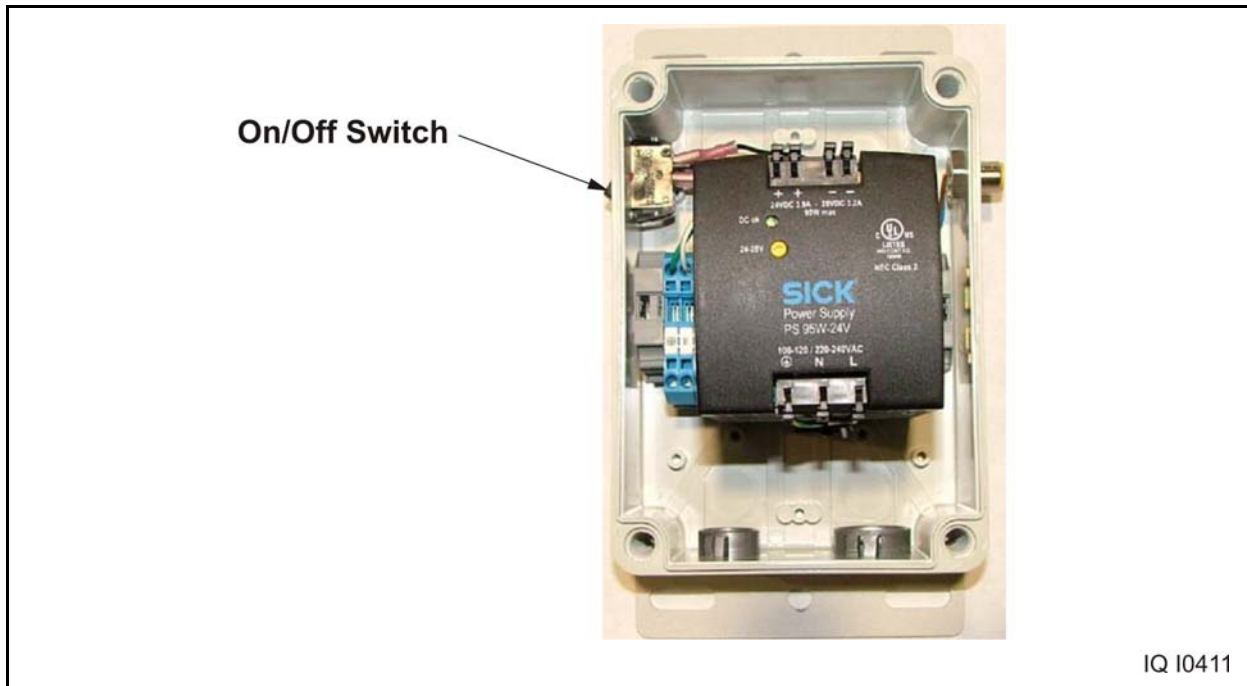
- 9.75/6.5 Transition Bracket Field Kit
- Skew Zone Guide Kit
- Belt Cutter/Welder Kit
- Knee Brace
- End Guard
- Brake Assembly
- Pop Up Stop (120V AC & 24V DC)
- Head-to-Tail Logic Kit
- Slug Release Zone Interface Module (ZIM)
- Splice Plate Kit
- Filter/Regulator
- Spacer Splice Channel
- Racking Tool - 16 to 22 inch BF
- Side Guides
  - Straight Side Guide
  - Photo Eye/Relector
  - Skate Wheel Side Guides
  - Transition - Photo Eye to Straight
  - Transition - End

**Drip Pan***Figure 3 - 1 Drip Pan*

<b>Overview</b>	The drip pan catches oil dripping from the gearbox and/or oiler.
<b>Installation</b>	It is most commonly installed on the drive section of each conveyor. The drip pan hangs from chains mounted on the frame of the drive, or on the reducer itself. Install drip pans as needed, typically one per drive.
<b>Part Numbers</b>	29001300



## Power Supply



### Overview

Each power supply can provide power for a maximum of 50 zones (25 zones in each direction) and must be located as close to the center of the zones as possible to balance the power supplied to the zones.

### Installation

If there are 25 zones or less, the power supply may be installed at the end of the conveyor closest to the 115V supply. If the total number of zones exceeds 50, an additional power supply and a power isolatin cable must be installed. For additional information regarding installation, see Chapter 3 Installation Procedures in this manual.

### Part Numbers

23193700 Power Supply, Accumulation 120VAC Input 24VDC, 3.7 Amp Output with Box and 2M T-calbe, Sick #7029740.

## 9.75/6.5 Transition Brackets Field Kit

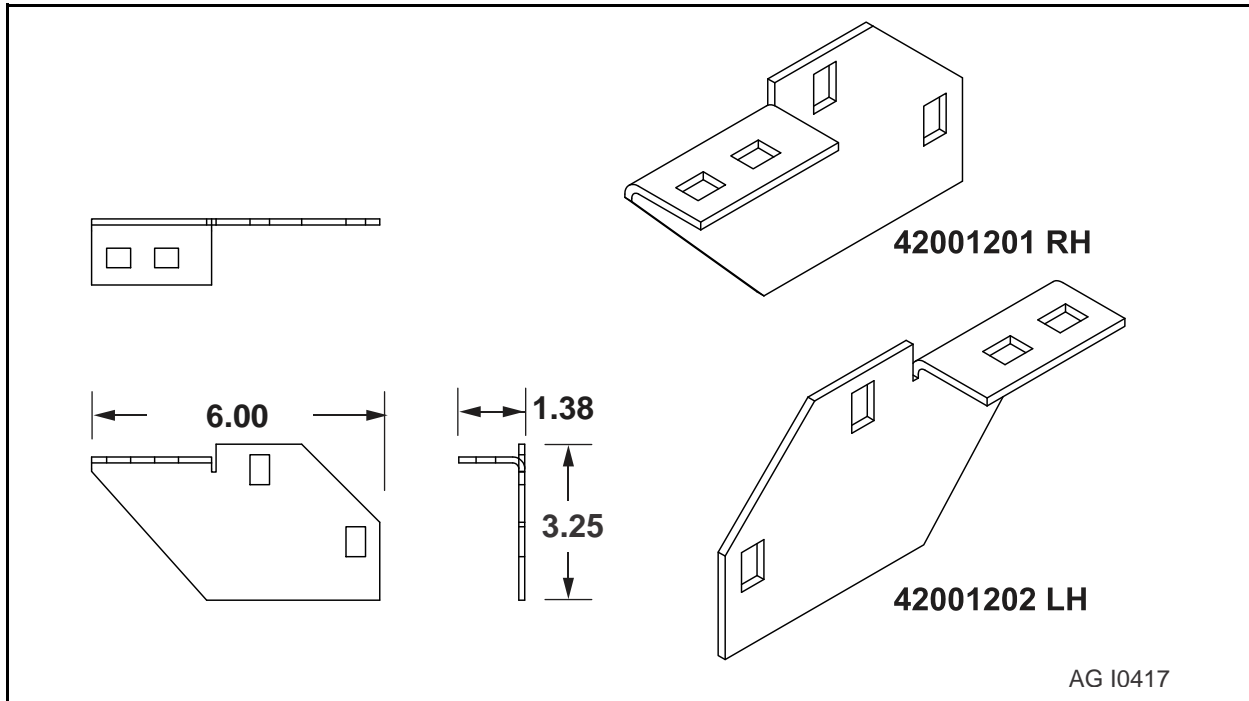


Figure 3 - 2 9.75/6.5 Transition Bracket Field Kit

### Overview

The Brackets can be ordered to reinforce the coupling of a 6.5 inch or a 9.75 inch frame conveyor.

Note: Any changes in frame height, in a single conveyor line, the brackets will be included at the factory.

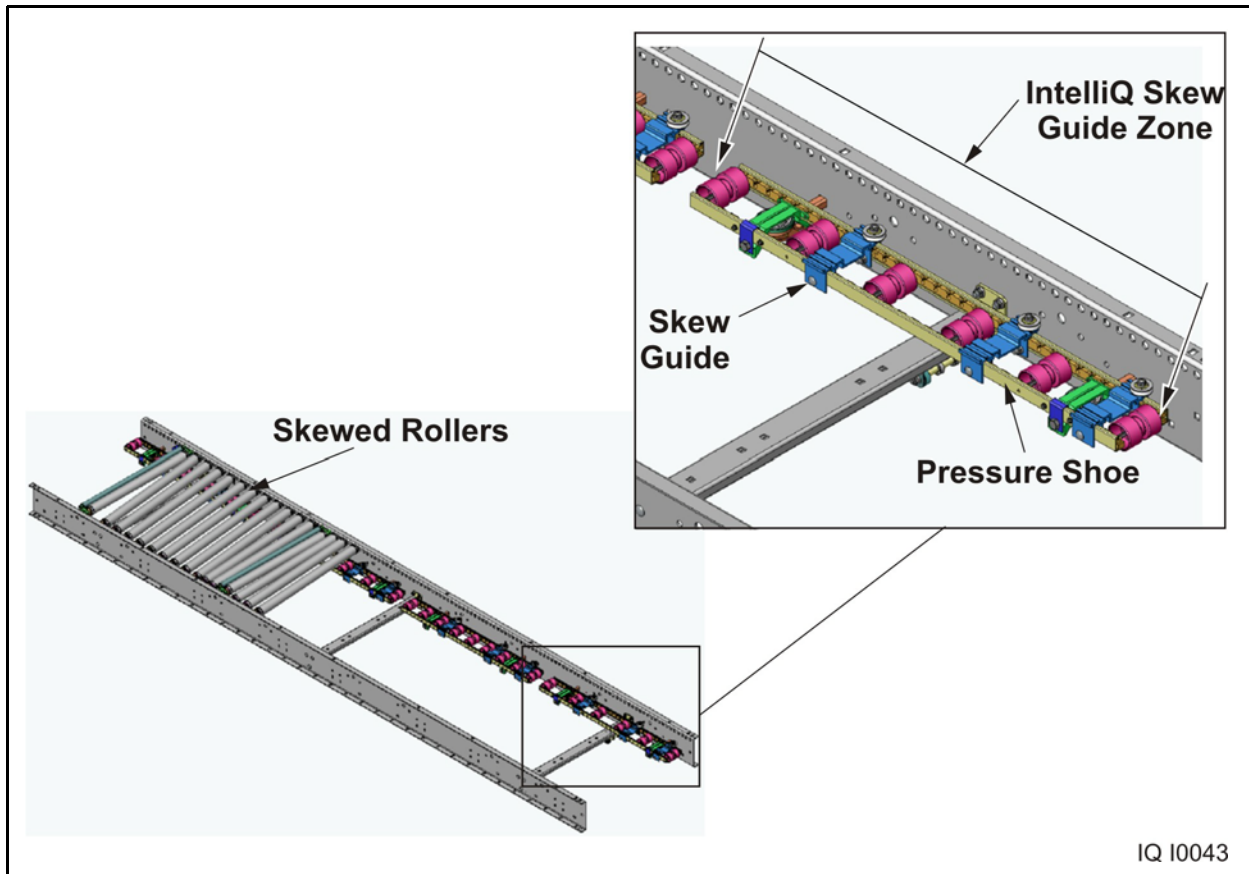
For example, this accessory can be ordered when transitioning from a 6.5 inch conveyor frame to a 9.75 inch conveyor frame.

### Part Numbers

42001201 - Right Hand

42001202 - Left Hand

**Skew Guide**

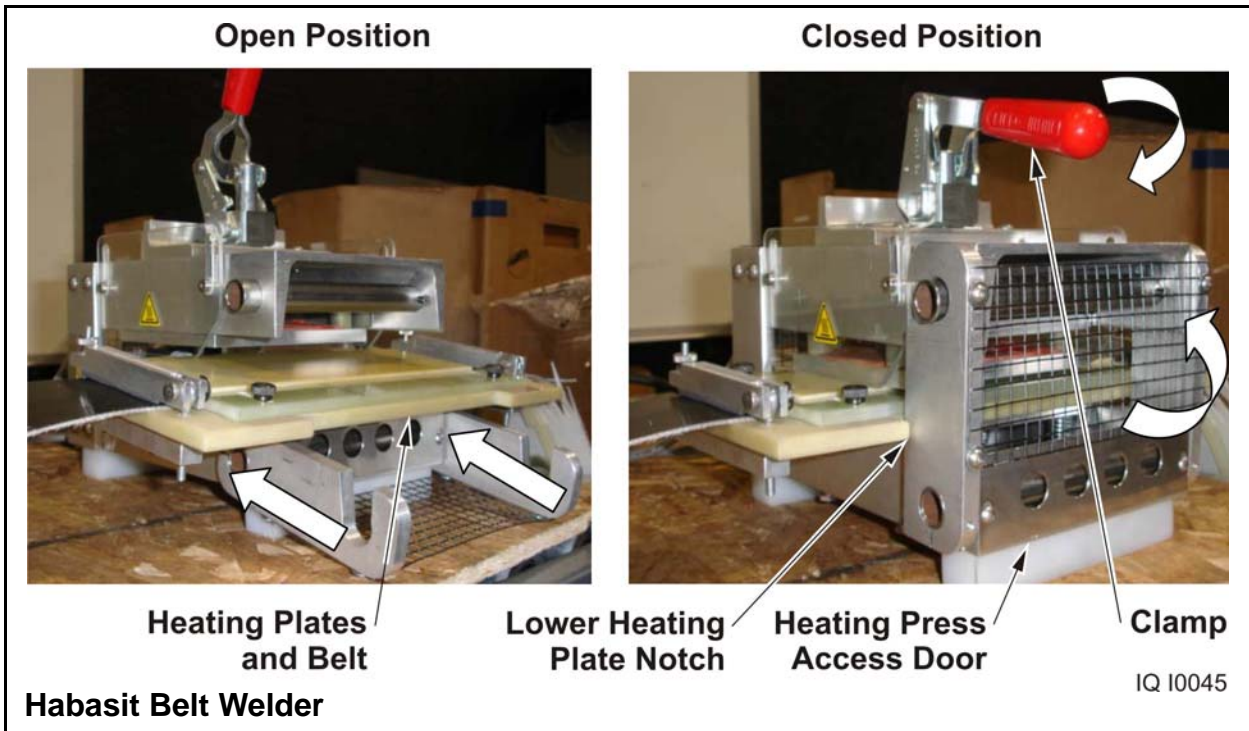


**Overview** The intermediates with skewed roller configurations require skew guides to keep the drive belt properly tracked on the pressure rollers as it goes through the skewed sections.

**Specifications** The conveyor is designed for a 1-inch roller offset skew, a 2-inch roller offset skew, and a 3-inch maximum offset skew. There must be a minimum of three skew guides per zone per shoe.  
 Note:Field-Assembled Skew Kits are available, but are not recommended. The recommended method for aligning product to one side of the conveyor is the placement of a V-Belt conveyor with a hard skew immediately upstream from the IntelliQ® Accumulation Conveyor.

**Part Number** 70095100

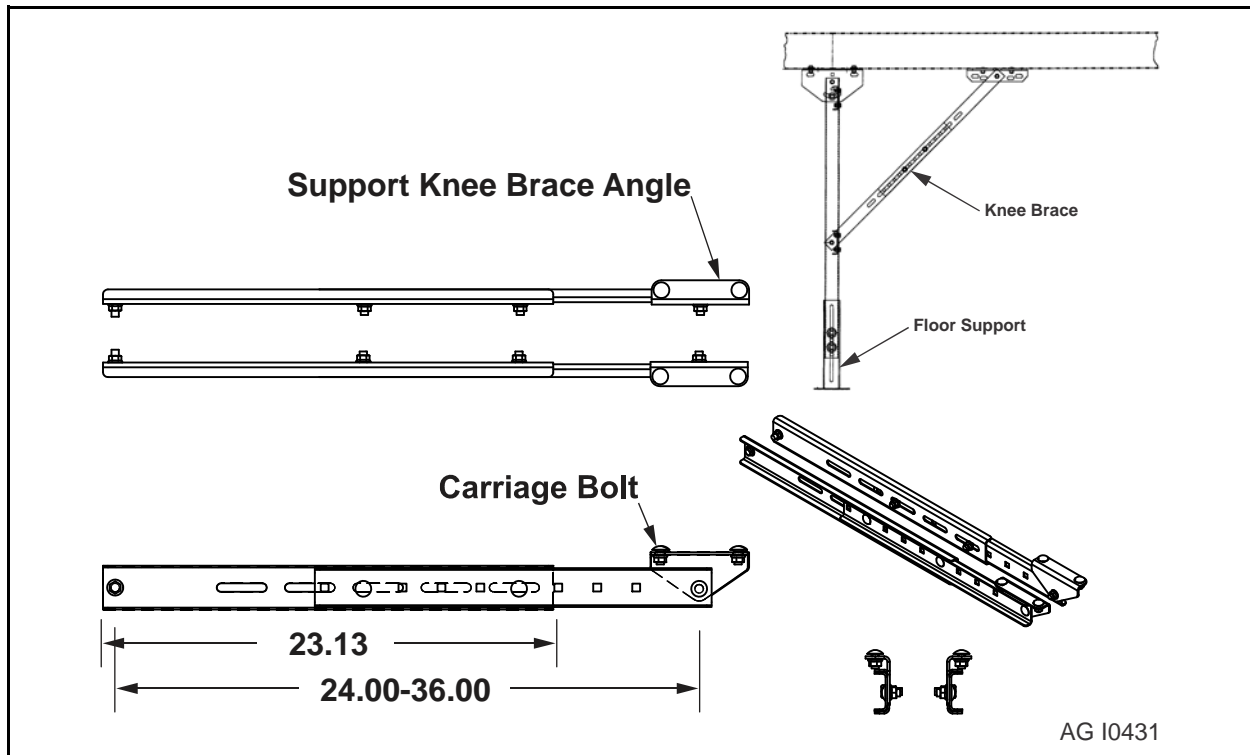
**Belt Cutter and Belt Welder**



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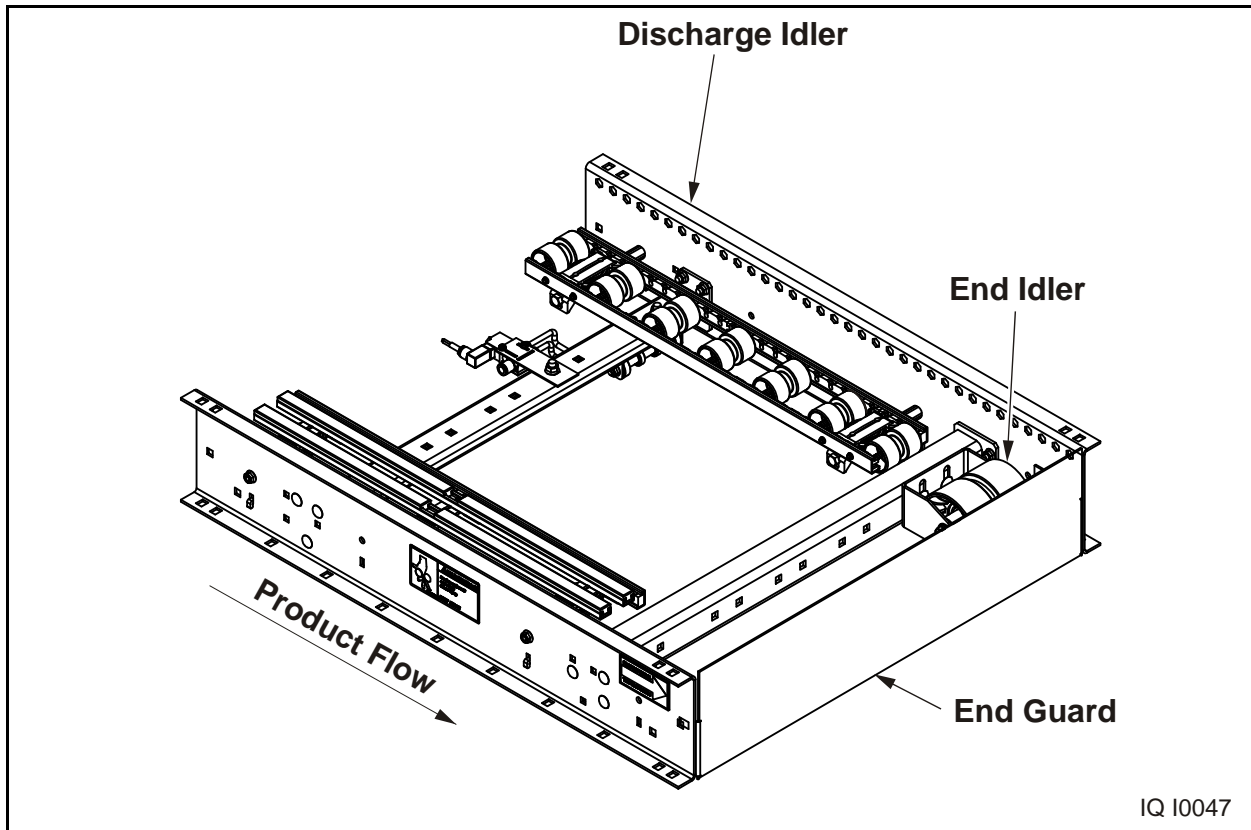
<b>Overview</b>	The recommended lacing method for drive belts is thermal welding. In the event of a breakdown, the drive belt may also be mechanically laced using #1-HT lacing until a shutdown period when the belt may be welded.
<b>Specifications</b>	<p>The belt is cut and welded using the Habasit Belt Cutter and Welder. The Habasit Belt Cutter is a manual, portable die cutting device that prepares the ends of the belt for welding.</p> <p>The Habasit Belt Welder is a manual, portable welding unit that welds the prepared ends of the belt together.</p>
<b>Part Numbers</b>	<p>29303500 - kit features a 3-stage cutter 29377600 - kit features 11-stage cutter For South America requiring 230VAC use the following part numbers 29406700 and 29406600.</p>

## Knee Brace

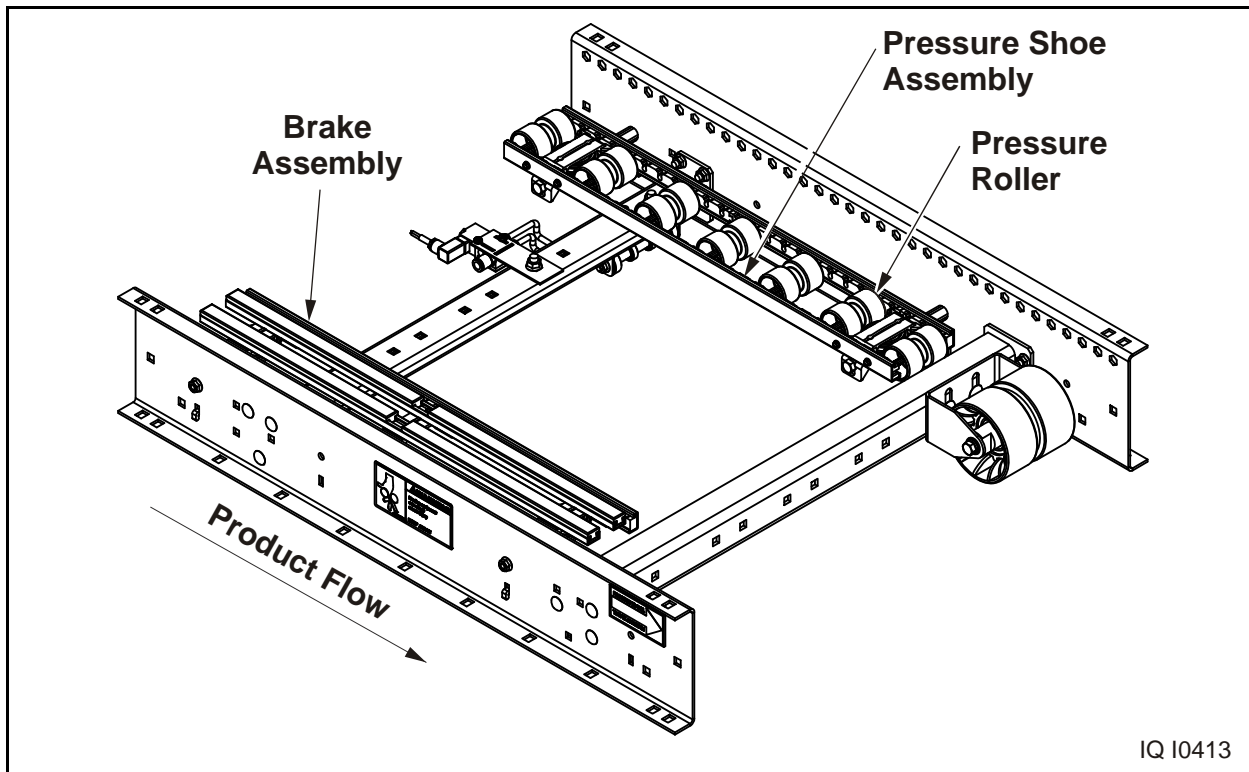


- Overview** The knee braces add longitudinal stability. The knee brace eliminates stress caused by flow direction, stops, and starts. Every support does not require bracing.
- Operation** Use knee braces: at the ends of straight runs, before case stops, near the drive, and approximately every 50 feet on a long straight run.
- Installation** Locate the knee braces on the downstream side of the supports, putting them in tension. However, starting the conveyor stresses the legs in the opposite direction. To resist these stresses, install braces near to, and upstream from the drive. For best results, keep the strap-to-frame angle between 30° and 45°. On shorts supports, where a small angle results, shorten the brace strap - this is optional.
- Part Number** 10005900

**End Guard**



- Overview** .The End Guard is used if the Discharge Idler is not attached to another conveyor. It protects the End Idler from being damaged.
- Kit Includes** End Guard RH and LH assemblies and mounting clips.
- Installation** Bolt the End Guard to the conveyor frame rails using the hardware supplied.
- Part Number** 40016200

**Brake Assembly****Overview**

IntelliQ® Accumulation Conveyor Discharge Idlers may be equipped with a Brake Assembly that provides a positive braking action to the rollers on the conveyor. This prevents products from coasting on the rollers.

**Installation**

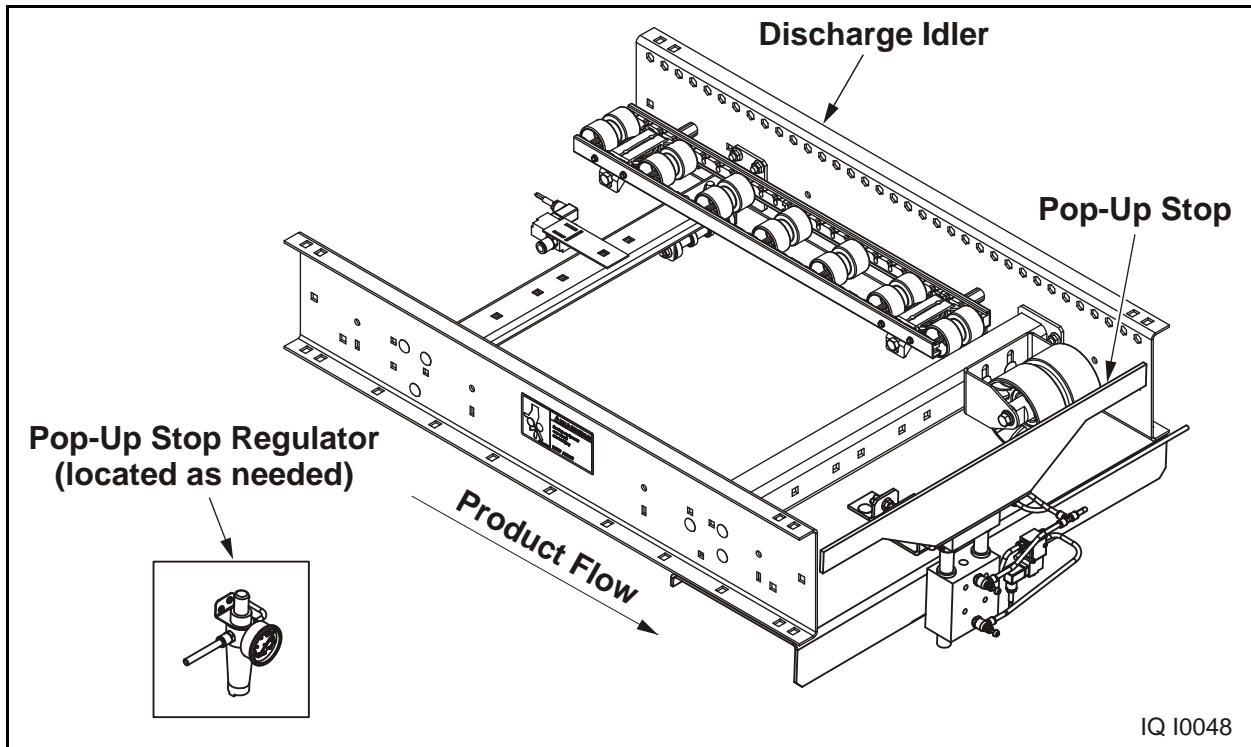
The assembly is identical to the pressure shoe assembly, with the exception of the brake pads and brake pad mounting channels. It is activated in the same manner as the normal pressure shoe assembly and is easily repaired, removed or replaced.

**Part Number**

40007600 - 610 Discharge Brake Kit



**Pop-Up Stop**



**Overview**

When activated, the Pop-Up Stop rises between rollers to stop product from moving downstream, even if the rollers are turning. It is available in 120 VAC or 24 VDC control signal configuration.

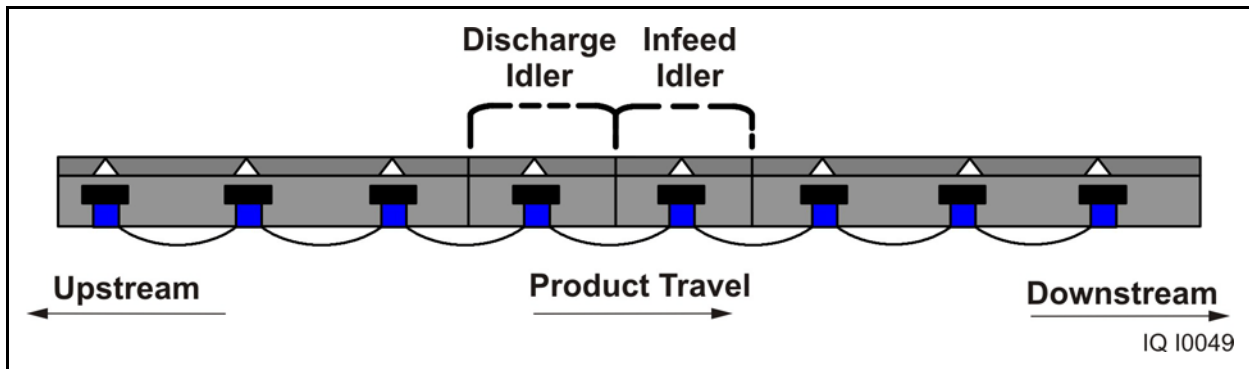
Note: The Pop-Up stop will work only with straight (not skewed) rollers on 3-inch centers.

**Installation**

Normally installed at the end of the Discharge Idler. If it is installed elsewhere on the conveyor, customized piping is needed.

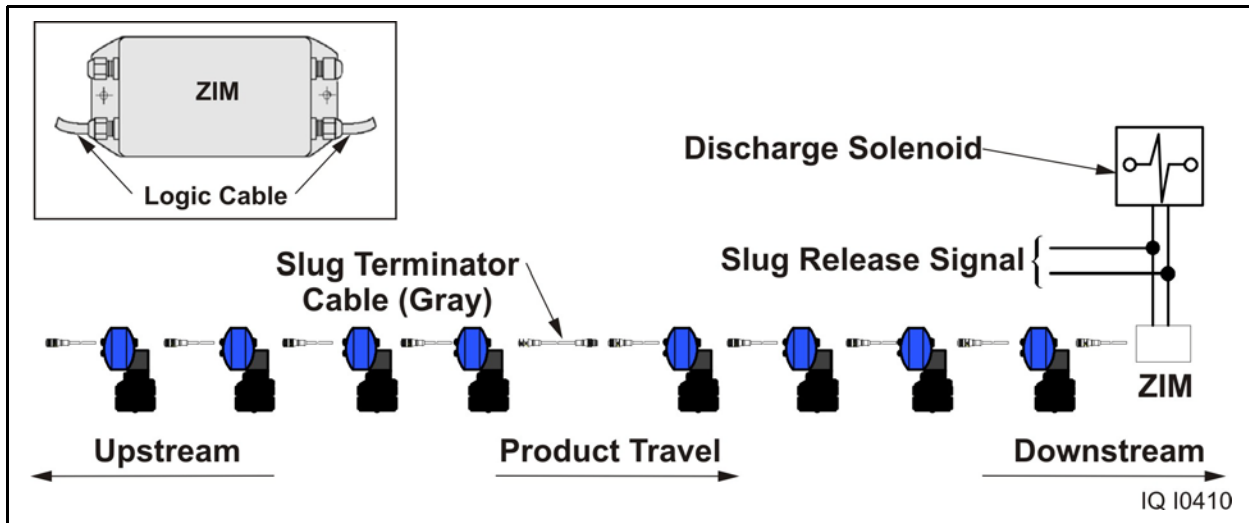
**Part Number**

80002200

**Head-To-Tail Logic Kit**

<b>Overview</b>	The Head/Tail Logic Kit provides seamless logic across two conveyors that are installed head-to-tail. The kit consists of two logic modules and the associated mounting and pneumatic hardware.
<b>Installation</b>	The infeed and discharge idlers are piped as if: 1.) they are an extension of the intermediate section, and 2.) there is no interruption in the conveyor.
<b>Part Number</b>	40016000

**Slug Release Zone Interface Module (ZIM)**



**Overview**

The ZIM provides the signal which energizes multiple zones at the same time to accomplish Slug Release. It accepts in True Singulation mode, and releases in Slug Mode.

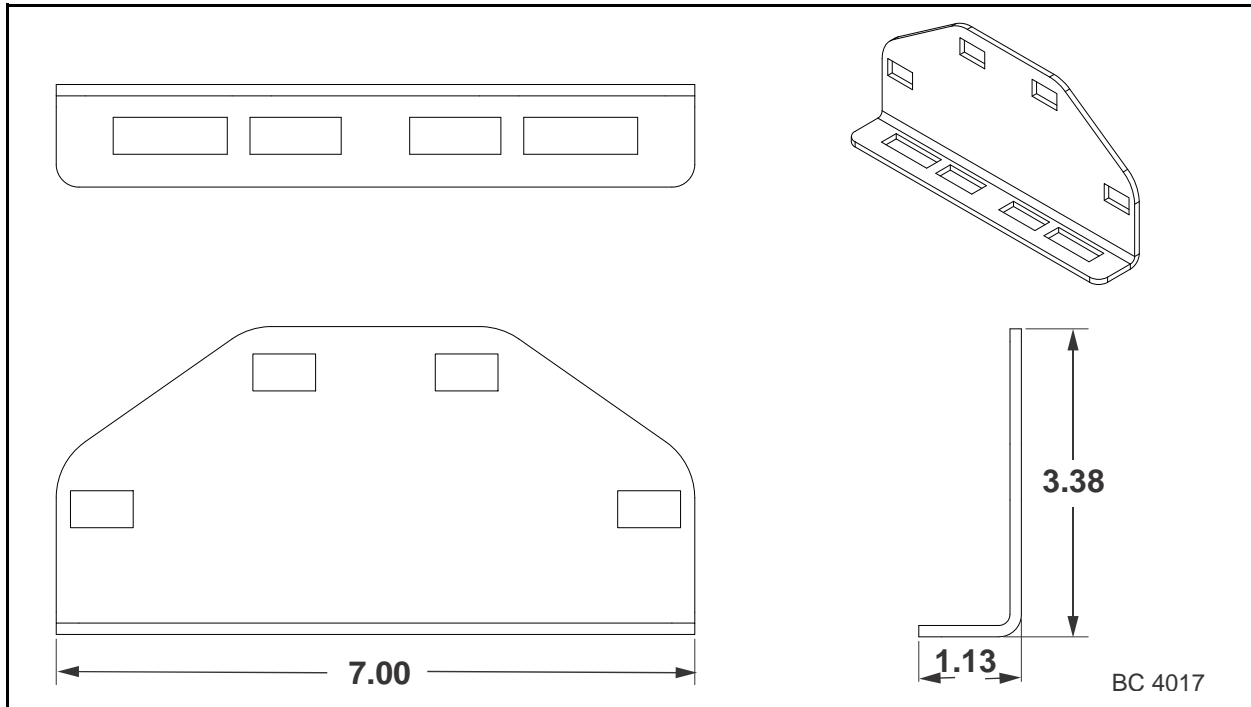
**Installation**

If a limited number of zones is going to be used for Slug Release and not the entire conveyor, a Slug Terminator Cable is installed between the last logic module used for the Slug Release and the next upstream module. The remaining zones will release in Singulation or True Singulation. The ZIM is available for conveyor discharge only.

**Part Number**

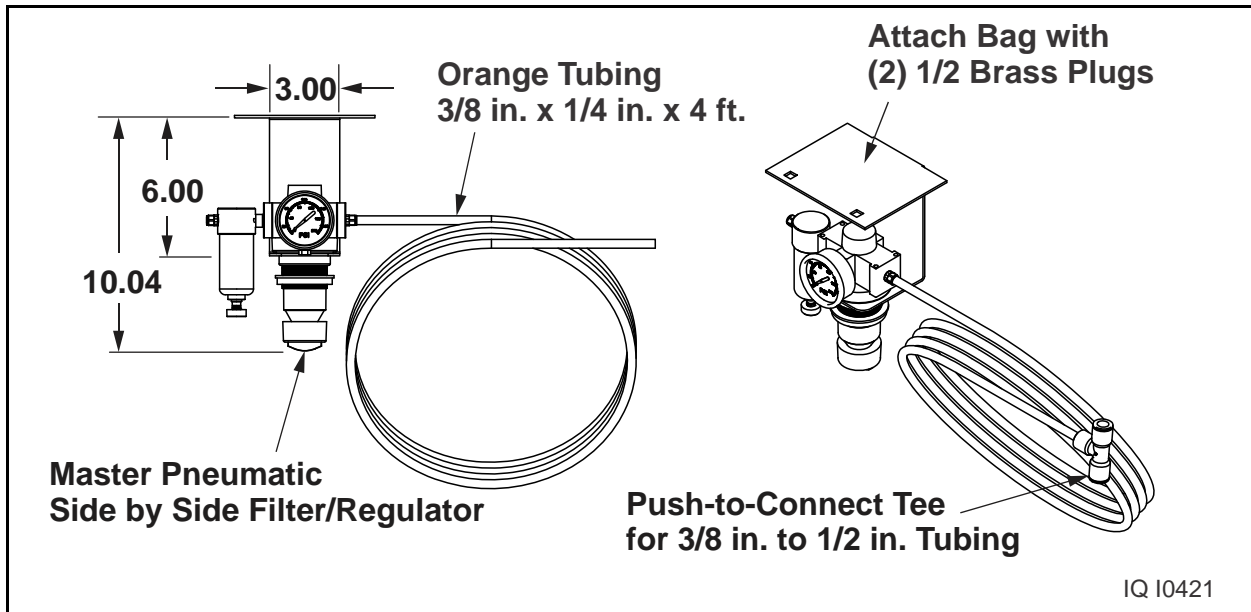
40013100

**Splice Plate Kit**



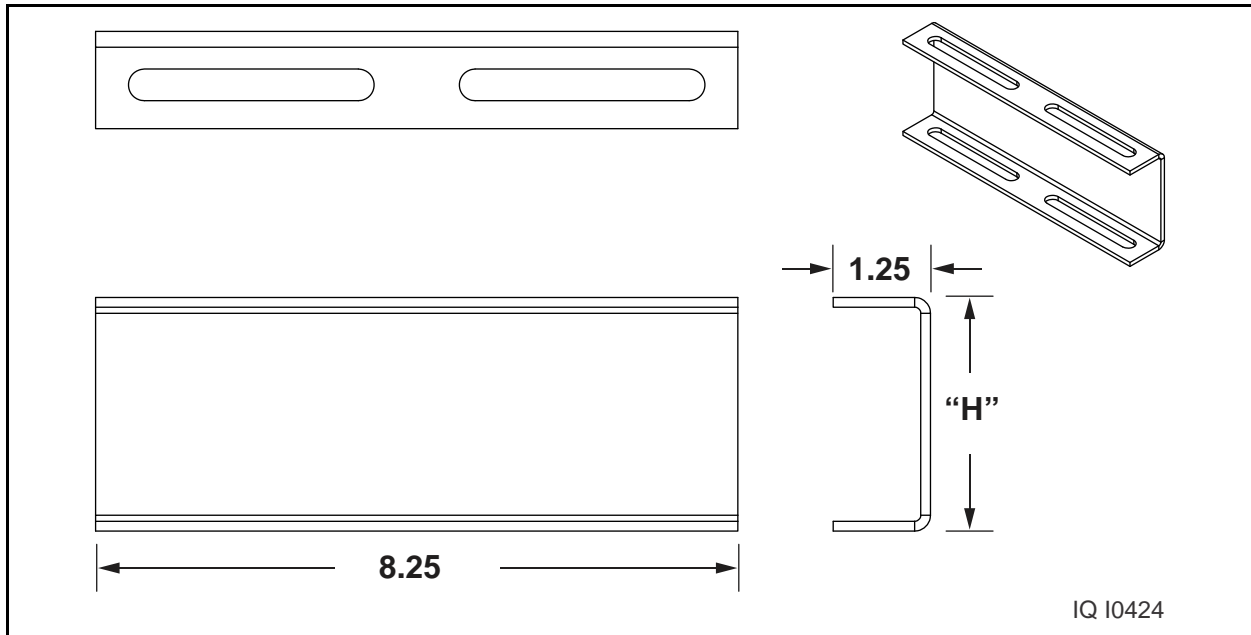
Overview	Standard plate for splicing sections together.
Installation	Use the splice plate to connect adjacent conveyor beds together.
Part Number	FK410241 (Kit) - 18000800 (plate only)

**Filter/Regulator**



<b>Overview</b>	A minimum of one is required for each 200 feet of conveyor.
<b>Installation</b>	Recommended initial setting of operation pressure for intermediates is 12 psi.
<b>Part Number</b>	70074200

**Spacer Splice Channel**



**Overview**

Used to span gaps in floor supports and to create space for straddled supports.

**Installation**

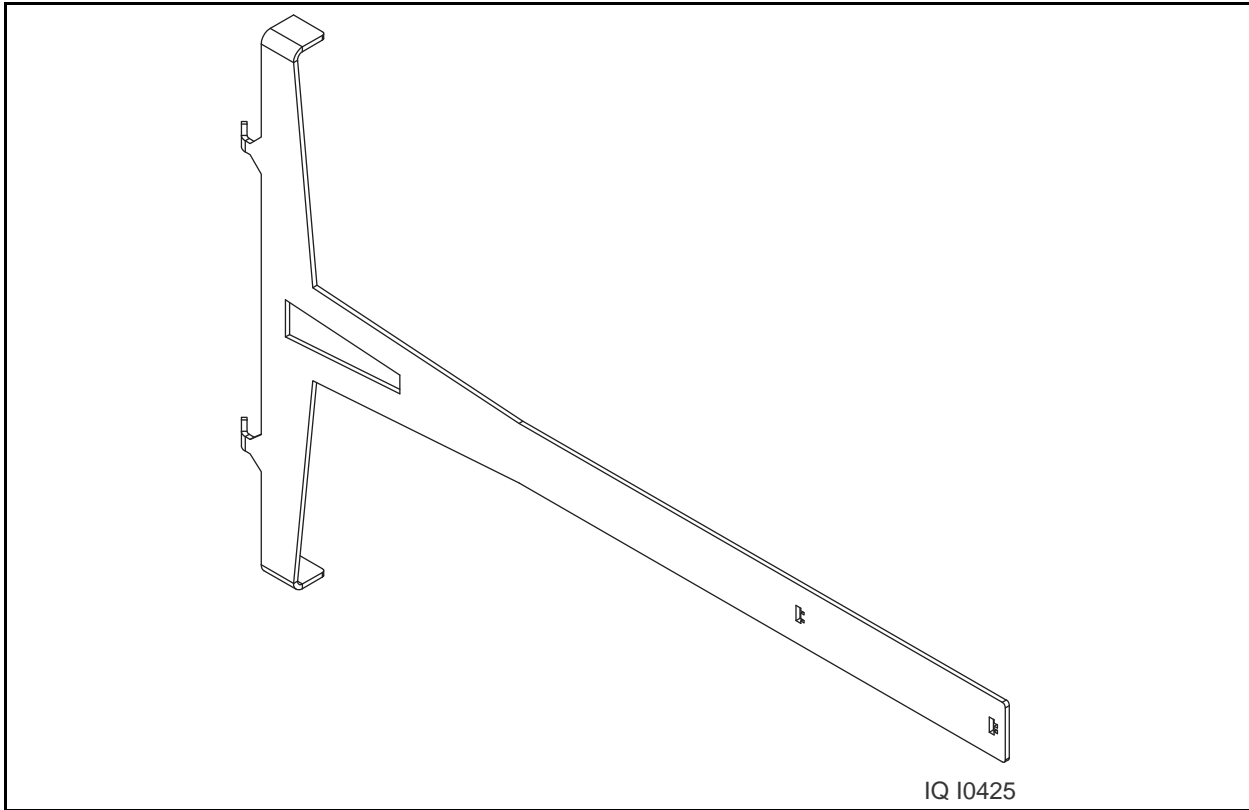
A 3 inch plate is required to straddle support for the drive.

**Part Numbers**

**Dim "H" (inches)**

18001601	3.00
18001602	6.00
18001603	9.00
18001604	12.00
18001605	4.00
18001606	5.50
18001608	6.50

**Racking Tool (Optional)**



**Overview**

The Racking Tool is an optional tool used for squaring the conveyor.

**Part Numbers**

**BF (inches)**

22	70246700
28	70246702
34	70246703
40	70246704

## Straight Side Guide

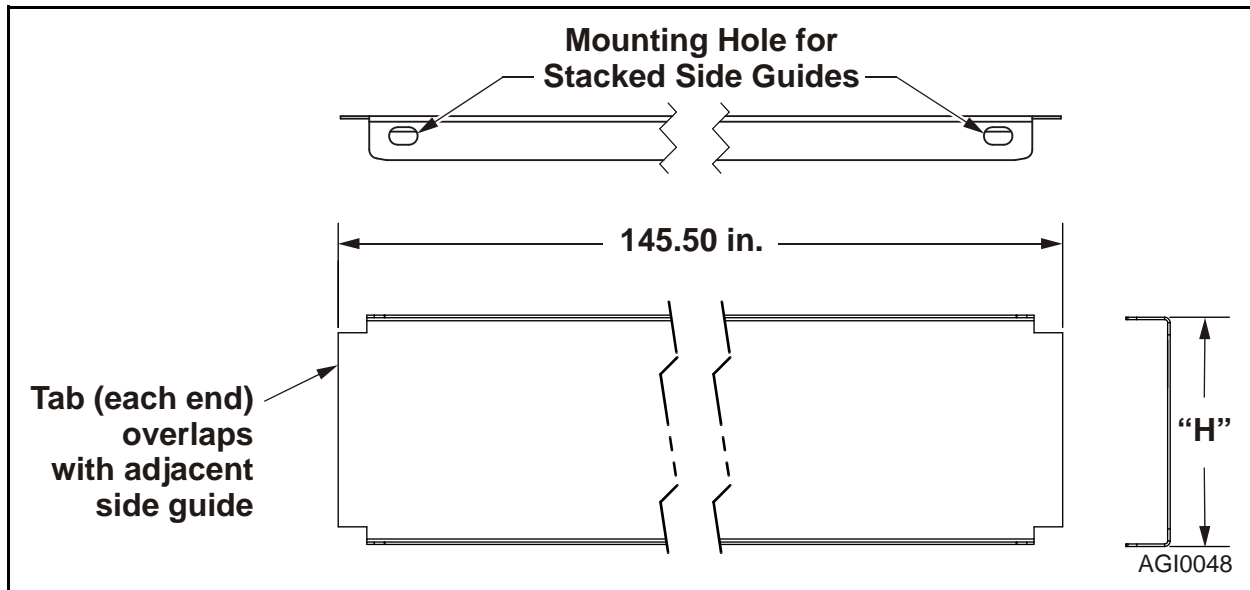


Figure 3 - 3 Straight Side Guide

**Overview** Used for all straight sections that do not require special guides.

**Specifications** Length: 12 feet, 1-1/2 inches  
 Height varies. See Part Numbers information below. If stacked on other side guides, total height limit of the stack (photo-eye and reflector side guides included) is 10 inches.

**Mounting Options**

- Direct-Mounted to the frame

**Mounting Hardware Kits** Provided for each mounting option. See Chapter 3 - Installation Procedures for detailed mounting information.

**Available Finishes**

- Powder-coated

Part Numbers	Part No.	“H” Height (inches)
	12000101	2.50
	12000102	6.50
	12000103	10.00 (used only in areas without PE/Reflector rails)
	12000104	7.50
	12000105	3.25
	12000106	4.00



**Photo-Eye and Reflector Side Guides**

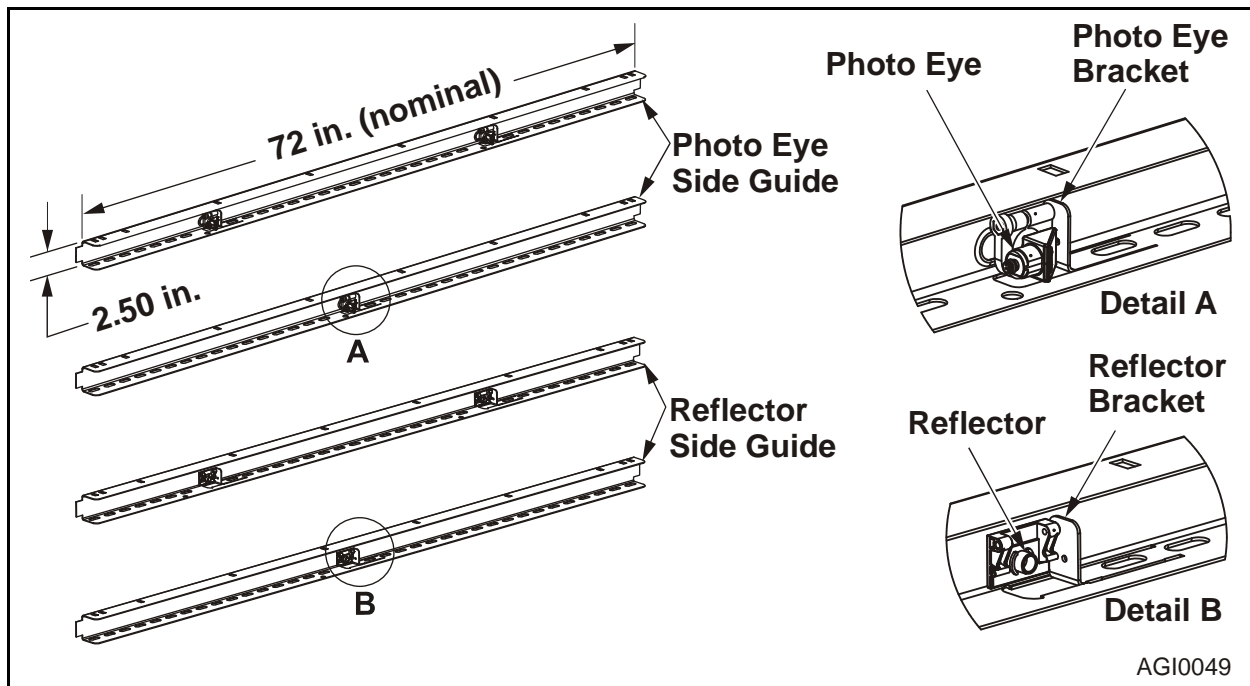


Figure 3 - 4 Photo-Eye and Reflector Side Guides

**Overview** Used for mounting photo-eyes and reflectors.

**Specifications** Length: 71.9 or 143.9 inches (6 or 12 feet nominal).  
See Part Numbers information below.  
Height: 2.50 inches.

**Mounting Options**

- Direct-Mounted to the frame

**Mounting Hardware Kits** Provided for each mounting option. See Chapter 3 - Installation Procedures for detailed mounting information.

**Avail. Finishes**

- Powder-coated

Part Numbers	Side Guide	Length	# of PE's/ Reflectors	PE/Reflector Spacing (feet)
Part No.	Type	(feet)		
40012601	Photo-Eye	6	2	3
40012602	Photo-Eye	12	4	3
40012701	Reflector	6	2	3
40012702	Reflector	12	4	3

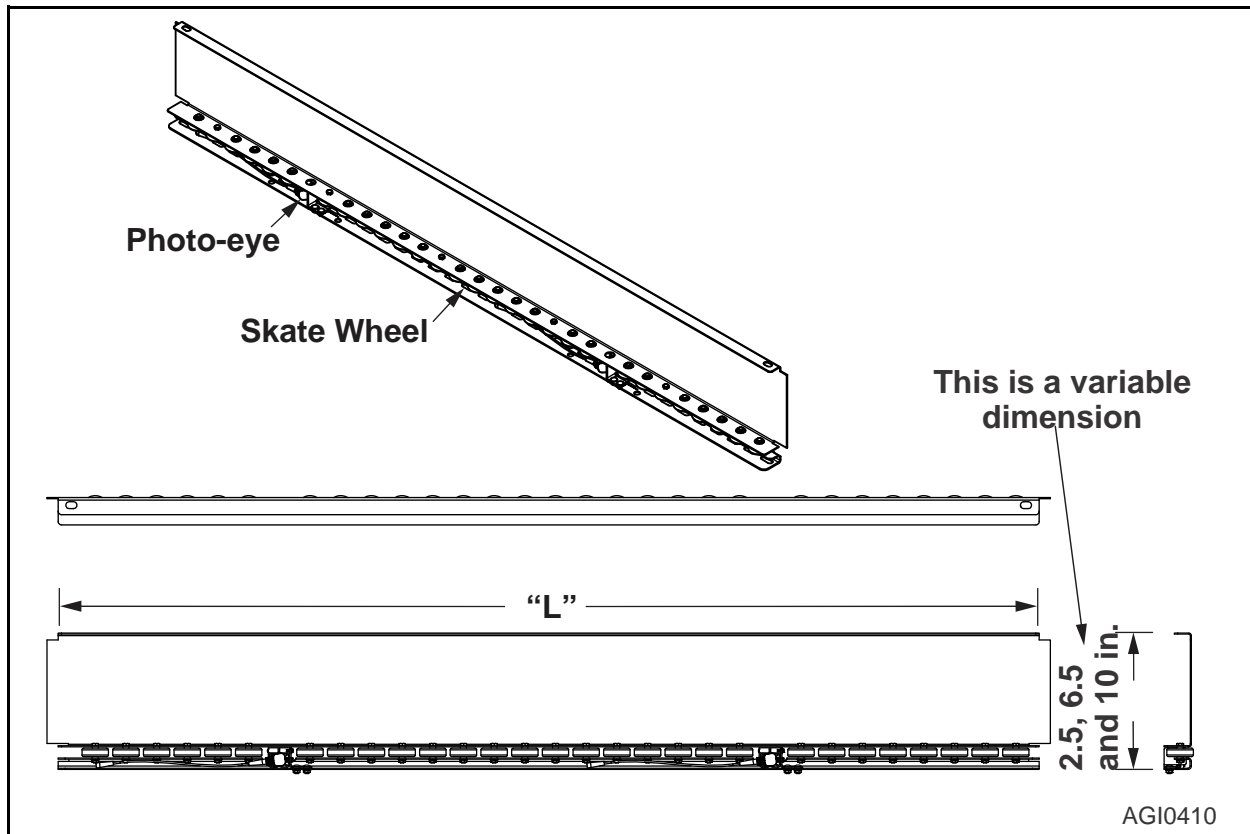
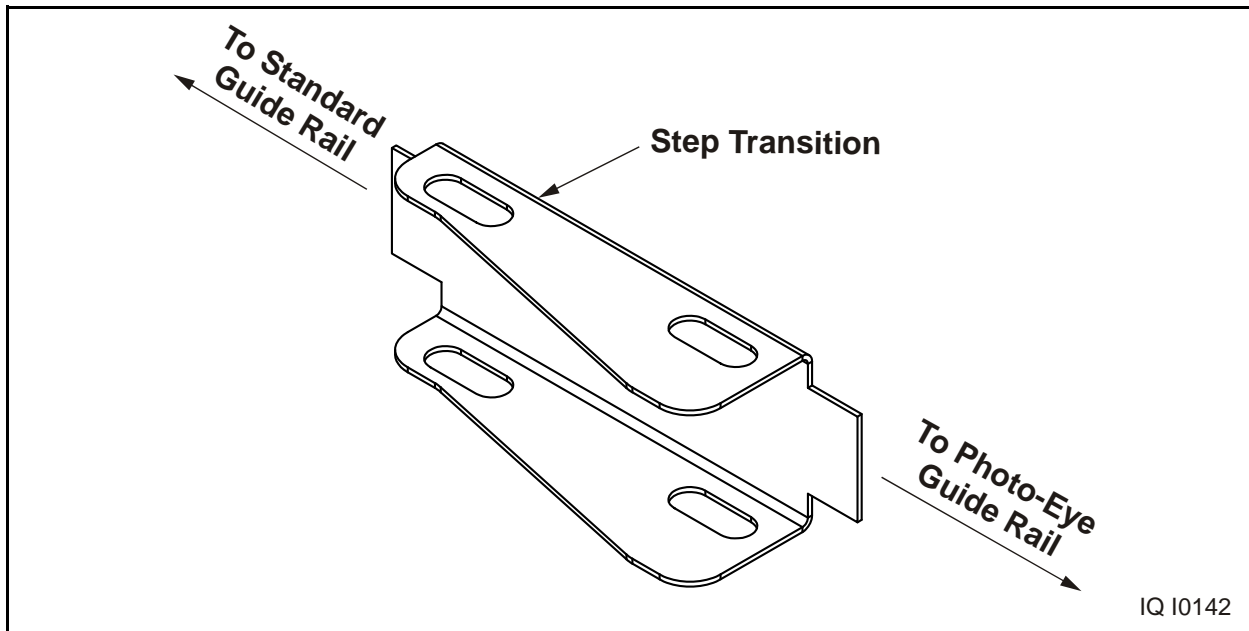
**Skate Wheel Side Guides**

Figure 3 - 5 Skate Wheel Side Guide - 10 inch height shown

Overview	Used for all straight sections where product is skewed to one side.
Specifications	Length: 6 and 12 foot lengths Height varies. See Part Numbers information below. Distance from the top of roller to the center of the skate wheel is 1 inch, and 11/16 inch to the bottom edge of the wheel . Equipped with SICK photo-eyes and reflectors.
Mounting Options	Direct-Mounted to the frame - Transportation Accuglide only.
Mounting Hardware Kits	Provided for direct mounting. See Installation Procedures chapter for detailed mounting information.
Available Finishes	Plain (powder coated)

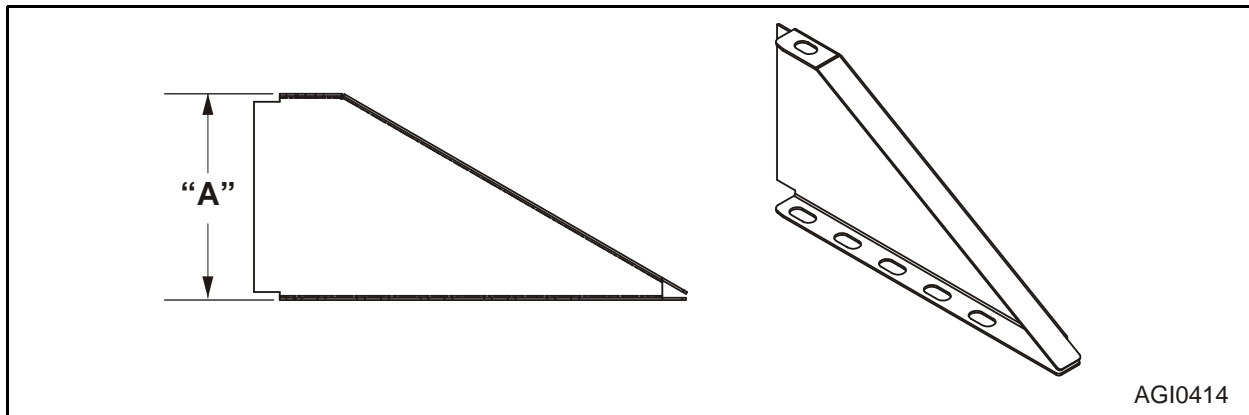
Part Numbers	Photo-Eye Part No.	Reflector Part No.	Length (feet)	Height (inches)	Zone Length (feet)
	12017901	12018401	6	2.50	3
	12017902	12018402	6	2.50	6
	12018001	12018501	12	2.50	3
	12018002	12018502	12	2.50	6
	12018101	12018601	6	6.50	3
	12018102	12018602	6	6.50	6
	12018201	12018701	12	6.50	3
	12018202	12018702	12	6.50	6
	12018301	12018801	6	10.00	3
	12018302	1208802	6	10.00	6
	12019501	12018901	12	10.00	3
	12019502	12018902	12	10.00	6

**Side Guide Transition - PE to Standard**

*Figure 3 - 6 Side Guide Transition - PE to Standard*

<b>Overview</b>	Used to transition from the 2.50-inch flange on photo-eye and reflector side guides to the 1-inch flange on a standard side guide.
<b>Specifications</b>	Height: 2.50 inches.
<b>Mounting Options</b>	<ul style="list-style-type: none"> <li>• Direct-Mounted to the frame</li> </ul>
<b>Mounting Hardware Kits</b>	Provided for each mounting option. See Chapter 3 - Installation Procedures for detailed mounting information.
<b>Avail. Finishes</b>	<ul style="list-style-type: none"> <li>• Powder-coated</li> </ul>
<b>Part Number</b>	40012800

**Side Guide Transition - End**



*Figure 3 - 7 Side Guide Transition - End*

**Overview** The Side Guide Transition with one end at 0 inches is used to end a side guide at the end of a conveyor line, or to transition from a conveyor section with side guides to a section without side guides.

**Specifications** Left-Hand and Right-Hand designations.  
 Length - varies  
 Height, Short Side of Transition - 0 inches  
 Height, Long Side of Transition - 2.50, 6.50, 7.50, and 10 inches  
 See Part Numbers information below.

**Mounting Options**

- Direct-Mounted to the frame

**Mounting Hardware Kits** Provided for each mounting option. See Chapter 3 - Installation Procedures for detailed mounting information.

**Available Finishes**

- Powder-coated

**Part Numbers**

Part No.	"A" (inches)	Designation
12012001	2.50	RH
12012002	6.50	RH
12012003	10	RH
12012007	7.50	RH
12012101	2.50	LH
12012102	6.50	LH
12012103	10	LH
12012107	7.50	LH



# 4 Engineering Data

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This chapter is an extension of Chapter 2 - Specifications. It contains the following detailed technical information:

- Conveyor Width Determination
- Live Load Requirement
- Release/Acceptance-Rate/Speed Requirement (Flow Rate)
- Power Requirements
- Motor Horsepower Formulas
- Speed Requirement
- Effective Pull Formula
- Air Consumption Determination
- Photo Eye Settings

## Power Requirements

The IntelliQ® Accumulation Conveyor motors require:

- Clean, electric power of 230, 460 or 575 volts, 3PH, 60 Hz; or 380 volts, 3PH, 50 Hz. controlled to within 10% of nominal,
- Power to be delivered through a lockable, fusible disconnect switch rated in horsepower,
- A separate disconnect switch, not fusible, located at the motor if the disconnect is not within sight, and not within 25 feet of the motor.

## Step 1 - Determine the Conveyor Width

Since the IntelliQ® Accumulation Conveyor is usually part of a larger conveyor system, the width of the conveyor is determined by either the upstream or downstream conveyor width.

If the IntelliQ® Accumulation Conveyor is a stand-alone conveyor, select a standard conveyor width (16 inches, 22 inches, 28 inches, 34 inches, or 40 inches) that is at least 2 inches wider than the widest product being conveyed. This minimizes the chance of product hanging up on the side guides and/or contacting the photo eye sensors. The width-dimension of the product is the dimension that is perpendicular to the conveyor's direction of travel.

## Step 2 - Determine the Live Load

Use the following formula to calculate the conveyor's "live load" (LL) requirement.

$$\text{Live Load (lbs/ft)} = \frac{\text{Total Weight on Conveyor (lbs)}}{\text{Conveyor Length (feet)}}$$

Note: Assume the conveyor to be fully-loaded with the heaviest product being conveyed.

DO NOT exceed 100 lbs./ft. Live Load (max.)

## Step 3 - Determine the Release, Acceptance-Rate/Speed Requirement

An IntelliQ® Accumulation Conveyor must be capable of releasing product at a rate (Release Rate) that meets the Flow Rate (FR) requirement of the adjoining downstream conveyor.

$$\begin{aligned} \text{Flow Rate (FR)} &= \text{Case Feet Per Minute (CFPM)} \\ &= \text{Number of cases per minute (max)} \times \text{Average Case Length} \end{aligned}$$

A conveyor's Release -Rate is determined by its Speed and Operational Mode.

Calculate the conveyor's Release -Rate/Speed requirement using the following formula.

$$\text{Speed/Release} = \frac{\text{Flow Rate of Downstream Conveyor/Equipment}}{\text{Release Rate Factor}}$$

**NOTE:** See Table 4 - 1 and Table 4 - 2 for Release Rate Factor information.



**Table 4 - 1 Release Rate Factors**

<b>Sensor/Location</b>	<b>Flow Control Mode</b>	<b>Release Rate (percentage of Design Speed)</b>	<b>Notes</b>
None	Transportation	Not Applicable	No Zone Control
SICK Retro-Reflective Photo Eye on Side Guide	Singulation	60 percent	Rate is estimated, not verified*
SICK Retro-Reflective Photo Eye on Side Guide	Singulation, Run-Up	50 percent	Rate is estimated, not verified*
SICK Retro-Reflective Photo Eye on Side Guide	True Singulation	50 percent	
SICK Diffused Photo Eye Under Rollers	All	50 percent	

\* Consult product engineer.

A conveyor's Release Rate capability is adversely affected when the weight of the product being conveyed increases. To compensate for these affects, multiply the calculated Release Rate in Table 4 - 1 by the appropriate factor in Table 4 - 2.

**Table 4 - 2 Product Weight Compensation Factors**

<b>Item</b>	<b>Product Weight</b>			
	<b>0 - 25 lbs.</b>	<b>25 - 35 lbs.</b>	<b>35 - 50 lbs.</b>	<b>50 - 100 lbs.</b>
Factor	1.00	0.95	0.90	0.85

## **Step 4 - Determine the Acceptance-Rate/Speed Requirement**

For this conveyor, the Acceptance Rate/Speed requirement is the same as the Release-Rate/Speed requirement.

## Step 5 - Determine the Conveyor Speed Requirement

The release-rate/speed requirement is the conveyor speed requirement. It is used to determine the power unit horsepower requirement. (See “Step 7 - Determine the Power Unit Horsepower” on page 6).

## Step 6 - Determine the Effective Belt Pull (EP)

Use the following formulas) to determine the Effective Belt Pull. Determine the pull prior to determining the conveyor's horsepower requirement.

The values of the following variables must be known before using this equation:

LL = Live Load (lbs./ft.)

CL = Conveyor Length (ft.) See Figure 4 - 1.

RF = Roller Friction Factor See Figure 4 - 2.

CW = conveyor Width (in.)

CRC = Roller Centers (in.)

B# = Belt Weight (lbs./ft.)

CS = Conveyor Speed

DE = Chain Drive Efficiency

RE = Reducer Efficiency

PR# = Pressure Roller Weight (lbs.)

PRC = Pressure Roller Centers (in.)

RRC = Return Roller Centers (in.)

BW = Belt Width

The following variables are derived from the equation:

CR# = Carrier Roller Weight (lbs.)

TM# = Total Moving Weight per Foot

Use the following equations to determine Effective Pull (EP):

$$CR\# = CW/12 \times 1.2 + (2 \times 0.178)$$

$$TM\# = LL + (2 \times B\#) + (CR\# \times 12/CRC) + (PR\# \times 12/PRC) + (RR\# \times 12/RRC)$$

$$\text{Effective Pull (EP)} = ((RF \times CL \times (LL + (2 \times B\#) + (CR \times 12/CRC) + (PR\# \times 12/PRC) + (RR\# \times 12/RRC))) + (TM\# \times CL \times 0))/0.85$$

DO NOT exceed 300 lbs. Effective Belt Pull (max.).

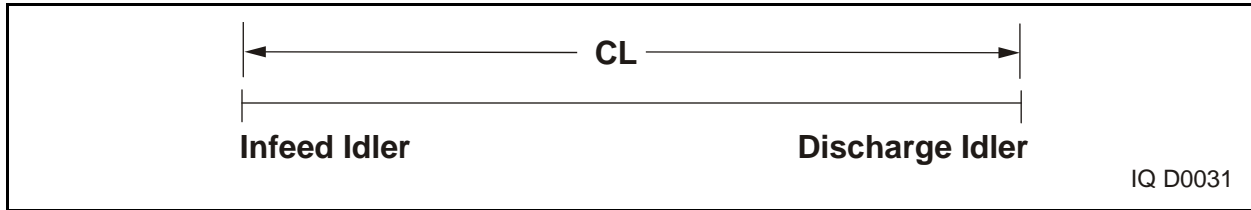


Figure 4 - 1 Conveyor Length

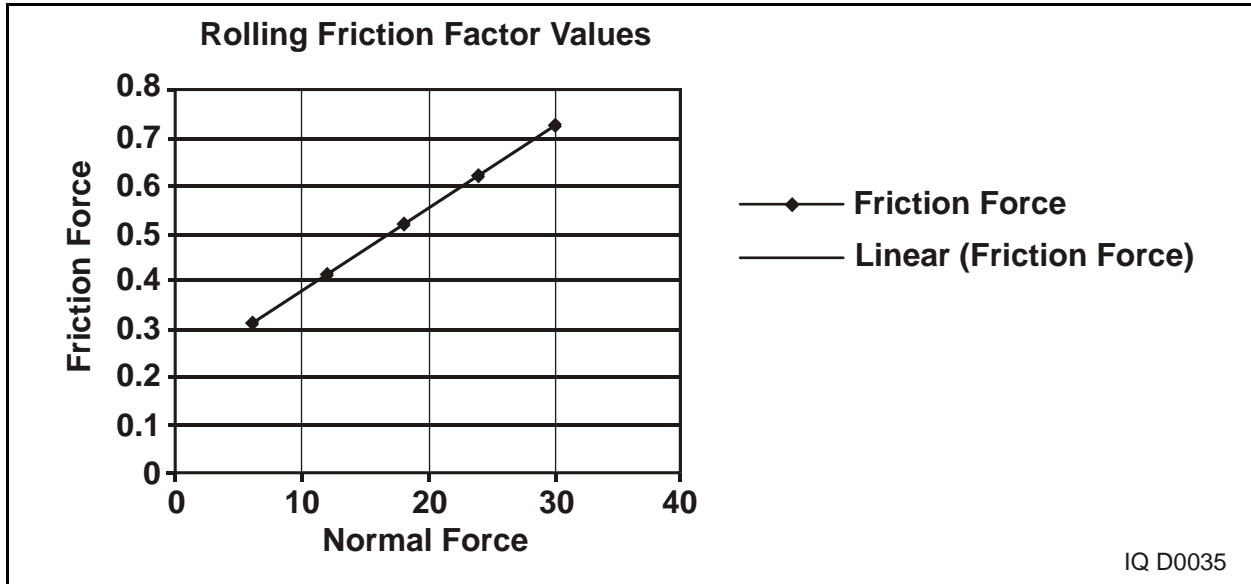


Figure 4 - 2 Rolling Friction Factor Values

## Step 7 - Determine the Power Unit Horsepower

Use either the following formula or Table 4 - 3 (below) to identify the power unit's horsepower requirement based on the conveyor's Speed and Effective Chain Pull requirements.

$$HP = \frac{EP \times V}{29,700}$$

Nomenclature Key:

HP = Horsepower

EP = Effective Chain Pull (pounds)

V = Velocity (conveyor speed - fpm)

To use Table 4 - 3 to identify the power unit's horsepower requirement:

1. Find the required speed in the Conveyor Speed column.
2. Look across the row containing the required conveyor speed, and locate an effective pull capacity rating that exceeds the conveyor's requirement. (See "Step 6 - Determine the Effective Belt Pull (EP)" on page 4.)
3. Find the required horsepower, listed at the top of the column containing the correct effective pull rating.

Table 4 - 3 Determining the Power Unit Horsepower

Conveyor Speed	Horsepower					
	.75	1.00	1.50	2.00	3.00	5.00
60 FPM	268	300	X	X	X	X
90 FPM	188	253	300	X	X	X
120 FPM	149	198	294	300	X	X
150 FPM	120	163	238	300	X	X
180 FPM	103	138	210	280	300	X
210 FPM	90	120	182	240	300	X
240 FPM	81	108	164	220	300	X
270 FPM	72	96	145	194	293	300
300 FPM	64	86	129	173	262	300
350 FPM	56	74	112	150	227	290
400 FPM	51	68	102	136	202	300

## Step 8 - Determine the Photo Eye Settings

Three variables determine the correct location and alignment of the photo eye:

- Operational Zone -- the area of the conveyor controlled by the photo eye,
- Placement of the Photo Eye -- the distance of the photo eye from the end of the control zone in which it is located, and
- Placement of the Reflector -- how far upstream the reflector is from the photo eye.

### Determine the Operational Zone

The conveyor line is divided into operational zones. An operational zone is a length of conveyor (measured in feet) in which rollers are either “powered” or “non-powered” in response to a signal based on the status of a particular photo eye. See Chapter 1 - General Description for explanations of each acceptance/release method. See Table 4 - 4 to determine the operational zone control for your application.

**NOTE:** Slug acceptance mode activates all designated slug zones simultaneously. When product reaches the furthest downstream Slug Acceptance Zone, it accumulates according to the logic modules installed in the remaining downstream zones.

Slug release mode activates all designated slug zones simultaneously. The number of zones activated is determined by the Slug Terminator Cable. The zones downstream from the Slug Terminator Cable release as soon as the slug release zone furthest downstream becomes clear.

Table 4 - 4 Determining the Operational Zone

Zone Control Name	Zone Control	Product Acceptance Modes	Product Release Modes
Zero-Zone Look-Ahead (also called Local Zone Control)	The photo eye (PE) is in the same operational zone as the rollers it controls.	Run-Up	None

Table 4 - 4 Determining the Operational Zone

Zone Control Name	Zone Control	Product Acceptance Modes	Product Release Modes
One-Zone Look-Ahead	The PE is in the operational zone immediately downstream (towards the discharge end of the conveyor) from the rollers it controls.	True Singulation	True Singulation  Singulation (one PE controls the rollers in the preceding 2 upstream zones)
Two-Zone Look-Ahead	The PE's are in the first and second operational zones downstream (towards the discharge end of the conveyor) from the rollers they control.	Singulation	None

**Determine the Placement of the Photo Eye**

The photo eye is always in the same location for all zone control methods. See Figure 4 - 3 for the correct placement of the photo eye.

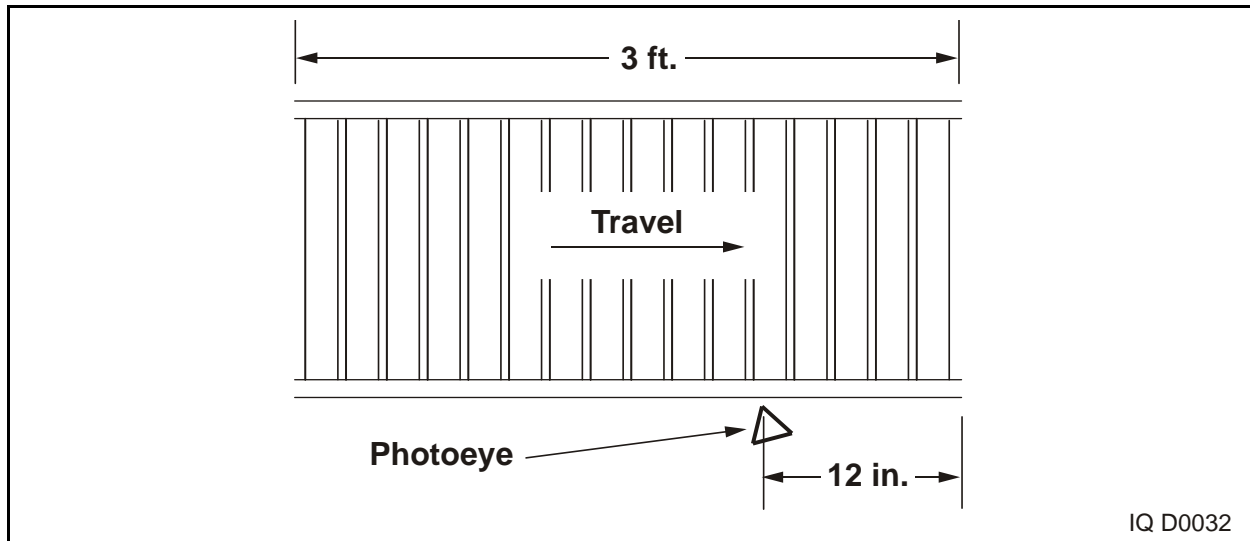


Figure 4 - 3 Photo Eye Placement for Zone Control

## Determine the Placement of the Reflector

The reflector is placed a specific distance downstream from the photo eye. The placement of the reflector is determined by the product shape (box or tapered tote).

**NOTE:** For boxes, the default photo eye/reflector offset (distance between the photo eye and the reflector) is 2 inches. The offset distance is measured along the axis of the direction of travel.

See Figure 4 - 4 and Figure 4 - 5 to determine the correct placement of the reflector.

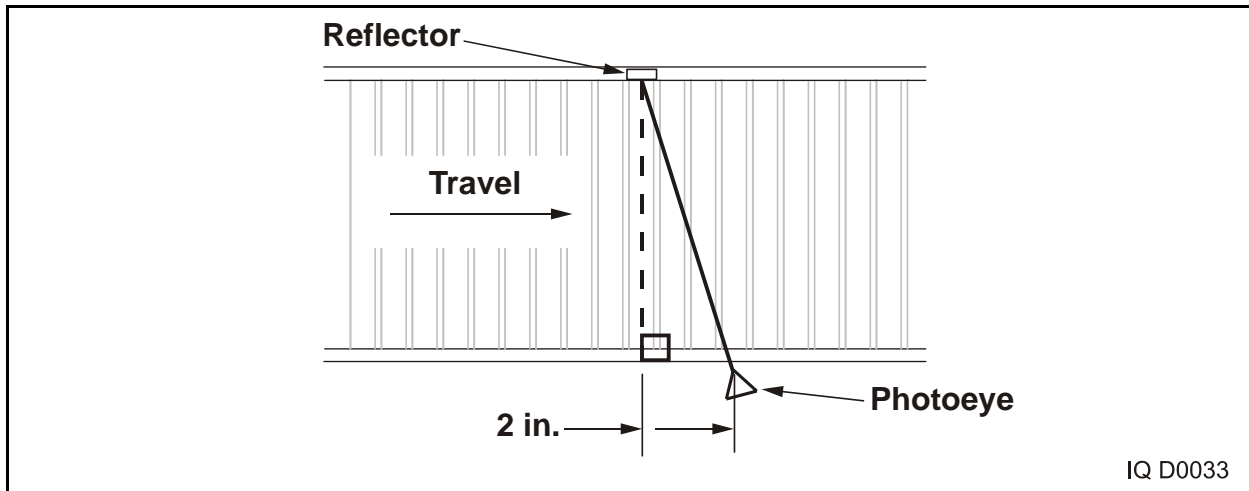


Figure 4 - 4 Reflector Placement for Zone Control - Boxes

**NOTE:** For tapered totes, the default photo eye offset (distance between the photo eye and the reflector) is 6 inches. The allowed photo eye offset range is 2-18 inches. The offset distance is measured along the axis of the direction of travel.

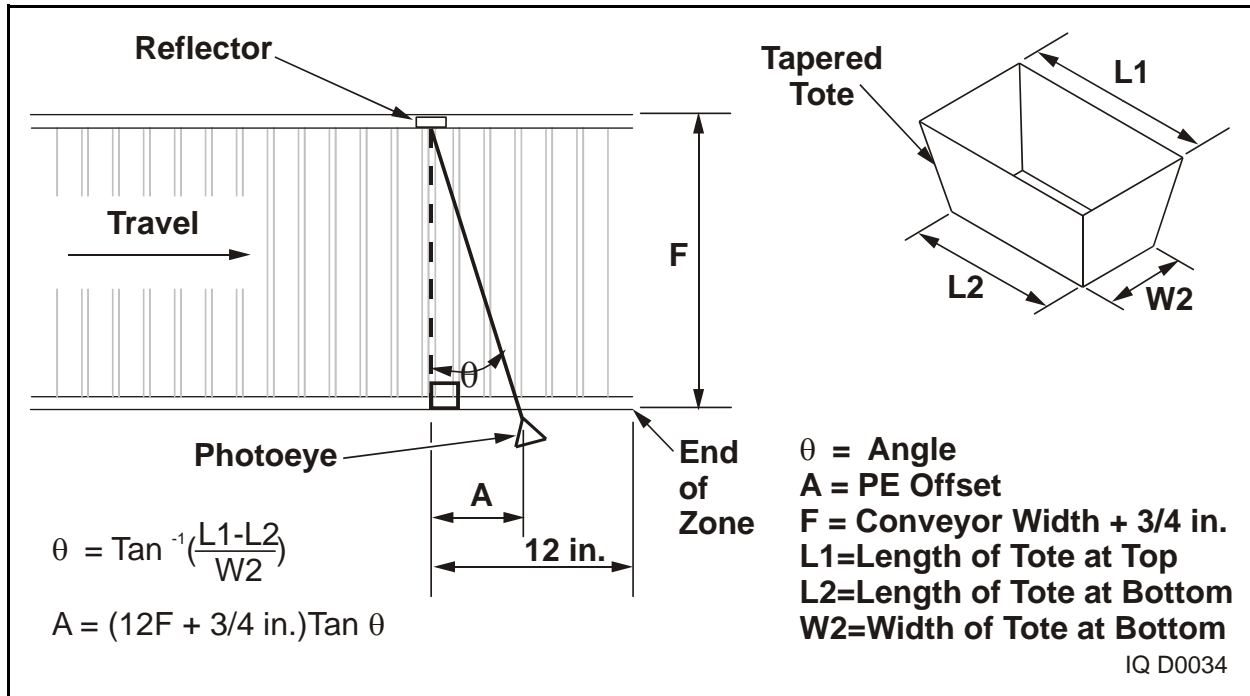


Figure 4 - 5 Reflector Placement for Zone Control - Tapered Totes

**NOTE:** Include detailed dimensions on the positions of the photo eyes and reflectors on the system layout drawings. The photo eyes and reflectors are pre-installed into side guides, which are mounted in the field.



## Step 9 - Determine the Air Consumption

Air consumption occurs while product is in transit or being released. Air is not consumed while cases are at rest (accumulated on the conveyor). The following calculation is based on singulation release, which is worst case.

The values of the following variables must be known before using this equation:

CL = Conveyor Length (feet)

SP = Conveyor Speed (FPM)

PL = Average Product (Carton) Length (inches)

The following value is constant:

SCF (Diaphragm SCF Per Zone) = 0.00064

The following variables are derived from the equation:

NZ = Number of Control Zones on the Conveyor

CR = Case Rate (CPM)

NCS = Number of Cases in Singulation

CM = Cycles per Minute

Air Consumption:

$NZ = CL/3$

$CR = SP/(PL/12)$

$NCS = CR/2$

$CM = NCS \times NZ$

$Total\ Flow\ (SCFM) = CM \times SCF$

## Step 10 - Determine the Belt Length

The belt is cut to the customer's specifications. Use the following formula to determine the Belt Length (in feet).

**NOTE:** This formula can be used for a welded or mechanically spliced belt. It provides two to three feet of extra length to cover length lost during the splicing or welding process.

For Straight Conveyor:

$$\text{Belt Length} = (\text{CL} \times 2) + 12$$

Nomenclature Key:

CL = Conveyor Length (ft.)

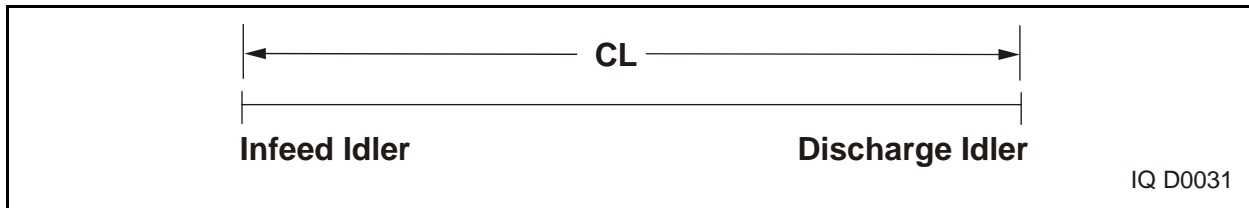


Figure 4 - 6 Calculating Belt Length

# 5 Layout Dimensions

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In this chapter, dimensions are given for conveyor components mentioned in the General Description chapter. The main conveyor sections are:

- Infeed Idler
- Intermediate Section
- Center Drives - Standard and Low Profile
- Discharge Idler

Use the following information for designing a layout for the IntelliQ® Accumulation Conveyor. All dimensions are in inches.

## Frames and Rollers

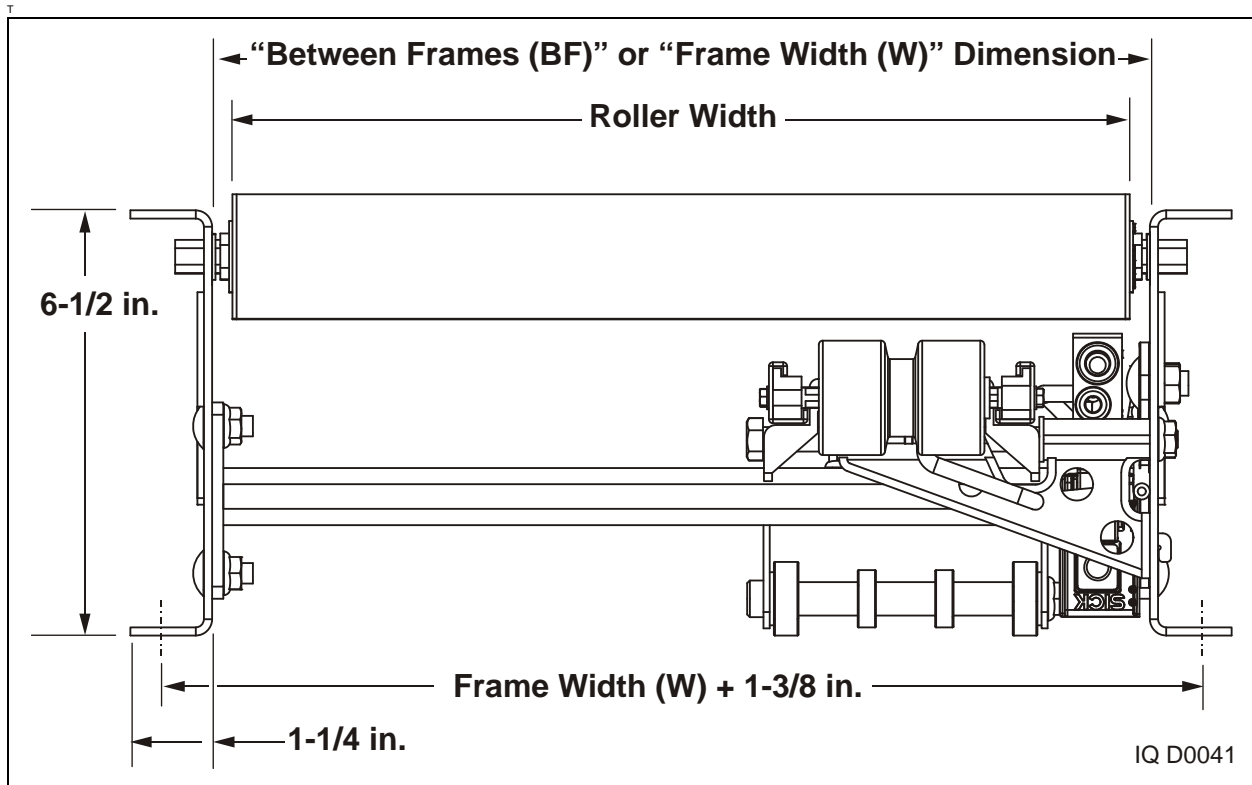


Figure 5 - 1 Frame and Roller

## Conveyor Line

See Chapter 5 - Application Guidelines for Effective Belt Pull calculations.

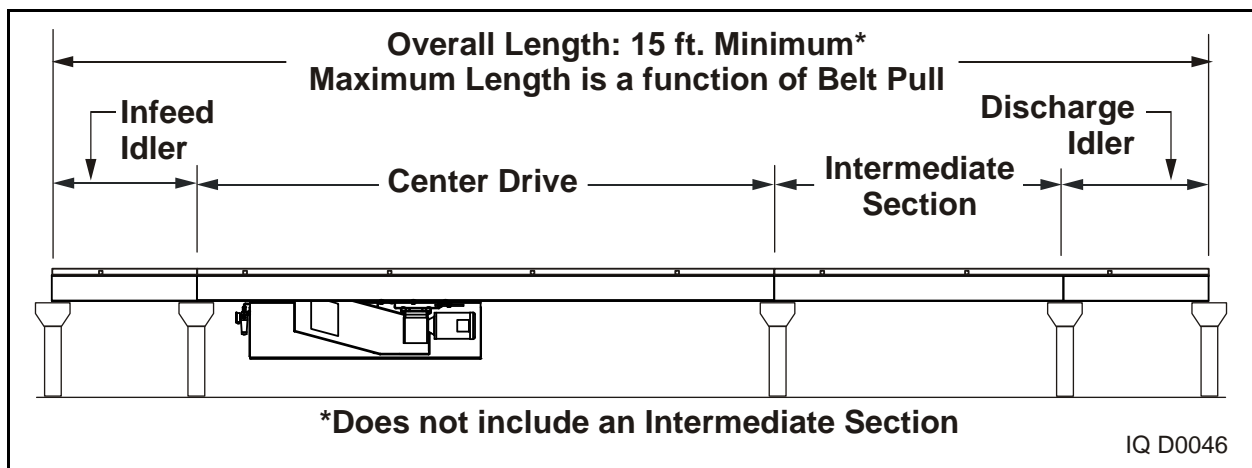


Figure 5 - 2 Overall Conveyor Line

## Infeed Idler

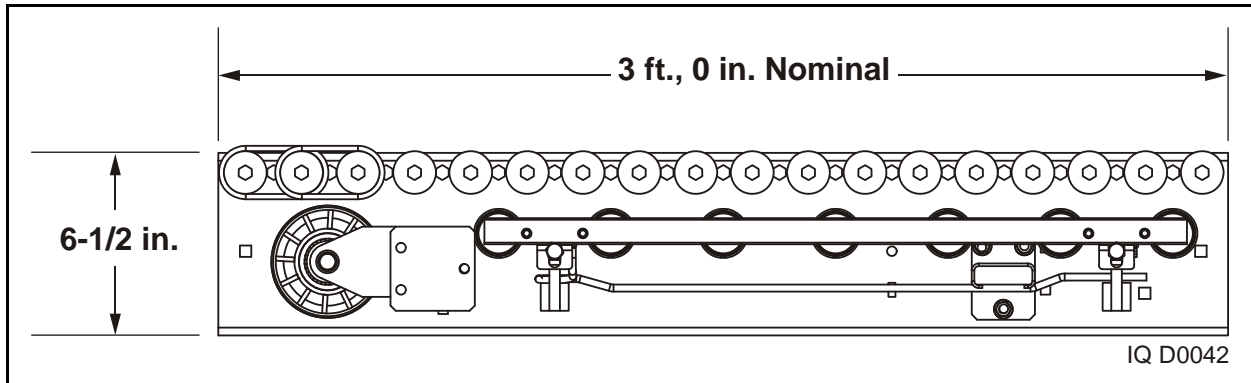


Figure 5 - 3 Layout Dimensions - Infeed Idler

## Intermediates

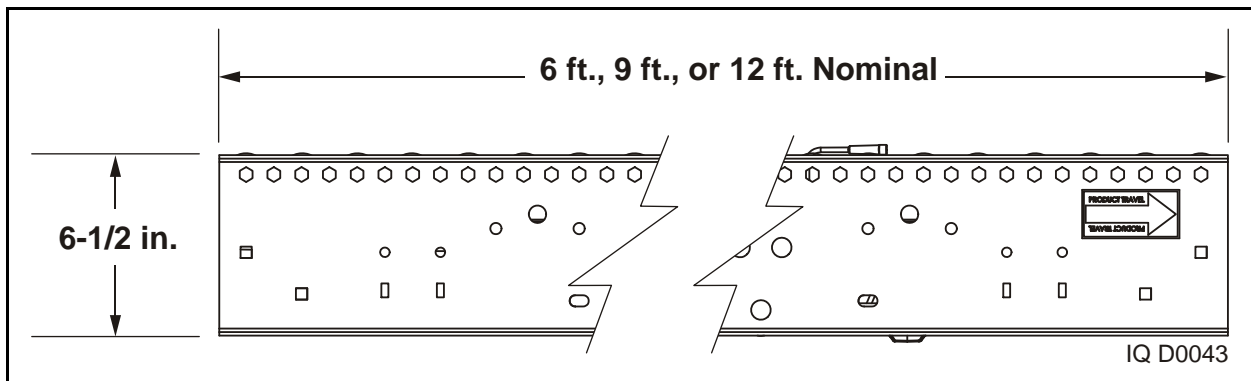


Figure 5 - 4 Intermediates

## Discharge Idler

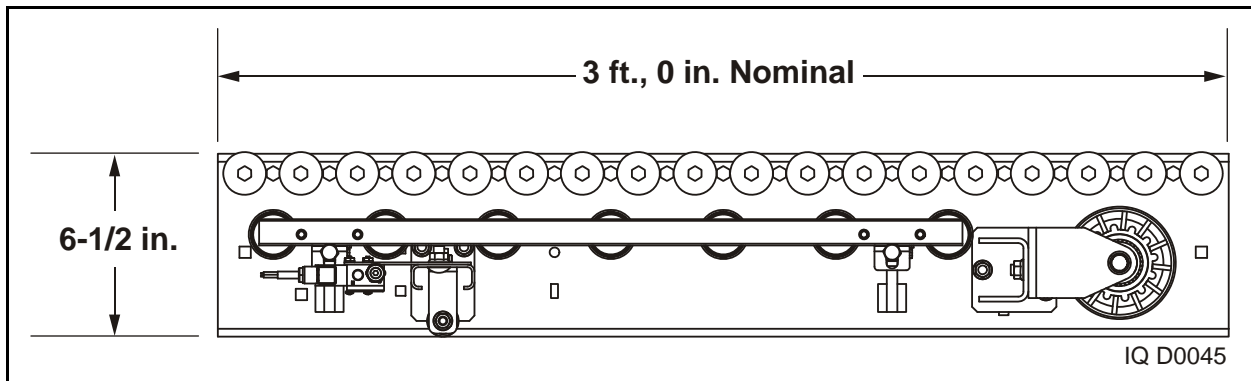


Figure 5 - 5 Discharge Idler

# Center Drive - Standard

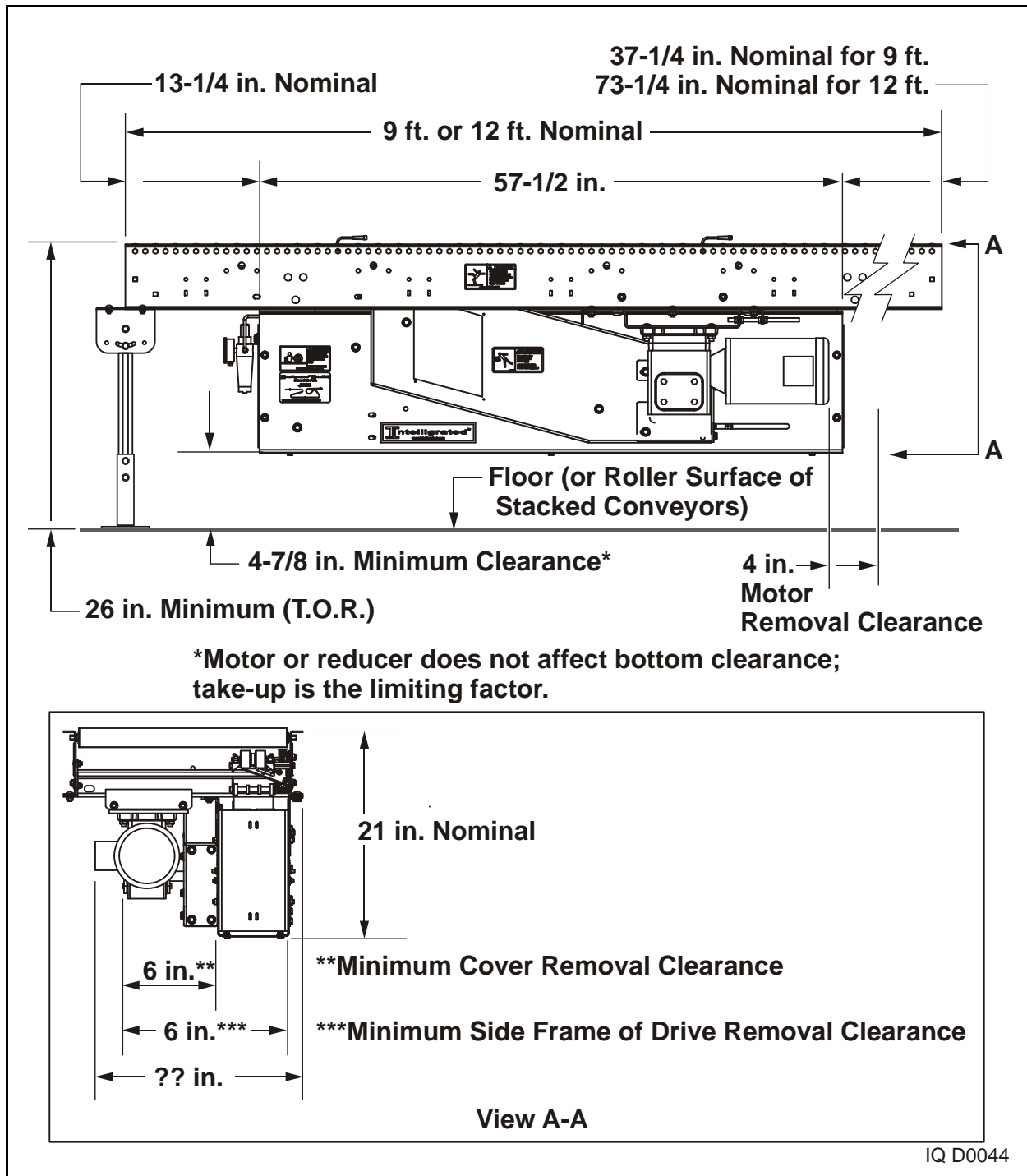


Figure 5 - 6 Center Drive - Standard, 9 and 12 Feet Long

# Center Drive - Low Profile

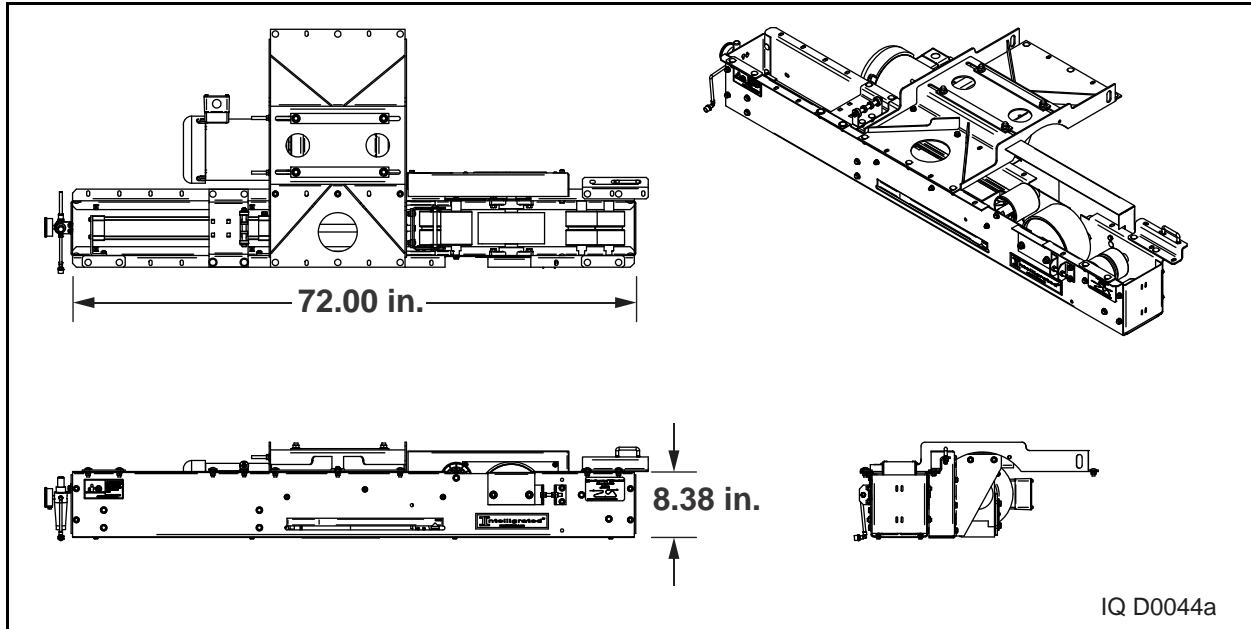


Figure 5 - 7 Center Drive - Low Profile, 9 and 12 Feet Long





# 6 Controls

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This chapter contains descriptions and illustrations of control components used on the IntelliQ® Accumulation Conveyor.

For an explanation of how the components are used to control the flow of product on the conveyor, see the General Description chapter.

## Photo Eyes and Reflectors

The IntelliQ® Accumulation Conveyor is equipped with retro-reflective or diffused photo eyes to sense the presence of product in the accumulation zones. Specially designed logic modules work in conjunction with the photo eye sensors to achieve the various accumulation and release modes.

Mounting brackets are manufactured into the side guide to serve as mounting points for the photo eyes and reflectors. The integral bracket is designed to be bolted to the conveyor frame independent of the side guide to isolate it from any flexing of the side guide due to product pressing against it. Slots have also been stamped through the side of the side guide for the light source to pass through. The edges of the slots are recessed to prohibit packages from catching on them.

### Retro-Reflective Photo-Eyes

<b>Application</b>	Standard photo-electric sensor used to detect product within the zone.
<b>Voltage</b>	24 VDC
<b>Output</b>	PNP, dark-operated.
<b>Mounting</b>	Mounted to integral brackets in the side guide using a ball mount. Mounting protects the photo-eye from passing product, and allows for easy adjustment for alignment with reflector. Extended flanges on the side guide channel protect the photo-eye from passers-by.
<b>Cord / Connector</b>	Four (4) pin male PICO QD connector; connects to the Solenoid Control Module's 25 inch cable with female connector.
<b>Cord Length</b>	NA
<b>Voltage Range</b>	10-30 VDC
<b>Sensing Range</b>	12 feet
<b>Temperature Range</b>	-4° to +158°F
<b>LED Indicators</b>	Amber LED "ON" indicates photo-eye is aligned with the reflector and is unblocked. Green LED "ON" indicates sensor has power.
<b>Reflector</b>	Mounted with screws to integral brackets in the side guide. Locating stud correctly aligns reflector.

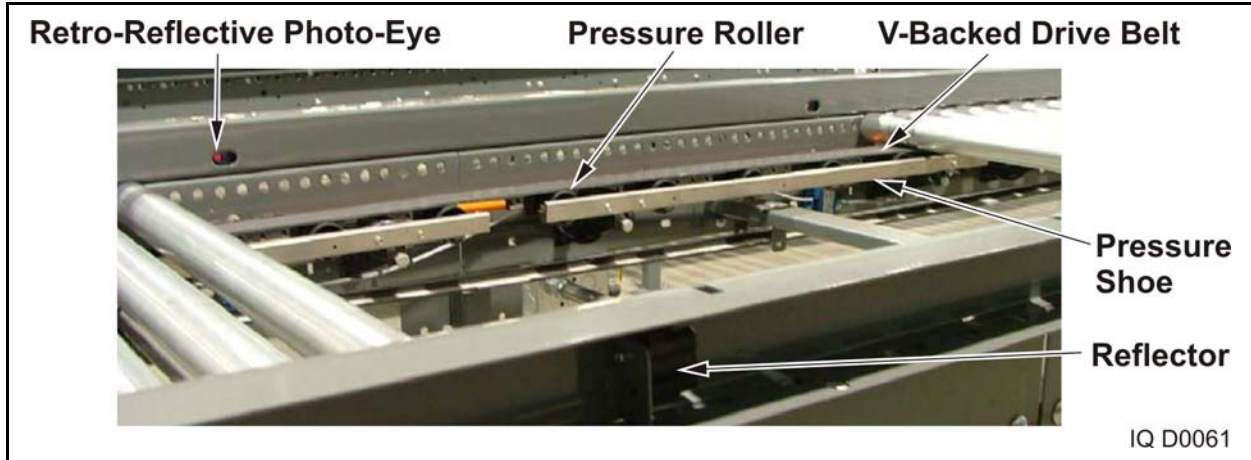


Figure 6 - 1 Retro-Reflective Photo-Eye and Reflector



Figure 6 - 2 Retro-reflective Photo-Eye (Ball Mount)

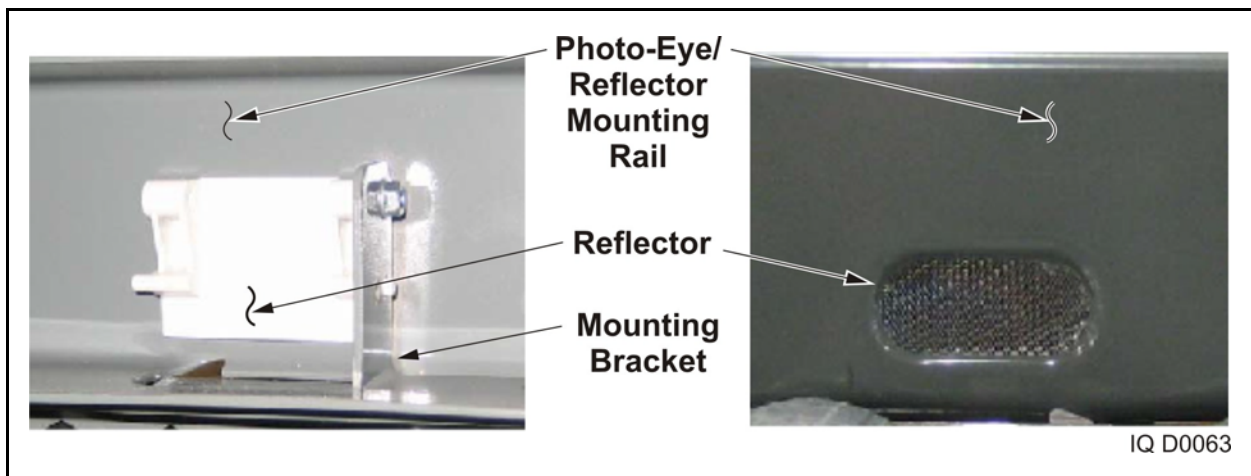


Figure 6 - 3 Reflector

**Diffused Photo Eye with Integral Valve**

<b>Application</b>	Used in applications where side guide cannot be installed.
<b>Voltage</b>	10-30 VDC
<b>Output</b>	PNP, light-operated.
<b>Mounting</b>	Mounted below the rollers so that the top of the sensor is at least 1/4 inch below the high point of the adjacent rollers.
<b>Cord / Connector</b>	Photo-eye mounted directly to zone control valve (no cable or connector).
<b>Cord Length</b>	NA
<b>Voltage Range</b>	10-30 VDC
<b>Sensing Range</b>	Variable, up to 900 mm. Adjust gain using black dial on top of sensor.
<b>Temperature Range</b>	-4° to +158°F
<b>LED Indicators</b>	White LED on top of sensor. Brightness increases when product is sensed.
<b>Reflector</b>	None

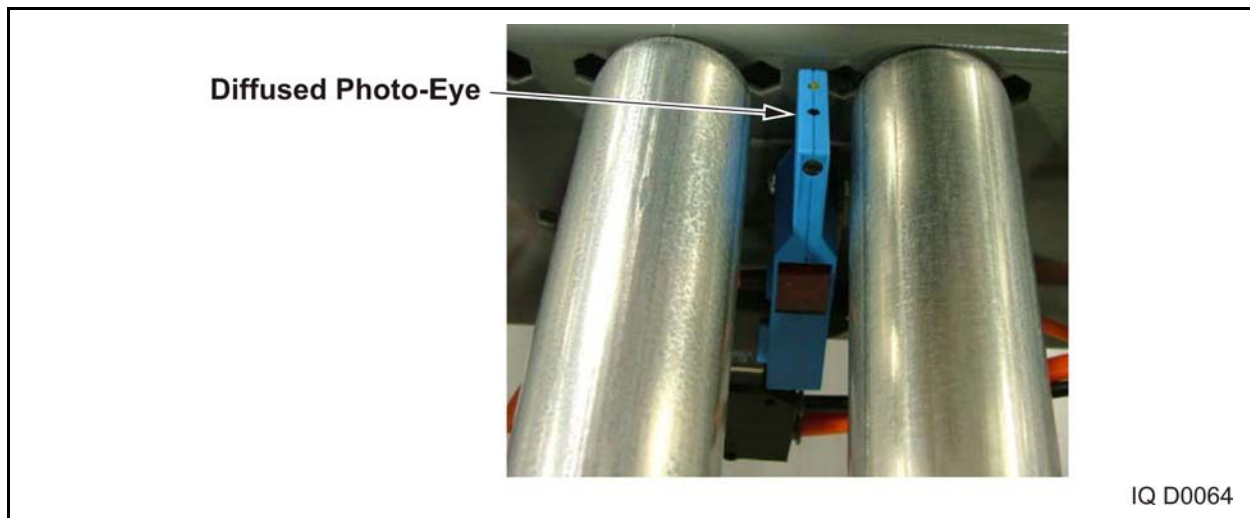


Figure 6 - 4 Diffused Photo Eye

# 7 Application Guidelines

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This chapter contains an overview of the product line, as well as descriptions of features and functions. It provides information on factors to take in consideration when designing a conveyor line. Consult the manufacturer if there are requirements for an IntelliQ® Accumulation Conveyor with specifications outside those described in this chapter.

## Functions

The IntelliQ® Accumulation Conveyor is designed for highly mechanized distribution centers. The conveyor:

- Provides quiet, high-speed transportation of product (cartons, cases, totes, etc.),
- Enables gentle, zero-pressure accumulation of product; and
- Provides efficient, high-rate release of accumulated product.

The conveyor can be stand-alone, or can be integrated into other upstream or downstream conveyor systems.

## Available Design Options

The IntelliQ® Accumulation Conveyor consists of the following sections, see Figure 7 - 1:

- Infeed Idler (required) - 3 feet long,
- Center Drive - Standard and Low Profile (required) - always the first or second section after the Infeed Idler, pre-assembled to a 9 or 12 foot long Intermediate Section,
- Intermediate Section (optional) - 6, 9, or 12 feet long,
- Field-Assembled Skew Kit (optional) - available as an accessory, but not recommended. The recommended method for aligning product to one side of the conveyor is the placement of a V-Belt conveyor with a hard skew immediately upstream from the IntelliQ® Accumulation Conveyor.
- Discharge Idler (required) - always the last section, 3 feet long; optional brake or pop-up stop available.

The IntelliQ® Accumulation Conveyor has no curves or junctions.

See Chapter 2 - Specifications for more detailed descriptions of the conveyor sections, frames and rollers.

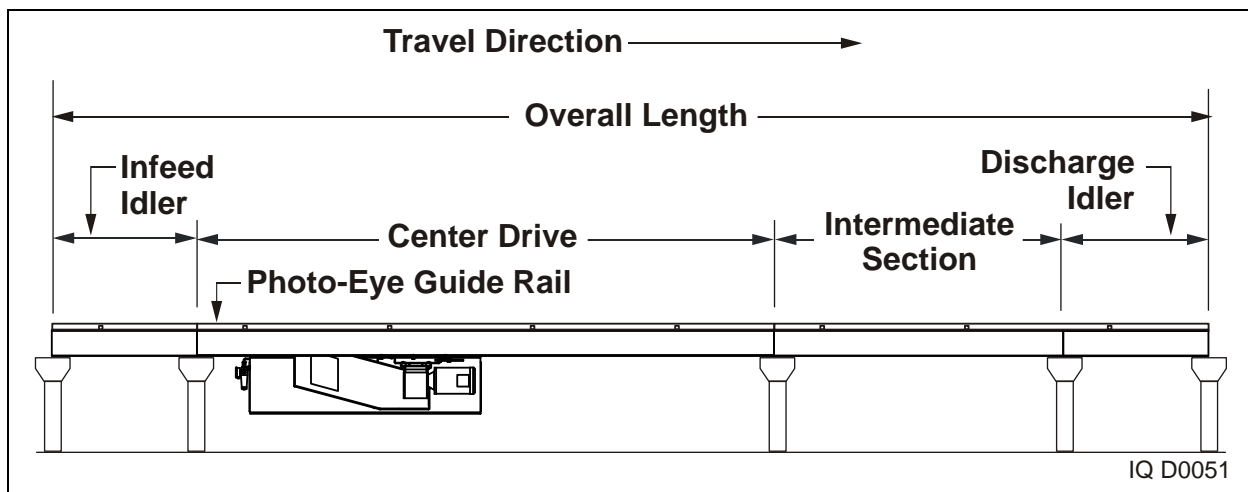


Figure 7 - 1 IntelliQ® Accumulation Conveyor Design Options

## Description of Operation

The conveyor is divided into three-foot zones. Each zone is equipped with a retro-reflective or diffused photo eye to sense the presence of product in the zone, and each photo eye is connected to a logic module with an integrated pneumatic valve. Typically, the photo eye controls the state of the next upstream zone. This means that the

photo eye in Zone #1 (furthest downstream) controls the state of Zone #2, the photo eye in Zone #2 controls the state of Zone #3 (furthest upstream), and so on. The type of logic module used determines the acceptance and release methods.

When a zone is cleared of product, the photo eye becomes unblocked. The photo eye sensor then sends a signal to the logic module that there is no product present, causing the logic module to energize the solenoid on the pneumatic valve.

With the pneumatic valve energized, air is supplied to the Air Diaphragms, see Figure 7 - 2. As the Air Diaphragms inflate, they raise the Pressure Shoe and Pressure Rollers, which push the V-Backed Belt up to contact the undersides of the rollers. The V-Backed Belt then drives the Rollers.

When the photo eye becomes blocked, it signifies that the zone is full. It sends a signal, causing the Air Diaphragms to deflate, lowering the V-Backed Belt. The V-Backed Belt stops driving the rollers.

**NOTE:** The V-Backed Belt runs continuously, and receives its driving power from an integral drive/power unit located in the Center Drive. When the Pressure Shoe Assemblies are raised, they cause every roller above them to be driven: either directly by the V-Backed Belt, or by Power Transfer Bands attached to the rollers.

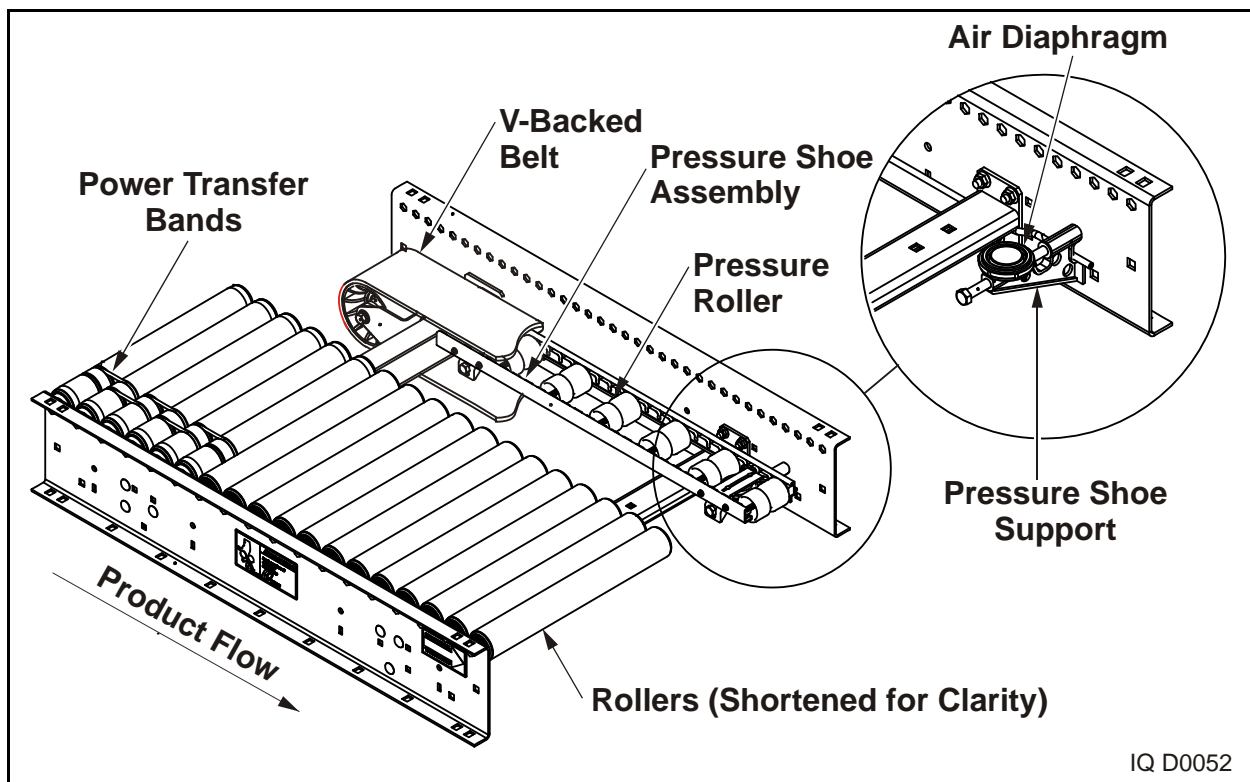


Figure 7 - 2 Description of Operation

The Discharge Idler is usually connected to a downstream conveyor, but it can be a stand-alone conveyor end-point. An optional brake or pop-up stop helps to control product flow.

## Product Flow Control

The flow of the product is controlled by a system consisting of photo eyes, logic modules, and pneumatically-operated air diaphragms. The acceptance/release methods are singulation, true singulation, and slug. Table 7 - 1 details the application recommendations for each acceptance/release method. Table 7 - 2 lists the types of logic modules needed to accomplish the various acceptance and release methods. See the General Description chapter for explanations of each acceptance/release method.

Table 7 - 1 Acceptance/Release Methods-Applications

Acceptance/Release Method	Application Notes
Singulation Acceptance-Standard	Typically results in somewhat denser accumulation than True Singulation Acceptance.
Singulation Acceptance-Run-Up	Used for very lightweight cartons that do not coast well.
True Singulation Acceptance	Introduces gaps in slugs of product.
Slug Acceptance	Used at infeed end of accumulation conveyor to positively convey product away from an upstream conveyor (such as the divert lane of a sorter) in one slug.
Singulation Release	After releasing approximately six feet of product at start-up, releases product in three-foot-long groups separated by three-foot-long gaps.
True Singulation Release	Introduces gaps between cartons. Product is not released from a zone until the zone immediately downstream has cleared.
Slug Release	Typically used at discharge end of accumulation conveyor to clear product from a conveyor. Releases all product downstream from the Slug Terminator cable as one slug.

Table 7 - 2 PE Acceptance/Release Methods-Components

Acceptance/Release Method	Logic Module Required	Additional Components Required
Singulation Acceptance-Standard	Singulation Module	None



<b>Acceptance/Release Method</b>	<b>Logic Module Required</b>	<b>Additional Components Required</b>
Singulation Acceptance-Run-Up	Singulation Module	None. Same logic as Standard Singulation, except for connection of the air line to a different zone.
True Singulation Acceptance	True Singulation Module	None
Slug Acceptance	Slug Module	Zone Interface Module (ZIM) wired to the infeed end of the conveyor
Singulation Release	Singulation Module	None
True Singulation Release	True Singulation Module	None
Slug Release	Singulation or True Singulation Module	Zone Interface Module (ZIM) wired to the discharge end of the conveyor Slug Terminator Cable

**NOTE:** Accumulation and release modes are determined by the zone controller. The IntelliQ® Accumulation Conveyor currently uses SICK single-zone ZLM modules. These modules do not allow for DIP-switch-selectable release modes, and do not feature Auto-Slug mode. A mode similar to Auto-Slug can be achieved by replacing some of the True Singulation modules with local slug modules. Consult product engineer for details.

## Conveyor Speed/Product Flow Rate

Speeds are measured directly above the drive belt. Carrying speeds are uniform across the width for all sections.

Correct speed of operation is important. The conveyor should run faster than the feeding units and equal to, or slower than the receiving units. This ensures product items are not forced onto the conveyor units, nor restrained from leaving them. To minimize noise and energy usage, select the lowest conveyor speed that will provide the required flow rate and/or accumulation density.

It is recommended that the transportation, accumulation, and release of product be limited to speeds of 240 fpm or less. If a higher speed is required, the application should be reviewed and the product tested at the desired speed to determine whether it is able to be satisfactorily handled.

Flow Rate is also important. It is the amount of product that a conveyor will transport and is measured in “case-feet-per-minute” (CFPM). The conveyor must have sufficient flow rate to: 1) match or exceed the upstream conveyor's flow rate; and 2) release sufficient product to meet the downstream conveyor's product flow-rate requirement.

Selection of the conveyor's operational-mode and speed is based on its flow-rate requirement. Both upstream and downstream speed and flow-rate requirements must be identified as part of establishing the IntelliQ® Accumulation Conveyor's speed/flow rate.

See the Engineering Data chapter for Flow Rate formulas.

## Product Requirements

The following must be considered when engineering a material handling system to ensure satisfactory operation.

### Product Weight

Table 7 - 3 Product Weight (Minimum/Maximum)

Minimum Product Weight	< 5 pounds
Maximum Product Weight	200 pounds
Capacity Live Load	100 lbs./ft.

While there is no set minimum product weight limitation, it is important to consider the following two factors:

#### **Product Transportation**

Light weight product (less than 2 pounds) may not convey smoothly as it has a tendency to bounce around due to conveyor vibration, air currents, etc. especially at higher speeds.

#### **Product Accumulation**

Light-weight product stops abruptly upon entering a non-powered operational zone, if the rollers have had sufficient time to stop turning. The next, trailing product will bump the non-moving product and push it further into the non-powered zone.

A conveyed product must not exceed the frame's rated capacity of 100 lbs./ft. When conveying heavier product, it is necessary to account for its greater mass and increased momentum. Heavy products will coast further than light loads into a non-powered zone. This may limit the conveyor's maximum speed, especially when handling a mix of load weights. See "Accumulation Density" on page 8 for more information.

#### **Product Release**

Heavier products restart and accelerate at a slower rate than lighter products. This adversely affects the conveyor's Release Rate. See the Product Weight Compensation Factors table in Chapter 3 - Engineering Data.

## **Product Height - Minimum and Maximum**

- Minimum - For Intermediate Straight Sections, the minimum product height should be at least one inch, to ensure that the photo eye sensor can detect the conveyed product.
- Maximum - The maximum product height is limited by the ability of an accumulated product to remain upright when its “non-powered” operational zone returns to its “powered” state.

## **Product Length - Minimum and Maximum**

- Minimum - The minimum product length is determined by the roller centers of the conveyor's Center Drive. A product's length must be at least 3X the roller centers to ensure that the product is supported by three rollers at all times. The minimum length for product on the IntelliQ<sup>®</sup> Accumulation Conveyor is 9 inches for 3-inch roller centers, and 6 inches for 2-inch roller centers.
- Maximum - The maximum product length is 48 inches.

## **Product Width - Minimum and Maximum**

- Minimum - The minimum product width should be equal to 3X the roller centers of the Center Drive, sufficient to allow the product to properly convey when accidentally turned sideways on the conveyor.
- Maximum - The maximum product width should be equal to the conveyor's width (W) less 2 inches.

## **Mixed Product with Varying Widths**

The minimum/maximum product width ratio should not exceed 3:1. (See “Product Alignment” on page 8.)

## **Product Surface(s)**

The side surfaces of the product must not reflect the light beam and cause sensor error.

Product must not be transparent or have openings that would allow the photo eye light beam to pass through and cause sensor error.

## **Product Structure/Integrity**

Products must be able to withstand the momentary impact that may occur when a trailing product coasts into an occupied accumulation zone.

## Product Alignment

Positioning product to one side of the conveyor is recommended for maintaining product orientation and reducing the chance of narrow product conveying side-by-side.

### Skewed Carrier Rollers

Skewed carrier rollers are not recommended. The recommended method for aligning product to one side of the conveyor is the placement of a V-Belt conveyor with a hard skew immediately upstream from the IntelliQ® Accumulation Conveyor. If skewed rollers on the IntelliQ® Accumulation Conveyor are required, a field-assembled skew kit can be ordered.

## Accumulation Density

Accumulation density is a measure of a conveyor's accumulation efficiency (carton-feet of accumulated product per length of a conveyor's accumulation capacity).

The extent that advancing product will accumulate in a non-powered accumulation zone is dependent on: 1) the product's weight, length, bottom surface condition; and 2) the conveyor's width, sensor position, pitch, carrier roller(s), and speed.

The conveyor speeds in Table 7 - 4 are based on the conveyor being fed product at a rate of five cases per minute. This is considered a worst-case condition, as it allows the carrier rollers in the non-powered accumulation to come to rest when the previous product actuates the sensor.

If product is fed at a higher rate, or indexed forward (in singulation mode) then 100 percent accumulation density is often obtained at the next lower speed (down to a minimum speed of 90 fpm).

Table 7 - 4 Minimum Conveyor Speeds for 100% Accumulation Density

Product Weight	Conveyor Speed - fpm				
	Product Length (in inches)				
	6-9	9-14	14-21	21-24	27-48
5 lbs.		200	200	200	*
10 lbs.		180	180	200	*
15 lbs.		140	140	180	200
25 lbs.		120	120	140	200
35 lbs.		120	120	120	140
50 lbs.		120	120	120	140

\*Not recommended.

## Conveyor Pitch

An IntelliQ® Accumulation Conveyor should not be inclined (pitched upwards).

While normally used for horizontal operation, the conveyor may be declined (pitched downwards) to suit an application's requirements.

Because product accumulated on a pitched conveyor tends to gravitate, line-pressure at the conveyor's discharge end will result. The amount of line-pressure will depend on the amount of pitch (a two-inch decline in 12 feet works well; five inches in 12 feet is the maximum recommended).

The line-pressure causes the accumulated product to discharge in a group, making it difficult to control the release.

## Air Supply / Quality

Clean, dry air must be provided for reliable operation of the conveyor's pneumatic controls. The air system must contain suitable driers to produce a pressure dew point temperature that is approximately 10°F below the lowest ambient temperature to which the air lines will be exposed.

Remove compressor “carry-over” oil by filtration with a five-micron pre-filter and coalescing filter, see Figure 7 - 3.

The accumulation controls for Intermediate Straight Sections operate at 12 psi. Refer to Chapter 3 - Engineering Data for air-consumption information.

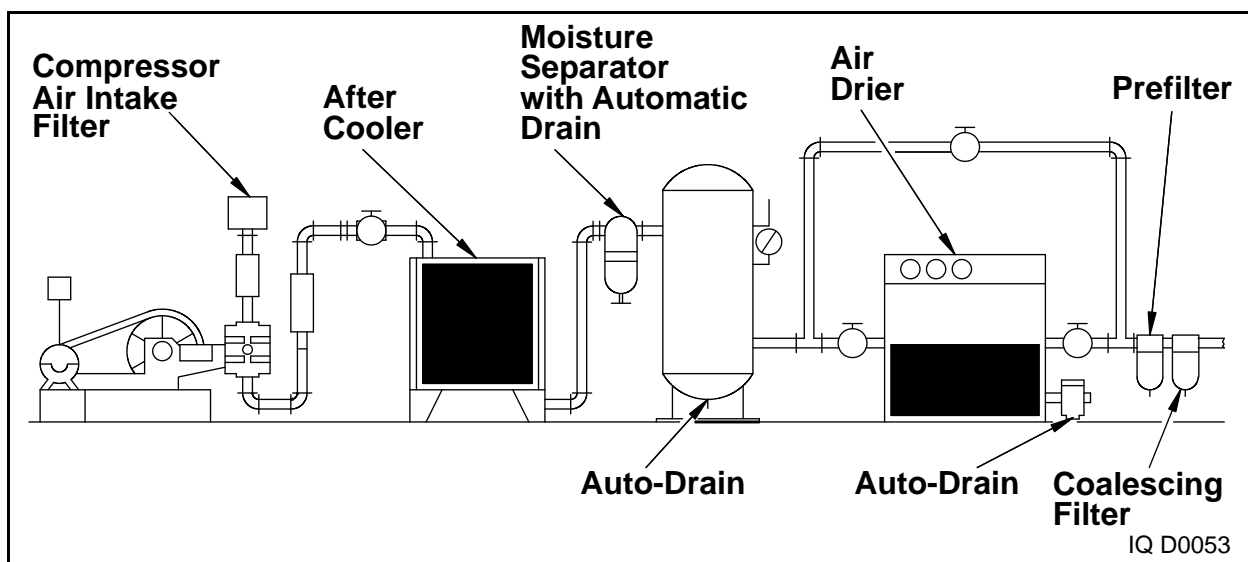


Figure 7 - 3 Typical Air Treatment for Compressed Systems

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## Pneumatic / Air Supply Components

IntelliQ® Accumulation Conveyor Intermediate Straight Sections are shipped with all components pre-piped and all air-lines included. At installation, they are coupled by making a few simple hose connections.

Depending on a conveyor's speed and length, one or more air drops will be required. (See Chapter 3 - Engineering Data for engineering information and IntelliQ® Accumulation Conveyor Installation Manual, Chapter 3 - Installation Procedures for installation information.

## Environmental Conditions

The IntelliQ® Accumulation Conveyor is suited for:

- Operation in temperatures between 40° and 140°F,
- Installation in soft drink plants, breweries, etc.

**NOTE:** If product spillage is possible, locate the control module on the outside of the rail.

Do not install the conveyor in:

- Wash down areas,
- Excessive spillage areas; spillage often occurs downstream of case packers,
- Excessively dirty and corrosive environments,
- Oily product areas; oily products can cause slippage between the driver pad and the carrier rollers.

# 8 Component Index

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The Component Index lists all the primary components and options available for order.

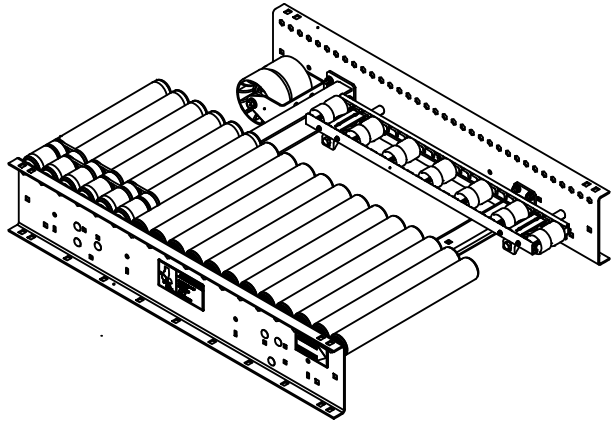
The assemblies listed in this chapter are the “building blocks” of a conveyor system. They may be combined into several different configurations. For illustrations and detailed itemization of each “building block”, see Chapter 2 - Specifications. For information on available configurations, see Chapter 4 - Layout Dimensions. For help with designing a system based on your particular product, see Chapter 3 - Engineering Data.

The following are covered in this chapter:

- Infeed Idler'
- Intermediate Assemblies (6, 9, and 12 feet long)
- Center Drives - Standard and Low Profile(9 and 12 feet long)
- Discharge Idler
- Accessories.

# Infeed Idler

Table 8 - 1 Infeed Idler Available Options

Part Number	Description	
40007100	610 INFEED IDLER ATO MODEL	
<b>OPTIONS</b>		
<b>Hand</b>	Left Hand	
	Right Hand	
<b>Width</b>	16 inches	
	22 inches	
	28 inches	
	34 inches	
	40 inches	
<b>Rollers</b>	ABEC	
	High Speed	
	Premium High Speed	
<b>Roller Centers</b>	2 inches with fixed-type mounting	
<b>Speeds</b>	Determined by the Center Drive (Refer to Table 8 - 3).	
<b>Options</b>	Pop-Up Stop (customized piping required)	

IQ D0061



# Intermediate Section

Table 8 - 2 Intermediate Section Available Options

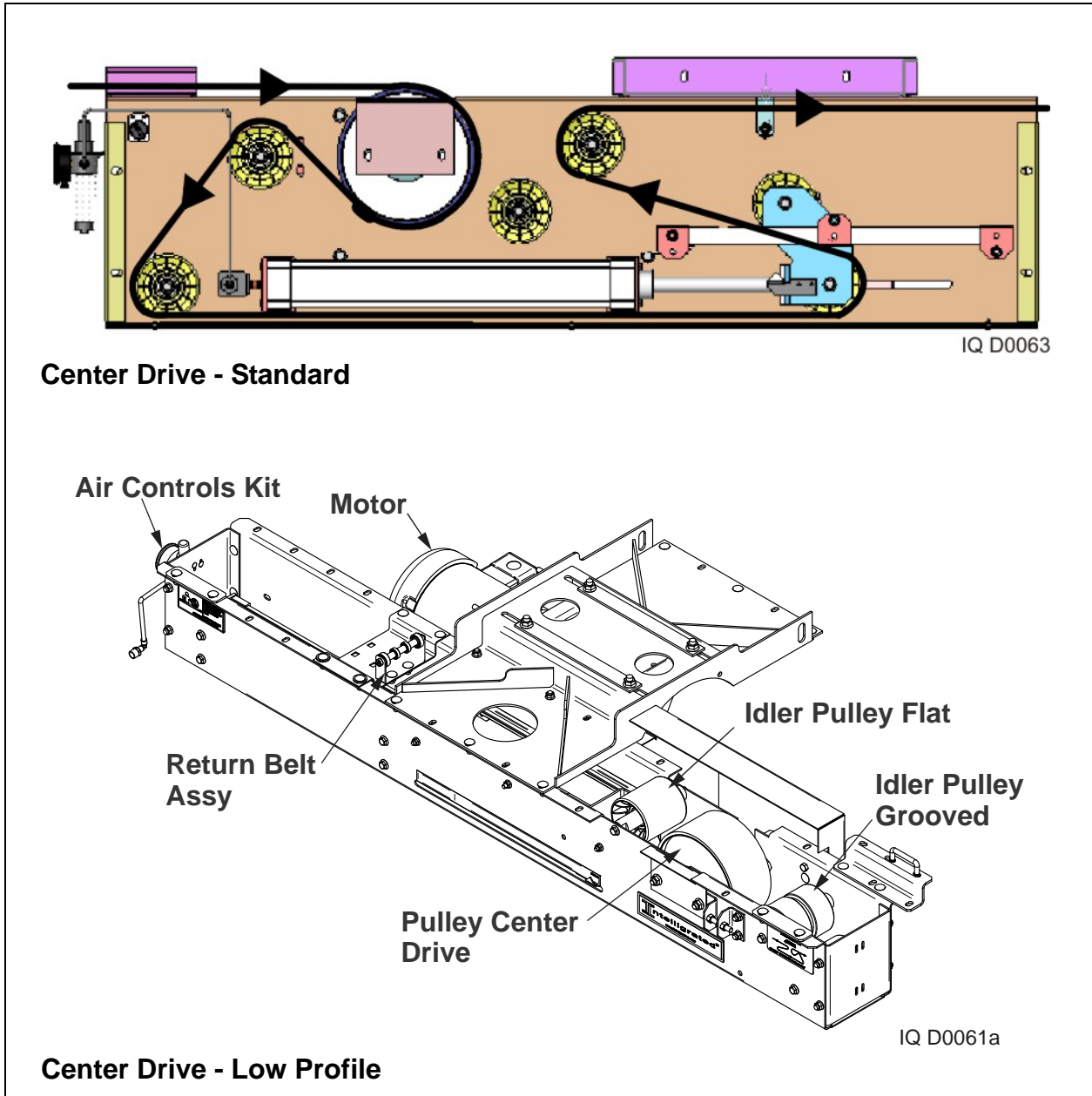
Part Number	Description	
40008100	610 INTERMEDIATE ASSY 6' LONG	
40008200	610 INTERMEDIATE ASSY 9' LONG	
40008300	610 INTERMEDIATE ASSY 12' LONG	
<b>OPTIONS</b>		
<b>Hand</b>	Left Hand	
	Right Hand	
<b>Width</b>	16 inches	
	22 inches	
	28 inches	
	34 inches	
	40 inches	
<b>Rollers</b>	ABEC	
	High Speed	
	Premium High Speed	
<b>Roller Centers</b>	2 or 3 inches with fixed-type mounting	
<b>Speed</b>	Determined by the Drive speed	
<b>Options</b>	Pop-Up Stop (customized piping required)	
		<p style="text-align: right;">IQ D0062</p>

## Center Drives - Standard and Low Profile

Table 8 - 3 Center Drives Available Options

Part Number	Description				
40020400	610 CENTER DRIVE STANDARD ASSEMBLY				
40035800	610 CENTER DRIVE LOW PROFILE ASSEMBLY				
<b>OPTIONS</b>					
<b>Hand</b>	Left Hand		<b>Speed</b>	60	240
	Right Hand			90	270*
<b>Width</b>	16 inches	34 inches		120	300*
	22 inches	40 inches		150	350*
	28 inches			180	400*
<b>Rollers</b>	ABEC			210	
	High Speed		<b>Options</b>	Pop-Up Stop (customized piping required)	
	Premium High Speed				
<b>Roller Centers</b>	2 or 3 inches with fixed-type mounting				

Table 8 - 3 Center Drives Available Options



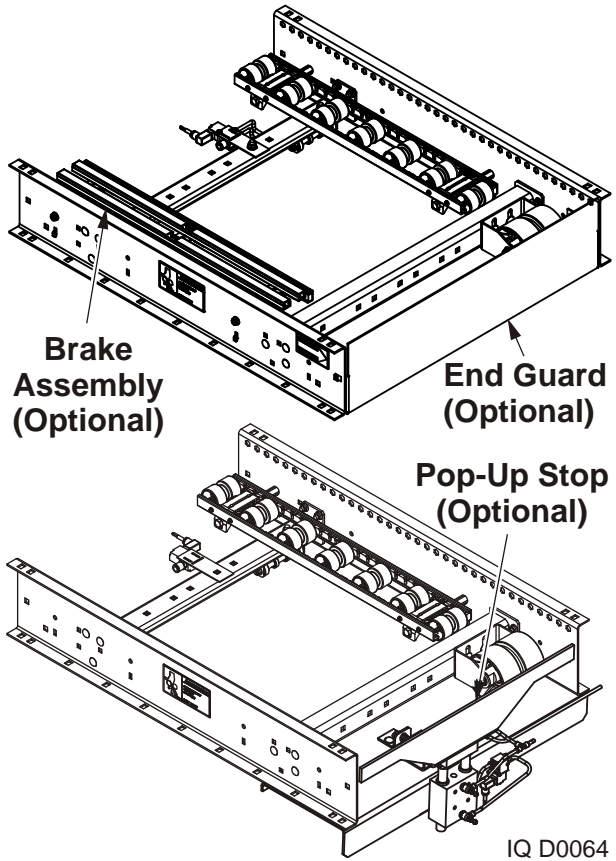
\*Consult product engineer for applications above 240 FPM

## Motors

Description
3/4 HP 230/460 VAC, 3PH, 60HZ, STANDARD EFFICIENCY
1 HP 230/460 VAC, 3PH, 60HZ, STANDARD EFFICIENCY
1-1/2 HP 230/460 VAC, 3PH, 60HZ, STANDARD EFFICIENCY
2 HP 230/460 VAC, 3PH, 60HZ, STANDARD EFFICIENCY
3 HP 230/460 VAC, 3PH, 60HZ, STANDARD EFFICIENCY
5 HP 230/460 VAC, 3PH, 60HZ, STANDARD EFFICIENCY
3/4 HP 230/460 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
1 HP 230/460 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
1-1/2 HP 230/460 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
2 HP 230/460 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
3 HP 230/460 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
5 HP 230/460 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
3/4 HP 575 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
1 HP 575 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
1-1/2 HP 575 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
2 HP 575 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
3 HP 575 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
5 HP 575 VAC, 3PH, 60HZ, PREMIUM EFFICIENCY
3/4 HP 380 VAC, 3PH, 50HZ, STANDARD EFFICIENCY
1 HP 380 VAC, 3PH, 50HZ, STANDARD EFFICIENCY
1-1/2 HP 380 VAC, 3PH, 50HZ, STANDARD EFFICIENCY
2 HP 380 VAC, 3PH, 50HZ, STANDARD EFFICIENCY
3 HP 380 VAC, 3PH, 50HZ, STANDARD EFFICIENCY
5 HP 380 VAC, 3PH, 50HZ, STANDARD EFFICIENCY
3/4 HP 380 VAC, 3PH, 50HZ, PREMIUM EFFICIENCY
1 HP 380 VAC, 3PH, 50HZ, PREMIUM EFFICIENCY
1-1/2 HP 380 VAC, 3PH, 50HZ, PREMIUM EFFICIENCY
2 HP 380 VAC, 3PH, 50HZ, PREMIUM EFFICIENCY
3 HP 380 VAC, 3PH, 50HZ, PREMIUM EFFICIENCY
5 HP 380 VAC, 3PH, 50HZ, PREMIUM EFFICIENCY

# Discharge Idler

Table 8 - 4 Discharge Idler Available Options

Part Number	Description	
40006600	610 DISCHARGE IDLER ATO MODEL	
<b>OPTIONS</b>		
<b>Hand</b>	Left Hand	
	Right Hand	
<b>Width</b>	16 inches	
	22 inches	
	28 inches	
	34 inches	
	40 inches	
<b>Rollers</b>	ABEC	
	High Speed	
	Premium High Speed	
<b>Roller Centers</b>	2-inch with fixed-type mounting	
<b>Speeds</b>	Determined by the Center Drive (Refer to Table 8 - 3).	
<b>Options</b>	Brake Assembly	
	End Guard	
	Pop-Up Stop	

IQ D0064

## Accessories

### ACCESSORIES

PART NO	DESCRIPTION	PART NO	DESCRIPTION
<a href="#">29092300</a>	LACING #1 HIGH TENSILE 12" LONG CLIPPER 02242	<a href="#">29304000</a>	610 SPLICE FOIL 75mm X 85mm (PRE-CUT SQUARE)
<a href="#">22591500</a>	PIN CONNECTING 0.065 DIA DURASTAINLESS #25 CLIPPER #02826	<a href="#">29303500</a>	610 IQ BELT WELD KIT HABASIT PF-80OUS AND AF-76 AND GRV012-70/80C
<a href="#">40013100</a>	610 SLUG TERMINATOR SICK # 7027187	40012601	610 Guide Rail PE Sick 6'LG/3'ZN Assy
<a href="#">23194000</a>	POWER SUPPLY 2 AMP WITH BOX SICK #7029741	40012602	610 Guide Rail PE Sick 12'LG/3'ZN Assy
<a href="#">23193700</a>	POWER SUPPLY, ACCUMULATION 120VAC INPUT 24 VDC. SICK #70297	40012606	610 Guide Rail PE Sick 6'LG/6'ZN Assy
<a href="#">23195900</a>	RELEASE ZIM MODULE SICK # 7029609	40012607	610 Guide Rail PE Sick 12'LG/6'ZN Assy
<a href="#">40013500</a>	POWER ISOLATOR INTERCONNECTING CABLE SICK MODEL	12019601	Guide Rail PE 6ft. LG 3ft. ZN 2.5in. H Assy
<a href="#">40013800</a>	T-CABLE TYPE 1 M12 DC 4 PIN JD4-TM12300A SICK #6011682	12019602	Guide Rail PE 6ft. LG 6ft. ZN 2.5in. H Assy
<a href="#">40015100</a>	T-CABLE TYPE 2 M12 DC 4-PIN JD4 TM12300B SICK #6011683	12019701	Guide Rail PE 12ft. LG 3ft. ZN 2.5in. H Assy
<a href="#">40015500</a>	CABLE COMM BREAK SICK # 7029124	12019702	Guide Rail PE 12ft. LG 6ft. ZN 2.5in. H Assy
40015800	GENDER CHANGER MALE/MALE	12019801	Guide Rail PE 12ft. LG 3ft. ZN 10.0in. H Assy
40015900	GENDER CHANGER FEMALE/FEMALE	12019802	Guide Rail PE 12ft. LG 6ft. ZN 10.0in. H Assy
<a href="#">40015200</a>	CABLE 10" M12 4-PIN SICK #7028981	12019901	Guide Rail PE 12ft. LG 3ft. ZN 10.0in. H Assy
<a href="#">23194100</a>	CABLE M12 #22-4C 2 METER MALE TO FEMALE EXTENSION MODLE KD4-SINM122SM12 SICK # 7023135	12019902	Guide Rail PE 12ft. LG 6ft. ZN 10.0in. H Assy
<a href="#">40015300</a>	CABLE 3M M12 4-PIN SICK #7028657		

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