



## Technical Documentation

# KHL MODEL VERTICAL TRANSFER UNITS

Each serial number is unique to that specific unit and provides mk North America with complete order details.

The serial number is located on the frame of the conveyor. See section 2 for more details.

Your serial number is also recorded above, or on a designated sheet.

Ensure the serial number tag above matches the serial number on your equipment.

# Technical Documentation

## Vertical Transfer Units

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# 1 GENERAL INFORMATION

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## 1.1 Foreword

Congratulations on purchasing a vertical transfer unit from mk North America, Inc.. Our more than 25 years experience in material handling allows us to offer robust solutions with long life and reliable operation. We strive to make the best products in the industry even better and we are committed to making sure our customers get top notch support before, during, and after each and every sale.

## 1.2 The importance of reading your manual

Inside this manual you will find the instructions on how to set up and maintain your mk conveyor properly, as well as maximize its performance. Please take the time to read this manual and familiarize yourself with these set up and maintenance instructions. These instructions will help assure a long product life that requires a minimum amount of service and keeps your conveyor working at its maximum capacity.

## 1.3 If you need assistance

If you need assistance there are a variety of ways to get it. You can contact our customer service team Monday through Friday, 8am-5pm (Eastern Time) at 860-769-5500. You can also visit our website for additional information and technical documentation at [www.mknorthamerica.com](http://www.mknorthamerica.com). In addition, your local representative can provide support in many instances.

## 1.4 When your shipment arrives

- 1) Check your shipment
  - a) If you have not already done so, visually inspect the shipping crate/container for any damage caused during shipment.
  - b) Carefully unpack the crate/container making sure to inspect the components for damage that may have occurred inside the packaging materials.
  - c) If you find any damage, please contact the carrier and mk North America, Inc.
  - d) Lastly, check the contents against the packing slip provided by mk for any discrepancies. If you should find any, please contact mk North America, Inc.
- 2) Locate your ordered items
  - a) Units will ship in its own custom built container, carefully packaged in the most economical way.
  - b) Review the packing slip against your Purchase Order.

# Technical Documentation Vertical Transfer Units

## 2 DECODING YOUR SERIAL NUMBER

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- The conveyor's serial number is located on the frame of the conveyor.
- See image below for label example.
- **YOUR SERIAL NUMBER IS ON THE FRONT COVER OF THIS MANUAL.**
- We have provided an area in the back of this manual for you to add any notes about this unit.



**Serial #:** This number is unique to this item. With this number we can access all of the original order details.

**Date:** This is the date that the unit was scheduled to ship.

**Type:** This description refers to the type of unit that is associated with the particular serial number. The type should NOT be substituted for the serial number when inquiring.

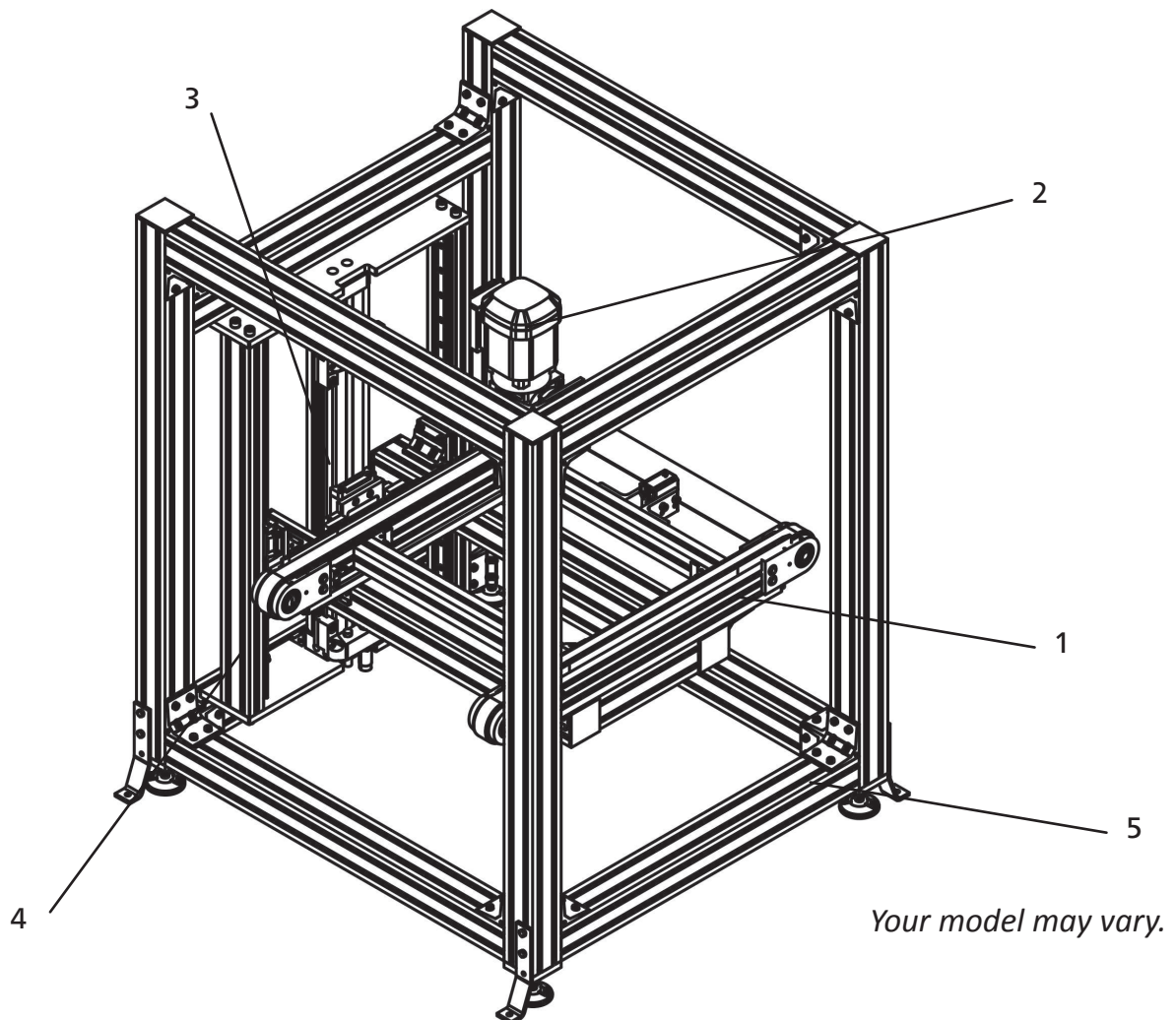
**DWG#:** This number, if applicable, refers to the specific drawing that was created for this unit. Not all orders require a drawing and therefore in some cases no DWG# is assigned. If your DWG# field is blank it is not a cause for concern.

**SO#:** This is the shop order number in which this unit was built. This is an mk North America, Inc. internal number. This number is also referenced on any related invoices, etc.

### 3 VERTICAL TRANSFER UNIT DESCRIPTION

There are three different Vertical Transfer units, but they all have the same main components; a mk ZRF-P timing belt conveyor mounted to a vertical pneumatic linear actuator.

- KHL 2045
- KHL 2010
- KHL 2012



#### Typical Components

- 1) Conveyor - [serial number plate mounted here](#)
- 2) Conveyor Gearmotor
- 3) Pneumatic Cylinder
- 4) Linear Guideway
- 5) Support Structure

# Technical Documentation

## Vertical Transfer Units

### 4 WARRANTY INFORMATION

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#### Limited Warranty

mk North America, Inc. (MKNA) warrants that our products are free from defects in workmanship and materials under normal use and with proper maintenance and cleaning for a period of ten (10) years from the date of shipping from MKNA's facility. This warranty is extended by MKNA only to the original purchaser of the equipment (Customer), and is non-transferable. All warranty requests shall be made by Customer.

MKNA will repair or replace, at our factory, any defective part within the warranty period and without charge. It is at MKNA's sole discretion whether to repair or replace. Customer will provide MKNA prompt written notice of the defect, including the serial number of the unit (when applicable) and the ship date.

This warranty does not apply to equipment and components manufactured by others, whether or not such equipment and components if the other manufacturer are covered by a warranty. Such equipment and components are subject to any limitation contained in the original manufacturer's warranty and include, but are not limited to: bearings, belts, casters, controllers, motors and pneumatic devices.

At MKNA's request Customer will return all defective parts for evaluation at MKNA. MKNA will provide the Customer with a return goods authorization number (RGA#). No parts will be returned without a RGA#. The RGA# must clearly be marked on all labels, packages and packing slips.

Customer shall pay all costs for packaging, shipping, duties and/or any other related costs in the sending or receiving of parts. Customer is responsible for all labor associated with sending or receiving of parts.

No work will be performed by MKNA or an MKNA factory authorized service representative at the site of installation unless in MKNA's opinion it is impractical for Customer to remove and return the defective part to MKNA's factory.

**MKNA PROVIDES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE; UNLESS IT IS AGREED TO BY MKNA AND CUSTOMER IN WRITING PRIOR TO PLACEMENT OF ORDER. Such agreement requires approval of MKNA management.**

**UNDER NO CIRCUMSTANCES SHALL MKNA BE LIABLE FOR DAMAGES OR LIABILITY FOR LOSS OF PRODUCTION, PRODUCT, EQUIPMENT OR PROFITS OR LIABILITY FOR DIRECT, INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES TO PERSONS OR PROPERTY, WHATSOEVER.** Customer agrees that Customer's sole remedy for liability of any kind, including negligence with respect to the equipment and services furnished by MKNA shall be limited to the remedies provided herein. This warranty shall not apply to any failure of the unit or its components caused by lack of maintenance and/or improper maintenance, incorrect adjustments, misuse or unreasonable use or exposure to chemicals and/or environments which the unit is not designed for. Unauthorized modification of the unit or the use of non-MKNA replacement parts and building components voids this warranty.

**EXCEPT AS EXPRESSLY STATED HEREIN, THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, OF THE EQUIPMENT OR SERVICES FURNISHED BY MK OR FACTORY AUTHORIZED SERVICE REPRESENTATIVE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.**

## 5 SAFETY REQUIREMENTS

**READ AND UNDERSTAND ALL OF THESE WARNINGS PRIOR TO OPERATING EQUIPMENT.**



**⚠ DANGER**  
 Climbing, sitting, walking or riding on conveyor at any time will cause severe injury or death.  
**KEEP OFF.**



**⚠ DANGER**  
 DO NOT OPERATE CONVEYORS IN AN EXPLOSIVE ENVIRONMENT.



**⚠ WARNING**  
 Exposed moving parts can cause severe injury.  
 LOCK OUT POWER before removing guard.



**⚠ WARNING**  
 Moving equipment can cause severe injury.  
**KEEP AWAY.**



**⚠ WARNING**  
 Gearmotors may be HOT.  
 DO NOT TOUCH gearmotors.



**⚠ WARNING**  
 Loosening stand height or angle adjustment screws may cause conveyor to drop down, causing severe injury.  
 SUPPORT CONVEYOR SECTIONS PRIOR TO LOOSENING STAND HEIGHT OR ANGLE ADJUSTMENT SCREWS.

**⚠ WARNING**  
 Injury is possible if the stands are not lagged to the floor, cross ties are not used, or angle braces are not present. Never place a conveyor in operation until all proper mounts are installed and secured. It is the end user's responsibility to ensure that the support system is safe and secure.

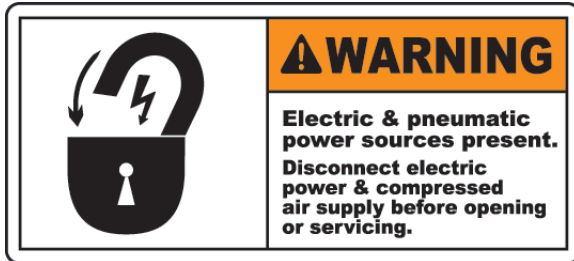
**⚠ WARNING**  
 Never operate equipment unless all operating instructions are understood and all guards, interlocks, covers, safety devices or circuits and protective components are functioning properly.

**⚠ WARNING**  
 Never operate or service this equipment if under the influence of alcohol, drugs or other substances or conditions which decrease alertness or judgement.

# Technical Documentation Vertical Transfer Units

## 5 SAFETY REQUIREMENTS (CONT.)

**READ AND UNDERSTAND ALL OF THESE WARNINGS PRIOR TO OPERATING EQUIPMENT.**



- OBSERVE ALL MANUFACTURER'S INSTRUCTIONS
- Maintenance and repair work of pneumatic equipment may only be performed by specially trained personnel!
- De-pressurize the machine's pneumatic equipment before starting any maintenance or repair work.
- Hose lines should be replaced regularly during preventative maintenance even without visible damages.
- Before restarting the machine after maintenance or repair work, ensure that all screws are tightened and removed covers, strainers or filters are reinstalled.
- After completing maintenance or repair work and before restarting the production ensure that:
  - All required maintenance and repair materials, tools and equipment are removed from the work area.
  - All safety devices of the system are working properly!



## 6 WEAR ITEMS & MAINTENANCE

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### 6.1 Important Notes About Wear Items & Maintenance

The following information regarding life of the wear items and service or adjustment intervals of the functional elements are only GUIDELINES. Vertical Transfer Units are application-specific products whose life expectancy can vary depending on their relative loads and speeds, and which can be significantly influenced by environmental factors.

- All moving components and screw connections should be checked every 6 months.
- All safety-relevant components should be part of a regularly scheduled weekly inspection
- The proper function of these components must be confirmed at all times.
- Do NOT operate conveyors if safety-relevant components are damaged or missing.
- All parts which contact the product should be cleaned weekly (example: belt).
- Belts require little special care. They are easily cleaned using lukewarm soapy water.
- Remove heavy grease coatings with ethyl alcohol.
- Blow off debris from belts with structured surfaces using compressed air.

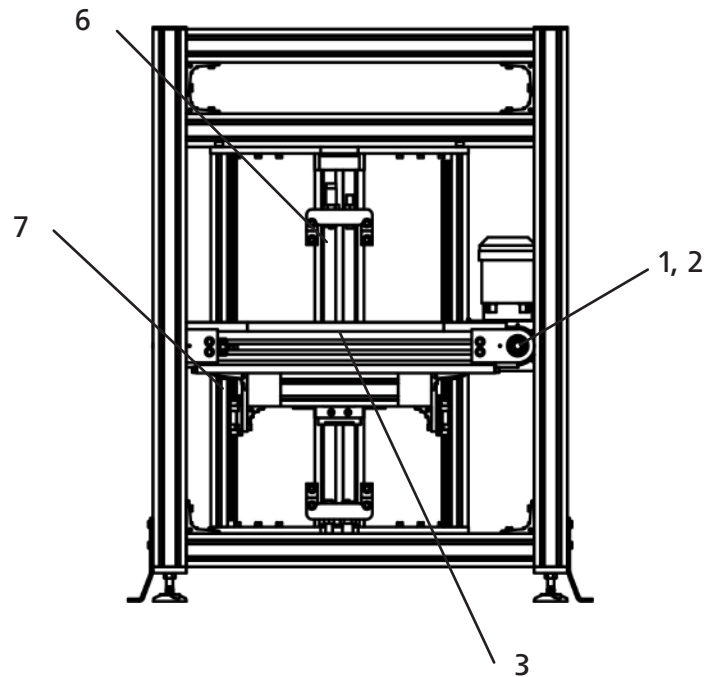
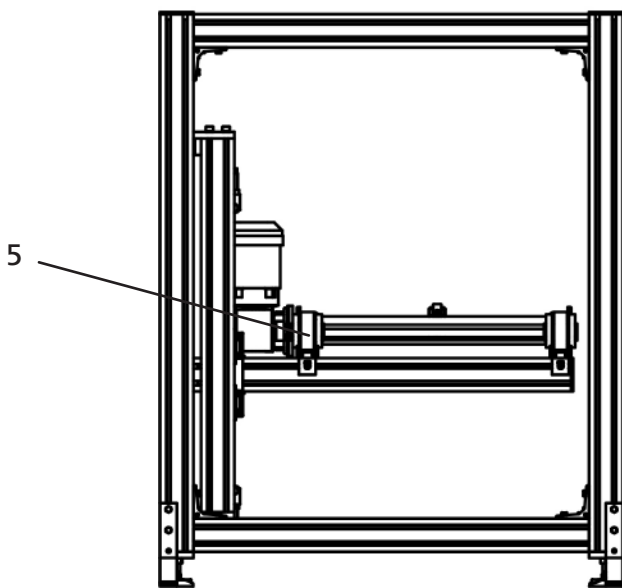
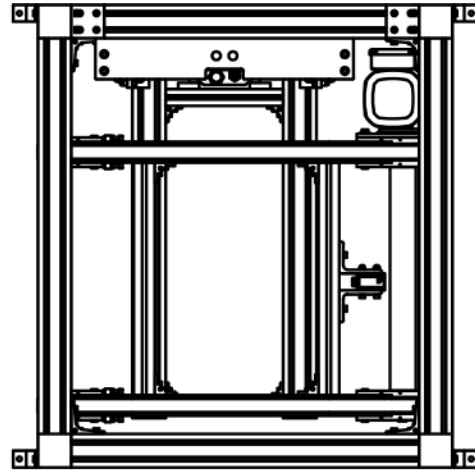
# Technical Documentation Vertical Transfer Units

## 6 WEAR ITEMS & MAINTENANCE (CONT.)

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### 6.2 KHL 2045 / KHL 2010

*This vertical transfer system features a ZRF-P 2010 timing belt conveyor.*



*NOTE: Not all items shown in all views for clarity. Not all views are to scale.*

(Cont.)

## 6 WEAR ITEMS & MAINTENANCE (CONT.)

### 6.2 KHL 2045 / KHL 2010 (Cont.)

#### Maintenance Work

Position	Description	Action*	Interval in Hours (Months)
1	Roller Bearing	I	1,000 Hours (Max. 6 Months)
2	Drive/Idler Sprocket	I, C	500 Hours (Max. 3 Months)
3	Wear Strip	I, C	500 Hours (Max. 3 Months)
		R	If wear is visible
4	Timing Belt	I, C	500 Hours (Max. 3 Months)
		R	If wear is visible
5	Gearmotor	I, C	Service & maintenance per manufacturer's documentation
6	Pneumatic Cylinder	I, C	Service & maintenance per manufacturer's documentation
7	Linear Guideway	I, C	Service & maintenance per manufacturer's documentation

\* LEGEND: *Inspect, Replace, Tension, Clean, Lubricate (grease).*

#### Replacement Parts

Position	Description	Part Number
1	Roller Bearing 6006-2RS1	K101001316
2	Drive/Idler Sprocket	58.01.0024
3	Wear Strip	Inquire with mk North America
4	Belt	Inquire with mk North America
5	Gearmotor	Inquire with mk North America
6	Pneumatic Cylinder	Inquire with mk North America
7	Linear Guideway	Inquire with mk North America

*NOTE: For adjusting the chain tensioning, please see the related section for details. When cleaning the chain, avoid any harsh chemicals or detergents.*

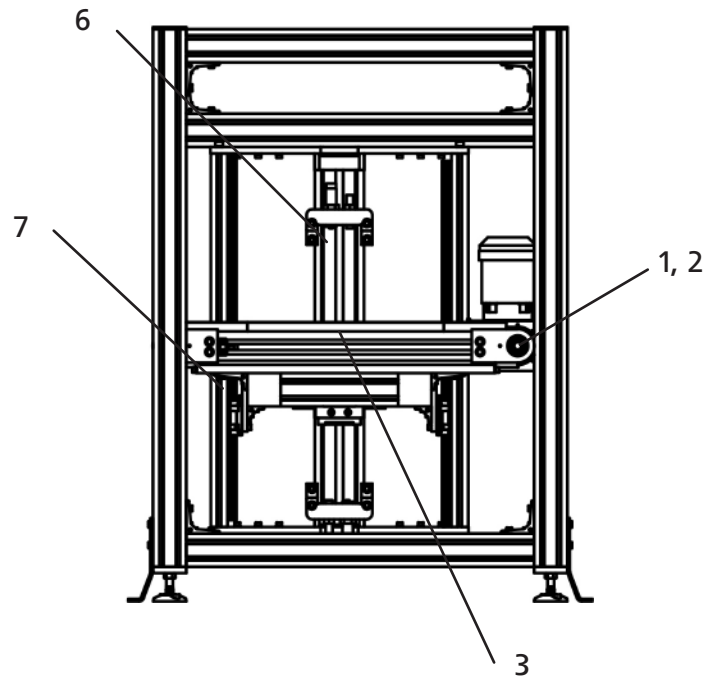
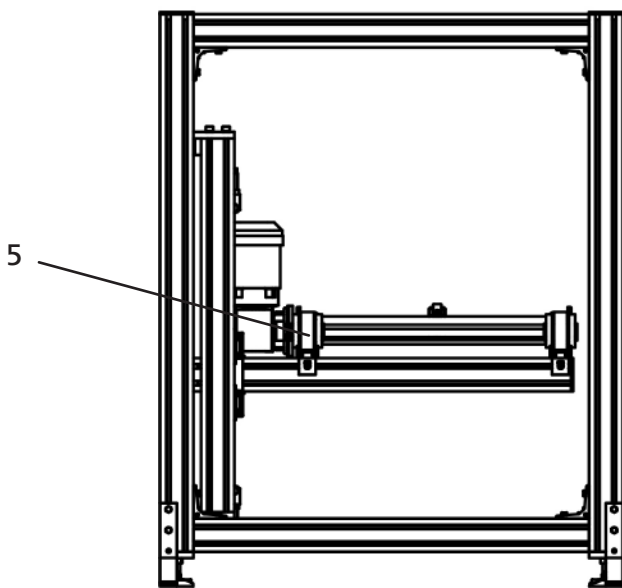
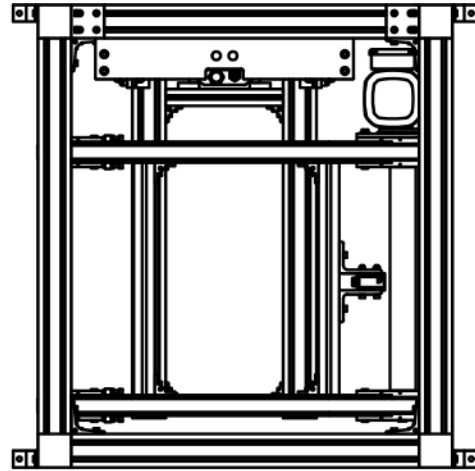
# Technical Documentation Vertical Transfer Units

## 6 WEAR ITEMS & MAINTENANCE (CONT.)

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### 6.3 KHL 2012

*This vertical transfer system features a ZRF-P 2040 timing belt conveyor.*



*NOTE: Not all items shown in all views for clarity. Not all views are to scale.*

(Cont.)

## 6 WEAR ITEMS & MAINTENANCE (CONT.)

### 6.3 KHL 2012 (Cont.)

#### Maintenance Work

Position	Description	Action*	Interval in Hours (Months)
1	Roller Bearing	I	1,000 Hours (Max. 6 Months)
2	Drive/Idler Sprocket	I, C	500 Hours (Max. 3 Months)
3	Wear Strip	I, C	500 Hours (Max. 3 Months)
		R	If wear is visible
4	Timing Belt	I, C	500 Hours (Max. 3 Months)
		R	If wear is visible
5	Gearmotor	I, C	Service & maintenance per manufacturer's documentation
6	Pneumatic Cylinder	I, C	Service & maintenance per manufacturer's documentation
7	Linear Guideway	I, C	Service & maintenance per manufacturer's documentation

\* LEGEND: *Inspect, Replace, Tension, Clean, Lubricate (grease).*

#### Replacement Parts

Position	Description	Part Number
1	Roller Bearing 6006-2RS1	K101001316
2	Drive/Idler Sprocket	Inquire with mk North America
3	Wear Strip	Inquire with mk North America
4	Belt	Inquire with mk North America
5	Gearmotor	Inquire with mk North America
6	Pneumatic Cylinder	Inquire with mk North America
7	Linear Guideway	Inquire with mk North America

*NOTE: For adjusting the chain tensioning, please see the related section for details. When cleaning the chain, avoid any harsh chemicals or detergents.*

# Technical Documentation Vertical Transfer Units

## 7 CONVEYOR MAINTENANCE - BELT TENSIONING & TRACKING

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All work to be performed by qualified personnel only.  
Conveyor power must be disconnected before replacing belt.

7.1	General Remarks	14
7.2	All Models	15

### 7.1 General Remarks:

- Prior to delivery of the mk conveyor, the belt was tensioned and tracked at the factory.
- Conveyor belts should not require additional tracking once installed.
- It may be necessary to remove the conveyor from the vertical transfer unit before servicing.
- Any interfering parts must also be removed.
- Reassemble in reverse order.
- Never operate without all guards in place.



## 7 CONVEYOR MAINTENANCE - BELT TENSIONING & TRACKING

### 7.2 All Models



All work to be performed by qualified personnel only.

<p><u>Belt Tensioning</u></p> <p><b>Caution!</b></p> <p><i>Belt tensioning is only to be done at the idler end (opposite the motor end).</i></p> <p>General Instructions:</p> <ul style="list-style-type: none"> <li>• The belt was tensioned and adjusted at the factory before delivery of the mk product.</li> </ul> <p>Loosen screws (2) and (4) to pull the entire assembly (1) out (arrow direction) in order to pretension the timing belt. Tighten screw (4) and then finally adjust the timing belt with screw (3), see below.</p> <p>Tighten bolt (2).</p>	
<p><u>Belt Tracking</u></p> <p><b>Caution!</b></p> <p><i>Tracking (or realignment) of the belt must only be done while the belt is moving (pinch points).</i></p> <p>Adjust bolt (2) and screw (3) in the direction of the arrow, for the fine adjustment to the timing belt until the belt is running centrally on the pulley. Tighten the bolt (2).</p>	

# Technical Documentation Vertical Transfer Units

## 8 CONVEYOR MAINTENANCE - REPLACING THE BELT

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All work to be performed by qualified personnel only.  
**Conveyor power must be disconnected before replacing the belt.**

8.1	General Remarks	16
8.2	KHL 2045 / KHL 2010	17
8.3	KHL 2012	18

### 8.1 General Remarks:

- This section does not apply to RBM 2010.
- It may be necessary to remove the conveyor from the vertical transfer unit before servicing.
- Any interfering parts must also be removed.
- Reassemble in reverse order.
- Never operate without all guards in place.
- Always track and tension new belts after installing, see Section 7.
- It is recommended to replace belts in pairs.





## 8 CONVEYOR MAINTENANCE - REPLACING THE BELT



All work to be performed by qualified personnel only.

Conveyor power **must** be disconnected before replacing the belt.

### 8.2 KHL 2045 / KHL 2010

<p>Loosen all bolts and push the entire head (1) inwards (in the direction of the arrow), in order to create slack in the timing belt.</p>	
<p>Remove the belt return guard (2) by removing all screws. Do this at BOTH ends of the conveyor.</p>	
<p>Remove the closure strip (3) by sliding the material out of the end. This will expose the belt return channel.</p>	

#### Next Steps for Belt Removal and Replacement:

- The belt can now be replaced once all auxiliary obstructions are removed.
- To replace belt, slip it over the side of the conveyor and fit into the return channel.
- Reassemble conveyor in the reverse order.
- Track and tension belt prior to use. (see Section 7).

# Technical Documentation

## Vertical Transfer Units

### 8 CONVEYOR MAINTENANCE - REPLACING THE BELT



All work to be performed by qualified personnel only.

Conveyor power must be disconnected before replacing the belt.

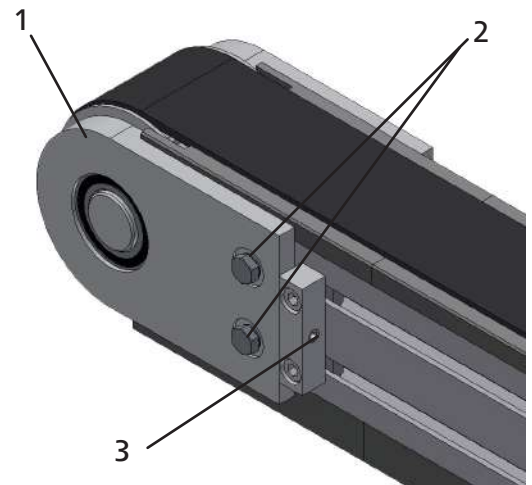
8.3 KHL 2012

#### General Instructions:

Loosen bolts (2) and screw (3) on both sides of the assembly.

Push assembly (1) toward the conveyor frame to loosen the belt.

Complete steps below.



#### Next Steps for Belt Removal and Replacement:

- The belt can now be replaced, once all auxiliary obstructions are removed (see General Remarks).
- Slide the existing belt off the free side of the conveyor frame.
- To replace belt, slip it over the side of the conveyor.
- Ensure belt return is in UHMW-PE bottom guide.
- Reassemble conveyor in the reverse order.
- Track and tension belt prior to use. (see Section 7).



# Technical Documentation

## VERTICAL TRANSFER UNITS

**mk North America, Inc.**  
an mk Technology Group Company  
105-125 Highland Park Drive  
Bloomfield, CT 06002, USA  
Phone: 860.769.5500  
Fax: 860.769.5505  
[www.mknorthamerica.com](http://www.mknorthamerica.com)  
[sales@mknorthamerica.com](mailto:sales@mknorthamerica.com)