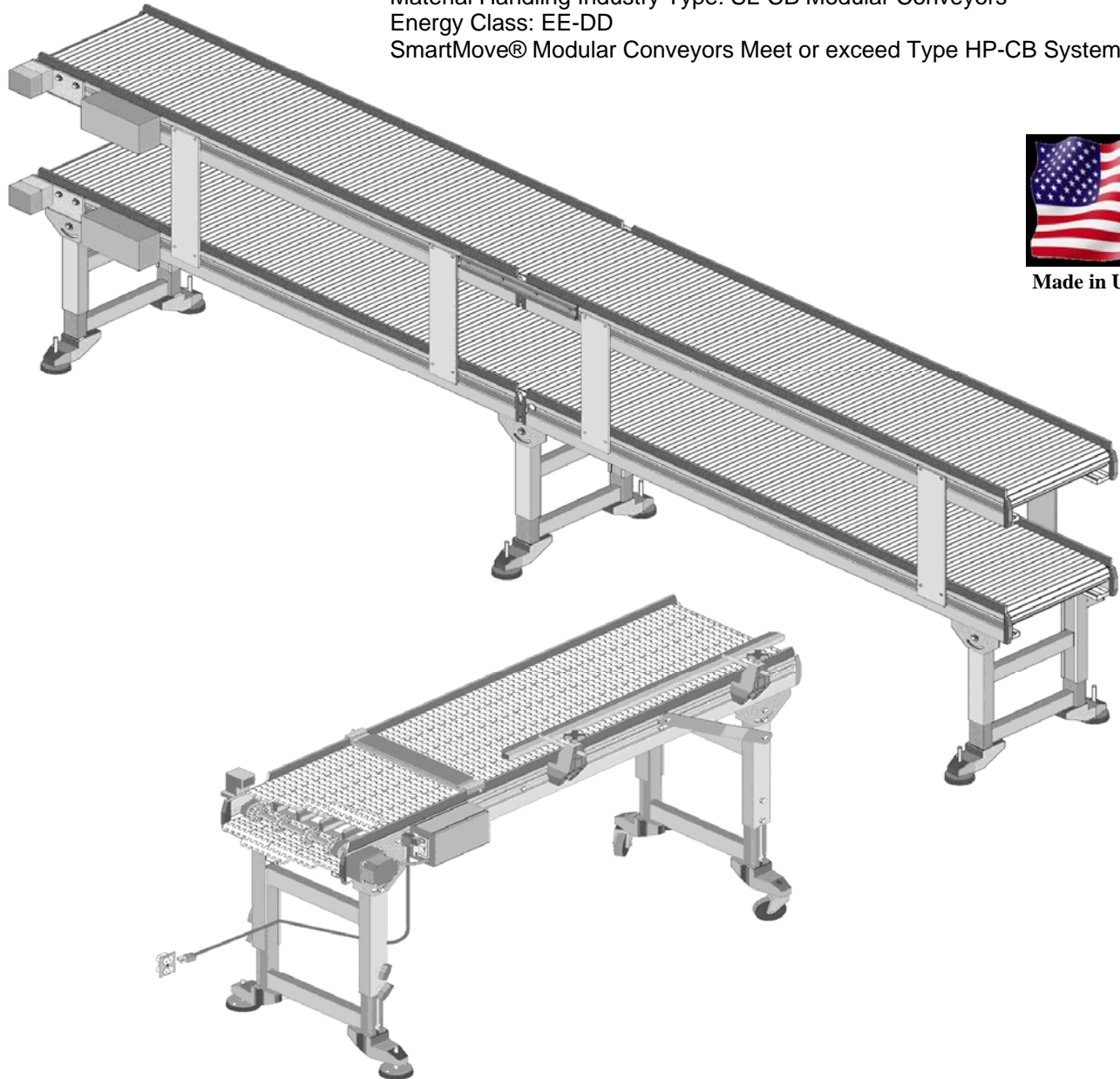


OWNERS MANUAL & OPERATING INSTRUCTIONS

AX & ZX SERIES CONVEYORS

Material Handling Industry Type: SL-CB Modular Conveyors
Energy Class: EE-DD
SmartMove® Modular Conveyors Meet or exceed Type HP-CB Systems



Made in U.S.A.

Thank you for purchasing from SmartMove® Conveyor.

SmartMove® conveyors are engineered and manufactured in the U.S.A. by AMA ENGINEERING - SMARTMOVE CONVEYOR, LLC. Our systems are designed for easy installation without technical expertise. When properly operated, they will give many years of maintenance free performance.

PLEASE READ AND SAVE THIS MANUAL

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SAFETY SYMBOLS

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols, and the explanations with them, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

Symbol

Definition



DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury



WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury



CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices that may cause property damage.

NOTE

Advises you of information or instructions vital to the operation or maintenance of the equipment.



Advises you that hardware is factory set and not adjustable. Making adjustments could cause damage that is not covered by warranty.

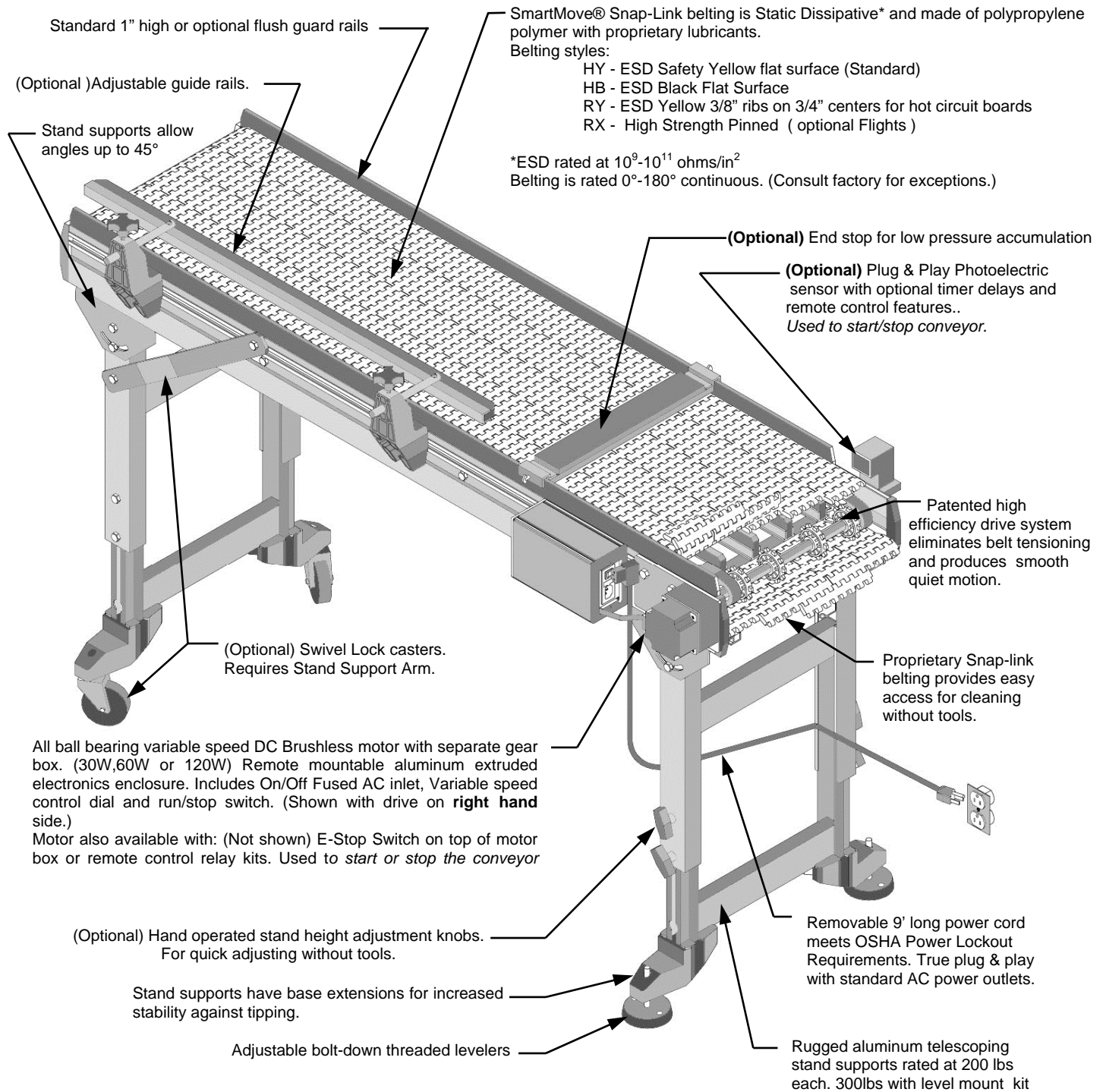
RULES FOR SAFE OPERATION

Safe installation and operation of SmartMove® conveyors and their accessories requires that you read and understand this manual and all related instructions shipped with this equipment. Installation, although not technical in nature, does require experience with mechanical assembly. Safety is a combination of common sense, staying alert and understanding the equipment being installed and operated.

- **DISCONNECT FROM POWER** before servicing. Unplug equipment before servicing or adding accessories. Never allow the internal circuitry to be connected to earth ground.
- **KEEP COVERS AND GUARDS IN PLACE.** Never operate the conveyor or it's accessories without the factory installed covers or guards installed.
- **NEVER STAND OR LEAN** on the equipment. Do not use the conveyor as a raised platform for standing. Conveyor could tip over causing you serious injury or damage to the unit. To protect from tip over, bolt stands to the floor through the holes located in the adjustable leveler pads.
- **REPLACE DAMAGED PARTS.** Any part that is damaged should be promptly repaired or replaced upon discovery. *Scratches, cuts or normal wear occurring to the belt or support surfaces should not be considered damage.*
- **AVOID PINCH POINTS.** Small motors can achieve high torques when using reduction gears. If the motor is stalled, it will continue to apply full torque for 10 seconds before automatically shutting off. Do not put hands under a moving belt. Use transition plates to guard against pinch points.
- **NEVER OVERLOAD THE CONVEYOR.** Never place more than 300 lbs on a section spanning the support stands. Dropping loads over 35 lbs or exceeding the support load could cause the stand support blocks to fail, resulting in the conveyor suddenly dropping 3-5" from it's set height.
- **AVOID COLLISIONS** when moving conveyors with casters. Conveyor drive is a high efficiency motor with precision internal components that can be damaged by impact. When relocating conveyors, watch for side clearance when passing through doorways or obstructions that may collide with motor housing.
- **DISASSEMBLE BEFORE MOVING** conveyor lines that are joined together. Moving long conveyors while assembled could bend deck extensions or stand mounting brackets which may cause belt operating problems.
- **DO NOT REMOVE STAND SUPPORT ARM.** Stands with casters must have a support arm between the conveyor frame and the stand upright to prevent the stand from accidentally "folding" under the conveyor. *Do not remove support arms when using stands with casters.*
- **DIRECTION OF FEED.** SmartMove® Conveyors are designed to pull product on the conveyor belting in the direction toward the motor drive end. Poor operating performance may be experienced when running the belt in the opposite direction.
- **CHECK FOR LOOSE FASTENERS.** Periodically inspect support, drive set screws and structural fastener hardware to insure that it is properly tightened. Tighten or replace missing fasteners before operating equipment.
- **GROUND ALL ELECTRIC EQUIPMENT** This equipment has a three prong plug and should be plugged into a three-hole grounded outlet. If an adapter is used to accommodate a two prong receptacle, the adapter plug must be attached to a known ground. Never remove the grounding prong.
- **AVOID DANGEROUS ENVIRONMENTS.** Do not use electrical equipment in damp or wet locations or areas subjected to rain. Do not operate the product in an explosive or flammable atmosphere. Keep you work area well lighted.
- **USE CORRECT LINE VOLTAGE.** Be sure to keep the line voltage within 10% of that specified on the control panel. (115 or 220)
- **KEEP WORK AREA AND EQUIPMENT CLEAN.** Loose debris from handling product may enter the conveyor and possibly pass through the conveyor belting to collect under the equipment. Debris may become trapped inside the conveyor and cause failure or pre-mature wear. Open the belting often and clean the inside of any debris. Clean under the conveyor to remove any debris that may pose safety issues. Remove the belt, as needed and clean with water and soap. Replace any damaged section of belting. Blow or air dry before re-installing.
- **AVOID DROPPING PRODUCTS** onto the conveyor surface. Although SmartMove's snap-link belting is impact resistant, it should not be used to cushion heavy, sharp products dropped onto the belting. Sliding or placing products onto the conveyor will insure a long belt life. If belt is damaged, be sure to replace the broken links as soon as possible to avoid additional damage to the remaining belting. *Operating with belt sections broken or missing will allow debris to enter the interior of the belting*

FEATURES AX SERIES

Shown below is a single section **AX Series SmartMove® Conveyor** with some of the available accessories.
For installation instructions: Please follow the directions starting on Page 7.



FEATURES AX SERIES WALK-THRU GATE

The **AX Series SmartMove® Conveyor with Gate** has the same features as the **AX Series Conveyors** shown on the previous page with the additional ability to provide an automatic shut-off walk-thru feature. Shipped fully assembled. **Please proceed to Page 16 for Setting Up Gate Conveyor.**

(Optional) Folding Stand for using on end-of-line or dual gate systems. Folding stand operates with it's own counterbalanced gas spring .

Motor can be mounted on the moving gate section (as shown) or on the stationary section. When mounted on gate, belt is stopped when gate opens. When mounting the motor on the stationary section, the adjacent SmartMove® Conveyor can be supplied with "Gate-Open" sensors to start/stop in-feeding conveyor when gate is open/closed.

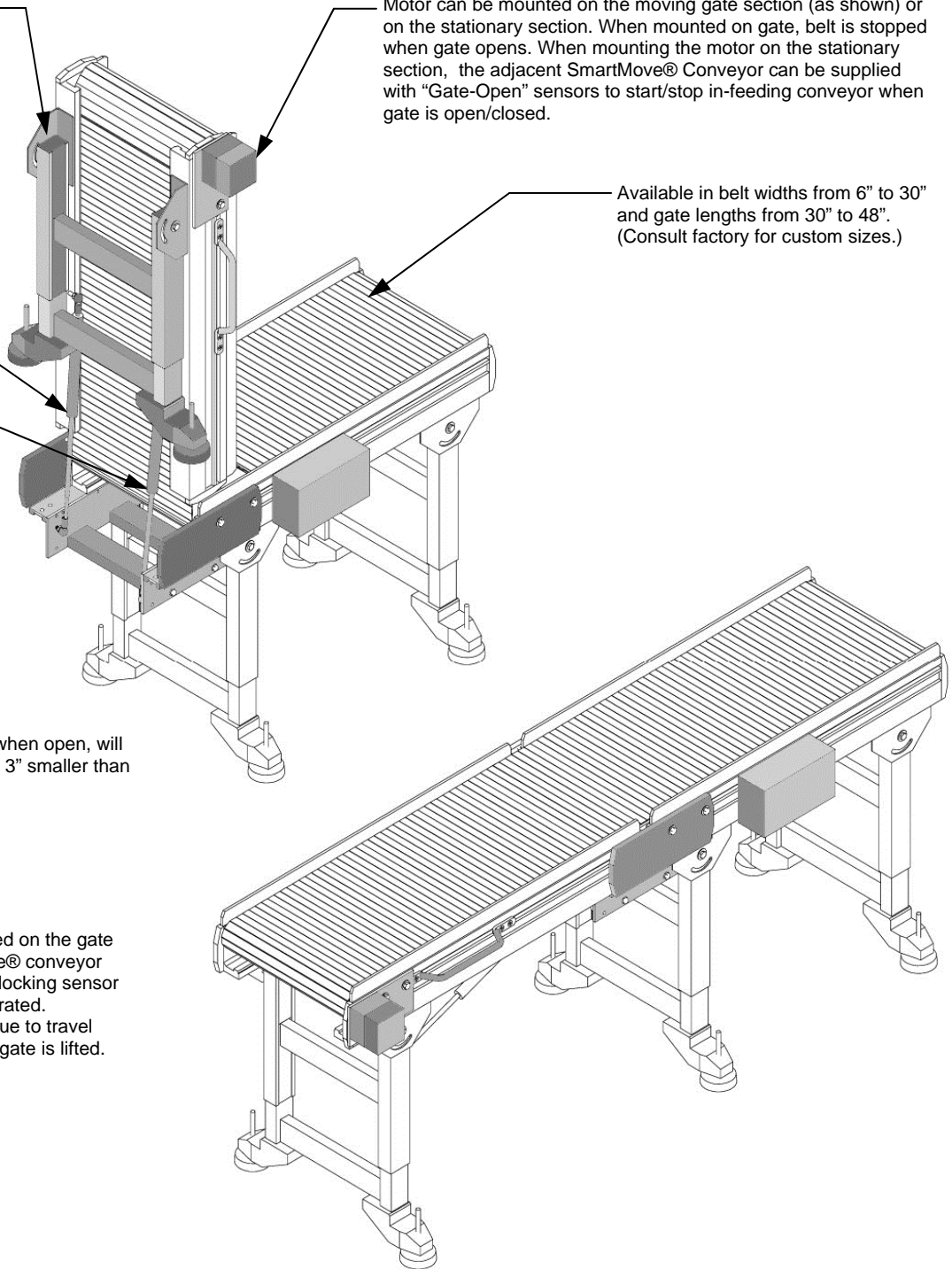
Available in belt widths from 6" to 30" and gate lengths from 30" to 48". (Consult factory for custom sizes.)

Easy lift with counterbalanced gas spring.

Safe controlled lowering with gas dampener.

Walk-Thru Clearance: Gate, when open, will provide a walk-thru path that is 3" smaller than the length of the gate section.

Note: If the motor is not located on the gate section, the infeed SmartMove® conveyor can be equipped with an interlocking sensor to start/stop when gate is operated. Otherwise, parts would continue to travel toward the opening when the gate is lifted.

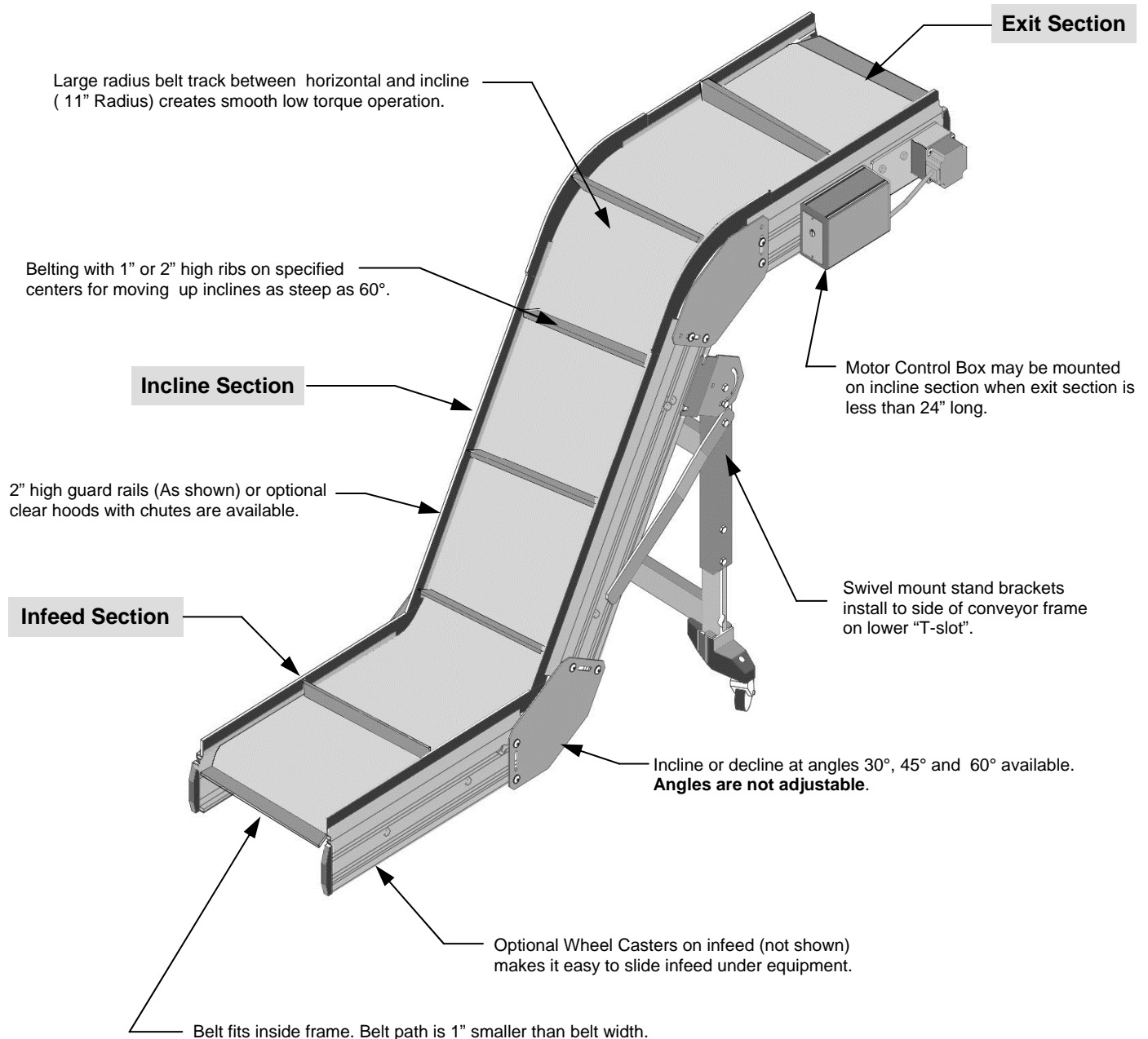


FEATURES ZX SERIES

The **ZX Series** shares many of the same excellent features that are standard with the **AX Series** but utilizes a different conveyor frame structure that closes the edges of the belt to keep parts from entering inside the conveyor belt. Frames can be joined at 30°, 45° or 60° angles. Transfer is accomplished by “water-falling” method.

Units are shipped fully assembled and ready to operate.

(Please proceed to page 21 for Electrical Connection.)



Unpacking

Units shipped via UPS (Some assembly required.)

- ˆ Carefully remove all parts from the carton and compare to packing slip. (*Some items, such as the drive, may already be assembled, even though listed individually on the packing list.*)
Note: If any parts are missing, please contact us immediately.
- ˆ **Refer to the *Table of Contents* on *Page 2*** to locate the instructions you may need for assembly of items shipped.

Units shipped freight on custom crate (Some assembly required.)

- ˆ Cut straps and carefully remove items from skid. (Use assistance to lift heavy items. Never drag items.)
- ˆ Follow warning labels and remove shrink-wrap taking care not to cut internal components.
- ˆ Do not discard the packing materials until you have carefully inspected the equipment and are satisfied that all items listed on packing slip have been received. Most loose hardware is packaged in Zip-lock bags. (*Some items, such as the drive, may already be assembled, even though listed individually on the packing list.*)
Note: If any parts are missing, please contact us immediately.
- ˆ **Refer to the *Table of Contents* on *Page 2*** to locate the instructions you may need for assembly of items shipped.

Tools needed

Most **AX Series** conveyors will require the following tools: (*If you purchased a ZX Conveyor, skip to page 21.*)

- ˆ Open end 9/16" or adjustable wrench (Optional ratcheted wrench with 9/16 hex socket)
Note: It is not recommended to use pliers on hex bolts as they will cut through the anti-corrosion plating.
- ˆ Leveling device such as "carpenters level" is recommended to square stand to frame and set belt surface.
- ˆ Rubber mallet or plastic headed hammer. (For removing and installing press fit end caps.)

Additional tools that may be necessary for Long Lines greater than 10' long.

- ˆ 5/16 Hex headed nut driver with cordless drill
- ˆ Cordless Drill with 1/8" bit
- ˆ 5/32 hex wrench

Note: Conveyor sections can be up to 10' long and weigh in excess of 50 lbs. Have someone available for assistance in lifting and holding during assembly. Don't try to "flip-over" a conveyor by yourself.

Work Area (*Preparation before assembly*)

When preparing the location for assembling and installing, please consider the following:

- ˆ Please consider all recommendations on page 3 to insure that the selected work area will be safe to operate.
- ˆ Locate a power source (**See *Electrical Connection* on *Page 21***) within reach of the 9' power cord.
- ˆ Pre-install floor mounting hardware. ***If conveyor is not mobile, it should be bolted to the floor.***
- ˆ Stand base clearance. Please allow a 4-5" clearance away from walls or columns to avoid interference that may occur with motors or stand bases.
- ˆ Do not block fire or emergency exits with conveyor lines. Use Walk-thru Gate Models. **See *Page 5***.

CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Stands– Short Lines

1. Place the conveyor upside down on a flat, non-abrasive surface. **See Figure 1A** and **Figure 1B**.
Note: See Long Lines instructions on the Next Page if you are joining sections with the same stand.
2. Loosen bolts on stand supports enough to allow the “T-nuts” to slide into the “T-slots” located on the underside of the extruded side frames. **See Figure 1B**.
3. Slide the stand assembly into the “T-slots” until the edge of the stand bracket is approximately 1” from the end.
4. Tighten the 4 bolts (9/16 Hex) making sure that the stand brackets are both flat against the extruded side frame. (If the stand brackets do not sit flat, loosen the bolts that attach them to the uprights of the stand. Re-tighten after brackets sit flat before tightening the 4 “T-slot” bolts.
5. Repeat steps 2-4 (from above) for the second stand at the opposite end of the conveyor.
6. Have someone help you lift the conveyor and set it upright on the two stands. It can now be installed in it’s operating position.
7. Adjust stand uprights, (one at a time), so they stand vertical to the floor by loosening the pivot bolt and locking bolts on both mounting brackets. Use a carpenters level or square to adjust. Fine tune leveling with threaded levelers in base. *Note: If stands have casters– loosen the bolts that secure the stand support arm to make adjustments.*
8. Install sideframe End Caps, (shipped with this owners manual) to protect exposed sharp edges. **See Figure 1B**.
9. **Proceed to Electrical Connection on Page 21** if conveyor was shipped fully assembled and you are not installing any other accessories.



WARNING:

Prevent Conveyor from tip over. Serious injury can occur if conveyor tips over. Mounting holes in stand levelers are provided as a method of bolting conveyor stands to the floor. When not possible to anchor to the floor, anchor the conveyor to other stationary objects, (walls, poles, etc.).

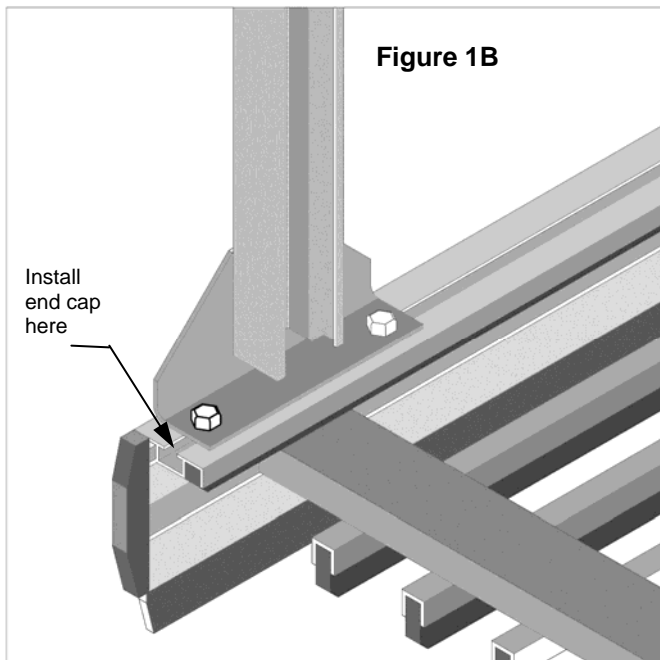


Figure 1B

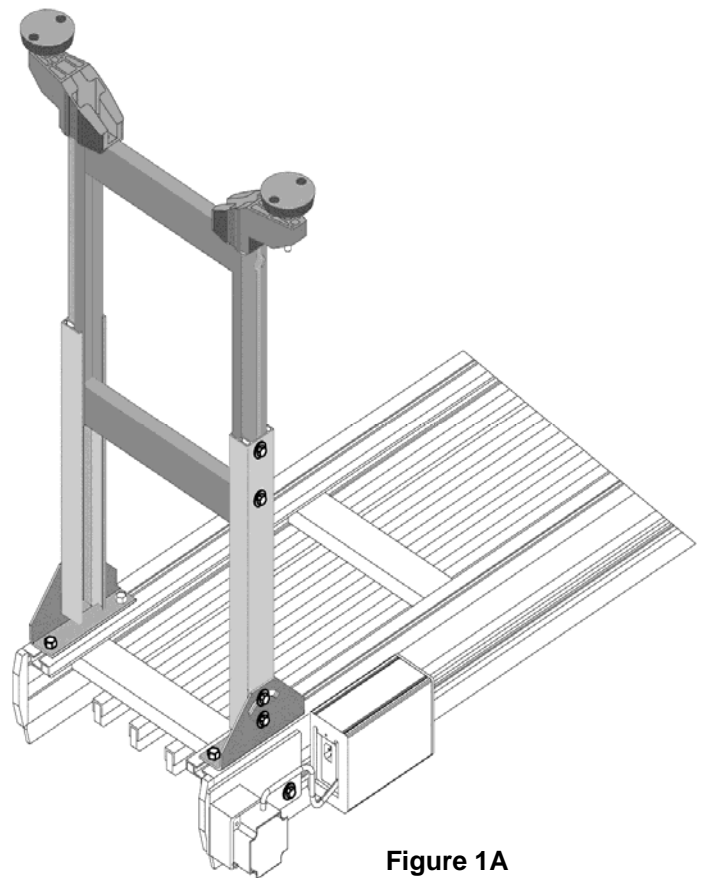


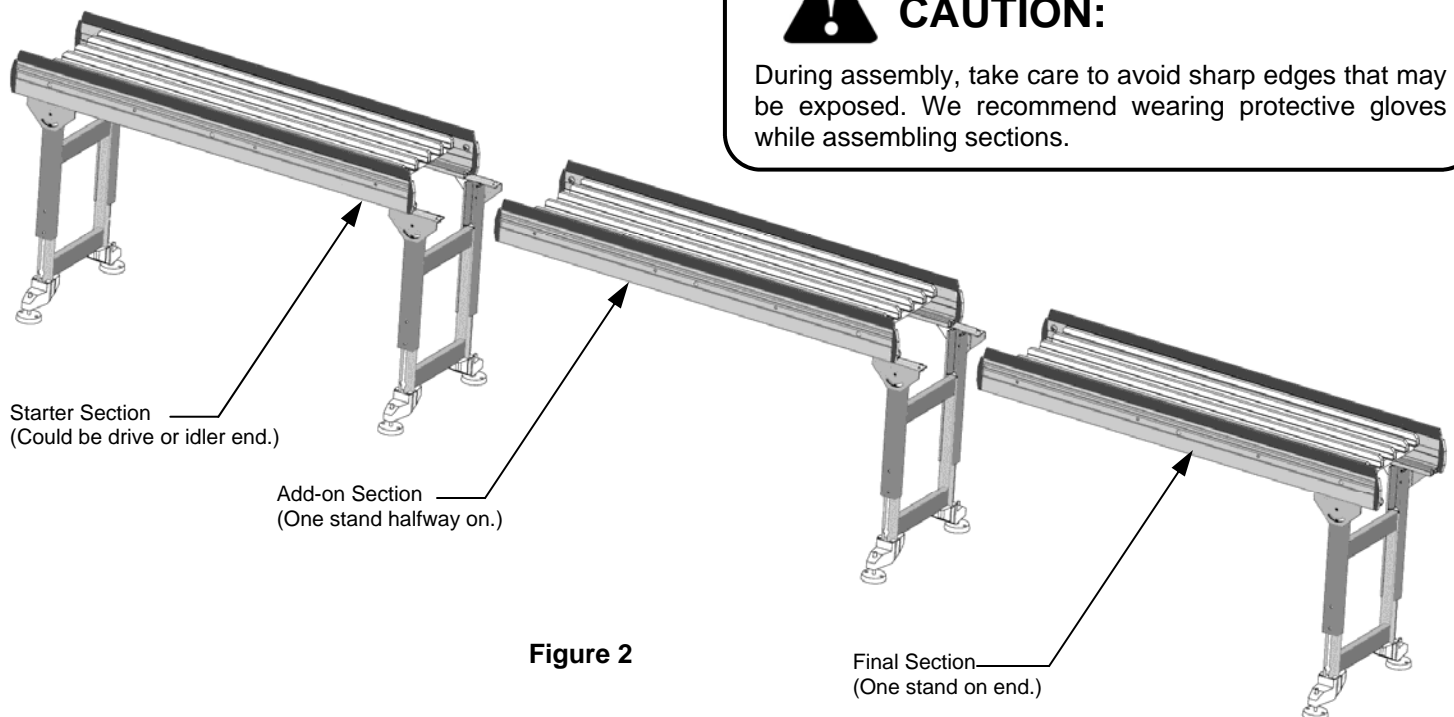
Figure 1A

CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Stands– Long Lines

Note: Conveyor sections are pre-drilled at the **drive end** with a large hole in the sideframes for connecting the drive motor to the drive shaft. When assembling multiple sections, always orientate the sections with the **drive ends** in the same direction.

1. **Install one stand** on the end of the first section that starts a continuous line conveyor. This stand, unless it is going to be used to join to another conveyor will be installed one inch from the end as directed by Stands -Short Line - Steps 2 -4. **See Figure 1A on Page 8 .**
2. **Install the second stand** on the same section at the other end with the mounting brackets half-way off the end of the conveyor sideframe. **See Figure 2, Below.**
3. With the help of an assistant, **turn the conveyor section over**, taking care to avoid bending or damaging any half-mounted stand brackets.
4. Place the conveyor section where it will be finally located.
5. **Set the height** of the first section by loosening the lower bolts on the stand extensions. Use a carpenters level to get the conveyor deck leveled at the desired height. (*Disregard this instruction if you are setting up an incline conveyor. See Page 10.*)
6. Repeat the installation of each add-on section by installing only one stand halfway on one end. Bring each section into alignment (setting height) with the previous section such that ends are butted to each other. Tighten the bolts in the stand bracket to secure each section to each other. Periodically check that you are remaining in a straight line from the first section to the last, thereby creating a straight level Long Line Conveyor.
7. **Secure each section to the floor** or to some other stationary object. (Walls, poles, etc.)
8. Install sideframe End Caps on the first and final section ends, (shipped with this owners manual) to protect exposed sharp edges. **See Figure 1B on page 8.**
9. Proceed to **Conveyor Assembly - Deck Extensions on the Next Page.**

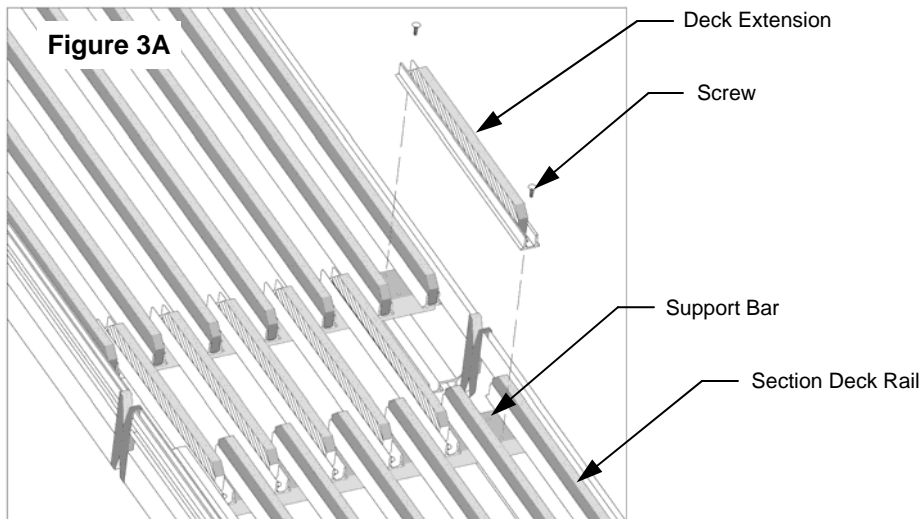


CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

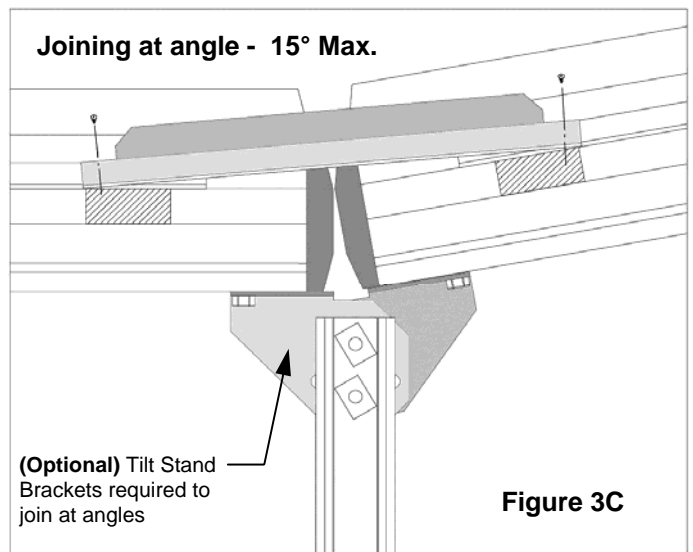
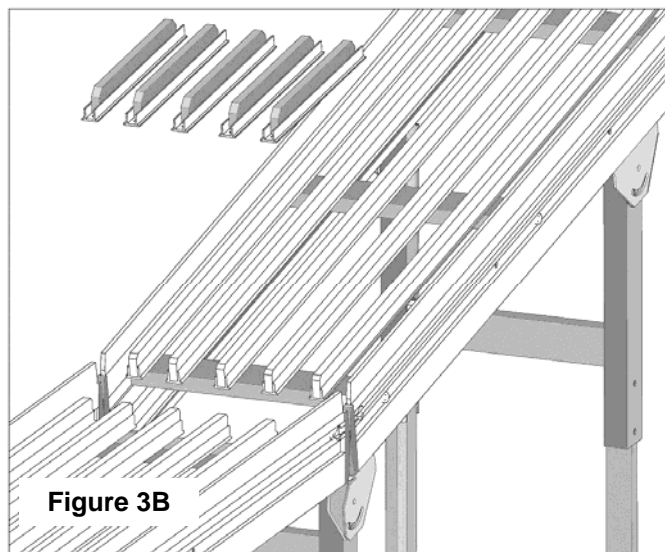
Deck Extensions (Multi-sections)

1. **Review Figures 3A, 3B and 3C below** for location of deck extensions being installed on horizontal or angled joints. Mount deck extensions to the existing holes in support bars as shown, (factory drilled). The **Table** below lists the quantity of deck extensions required at each joint.
2. If holes are not present, place the extensions centered between existing support bars and transfer mounting holes of the deck extension to the conveyor support bar. Drill holes 9/64" diameter for screws.
3. Place each extension centered between the existing deck and install screws to secure. **Note:** If installing deck extensions between non-parallel sections, (i.e. for inclines or declines up to 15°) tighten the screws equally until the extension is secured. *Do not "bottom-out" screw until both screws are installed.*
4. Repeat installing all remaining deck extensions for all connected joints. **Proceed to Conveyor Assembly - Idler Shaft Mounting on the Next Page.**

NOTE: Do not omit deck extensions! Without deck extensions, belt and product will not be properly supported between sections.



Extensions per joint	
Belt Width	Quantity
6"	2
9"	3
12"	4
15"	5
18"	6
21"	7
24"	8
27"	9
30"	10



CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Idler Shaft Mounting- (if not installed)

1. The Universal Drive Kit includes a fully assembled idler. The idler is mounted to the **entry** support bar of a continuous line of conveyor. (The term "**entry**" refers to the point which the belt will rotate from the underside of the conveyor frame to the surface where product is carried on top of the belt. See Figure 4.
2. **Slide the assembly onto the tie bar** and sight through one of the holes in the "nose" to line up with the hole in the support bar. If the holes do not line up with the idler assembly, you may have the wrong idler for the model you are trying to install it on. Don't use the wrong idler. (For example, don't install a 9" belt idler onto a section designed for 18" belt.)
3. With the holes lined up, **install the #10 x 1.5" Ig. Tek screws**. (We recommend using a power or cordless drill with a Nut driver to facilitate assembly.) Do not tighten the screws until all 4 are installed. Check that idler is secured and sitting flat on the support bar.
4. **Continue to Drive Shaft Mounting instructions Below.**

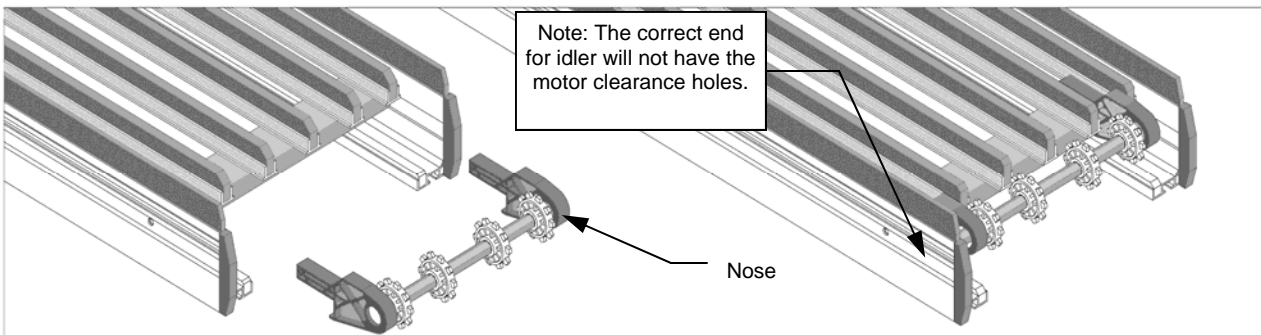


Figure 4

Drive Shaft Mounting - (if not installed)

1. The Universal Drive Kit includes a fully assembled Drive Shaft Assembly. The assembly is mounted to the **Exit** end of the conveyor to pre-drilled holes in the support bar. (The term "**Exit**" end refers to the point in the conveyor which the belt will rotate from the top of the conveyor to underside of the conveyor deck.
2. Select the side you want the motor mounted, and configure the drive shaft to match. See Figure 5 for either **LH** or **RH** assembly configurations. If you need to reverse the configuration, loosen the set screw retaining the bearing axle pin until you can pull the hex shaft away from the bearing. Once separated, remove the pin inside the bearing and re-install it from the opposite side. Replace the drive shaft on the axle pin and tighten the set screw. The new assembly should match the configuration you desire.
3. **Slide the assembly onto the support bar** and sight through one of the holes in the "nose" to line up with the hole in the support bar. If the holes do not line up with the drive assembly, you may have the wrong drive size. With the holes lined up, **install the #10 x 1.5" Ig. flat head screws**. (We recommend using a power or cordless drill with a Phillips drive to facilitate assembly.) Do not tighten the screws until all 4 are installed.
4. You are now ready to install the **Drive Motor** as instructed on the **Next Page**.

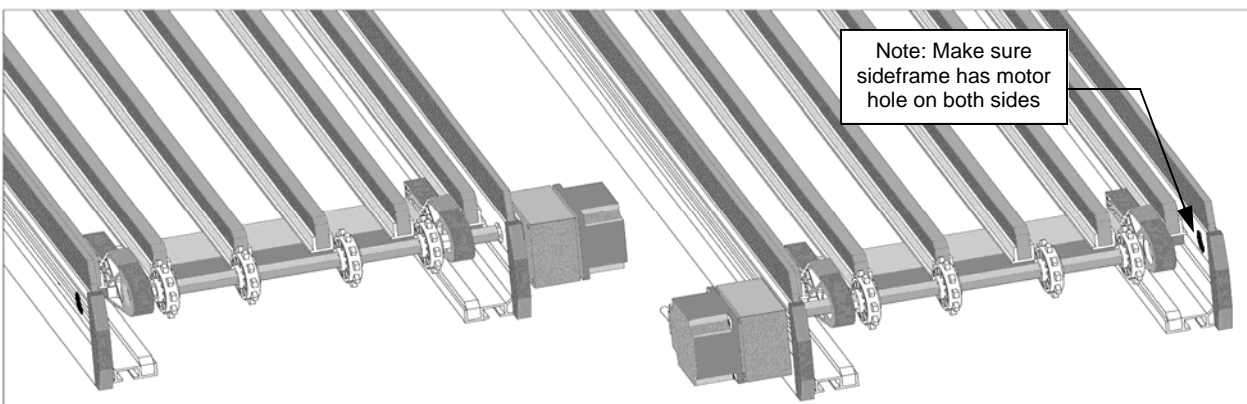


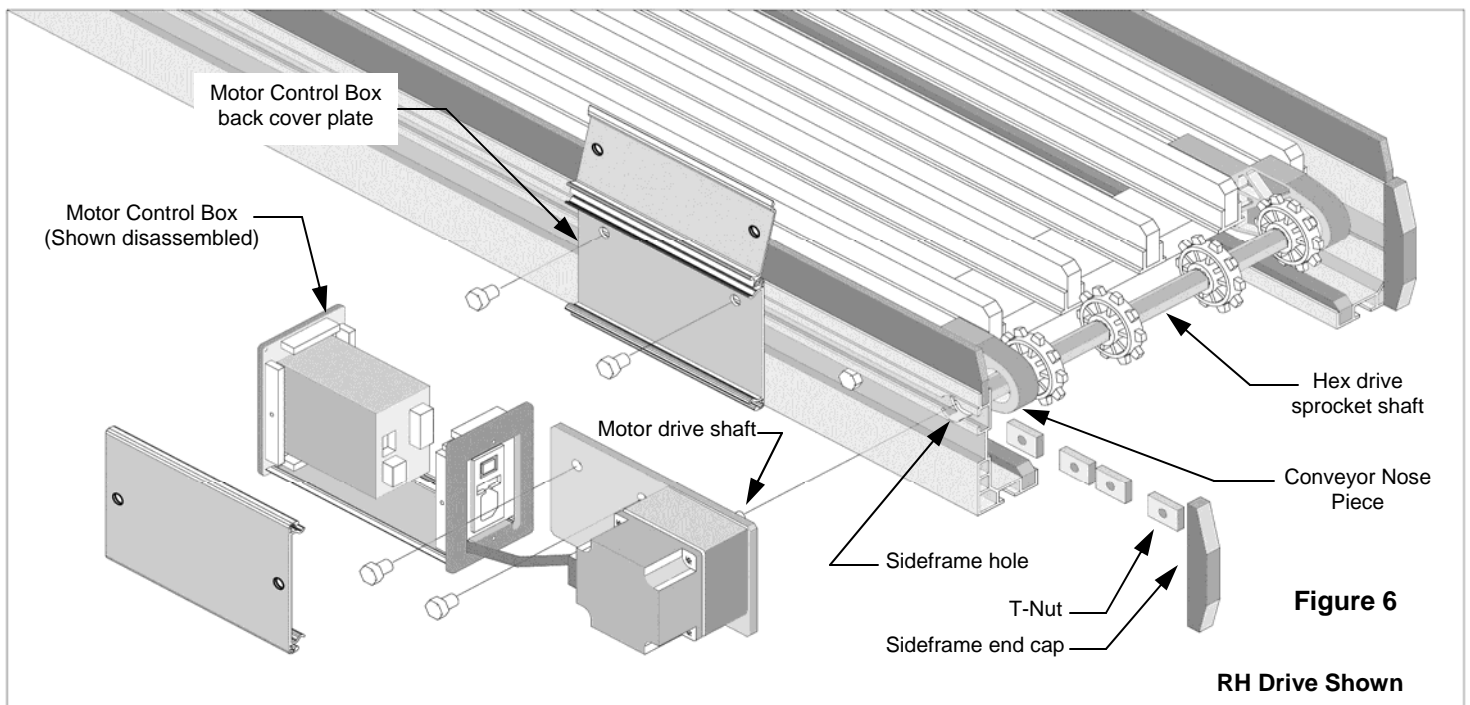
Figure 5

CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Drive Motor Mounting (if not installed)

1. **Prepare the motor for installation** by removing the covers on the Motor Control Box. *Remove only the front and top screws to detach covers.* (Unit is shipped with covers attached.) **Refer to Figure 6 Below.**
2. Install **4 "T-nuts"** into the sideframe, approximately where they line-up with the holes in the motor mounting plate and the back cover plate of the Motor Control Box. Replace the end cap afterwards.
3. Use #3/8-16 x 1/2" lg. bolts to **attach the Motor Control Box back cover plate** to the first 2 "T-nuts" you installed at approximately 9" from the end of the conveyor.
4. **Line-up the motor drive shaft** with the sideframe hole and the last 2 "T-nuts" in the sideframe. As you pass the motor drive shaft through the sideframe hole, line up the flat on the motor drive shaft with the set screw in the shaft coupling and the hex drive sprocket shaft. Unthread the set screw enough to allow the motor drive shaft to slide freely into the end of the hex drive sprocket shaft. (Do not tighten the set screw at this time.)
5. **Line-up the motor plate** holes with the "T" nuts in the sideframe and install the #3/8-16 x 5/8" long bolts and washers into the "T-nuts." Finger tighten the bolts. *The motor plate should sit flat against the sideframe if the motor drive shaft is properly inside the hex drive sprocket shaft.*
6. **Line-up the hex drive sprocket shaft** by sliding the motor plate until the shaft is centered on the hole in the conveyor nose piece. Hold the aligned position while tightening the motor mounting plate bolts. (Note: Check that the drive shaft is correctly aligned by "eyeing" from the top and the front to see if the shaft is parallel to the support bars and level across the frames.)
7. **Tighten the set screw of the coupling and hex drive sprocket shaft.** Make sure the set screw is seated against the flat of the motor drive shaft. *(Failure to align set screw with flat will result in screw coming loose. Operating the motor with a loose set screw can permanently damage the gearbox output shaft!)*
8. **Reassemble the motor control box** by reversing the order used to open the box.
9. **Proceed to Conveyor Assembly - Belt & Sprocket Alignment on Next Page.**

Note: If you have relocated the motor or changed the motor gear head, it may not rotate in the correct direction. Refer to **Motor Wiring on Page 27** to change the motor direction.



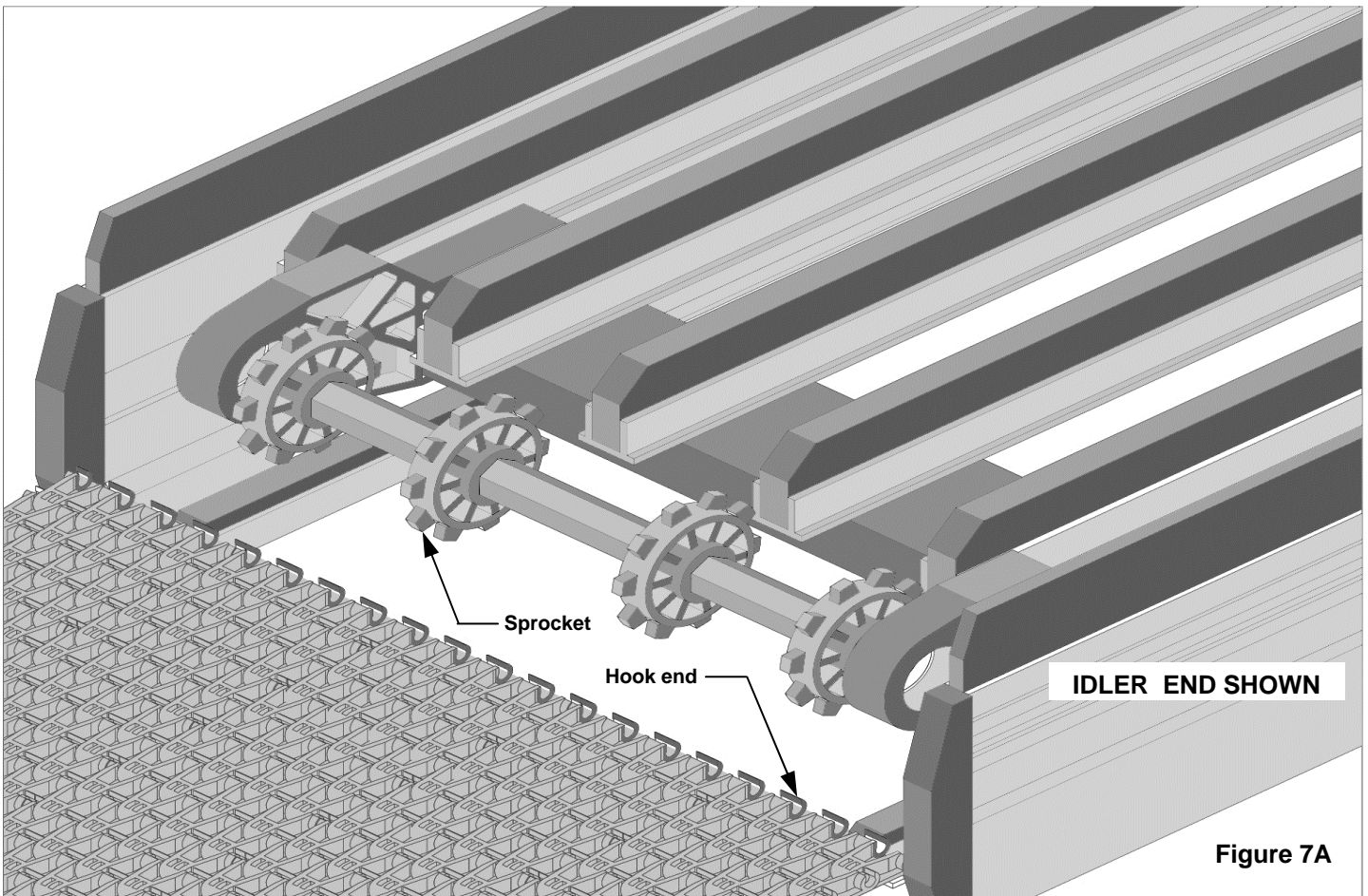
CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Belt Installation

SmartMove® Belting has a unique snap-link design that provides quick installation without tools. The snap-link belting is comprised of links that are 3" and 6" long that are joined in a "brick-like" offset arrangement to create different belt widths. The belt links are joined by a series of "**Hooks**" and "**Rods**" molded on opposite sides. The "rod" side of the belt is the **front end** while the "hook" is the **tail end**. When installing the belting on the conveyor, care should be taken to follow the correct orientation of the belting. A backward installed belt has reduced load capacity and can be damaged if run with links unsnapped as they can be pried open if obstructed from forward motion. Contrarily, belting that is installed correctly will have full strength and if a link is unsnapped, it will "dive" under obstructions to avoid damage.

Note: Belting is shipped in 10' long rolls with the "Hook" end conveniently on the outside of the roll. When you unroll the belting, it will end with a correct matching "Rod" end that can be joined to the next roll to create a continuous belt. If shortening the length, try to keep the belting with alternating links joined. Creating matched rows of links will weaken the belting.

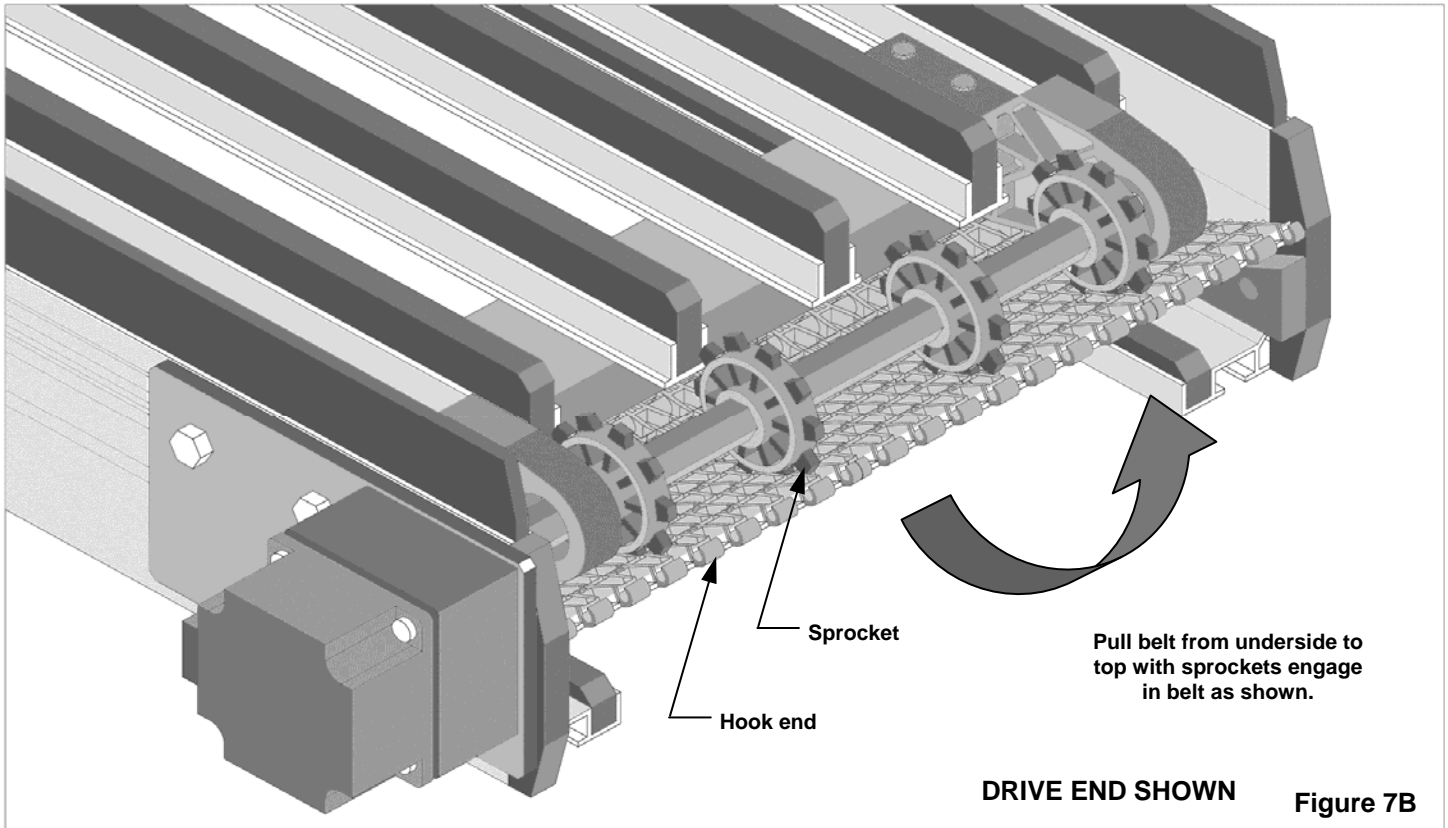
1. **Before installing belting**, check that all required joiner bars and deck extensions are installed.
2. **Start at the idler end** of the conveyor, (opposite the motor end) to begin installing the belting, with the belt underside facing up and the "hooks" at the leading edge. Slide the belting under the sprockets, keeping the underside facing up as you do so. **See Figure 7A Below**
3. **Continue feeding belting into the lower track.** Long line conveyors are shipped with 10' long rolls of belting. You will need to join the ends of each roll as you continue to feed belt. It is easier for two people to install belting on long lines by having one feed belt and the other pull the belt from the underside. (**Figure 7A** shows the correct orientation of the belt as it is installed at the idler end.)



CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Sprocket Alignment

4. **Align Idler and Drive Sprockets at both ends** to the belt, keeping equal spaces between each. (About 3" apart") The sprocket tooth should be located in the belt between the "Hooks". Do not engage the sprocket teeth with the "hooks" as there may be joints present. **See Figure 7B**
5. **Align the belt to the sideframe.** (Factory set on new models.) If the belting is not centered between the sideframes when engaged in the sprockets, it may be necessary to adjust their location. Rotate the axle until the set screws on the outer sprockets are visible from the top. Loosen both sprocket set screws until they can freely slide on the hex shaft. Move the sprockets until they are all properly engaged with the underside of the belting. While holding the belting engaged with the underside of the sprockets, slide the belt left or right to center the belt on the conveyor. (Try to get an equal space from the sideframe on both sides.) Now, tighten the sprockets to lock the position. (Do not over tighten. They only need to hold the sprocket from sliding.)
6. **Continue to feed the belt back over the idler toward the drive** on the top side of conveyor. (Now with flat side on top.)
7. **Bring the both ends together** and adjust the belt length by adding or removing rows of belt until a slight force is needed to pull the ends toward each other. (This will set the initial belt tension.) *Note: Overstretching to create a very tight belt is unnecessary and will actually cause the belt to run irregular.*
8. **Engage the "hooks" and "rods"** and proceed to snap them together over the sprockets. Continue snapping each link until all joints are engaged. (If you have trouble getting the snap-link completely engaged, you can manually rotate the unconnected links to the topside of the conveyor where you can place one hand under the belt and push down on each joint of the belt from the top with the other hand. *Note: ZX Series requires you to join links together at the ends at about halfway around the turn.*
9. Move the belt by hand to check that all links are correctly engaged and that there are no links "sticking" up.
10. Proceed to **Electrical Connection** on **page 21** if you are not installing any other accessories.

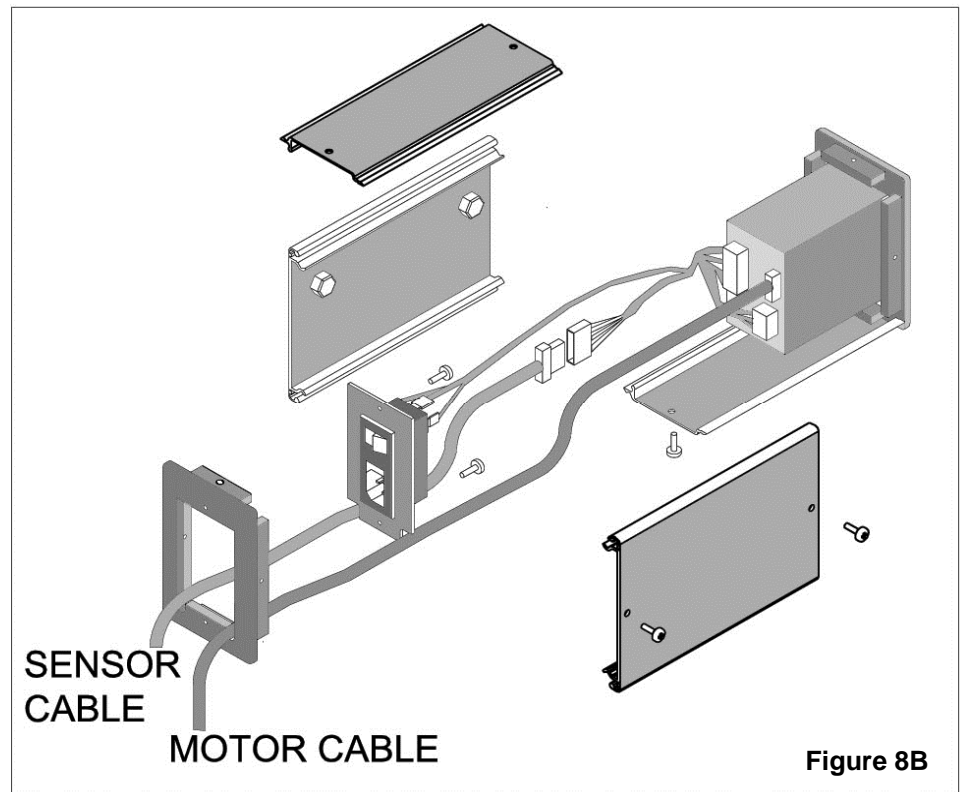
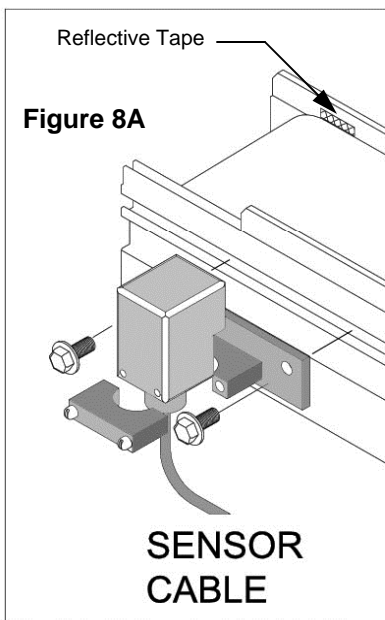


CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Sensor Controls

SmartMove® Motor Control Boxes are pre-wired to accept sensor controls. Use these instructions to add a sensor to an existing conveyor or to relocate sensors to other conveyors. When sensors are located on the opposite side of the conveyor, they are factory wired “through” the sideframe via holes located at a cross member of the frame. If relocating wiring, make sure all wires are secured out of harms way.

1. **Locate the sensor where it will be operated** on the conveyor using the supplied hardware to attach to the sideframe “T” slots. **See Figure 8A.**
2. **Remove approximately 5” of the conveyor guard rail** central to the sensor location. (For the sensor to look across the conveyor.) (Cut Guard Rail with saw or industrial cut-off pliers)
3. **Install the reflective tape** to the inside of the guard rail opposite the sensor. (Or wherever the sensor will be pointed.) (NOTE: Prepare area of application by cleaning with ammonia based surface cleaner.)
4. Open the motor control box by removing the top and front mounting screws. **Refer to Figure 8B.**
5. Flip the electronics up and over to expose the underside. Remove the Cover Panel that houses the A/C Switch Inlet.
6. Once the cover is removed, turn the cover so that the inside is facing you. Now, remove the two screws holding the A/C Switch Inlet metal panel.
7. With the panel removed, you can **bring the connector end of the Sensor cable through the cover** and plug it into the 4 pin connector located on the wire harness. (It is polarized and will only install one way.)
8. Reinstall the metal panel to the cover with both wires passing through the cover located as shown in the **Figure 8B Below.**
9. Reassemble the motor box. Bring any excess wire leading from the sensor to the inside of the Motor Control Box.
10. **Refer to Electrical Connection on Page 21.**
11. Please refer to the original equipment manufacturers (OEM) manual for adjusting standard sensor or optional time delay settings.



CONVEYOR ASSEMBLY (IF NOT PRE-ASSEMBLED)

Setting up Gate Conveyor

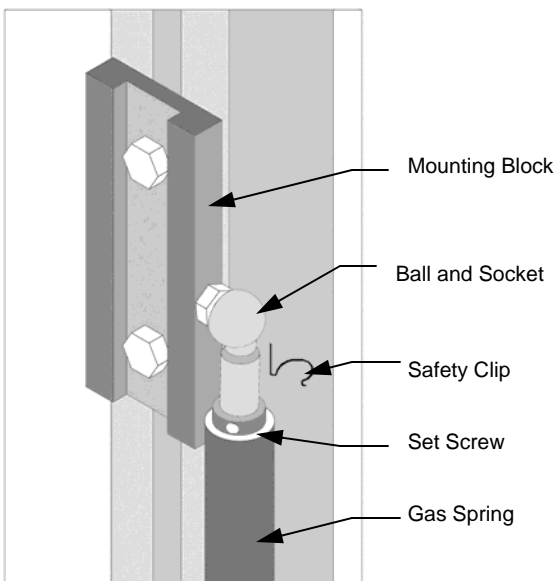
SmartMove® Gate conveyors are normally shipped fully assembled with stands folded. Some adjustments may be needed after set up. Please follow these instructions as well as any additional instructions shipped with the gate before operating.

1. If unit was shipped upside down with stands folded, **Refer to Page 5** for view of stand assembly. You will need to **remove the bolts locking the stand in the folded position**.
2. Once removed, loosen the stand bolt on the support bracket to free the stand frame for rotating to the upright position. **Set the stand vertical to the conveyor** and re-install the bolt, washer and "T-nut" in the stand support bracket. Lock in the vertical position.
3. When both stands are installed, have someone help to **flip the conveyor assembly upright**.
4. **Locate the gate conveyor where it will be operated**. If the gate is part of a continuous line of other SmartMove® conveyors, locate any other conveyors that may have been designed to operate in conjunction with the gate.
5. **Remove the shipping bolt** located at the base of the gate section. This bolt secures the gate in the horizontal position during shipment. The gate will not open until the bolt is removed.
6. **Test the lift settings of the gate**. The gate should be easy to open and should close slowly when released to the closed position. Some adjustments may be necessary as the result of installation variations that differ from the factory setting of the conveyor. Follow these instruction for making any adjustments to the gate.

Adjusting the force of the gas spring used to lift the conveyor.

1. The gas spring has a fixed amount of compressed gas that controls the force applied to the piston.
If the gate is too heavy to lift, you will need to contact the factory to replace the gas spring.
If the gate will not close on it's own weight, follow these instructions.
 - a. Remove the dampener piston. This is similar looking to the gas spring, but is functionally different. It is easy to identify as it does not have the collar with set screw at the end of the piston tube. Instead it has a ring with a slot where the rod enters the tube. To remove the dampener, you will have to remove the wire safety clip located on the socket of the Ball and Socket joint. **See Figure 9**. It is a bent wire that clips to the socket body and slides through a small hole in the housing to trap the ball from popping out of the socket. Once remove, the ball can be popped out of the socket to release the dampener from the mounting ball.
 - b. Locate the set screw in the collar of the gas spring. **See Figure 9**. Install a 5/64 Allen key into the set screw. Position the gate half closed and "crack" the set screw to release a small amount of gas. Continue to "crack" and then retighten the set screw releasing small amounts of gas until the gate lowers on it's own weight.
Note: The gas released cannot be replaced. If you release too much gas, the spring will not support the lifting of the gate and the gate will be difficult to lift. **Only release gas if the gate will not close on it's own weight.**

Figure 9



Adjust vertical upright position.

If the conveyor does not rest at a vertical position when opened or goes past vertical when open, you should adjust the location of the gas spring mounting block on the underside of the gate. **See Figure 9**.

Hold the conveyor in the open position. Loosen the bolts holding the gas spring block shown in **Figure 9**. Hold the gate at the vertical upright position and tighten the bolts on the gas spring block.

The same procedure can be used to **adjust the extended position of the optional folding stand**. Moving the mounting block on the stand gas spring will change the stand stop position.

Conveyor Configurations

Making 90° turns

Low friction flat chain belt, like that supplied on SmartMove® Conveyors, is ideal for making 90° turns. This simple and cost effective method of getting around corners works with most products that have flat bottoms. When in doubt, it is best to make a “trial” set-up to check how products will turn. *Note: Products that are less than 3” long will require backpressure from products traveling behind them to make the transition at the turn.*

To set up the 90° turn, cut out a section of the guard rail where you will be turning. (Make the opening to the width of the conveyor being installed at the turn.)

*Note: Product must move off the exit of one conveyor and be “pulled” onto the side of the next conveyor. Refer to the direction arrow of **Figure 10**.*

Set the stands up on the two joining conveyors as **Shown in Figure 10**. Use one stand slightly extended beyond the end of the frame to attach the conveyors together. *Note: You will need to remove some stand bolts to get additional “T” nuts installed on the lower slot of the frame. Stands may need to be relocated to avoid interference with each other.*

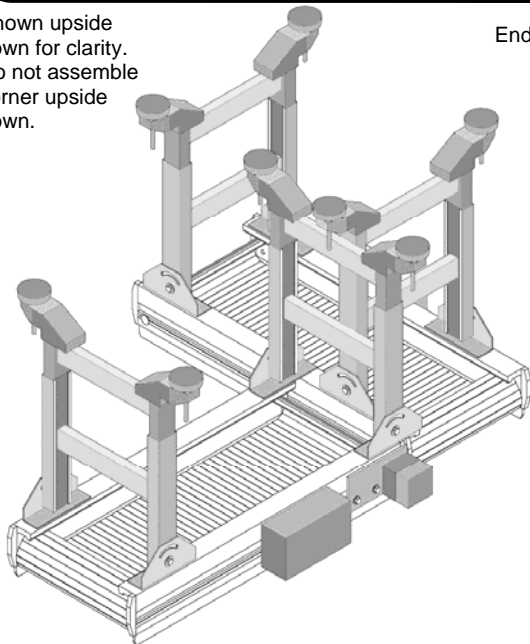
Once the corner is formed by the two attached conveyors, you can install the Corner Turn Kit and the End-to-Side Transition plate. (Plate fits into the frame where guard rail was removed.) These components help keep the product being transferred from catching either the edges of the guard rails or the sides of the conveyor belt. Most products, even if less than 1” high will make the turn. If you have trouble turning thin products, please contact the factory about installing a continuous piece of guard rail.



CAUTION:

Transition points are possible pinch points. The End-to-Side transition plate acts as a guard to protect against pinching. Do not operate system without transition plates installed.

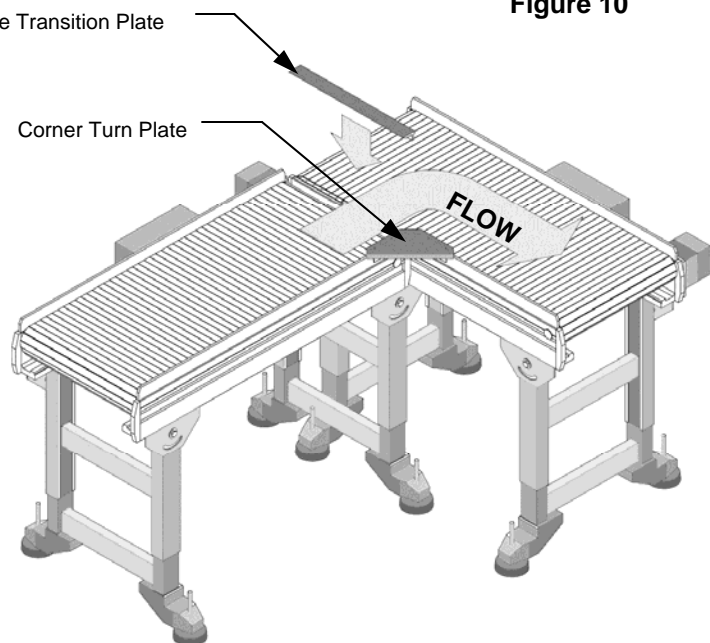
Shown upside down for clarity. Do not assemble corner upside down.



End-to-Side Transition Plate

Corner Turn Plate

Figure 10



Under side joiner plate maybe used in place of leg in short or low weight applications

Conveyor Configurations

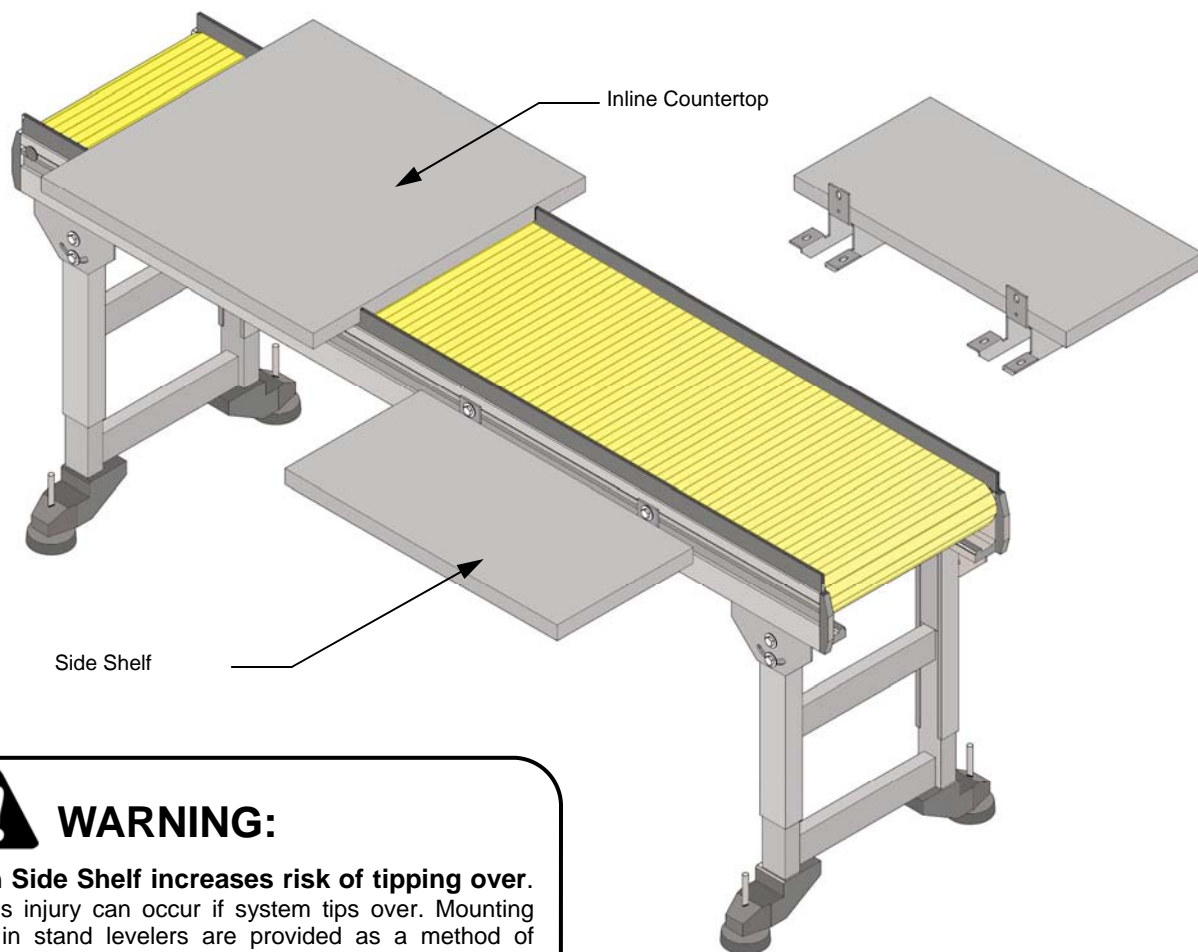
Workstation Conveyors

Working directly on top or just off to the side of the conveyor improves ergonomics with less lost motion.

AX Series Counters are designed to replace tables on assembly lines. Simple to install and available for all width model **AX Series** Conveyors.

Inline Countertops come fully assembled and simply sit on the existing 1" high guard rails. **See Figure 11.** The location of the countertop can be adjusted by sliding it to a new location or lifting and resetting it at the new location. Product being carried by the belt will be stopped by the countertop within easy reach of the operators on either side of the conveyor. Size of countertop is based on width of conveyor. (Standard countertop will overhang the frame approx. 3" on each side and are available in 18" or 24" length.)

Adjustable **Flush Side Shelves** can be mounted to the sideframes wherever space is available. **See Page 19** for installation instructions. Side shelves provide flush sliding transfer of product without needing to lift the product off the conveyor line for subassembly processing. Installs to side and bottom "T" slots with hardware provided. Shelves can be located next to each other to create longer shelf area.



WARNING:

Flush Side Shelf increases risk of tipping over. Serious injury can occur if system tips over. Mounting holes in stand levelers are provided as a method of bolting conveyor stands to the floor. When not possible to anchor to the floor, anchor the conveyor to other stationary objects (walls, poles, etc.) .

Figure 11

Conveyor Configurations

Side Shelf –Installation

Adjustable position side shelves are mounted to SmartMove® Conveyors with Shelf Support Brackets that attach to the sides and underneath “T” slots to provide a surface approximately 2” below TOB. Great for holding tools, parts or accessories while working directly on the line.

Please read and follow the instructions to properly install your side shelf.

Shelf Kit includes:

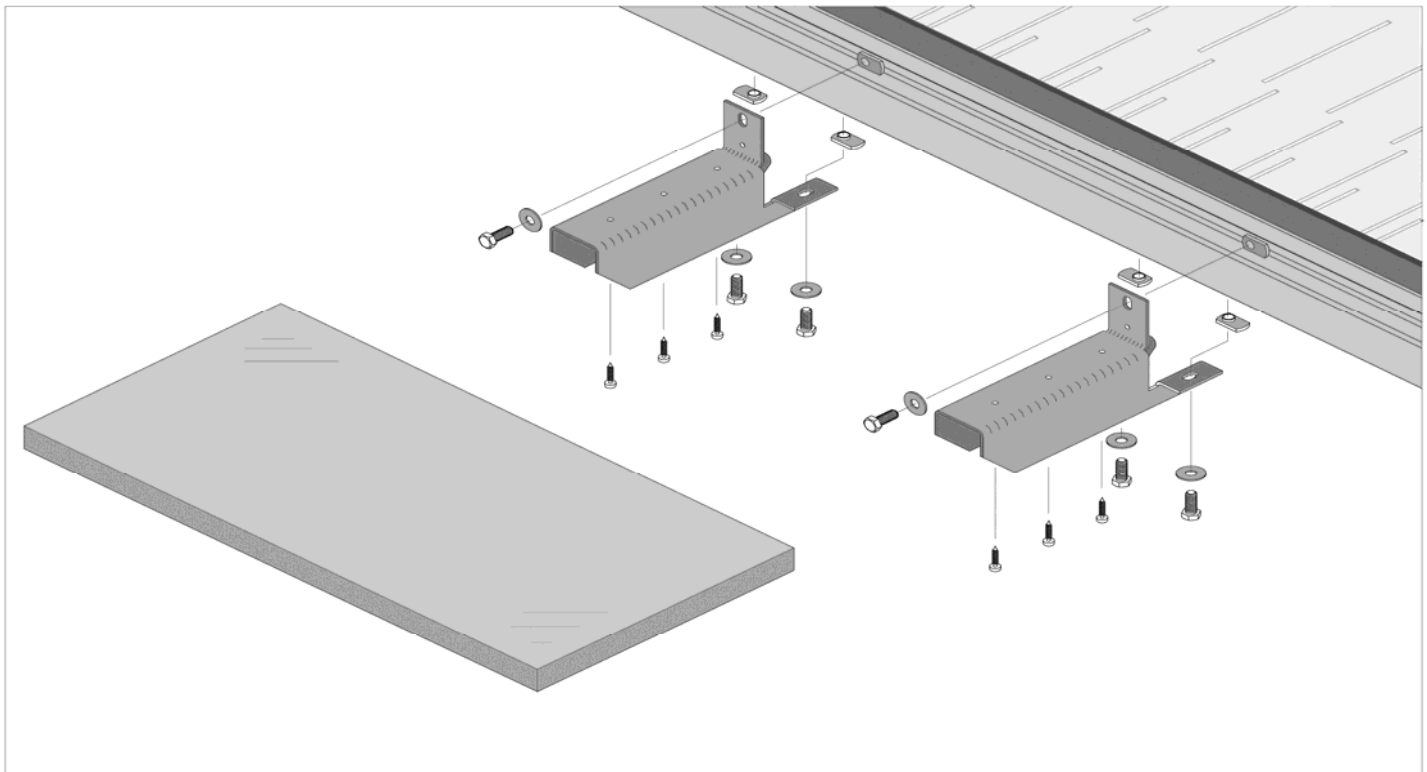
- Qty (1) Shelf (to dimensions specified.)
- Qty (2) Shelf Support Bracket
- Qty (6) Hex Head Bolt 3/8-16 x 1/2” Lg.
- Qty (6) Flat Washer 3/8
- Qty (6) “T” nut 3/8-16 threaded
- Qty (6) #10 Phil Head Wood Screws

Tool Required:

- 9/16 Socket or Adjustable Wrench
- Phillips Screw Driver or Screw Gun

Instructions:

1. Prepare the location for installing the shelf by installing “T” nuts into the slots on the side of the conveyor frame and on the underside of the sideframe approximately where brackets will be mounted.
2. Hold the Shelf Support Bracket against the frame and hand install the bolts and washers through the bracket and into the side frame “T” nuts. Hand tighten at this time.
3. Repeat step 2 for the second (or more if required) Shelf Support Bracket.
4. Locate the Shelf over the brackets with the front facing outward (Marked “**Front**” on the underside.) and slide the brackets until they are lined up with the pre-drilled holes on the underside of the Shelf.
5. Install all 6 screws into the shelf brackets into the pre-drilled holes and then tighten.
6. Position the shelf to the desired location and secure the (2) bottom Hex Head bolt and (1) the Hex Head Bolt in that order on both brackets to complete the installation.



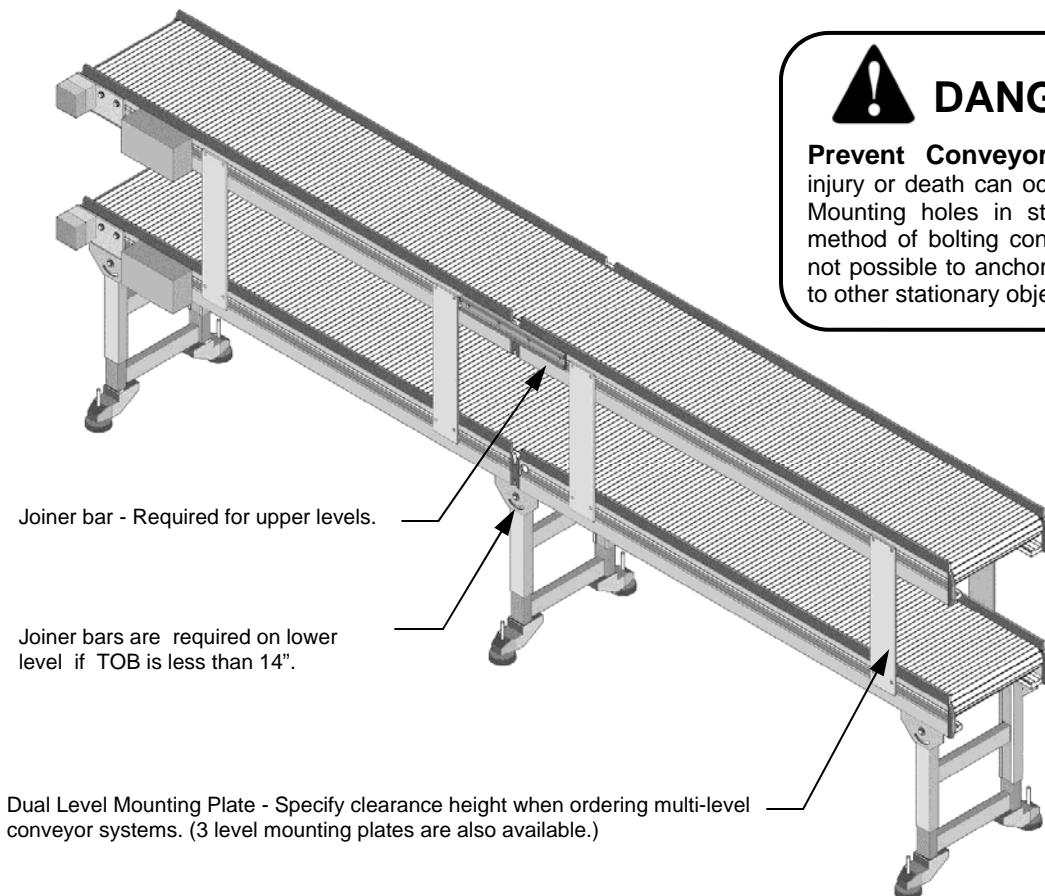
Conveyor Configurations

Multi-Level Conveyors

Creating a multi-level system is as simple as supporting one conveyor over the other. Supports are ordered based on the clearance needed to move packages under conveyors. Multi-level lines are useful for creating both delivery and take-away systems as well as a great way to save space in your facility.

To Assemble.

1. **Assemble the lower line first.** This line should be in its final location and secured to the floor.
2. **Install 4 Multi-Level Mounting Brackets** on each of the lower line sections. At each level the bracket has 2 clear holes with one tapped hole centered below. Locate brackets at least 12" from each end. Tighten all bolts securing the brackets to the lower level.
3. **Install the 1" long bolts** into the tapped holes of the multi-level brackets facing inward. *Note: The bolts act as temporary "staging" to support the upper conveyor during installation of the mounting bolts.*
4. **Rest one section at a time** on the 1" long staging bolts of the multi-level brackets and secure the brackets using the "T-nut" hardware provided.
5. **Secure each section** before installing additional sections.
6. **Join the ends of each section** with Joiner Bars mounted to the side "T" slots. Use the bottom "T" slot if side "T" slots are inaccessible.
7. Tighten all hardware. Staging bolts should remain installed for future disassembly.
8. Complete each level conveyor assembly before starting a new level. **See Assembly Instructions for Long Lines starting on page 9.**



DANGER:

Prevent Conveyor from tipping-over. Serious injury or death can occur if dual level system tips over. Mounting holes in stand levelers are provided as a method of bolting conveyor stands to the floor. When not possible to anchor to the floor, anchor the conveyor to other stationary objects (walls, poles, etc.) .

Figure 13

ELECTRICAL CONNECTION

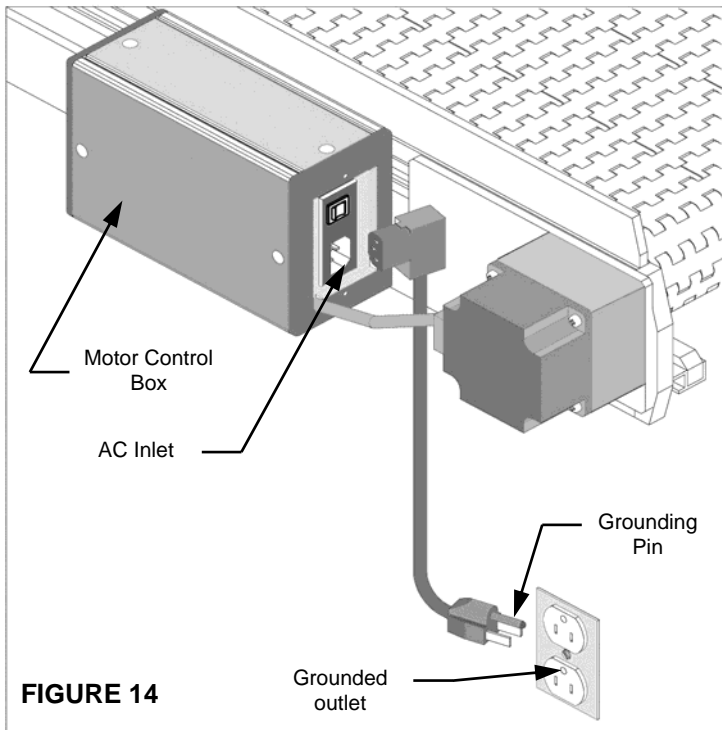


FIGURE 14

Your conveyor is powered by installing our removable 9' long power cord to an AC power supply that matches the voltage specified on the AC inlet control panel.

See **Figure 14**.

- Do not modify the plug provided. If it will not fit the outlet, have the proper outlet installed by a **qualified electrician**.
- Do not operate the conveyor with incorrect voltage.
- If the conveyor does not operate when plugged into the proper AC outlet, double check the power supply before investigating a problem with the conveyor.



CAUTION:

Protect the power cord from being cut or damaged when plugged into a power outlet. If necessary, secure the cable out of harms way.

FUSE PROTECTION

The electronics are protected by a fast blow type fuse. If the current draw exceeds the fuse rating, the internal element of the fuse will melt and disconnect the overloaded circuit. The fuse is only useful for one protective event and must be replaced afterward.

The fuse housing is located within the A/C Switch Inlet and can only be removed when the power cord is removed. See **Figure 15**.

Within the fuse housing is stored a spare fuse of the matching rating originally supplied with the equipment. (Fuse Miniature Slow Blow Acting 6.3A 250V 5mm X 20mm Glass) Always replace fuse with the same rating.

Note: Failure of the fuse can indicate a permanent failure of some internal electronics. If replacing a fuse results in a continued failure, contact the factory for replacement of the motor electronics.

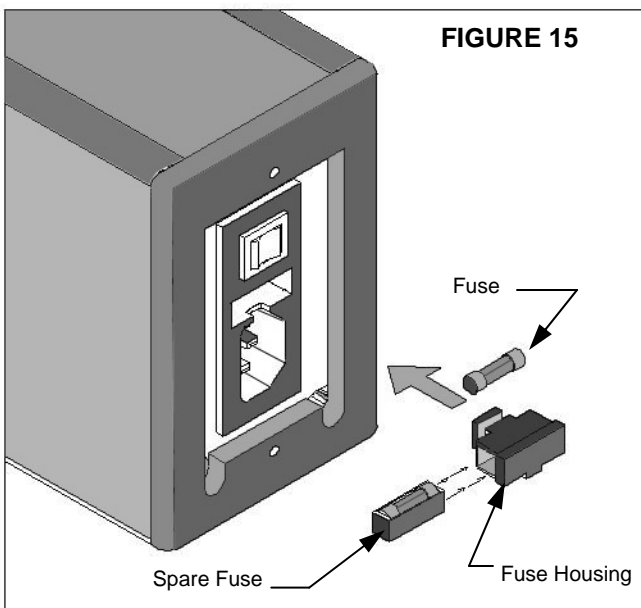


FIGURE 15

EXTENSION CORDS

Use only 3-wire extension cords that have 3-prong grounding plugs and 3-pole receptacles that accept the conveyors 9' power cord. To maintain proper operating voltage, use 16 AWG wired extension cables less than 100 feet long.

ELECTRICAL CONNECTION

Starting Conveyor and Testing

1. **Before Installing Power.** Read the **Electrical Connection** instructions on the previous page. Make sure that the Run/Stand-by Switch is set to Standby. If not, a sudden start of the conveyor may occur if power is installed and the A/C Switch is in the “On” position. Also, check that the belt is clear of components and tools used to set up. (These will travel if the belt starts.)
2. **Install Power.** The SmartMove® conveyor is supplied with a 9' long power cord that has a Right Angle IEC style molded plug that fits our A/C Switch/Fuse Inlet located on the Motor Control Box. **See Features Page 4 and Figure 14 on the Previous Page.** Plug one end into the Motor Control Box and the other end into the appropriate power source. If the conveyor was ordered with the optional internal power cords, it will have a built in power extension cable extending out the sideframe end cap at the idler end of the conveyor. This cable can be used to connect the power from this conveyor Motor Control Box to the next. You can “daisy chain” as many as 4 Motor Control Boxes to each other. (With the internal power cord option, all connected conveyors will turn off when the source box is shut off.)
3. **Turn on the power switch.** This is the rocker switch located directly above the inlet for the power cord. If power is being supplied, the control display will illuminate with the last set drive speed. *If an error code is displayed, you should Refer to Trouble Shooting on Page 31.*
4. **Slide the Run/Stand-by Switch to run.** At this point, the conveyor motor will run and the belt will move. If the belt moves in the wrong direction, (i.e. it is driving the belt toward the idler end, instead of toward the motor end), you will need to reverse the direction of the motor. **See Motor Wiring on Page 27.**
5. Adjust the speed of the conveyor by rotating the speed potentiometer located on the control panel of the Motor Control Box. *Note: Motor speed setting does not affect the load rating of the conveyor.*
6. **Test the Accessories installed.** If your system was equipped with a sensor control, check that it is operating as intended. Make necessary adjustments to the accessories to meet your requirements.
7. **Perform a drag test.** With the motor on and the belt running, (any speed.) try to hold the belt from moving by gripping the idler end of the belt. *For safety reasons, the motor has overload protection and will shut off if it is stopped for more than 10 seconds.* It is not necessary to stop the belt to determine that all components are correctly installed. This test should result in a resistance from the motor to stop. If holding back the belt slows the motor without having the belt slip on the drive sprockets, the conveyor belt length is correct. If the motor continues to drive, but the belting is “hopping” over the teeth on the gears, the belt length needs to be shortened. **See Troubleshooting, “Belt is slipping” on Page 31 if the motor is spinning, but the belt is not moving.**
8. **Inspect the conveyor while it is operating for any unusual sounds or erratic motion .** Our patented drive will deliver smooth quiet performance if properly assembled, installed and operated. Clicking, clacking or scrapping noises are indicators of an abnormal operation. Investigate the source of noises to determine the cause. *Take corrective action as recommended by Troubleshooting on Page 31.*

Congratulations on a successful installation.

Except for periodic removal of debris that may get inside the belting, no other maintenance will be required for the life of your conveyor!

Since damage can occur to almost any product, please consider, “**How “vital” is your conveyor to your operation?**” When considering the cost of purchasing spare components, please calculate the cost that you will experience if your conveyor is non-operational for 5-10 working days.

Although each unit is shipped with an emergency belt repair kit, we recommend having **1 foot of spare belt** in the same width as your conveyor and a **replacement drive**. The foot of spare belt will repair a damaged belt and the replacement drive will get your conveyor running in minutes if for any reason your motor will not operate. Being prepared is your best defense for handling a non-operational conveyor.

MOTOR SPECIFICATIONS

SmartMove® conveyors are designed to be operated with single-phase 100V-115V (Optional 200V—240V available) Variable Speed High Efficiency Motors.

If your conveyor has a different motor, please refer to the motor manual that was shipped with the unit for additional specifications. These are our standard motor/gear head sizes. (Use the table below to extrapolate for other gear head

SERIAL NUMBER LABEL				
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> DX3-025-12 1275-1 </div>		MOTOR SPECIFICATION	[DX3= Motor style] - [025 = Belt Speed fpm] - [Belt width inches]	
		SERIAL NUMBER		
Motor Style	DX3			
Belt Speed Code Motor Mfg. Number Gear head Mfg Number	012 BLM230P-GFV2 GFV2G200A	025 BLM230P-GFV2 GFV2G100A	050** BLM230P-GFV2 GFV2G50A	083** BLM230P-GFV2 GFV2G30A
Belt Speed Range	1-12 fpm	1-25 fpm	1-50 fpm	2-83 fpm
Carry Load Capacity*	400 lbs	375 lbs	210 lbs	126 lbs
Rated Input Current Maximum Current (Amps)	1.2 2.0	1.2 2.0	1.2 2.0	1.2 2.0
Gear Ratio	200:1	100:1	50:1	30:1
* Carry Load Capacity is based on moving horizontal loads. See Conveyor Load Specifications on Page 26.				
** The 083 are only used in special applications with short lengths and light loads.				

Motor Style	DX6				
Belt Speed Code Motor Mfg. Number Gear head Mfg Number	012 BLM460SP-GFV2 GFV4G200A	025 BLM460SP-GFV2 GFV4G100A	050 BLM460SP-GFV2 GFV4G50A	083 BLM460SP-GFV2 GFV4G30A	125** BLM460SP-GFV2 GFV4G20A
Belt Speed Range	1-12 fpm	1-25 fpm	1-50 fpm	2-83 fpm	3-125 fpm
Carry Load Capacity*	500 lbs	450 lbs	400 lbs	200 lbs	150 lbs
Rated Input Current Maximum Current (Amps)	1.7 3.3	1.7 3.3	1.7 3.3	1.7 3.3	1.7 3.3
Gear Ratio	200:1	100:1	50:1	30:1	20:1
* Carry Load Capacity is based on moving horizontal loads. See Conveyor Load Specifications on Page 26.					
** The 125 are only used in special applications with short lengths and light loads.					

MOTOR SPECIFICATIONS

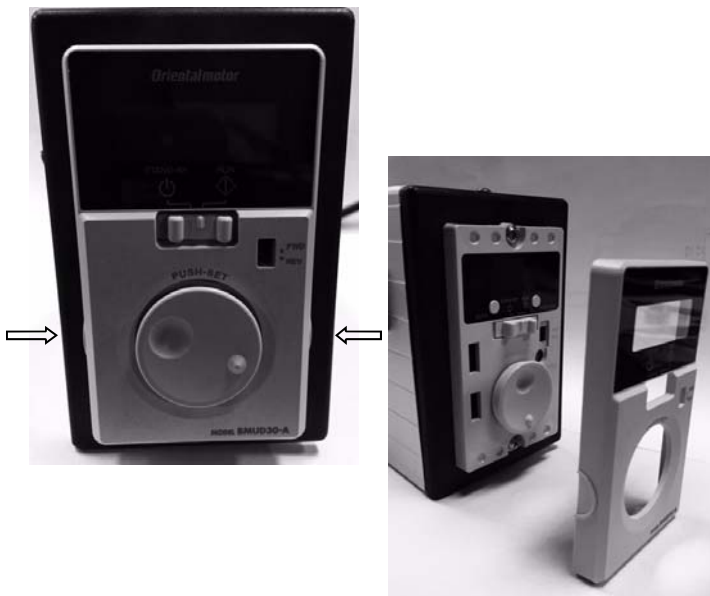
Motor Style	DX12						
Belt Speed Code Motor Mfg. Number Gear head Mfg Number	012 BLM5120P- GFV2 GFV5G200A	025 BLM5120P- GFV2 GFV5G100A	050 BLM5120P- GFV2 GFV5G50A	083 BLM5120P- GFV2 GFV5G30A	125 BLM5120P- GFV2 GFV5G20A	166 BLM5120P- GFV2 GFV5G15A	250** BLM5120P- GFV2 GFV5G10A
Belt Speed Range	1-12 fpm	1-25 fpm	1-50 fpm	2-83 fpm	3-125 fpm	3-166 fpm	5-250 fpm
Carry Load Capacity*	600 lbs	600 lbs	600 lbs	498 lbs	332 lbs	249 lbs	166 lbs
Rated Input Current Maximum Current (Amps)	3.3 6.8	3.3 6.8	3.3 6.8	3.3 6.8	3.3 6.8	3.3 6.8	3.3 6.8
Gear Ratio	200:1	100:1	50:1	30:1	20:1	15:1	10:1

*Carry Load Capacity is based on moving horizontal loads. Belt length and weight have a significant impact on carrying capacity
See Conveyor Load Specifications on Page 26.
** The 250 are only used in special applications with short lengths and light loads.

Slow start / slowdown option

How to remove front panel

Press Sides as shown, Then pull the face plate toward you.



Setting the slow start/stop time

The motor starts slowly when it starts up, and stops slowly when it stops. The slow start and slowdown time can be set within the range from 0.5 to 10 sec. (4000 r/min without load)



Slow start/slowdown time setting potentiometer

Time is increased by turning the potentiometer in the clockwise direction. Use an insulated Phillips screwdriver for this operation. The shortest time is selected at the time of shipment.

Figure 16

DRIVE OPERATING SPECIFICATIONS

Integration Sheet for BMU Series

Remove front cover

Power ON

Press *MODE* button three (3) times until the display reads *Par*

Press the function button once, until the display reads *Gr-r*

Press the dial knob once to enter the setting mode, and dial in the gear ratio for the speed reducer being used:

For Gear Head Ratio....	Dial In Gr-r value (Feet/min)	Dial In Gr-r value (Meters/min)
5:1	8.00	26.24
10:1	15.99	52.47
15:1	23.99	78.71
20:1	31.99	104.95
30:1	47.98	157.42
50:1	79.97	262.36
100:1	159.94	524.73
200:1	319.87	1049.45

After the value is dialed in, press the dial knob once to set

Press the *FUNCTION* button three times, until the display reads *oPAL*

Press the dial knob once, and rotate the knob until the display reads *OFF*

After the value is dialed in, press the dial knob once to set. (This disables the inhibit start function, so the motor will auto start after power is restored.)

Press the function button five times, until the display reads *ioEn*.

Press the dial knob once, and rotate the knob until the display reads *On*

After the value is dialed in, press the dial knob once to set. (This enables the controller to read the external signal settings for *FWD / REV*, as entered on CN4, 9 pin Phoenix Block)

Power off the unit, and when re-energized, the display will read conveyor speed in *Feet / Min* and the "no reset" upon power up will be disabled. (An "on" condition set in *oPAL* mode will disable the automatic start up when power is applied. All normal speed controls and jumper inhibitors are active as usual.)

For additional Information see the BLM / BMU Complete Manuals at www.4SmartMove.com

UL Standards and CSA Standards

Applicable Standards

	Applicable Standards	Certification Body	Standards File No.	Degree of protection
Motor *	UL 1004-1 CSA C22.2 No.100	UL	E335369	IP65
Driver	UL 508C CSA C22.2 No.14	UL	E171462	IP20
Thermal class UL/CSA Standards: 105(A)				

ADDITIONAL OPERATING SPECIFICATIONS

SmartMove® Conveyors meet or exceed the following specifications regarding load capabilities. If you have a particular question that you cannot find the answer listed, please contact our sales office.

SmartMove® Conveyor Load Specifications				
Maximum Distributed Carry Load Capacity* by Conveyor Length (feet) and Belt Width (inches)				
Belt Width	20'	30'	40'	50'
6"	150 lbs	Not available	Not available	Not available
9"	200 lbs	200 lbs	Not available	Not available
12"	250 lbs	250 lbs	250 lbs	Not available
15"	300 lbs	300 lbs	300 lbs	300 lbs
18" or wider	350 lbs	350 lbs	350 lbs	350 lbs
* Carry Load Capacity is based on moving horizontal loads. Optional pinned belting can increase capacity's				

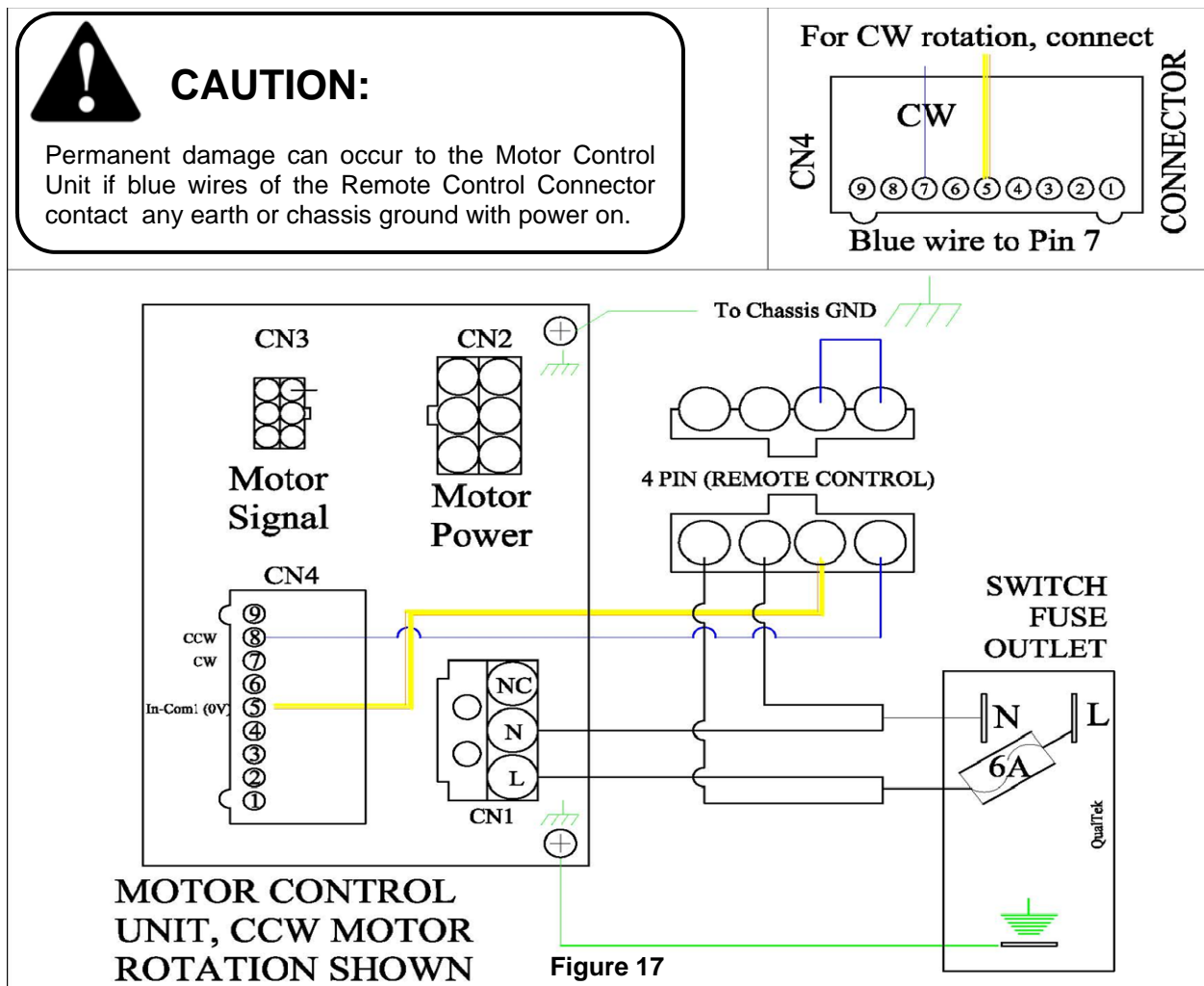
Additional Specifications	
Accumulating Loads: Sliding is approximately 1/3 of carry capacity. For example, if drive is rated to carry 300lbs, you can expect to be able to slide under a stopped load of 100lbs.	(Load Capacity) ÷ 3
Max. Load per Conveyor Section: This is a static load. Dropping product onto the conveyor could exceed this load and cause a failure of the stand support brackets. These limitations only apply to conveyors supported with SmartMove® Stands supports. (500 lbs Options Available)	350 lbs(158 Kg.)
Max. Conveyor Section Length: The section is the physical beam that supports the conveyor. It is measured from "end-cap" to "end-cap". Joined sections create long lines.	120"(3.05 Meters)
Max. Belt Width: This restriction is based on AX Series Sideframes.	48"(1219mm)
Min. Belt Width: This restriction is based on AX Series Sideframes	3"(76mm)
Belt ESD rating: This is the measured discharge resistance of ESD belting measured on the surface of flat belting. When using Brush or Ribbed belting, please request a sample of our flat belt if you need to test.	$10^9 - 10^{11}$ ohms/in ²
Max. Incline or Decline Angle: Although some rubber surfaced products may exceed this angle, our testing indicates that exceeding 15° inclines or declines will cause products to loose "grip" with our low friction belting and begin to slide. High friction and flighted belts available by request.	15°
Max. Belt Speed: We have only tested our belting up to 259fpm. Some applications may exceed this speed at their own risk.	259 fpm (79 M/min)

MOTOR WIRING

Motor Wiring Diagrams. Some motor wiring may differ from the diagram given below. *This diagram is also located on the inside cover of the Motor Controls box.* When wired accessories are installed at the factory, additional wiring information can be located inside the Motor Control Box. **Only qualified electricians** should attempt to alter or modify the conveyor wiring. All conveyor systems are shipped with a Motor Manual supplied by the Motor manufacturer. Please refer to the Motor Manual for additional information and for special features provided by these precision motors. These diagrams refer to Oriental BMU Series Motors sold with SmartMove® Series conveyors having “DX3,DX6” and “DX12” in the serial number located on the outside of the motor control box. Actual AC voltage required will be labeled on the control panel of the Motor Control Box, (to the side of the power cord plug housing.)

Remote Control: Use a matching connector (can be purchased from SmartMove®) to wire a start/stop switch to the conveyor motor. The black & white wires are AC Voltage (Do not exceed 3 amps on this circuit). Use the blue wires to stop the motor rotation by connecting them to each other with a switch. This connector is also used to connect to sensors or remote control relay options. **See Caution Below.**

Relocating Motor: If you are re-locating the motor from one side to the other, you will need to change the motor direction as indicated here. Changing gear heads may also alter motor direction. *Note: Operating the conveyor as a “pusher”, motor located at the start of the conveyor, is not recommended. SmartMove® Conveyors are not designed to operate the belt in the opposite direction of that shipped from the factory.*



GLOSSARY OF TERMS FOR CONVEYORS

ADJUSTABLE GUIDE RAIL

Used to support and guide product inward of the belt edges. These rod connected strips of UHMW in an aluminum "C" channel are mounted on extension blocks to the sideframe of the conveyor. They are used to narrow the belt path as well as for guiding and supporting product on the belt. The term **Stroke** as it pertains to the adjustable guide rail is the distance the rail can be adjusted as measured from the edge of the belt inward in inch increments. (For example, a stroke of 3" will allow the guide rail to be adjusted inward from the edge of the belt up to a maximum of 3 inches.) *See Features AX Series on page 4.*

ALARM CODE

Flashing display with alarm code.

See Troubleshooting "Alarm Codes on", page 32.

CORNER TURN

When making a 90° turn by placing the end of one conveyor to the side of another conveyor, it is advantageous to have the conveyor receiving the product to be slightly lower relative to the end of the delivery line. A end to side joiner plate with a 1/8" drop helps the product make a clean turn.

ROD END

This refers to one end of the belt when separated. We call the joints of the belt "Knuckles" and they are held together by snapping the "Rod" between each knuckle into the "Hook" of the opposing knuckle. When the belt is laid flat, one end will have all the Rods between the knuckles and the other will have the knuckles with the "Hooks." When the ends are brought together to form the continuous belting, the hooks are snapped over each rod between the knuckles to create the hinge joint. The Rod-end should always lead when carrying product. If the hook is leading, a backward force can lift the hook off the rod causing the belt to separate. Contrarily, the same backward force will lift the rods when they are leading, yet will still remain engaged to the hooks.

See Figure 7A on Page 13.

BELT STRETCH

If the "hinge like" joints in the belt exhibit wear during operation, the belt will increase in length. (Even the smallest amount of wear will be multiplied by the many number of joints used to create the rows of continuous belt. For example, .002 inches of wear on a 10' conveyor is like having an extra row of links added to the belt.)

Belt stretch causes the belt to operate erratically and requires frequent maintenance to correct.

SmartMove® belting, with its snap-link design and proprietary lubricants significantly reduces belt stretch to maintain its original length for the life of the product.

CLEARANCE HEIGHT

This term is usually associated with the path measured from the Top of the Belt to the underside of an overhead conveyor or cross member. In multi-level conveyors, the clearance height is the maximum height of product that will travel on the lower level.

See Figure 13 on Page 20.

FIXED GUARD RAIL

Designed into the top of the sideframe extrusions is a 1/4" wide channel that we mount UHMW strips. These strips extend above the belting by 1" and are used to: (1) keep products on the belt, (2) provide a side

thrust bearing surface for the belting, (3) support our adjustable end stops and (4) provide the support for the moveable workstation countertops.

PUSHER

Incorrect operation of the motor where the drive is at the beginning of the conveyor line and is "pushing" the belt in the direction of travel. The correct direction for non-tensioned belt systems is to have the motor at the exit end with product being "pulled" by the belt with the motor. Operating the motor as a "pusher" can cause the belting to slip on the drive or have problems transferring as the belt may "bulge" upward.

SIDEFRADE

The rugged aluminum extrusions that creates the sides of the conveyor frame. The side frames are used to support the guide rails, cross bars, accessories and stands

SNAP-LINK

SmartMove® belting is composed of 3" and 6" long injection molded components designed to snap-together to form a continuous hinge style conveyor belt. Integrally molded snap-link joints create improved belt life as compared to belting that uses metal or plastic hinge pins.

SPROCKET

This is the toothed wheel that engages the underside of the SmartMove® belting. Outer sprockets have set screws that are locked to the hex shaft. Inner sprockets are designed to "float" on the hex shaft and are therefore not locked by any set screws. *See Figure 7A on Page 13.*

SPEED SETTING POTENTIOMETER

This is the variable speed dial located on the control panel of the Motor Control Box.

"T"- NUT

A rectangular shaped nut designed to fit into our side frames to facilitate easy assembly of stands and accessories. These T-nuts are installed into the slots of the aluminum extrusions at the ends and will accept 3/8 -16 threaded bolts. *See Figure 6 on Page 12.*

TOB

This is an abbreviation for "Top of Belt." **TOB** is used to designate a measurement as taken from the top surface of the belt to the floor.

TRANSITIONS

A term used to describe the product moving from one conveyor to another conveyor. The transfer may be from the end of one conveyor to either the beginning or the side of another conveyor.

TRANSITION PLATE

Also know as "dead" plates, these fit between conveyor ends and beginnings to aide in the transfer of product. In the case of **end-to-end transition plates**, SmartMove® uses a "floating" drop in plate. These plates are beveled to fit between the end drive and beginning idler and held by gravity to prevent small products from falling between the two conveyor ends. For **End-to-Side transition plates**, SmartMove® uses its own design called a "tip" plate. This transfer plate leans on the exiting belt to allow product to be guided at a slight incline to clear the edge of the transferring conveyor belt. As the product weight rests on the transition plate, it "tips" to become below flush with the take-away conveyor. *See Figure 10 on Page 17.*

Maintenance

Operating Instructions

Operating your conveyor is as simple as turning on the power and adjusting the variable speed drive. For your safety, it is required that you read all safety instructions within this manual. For more operating instructions, please **Refer to the Starting Conveyor and Testing Instructions on Page 22.**

SmartMove® Conveyors with energy efficient drives can be operated at continuous duty cycles. Unlike tension driven, (rubber coated cloth), belt conveyors, there are no tracking or belt tensioning maintenance requirements.

Maintenance

No maintenance is required other than periodic cleaning.

Clean the belt while installed: Vacuum the belt and use a soft cloth with ammonia or common household cleaner to clean belt. See below for what chemicals that should be avoided. Check for missing or damaged links and replace as needed. *Your unit was shipped with a short length of belting to quickly repair any damage that may occur.*

Remove belt to clean inside the conveyor: Periodic belt removal may be needed depending on service usage. If the conveyor belt starts to experience unsnapping of links, it is likely that the belt needs to be removed for cleaning. Once removed, clean debris from the inside of the conveyor and any build-up on the drive system. Check the underside of the belt for any debris that may have become "lodged" into the belt and remove if found. Inspect drive and decking to insure that there is no abnormal wear occurring. (i.e., Belt not aligned and shows rub marks on aluminum that could be corrected by adjusting sprocket locations. **See Sprocket Alignment on Page 14.**)

While belt is removed: Remove any material that may become "wound-up" on the moving drive components. *The motor is a totally enclosed housing and does not require any maintenance for the life of the product.*

Check for loose hardware: Periodically check stand and frame mounted hardware for tightness.

Corrosion resistance

The following data is based on 68° F.

Some of the chemicals that **should NOT** come in contact with the belting or the conveyor.

Cyclohexane	Hexane	Chlorine	Xylene
Gasoline	Methylene Chloride	Turpentine	Acetone

Some of the chemicals that **are acceptable** to convey or come in contact with the belt.

Benzene	Ethyl Chloride	Hydrochloric Acid (up to 37%)
Iodine	Muriatic Acid	Carbon Tetrachloride

MOTOR REPLACEMENT

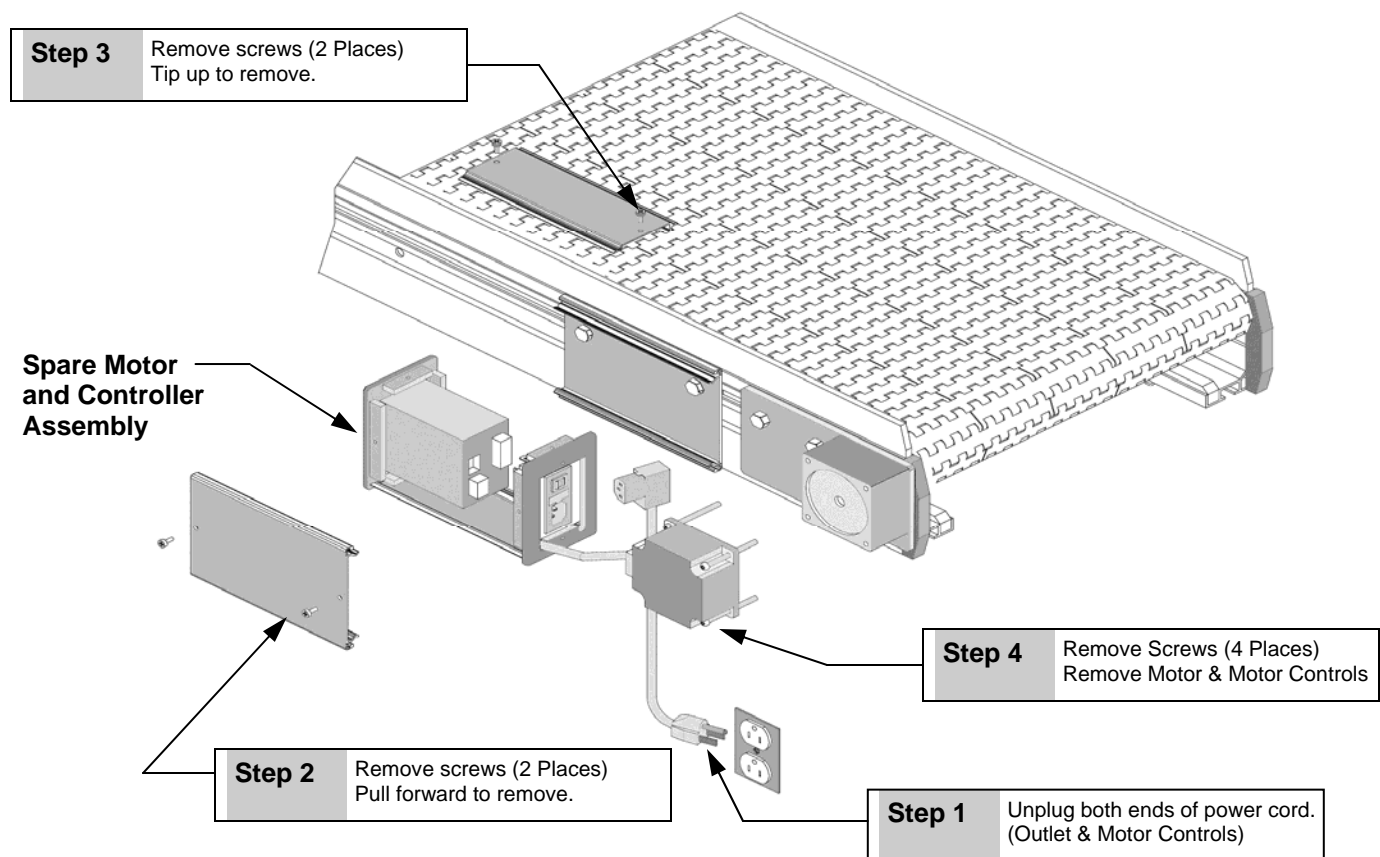
SmartMove® uses a precision all ball-bearing DC brushless motor with a separate gear head. It is of the highest quality and has a history of performing for many long years without maintenance. If you should experience problems with the operation of your motor, please perform the suggested corrective actions list in **Troubleshooting on the Next Page**. What may seem to be a motor failure, may simply be a loose wire or the need to reset the stall-out safety built into the Motor Assembly by removing it from power for 10 seconds.

Warranty Return. If you cannot get the motor to run after following the recommendation in **Troubleshooting**, please call our factory with the serial number on the Motor Control Box. If the motor is less than 2 years old and operated in accordance with our warranty policy, we will give you a return authorization number (RMA). You must return the Motor and the lower part of the control box that has the wired Motor Controls. (See steps below for Motor and Motor Controls removal.) (Reverse steps below for motor installation.)

NOTE: If your Motor Assembly is returned for warranty evaluation, you will be temporarily without the use of your conveyor. (Unless, like a good Boy Scout, you have a spare motor assembly.) We do not offer "loaner" motors for warranty returns. If your conveyor is critical to your process, we recommend stocking a spare Motor Assembly. It may take 4-6 weeks to evaluate the cause of failure before we can approve a warranty return. If expediting the purchase of a spare Motor Assembly, if in stock, please expect to pay expedited shipping and handling fees.

If your warranty has expired, please contact us to order a replacement Motor Assembly. Unlike replacing the engine in your car, the conveyor frame, axles, sprockets, stands and belting will have many years of service left that you can take advantage of by replacing a worn-out motor. We also recommend replacing the gear box at the same time.

NOTE: We do not sell the individual components for the Motor Assembly. (i.e., switches, motor controllers, fuses, covers



TROUBLE SHOOTING & REPAIR

Note: If you are unable to remedy the problem with these corrective actions, please contact our factory. Failure to correct the problem may lead to abnormal use of the conveyor, thereby, voiding the warranty.

Symptoms	Possible Cause	Corrective Action
Alarm Code.	Motor rotation has been stalled for at least 10 seconds.	Remove cause of motor stall. Turn off power until alarm code clears. (Approx. 10 seconds). Clear jam and restart the conveyor.
	<ul style="list-style-type: none"> · Exceeding load capacity. See Motor Specifications on Page 23, for ratings. · Belt jammed by components or debris inside belt. 	If alarm code returns each time unit is turned on, motor assembly will need to be replaced. See Motor Replacement on previous page. See Alarm Codes Page 32
Belt is slipping.	Drive shaft set screw loose. Reason: Could be due to motor misalignment. See Drive Motor Mounting on Page 12	Open belt and tighten drive shaft set screw. If screw will not tighten, replace drive shaft assembly.
	Belt length is excessive. See Belt Installation starting on Page 13	Shorten belt by removing rows of links until a slight force is needed to join ends.
	Drive shaft damaged.	The drive shaft can be damaged by excessive forces, (i.e. standing on the end of the conveyor or using the shaft to lift the conveyor.) If damaged, it will have to be replaced.
Belt is stalling when carrying load.	Load exceeds motor capacity. See Motor Specifications on Page 21 , for max load capacity.	Change the gear box to one that is slower to increase the load capacity or replace drive motor with a larger drive motor. (Upgrades available)
Belt folding out the end and jamming underneath the drive on start-up.	Belt on top of conveyor is moving before belt on bottom due to belt stretch. A jam may occur on long lines due to belt stretching.	Check for excessive belt. Check Belt Encapsulator Block. (Note: Units shipped before 2006 may require retrofit encapsulation block to solve problem.
Belt links are unsnapping causing the belt to come apart.	Belt is installed on the conveyor in the wrong direction.	See page 13 for correct orientation of the belt on the conveyor.
	Debris or obstructions have gotten inside the conveyor and can wedge between the sprocket and the belt to cause it to separate.	Check the inside of the belt and clear any obstructions or large debris present.
Drive making unusual noise.	Motor Misalignment with Drive shaft	Loosen motor mounting plate and move motor to a position where the noise ceases. (This is a motor alignment procedure.)
	Drive Sprockets out of alignment	Check that the belt and sprockets are correctly engaging the belt. See Sprocket Alignment on Page 14 .
Belt is not moving.	Motor is not running	Check power source
		Check the fuse and replace if blown. See Figure 15 on Page 21 .
		Remove power source. Open and inspect electronics box for loose screws or broken wires, incomplete connections or visual damage. Replace or repair if needed.
	If alarm code is active, See Alarm Codes Page 32 Cycle power and restart.	
Motor runs, but belt is not moving	Tighten the set screw on the drive shaft at the motor shaft location. Replace Coupling if set screw is "stripped."	

ALARM CODES

Note: If you are unable to remedy the problem with these corrective actions, please contact our factory. Failure to correct the problem may lead to abnormal use of the conveyor, thereby, voiding the warranty.

Code	Alarm type	Possible Cause	Corrective Action
AL20	Overcurrent	Excessive current has flown through the driver due to ground fault, etc	Check the wiring between the drive and motor for damage
AL21	Main circuit overheat	The temperature inside the driver exceeded the alarm detection temperature	Review the ambient temperature. Review the ventilation condition in the enclosure.
AL22	Overvoltage	The power supply voltage exceeded approximately 120% of the rated voltage. Vertical drive (gravitational operation) was performed or a load exceeding the permissible load inertia was driven	Check the power supply voltage.
AL25	Undervoltage	The power supply voltage became lower than approximately 60% of the rated voltage.	• Check the power supply voltage. • Check the wiring of the power supply cable.
AL28	Sensor error	The motor sensor signal line experienced an open circuit during operation, or the motor sensor connector came off.	Check the wiring between the driver and motor.
AL30	Overload	A load exceeding the continuous duty region was applied to the motor for the time exceeded the value set in the overload alarm detection time except when holding a shaft" parameter. *2 • The motor was started running under the state that the motor temperature was low. "	Reduce the load on the belt. Review the operation pattern such as acceleration/ deceleration time.
A31	Overspeed	The rotation speed of the motor output shaft exceeded approximately 4800 r/min.	
A41	EEPROM error	The stored data was damaged. • Data became no longer writable or readable.	Initialize the parameters.
A42	Sensor error at power-on	The motor sensor signal line experienced an open circuit during operation, or the motor sensor connector came off when turning on the power.	Check the wiring between the driver and motor.
AL46	Prevention of operation at power-on *2	When the external operation signal input" parameter was set to "OFF	while the operation switch was set to the RUN" side
AL6E	External stop *3	The EXT-ERROR input turned OFF.	Check the EXT-ERROR input.

RETURNED MERCHANDISE POLICY

SmartMove® wants you to be fully satisfied with our products or accessories, and we will work with you to achieve your complete satisfaction, and to build a long-term relationship between our companies. The Return Merchandise Policy applies to all requests for merchandise that is being requested for return.

Damaged Freight: SmartMove® is not responsible for damages during the course of transit. If you have a damaged freight claim, please file that claim with your carrier.

RMA Required: Whenever you wish to ship to SmartMove® any of our products, you must contact our factory to obtain a Return Material Authorization number. RMA numbers enable SmartMove® employees to track the product through our database system and improve our customer service. However, an RMA does not guarantee that your credit request will be approved. We will evaluate your credit request on a timely basis, and we will do our best to satisfy your request.

RMA Procedure (Catalog Products)

1. Contact a SmartMove® representative or factory sales office with your RMA request; he or she will gather the necessary information and will fax or E-mail a written decision concerning your request within two working days.
2. All RMA items must be shipped to SmartMove® with freight prepaid by the customer. SmartMove® will not accept freight collect shipments on any RMA or warranty work, unless there is prior written authorization.
3. After an RMA has been issued, it is valid for customer shipment to SmartMove® for 30 calendar days. Ship returned merchandise to our Westport, MA location. Returned merchandise must be returned in "like new" condition in order for credit requests to be considered. The RMA# should be prominently marked on the returned package or crate.
4. Upon receipt of the returned merchandise, SmartMove® employees will inspect the merchandise and review the situation surrounding the return. Disposition of the credit request will be decided by SmartMove® management and communicated to the customer within 5 working days.

Restocking Charges: The following restocking charges will be applied to returned items.

- Stock Catalog Items (off-the-shelf stock) 30% minimum charge
- Non-Stock Catalog Items (not normally carried in stock) 50% minimum charge
- Custom Items (custom fabricated, "built to order" customer applications-including catalog stock modifications.) non-returnable items

WARRANTY AND LIMITATION OF LIABILITY

WARRANTY

SmartMove® Conveyors, a division of AMA Engineering-Smartmove Conveyor, Inc. (the Company) warrants to the first end user Buyer that the Products and Parts thereof, when shipped, will be free from defects in materials comprising the same and in the Company's workmanship. If any such defects exist or later appear, the Company shall undertake, at its sole expense, prompt remedial action as stated herein to correct the same; provided however, that the Company shall have no obligation or liability under this Warranty unless it shall have received written notice specifying such defect no later than two (2) years from the date of shipment. Remedial action under this Warranty shall require only that the Company, at its option, repair or modify the Products or Parts thereof, replace the same F.O.B. Westport, MA, or accept the return of the Products or Parts thereof by Buyer and refund the purchase price.

Products, or Parts thereof, manufactured by others are warranted hereunder only to the extent of such manufacturer's warranty to the Company.

Since after shipment, the Products and Parts thereof are under the sole control of Buyer, this Warranty is subject to, and shall be applicable only if, the following conditions are met:

- A. The Company's instructions as to installation, operation and maintenance have been followed;
- B. The Products and Parts thereof have been used under normal operating conditions or under such conditions as hereinbefore specified by the Company, or specified by the Buyer and agreed to in writing by the Company;
- C. The Products and Parts thereof have been properly erected, installed, operated and maintained and have not been affected by misuse, neglect or accident;
- D. The Buyer has not attempted or performed corrective work or change on the Products and/or Parts thereof without the Company's prior written consent as to the nature and expense thereof;
- E. The company shall have received notice of any defect no later than thirty (30) days after the Buyer first had knowledge of the same; and
- F. Within the Warranty period and after prior authorization from the Company, the Products and/or Parts are shipped freight prepaid to the Company at 683 American Legion Hwy, Westport, MA 02790.

THE FOREGOING WARRANTY IS IN SUBSTITUTION FOR, AND IN LIEU OF, ANY AND ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY

THE COMPANY SHALL HAVE NO LIABILITY WHATSOEVER IN ANY EVENT FOR PAYMENT OF ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, DAMAGES FOR INJURY TO ANY PERSON OR PROPERTY. BY ACCEPTING THE PRODUCTS AND/OR PARTS THEREOF, THE FIRST END USER BUYER OR SUBSEQUENT USER AGREES THAT THE COMPANY SHALL NOT BE LIABLE FOR INDEMNIFICATION OR CONTRIBUTION (IN WHOLE OR IN PART) EITHER EXPRESSLY OR BY IMPLICATION.

IF FOR ANY REASON ANY OF THE FOREGOING PROVISIONS SHALL BE INEFFECTIVE, THE COMPANY'S LIABILITY FOR DAMAGES ARISING OUT OF ITS MANUFACTURE OR SALE OF ITS PRODUCTS OR PARTS, OR USE THEREOF, WHETHER SUCH LIABILITY IS BASED ON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE, SHALL NOT IN ANY EVENT EXCEED THE FULL PURCHASE PRICE OF SUCH PRODUCTS AND PARTS THEREOF.

Any action against the Company based upon any liability or obligation arising hereunder or under any law applicable to the sale or its Products or Parts thereof, or the use thereof, must be commenced within one (1) year after the cause of such action arises.

Owners Records

Please keep the following information available for future reference.

SERIAL NUMBER: (See page 23 for details) _____

SHIPMENT DATE: (This can help if you don't have the Serial Number) _____

BELT WIDTH _____

BELT COLOR _____

CONVEYOR OVERALL LENGTH _____

NOTES: