



Installation and Maintenance Manual

Automotive & Heavy Duty Handling



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Safety Guidelines for Our Conveyor Belts

As a standard, our conveyor belts are designed with particular attention to safety. Unnecessary hazards have to be avoided when handling and using conveyor belts. For this reason, many design features have deliberately been selected in such a way, that the injury hazards for personnel being charged to handle and operate our belts are minimized. The regulations on the prevention of accidents for continuous conveyors (VBG 10), and in particular the paragraphs 5, 12, 53, 54 and 55, have to be carefully observed.

Storage of Plastic Modular Belts

Warning: Do not expose the products to direct sun light.

Warning: Do not expose the modules to extreme temperatures.

Danger: Ignited plastic may generate poisonous smoke.

Warning: Do not expose belts to any chemical substances with a ph-value of less than 4.5 or higher than 9.0.













Safety Equipment on Our Conveyor Belts

One of the most frequent kinds of accidents in relation to conveyor belts is the injury of parts of the body that get caught in between the moving modular belt and the rotating rollers/ sprockets. To avoid such accidents or to minimize these risks as far as possible, all the conveyor belts have to be equipped with protective devices to cover any gaps and clearances in all those locations where the plastic belt runs on a roller, drum or sprocket. This protection has to be designed in such a manner that it re-locates its position during adjustment operations, and thus always remains in the correct position in relation to the sprocket/ roller. In order to prevent damages of electric devices and to minimize the danger of electric shocks, all our conveyor belts have to be connected to ground in all parts. Every conveyor belt must be equipped with a circuit-breaker which automatically switches off the unit in case of overload or overheating. It is also possible to fit one or more emergency out-switches to switch off the conveyor belt if danger is imminent.

General Safety Instructions

Caution: Wear safety shoes.

Danger: Wear protective goggles.

Warning: Wear protective gloves.

Caution: Prevent accidents.

Attention: Only use suitable tools that are in good condition.















Possible Hazards and Safety Risks

We expressly draw your attention to the following hazards being in the nature of things when using belt conveyors:

Risk of injuries by the frame

The constructional design makes it inevitable to have edges and corners on the conveyor where the risk of injury exists due to inattentiveness.

Risk of injuries by the plastic modular belt

The movement of the plastic modular belt may cause serious gashes and bruises if the running conveyor is touched.

Risk of injuries by moving parts

In general, all the moving parts of a running machine present a risk of injuries.

Injuries due to electricity

During the operation of the machine, the mechanical parts are live. Injuries due to electric current may still be possible up to 90 seconds after having disconnected the equipment from the mains. Injuries due to electricity are only excluded after this time.

Destruction of the plastic modular belt

Destruction of the plastic modular belt may be possible if it is not checked and inspected from time to time, and if occurring defects are not corrected immediately. The plastic modular belt may also be damaged and destructed by the products transported on it.

Fire hazard due to overload and jamming

If the conveyor belt is not properly protected against overload or when it is connected to electric current, the motor may catch fire.

In many cases, the particular operation conditions of the conveyor may require special measures. These may be provided by us or by the operator himself. Please contact uni-chains if you need assistance in this respect.





The Products You Received

For easier understanding, we once more list below the products and the accessory parts.

uni XLB





uni XLB M2 C





uni XLB K318





Pinhole diameter: 10.9 mm









uni XLB K400











Pinhole diameter: 10.5 mm



uni XLB K800









Pinhole diameter: 10.5 mm





uni XLB Sprocket







uni XLB Car Pusher



10% Curved



35.0 mm

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uni CPB M2





uni CPB M2 Rough



uni CPB 20% Rough











uni CPB M2 C uni CPB M2 Rough Pinhole diameter: 8.3 mm





uni CPB – Sprocket











uni CSB





uni CSB 8%



uni CSB Rough

uni CSB K600











Pinhole diameter: 8.4 mm



50.8 mm

uni CSB K1200











uni CSB Sprocket







uni CSB Car Pusher









Installation of Shafts and Sprockets

Installation and alignment of shafts

Sprockets are preferably locked on the outside of the outer sprockets with the same amount of play as the belt has to the side guides. The shafts have to be aligned in a level manner and one shaft behind the other. The locked sprockets ensure proper tracking of the belt along the complete conveyor. They are aligned to each other in the same way over the entire length of the conveyor. If the shafts are not precisely positioned to each other, proper tracking may be adversely affected.

Alignment of sprockets

Take care for correct alignment of the teeth when fitting the sprockets onto square shafts. If the number of teeth of a sprocket with square bore can evenly be divided by 4, with no remainder, the teeth are automatically correctly aligned, irrespective of how the sprockets are fitted to the square shaft (for example: $16 \div 4 = 4$). However, if there is a remainder, particular attention has to be paid to the correct alignment of the sprockets. In this case, all the sprockets are provided with a plumb bore. When fitting the sprockets, all these bores have to be radially flush and one after the other.

The sprockets are lined up on the shaft without any distance. In axial direction, the sprockets are fixed with appropriate means at the outer ends only, so that a certain axial moveability is allowed.







Carryway Configuration

In dry and clean environments, the belt supports are preferably out of uni-chains Unicon material since in most applications supports capable of electro-dynamic suspension (EDS) is required. In very wet conditions the use of stainless steel supports with drainage openings is the best choice. For conditions which are partially wet and/or not clean, please consult uni-chains.

Wearstrips

Bring each wearstrip profile in the correct position. In most cases, it is sufficient to bevel cut the opposing ends of the wearstrip profiles at an angle of 30° and to leave a gap of about 8 mm. Under extreme conditions, the angle should amount to 60°. The required width of the gap must be determined on basis of the thermal expansion calculations. To ensure smooth belt running, the joint locations of the wearstrip profiles should be staggered. Start at the idle end of the conveyor.

Belt Installation on Carryway

Preparatory Work

This manual contains general recommendations and instructions for the installation of uni-chains conveyor belts. Please pay attention to the differences between the individual conveyor types. The particularities of each conveyor frame and of each application have to be duly considered. The following points must be observed in any case, irrespective of whether you install a new belt or whether you replace an existing one:

- 1. In case of retrofits, you may use the same carryways for the uni-chains belts as have been used hitherto. The carryways have to be clean and in a good condition. They should be free from grooves or wear and from any damages on the surface.
- 2. Check whether the material of the wearstrips is compatible with the material of the new belt.
- 3. If required, replace the wearstrips.

Please consult uni-chains, should you need further assistance in this respect.





General Procedure

- 1. If a shaft take-up is installed, relax the same completely.
- 2. Feed the belt from the drive side of the conveyor through the carryway.
- 3. Fit the belt around the idle sprockets. Take care that the sprockets do not change their position.
- 4. For wide belts, make sure that the supplied sections are transported in a suitable manner.
- 5. Do not throw the belt sections onto the carryway. The non-observance of this instruction may result in the destruction of individual modules.
- 6. Center the belt in the conveyor frame. Pay attention to the location of the locked sprocket, and provide for sufficient distance between the belt edges and the conveyor frame, so that the belt may expand freely. This is of particular importance for applications involving considerable temperature fluctuations.

Belt Installation on the Returnway

- 1. Feed the belt through the returnway until the drive sprockets are reached.
- 2. Fit the belt around the drive sprockets. Take care that the locked sprockets do not change their position. Make sure that belt meshes with the locked sprocket at the drive end in the same position as on the idle end. The non-observance of this instruction may lead to poor belt tracking.
- 3. Connect the belt sections. Take care that the edges are properly aligned.
- 4. Fitting the connecting rods is facilitated by bevel cutting the rods.
- 5. Insert the connecting rod, but do not yet lock it in or secure it in any way.
- 6. Check the correct staggered arrangement of the sprockets. Improper arrangement or installation results in a reduction of the permissible tensile force.
- **NOTE:** Depending on the belt series, uni-chains uses different rod locking systems. Refer to the instructions given for your belt type. Please contact uni-chains should you need further details.





Installation Check

- 1. Turn the drive shaft slowly for several revolutions to make sure that the sprockets on the drive side and on the idle side engage properly with the belt. Watch for possible catch points!
- 2. If the belt does not track properly, check whether the sprockets on both shafts are correctly positioned. Make sure that the sprockets have been fitted in strict compliance with the instructions of this manual. Having ensured that the belt and the sprockets are correctly installed, check the precise alignment of the shaft bearings and the conveyor frame.
- 3. If long and wide conveyors are installed, it may take a certain time until the belt tension has built up in the carryway and proper belt travel is given.

Catenary Sag

- 1. Adjust the belt length, if necessary, to achieve proper catenary sag for the belt tension. This can be done by adding or removing module rows or by adjusting a take up, if installed.
- 2. As soon as the belt is properly tensioned and runs smoothly, the rods can be locked (snapped) at the joint point, or, depending on the belt type used, be secured.



Run-in Time

Depending on the application, the belts will elongate by 0.2 to 1% during the run-in time. This usually takes place during the first days of operation. In the event of excessive belt elongation, it may be necessary to remove one or several belt module rows in order to obtain proper catenary sag and adequate belt tension.





Wide and Long Conveyors

The installation of wide and long conveyors is more complicated than on narrow or short frames. It is advisable to use the conveyor motor to facilitate the installation.

- 1. If this possibility exists, span the distances in the returnway between the guides or rollers with tubes or lumber. This prevents the formation of catenary sags before the belt ends have been connected together.
- 2. Slide the belt through the carryway of the conveyor, starting from the idle end.
- 3. Wrap the belt around the drive sprockets. Then use the motor to pull in the belt completely.
- 4. Add further sections into the belt. While the motor continues to pull the belt into the carryway, feed the belt by hand or by using appropriate tools through the returnway.
- 5. For wide belts, make sure that the supplied sections are transported in a suitable manner.
- 6. Do not throw the belt sections. The non-observance of this instruction may lead to the destruction of belt modules.
- 7. After the belt in the returnway has reached the idle end of the conveyor, pull it up and lay it around the idle sprockets. Pull up such a length of the belt, that it cannot slip back again. If necessary, arrest the idle shaft.
- 8. It may be necessary to use winches or tackles to draw together the belt ends. Use appropriate means to attach these tools properly. Please contact uni-chains should you need more information on this subject.
- 9. After having connected the belt ends to each other, reverse the motor and pull the belt tight. Then return the motor to its original position.
- 10. Correct the belt length. ATTENTION: If long and wide conveyors are installed, it may take a certain time until the belt tension has built up in the carryway and proper belt travel is given.
- 11. Remove the supports in the returnway.
- 12. After any final adjustments, lock the rods.





Preventive Maintenance and Troubleshooting

uni-chains conveyor belt systems are designed for as maintenance-free operation as possible. As with all moving machines, however, mechanical problems may occasionally occur which have to be remedied. This manual helps you finding the cause for any troubles and solving mechanical problems that may occur on conveyors using the uni-chains system. Please contact uni-chains if you need additional assistance, more information or additional manuals.

What Should Be Reported To Your Maintenance Department?

- 1. Report damaged or missing modules as soon as this is detected. (The belt will probably continue to operate, however, damages of this kind can affect the strength of the belt and may lead to further damages).
- 2. Report damages of the belt edges, as soon as they are discovered. (Damages of belt edges should be examined immediately to prevent further even more serious damages).
- 3. Report mistracking or ,wandering' of sprockets as soon as this is detected. (If this is not corrected, damages of the belt edges or more serious damages can result).
- 4. Report damaged or non-rotating returnway rollers, missing guides or wearstrips, as soon as this is detected.
- 5. Report protruding (or missing) connecting rods as soon as this is detected. Carefully check the belt for signs of wear of any kind after the first 30 days of operation.
- 6. Check the belt (carry- and returnway), the sprockets and wearstrips for signs of wear or damages (grooves, scratches, cuts etc.).
- 7. Check the sprockets for proper engagement with the belt and for correct location on the shaft.
- 8. Check the returnway for worn or damaged rollers, guides or wearstrips.
- 9. Check the connection rods for wear (camshafting) by removing at least some of the connecting rods. Determine the cause for the increased wear and take immediate corrective measures. Please contact uni-chains for support and technical assistance.

It is recommended to perform these checks at regular intervals in order to detect and follow up signs of wear and to get familiarized with the operating characteristics of the conveyor. The observation and timely reporting of operation problems and monthly inspections ensure optimum performance and useful life of the uni-chains conveyor belt system.





Troubleshooting

1. The drive sprockets do not engage with the belt

Too low belt tension around the drive sprockets

Take care for catenary sag on the return way of the belt. Adjust the drive shaft so that the correct dimensions are maintained.

Incorrect returnway design

Provide for the recommended catenary sag in the return way. Change the distances between the rollers to obtain the desired sag. By-pass the slider bed return way to achieve correct sag. Please contact uni-chains if you need any assistance.

The sprockets are not aligned correctly on the shaft

Check the alignment of the sprockets by placing a ruler at the base of any sprocket teeth parallel to the shaft to ensure that all the sprockets have the same position across the belt. If the number of the sprocket teeth can be divided by four, without remainder, the teeth are automatically aligned correctly when fitting the sprockets on the shaft. If the number of teeth cannot be evenly divided, special attention has to be paid to the correct alignment of the sprockets in order to avoid problems. If the sprockets are provided with timing holes, these have to be flush across the entire shaft (see instructions for the installation of shafts and sprockets).

Insufficient tracking around the drive sprockets

Change the location of the first return way roller after the drive shaft to obtain a wrap angle of 180° to 190° or more. Please contact uni-chains for assistance in the respect.

2. The belt is not tracking properly

The drive and return way shaft are not plumb, even and parallel to each other

Check the shafts to make sure that they are plumb, even and parallel to each other. Arrest the shafts by means of the bearings. The conveyor frame and/or components are inclined and not level. Check and adjust the conveyor frame. Check the alignment of the shaft after each re-adjustment of the frame. It may be necessary to re-plumb, level and square the shafts.

The sprockets are not aligned correctly on the shaft

Check the alignment of the sprockets by placing a ruler at the base of any sprocket teeth parallel to the shaft to ensure that all the sprockets have the same position across the belt. If the number of teeth of a sprocket with square bore can be divided by four, without remainder, the teeth are automatically aligned correctly when fitting the sprockets on the shaft. If the number of teeth cannot be evenly divided, special attention has to be paid to the correct alignment of the sprockets in order to avoid problems. If the sprockets are provided with timing holes, these have to be flush across the entire shaft (see instructions for the installation of shafts and sprockets).

The belt is not connected correctly

All the belt types have flush edges when correctly connected.





The return way rollers are not level and square to the conveyer frame

Check the return way rollers and correct those that are not even or square to the conveyor frame. Retaining rings are missing or not fitted correctly. Replace missing retaining rings and check location of the rings to ensure precise alignment of the sprockets locked on the drive and idle shaft.

3. Excessive wear of the belt

Prevent or reduce deposits of abrasive materials that may come in contact with the belt, sprockets or wearstrips. Such material could be removed from the plastic parts of the conveyor at regular intervals, for example, by means of compressed air, or may be washed off after the end of the shift.

Incorrect wearstrip material

Make sure to use the correct wearstrip material for your application. Please contact uni-chains for assistance in selecting the correct wearstrip material.

The belt is binding in the conveyor frame

Check the conveyor frame to make sure that it is level. Correct any condition that may cause the belt to rub or to bind.

Sharp edges on the carryway and return wear wearstrips

Make sure that the leading edges of the wearstrips or slider beds are beveled or radiused to allow smooth belt movement.

4. Excessive wear of the sprockets

The sprockets are exposed to abrasive materials

Prevent or reduce deposits of abrasive materials that may come in contact with the belt, sprockets or wearstrips. Such material could be removed from the plastic parts of the conveyor at regular intervals, for example, by means of compressed air, or may be washed off after the end of the shift. Please contact uni-chains for assistance.

Incorrect belt tension

Take care for correct belt tension. Provide for catenary sag on the return way of the belt as recommended by the unichains engineering manual or by your local uni-chains office.

Increased belt speed

Reduce the belt speed, if possible.

Drive and idle shaft are not plumb, level or parallel to each other

Check the shafts to make sure that they are plumb, level and parallel to each other. Arrest the shafts by means of the bearings.

Insufficient number of sprockets

The conveyor belt may perhaps require a more even load distribution among the sprockets. Please consult uni-chains in this respect.





The sprockets locked on the drive and idle shaft are not precisely aligned to each other

Re-align the sprockets being locked with a retaining ring or by another device and make sure that the sprocket of the drive shaft is in line with that on the idle shaft.

The sprockets are not aligned correctly on the shaft

Check the alignment of the sprockets by placing a ruler at the base of any sprocket teeth parallel to the shaft to ensure that all the sprockets have the same position across the belt. If the number of teeth of a sprocket with square bore can be divided by four, without remainder, the teeth are automatically aligned correctly when fitting the sprockets on the shaft. If the number of teeth cannot be evenly divided, special attention has to be paid to the correct alignment of the sprockets in order to avoid problems. If the sprockets are provided with timing holes, these have to be flush across the entire shaft (see instructions for the installation of shafts and sprockets). Bent or twisted shafts have to be replaced. Wide bearings may require an intermediate bearing. Please contact uni-chains for assistance.

5. Excessive wear or damages of the belt edges

The belt rubs against obstacles on the conveyor bed, return way, frame or adjacent equipment

Check the conveyor frame to make sure it is even. Correct all the conditions that may cause the belt to rub or bind.

The belt is not aligned correctly and does not track properly

Re-align the sprockets being locked with a retaining ring or by another device and make sure that the sprocket of the drive shaft is in line with that on the idle shaft. Check the conveyor frame to make sure that it is even. Correct any conditions that may cause the belt to rub or to bind.

The belt edge rubs against the conveyor frame due to thermal expansion

Correct the dimensions of the conveyor belt to make sure there is a minimum distance of 6 mm on each side of the belt under full heat expansion conditions (highest temperature).

The conveyor frame is inclined or not level

Check the conveyor frame to make sure that it is even. Correct any conditions that may cause the belt to rub or to bind.

The shafts are not held in place correctly and can therefore migrate to one side

Make sure that the shafts are plumb, even and parallel to each other. Take corrective measures and lock the shaft in place.

The belt is not connected correctly

All the belt types have flush edges if correctly connected.

To avoid edge wear, it is necessary to control the travel of the belt. Please contact uni-chains for assistance.





6. The sprockets move laterally to the center or to the edge of the belt

Drive and idle shaft are not plumb, level or parallel to each other

Check the shafts to make sure that they are plumb, level and parallel to each other. Arrest the shafts by means of the bearings.

The sprockets locked on the drive and idle shaft are not precisely aligned to each other

Re-align the sprockets locked with a retaining ring or by another device and make sure that the sprocket of the drive shaft is in line with that on the idle shaft. (See instructions for the installation of shafts and sprockets).

The sprockets are not aligned correctly on the shaft

Check the alignment of the sprockets by placing a ruler at the base of any sprocket teeth parallel to the shaft to ensure that all the sprockets have the same position across the belt. If the number of the teeth of a sprocket with square bore can be divided by four, without remainder, the teeth are automatically aligned correctly when fitting the sprockets on the shaft. If the number of teeth cannot be evenly divided, special attention has to be paid to the correct alignment of the sprockets in order to avoid problems. If the sprockets are provided with timing holes, these have to be flush across the entire shaft (see instructions for the installation of shafts and sprockets).

Material deposits at the lower surface of the belt can negatively affect proper engagement of the sprocket teeth. Clean the lower belt surface and remove deposited material that may affect proper engagement of the teeth. It may be necessary to attach brushes, scrapers, scrolls or other devices to prevent further material deposits.

Deflection or twisting of the shaft

Check the shaft for signs of deflection or twisting. For wide belts, an intermediate bearing may be possible. Bent and twisted shafts must be replaced. Please contact uni-chains for further assistance.

7. Wear or damages of the sideguards (including breakage)

The sideguards contact or rub against the conveyor frame, return way or adjacent equipment

Remove all obstructions or obstacles contacting the sideguards. Check the conveyor frame to ensure that it is level. Correct any condition that may cause the belt or the sideguards to rub or bind.

8. Wear or damages of the pushers, drivers or dogs

The pushers contact obstacles on the conveyor frame, return way or adjacent equipment

Remove all obstructions or obstacles that come into contact with the dogs. Check the conveyor frame to ensure that it is level. Correct any condition that may cause the belt to rub or bind.

Incorrect support of the pushers in the return way

Belts that are equipped with dogs should be supported on each side of the belt and, if necessary, in several locations across the entire belt width. Please contact uni-chains for further assistance.





9. Excessive catenary sag at the belt

Incorrect total length of the belt

Excessive catenary sag must be detected at the coldest operating temperature of the belt, because the belt is than contracted to its shortest length. If you observe excessive catenary sag, shorten the belt by removing several module rows. All the uni-chains belt can be shortened in increments of one module row.

Insufficient belt tension at high temperatures

If excessive catenary sag is caused by thermal expansion due to the operating temperature and is not too large at cold condition, it may be necessary to fit a tensioning device to the belt, to compensate for the thermal growth. Please contact uni-chains if you need further assistance.

Belt elongation due to specific conditions during commissioning or due to heavy loads

During the initial run-in time, a plastic conveyor belt gets longer. This is a natural process and is more noticeable if heavy loads are involved. If this is the case, allow the belt some time to adapt to the operating conditions before shortening it.

ATTENTION: Watch and monitor the belt during this run-in time, in order to prevent binding or catching.

Maintenance

For the justification of any guarantee claims, a logbook has to be kept for every conveyor to document regular inspections, maintenance and repair measures. All entries have to be counter-signed by the responsible maintenance manager.

Regular inspections and checks include:

- · Visual inspection of the belt surface
- · Visual inspection of the belt edges
- · Visual inspection of the wearstrips
- · Visual inspection of the drive and idle sprockets
- · Visual inspection of the rollers in the returnway
- · Visual inspection of the take-up/ tensioning devices
- · Visual inspection of protective devices on gaps and clearances before the drive and idle stations for deposits of foreign material
- · These inspections have to be performed at least once a month

The appropriate cleaning intervals have to be defined by the maintenance manager, as these intervals strongly depend on the ambient conditions. Significant amounts of dirt and impurities reduce the useful life of the modular plastic belts.

Your Contact Partners

Ammeraal Beltech provides a 24 hours service. Please contact your local Ammeraal Beltech organisation when service is required.



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