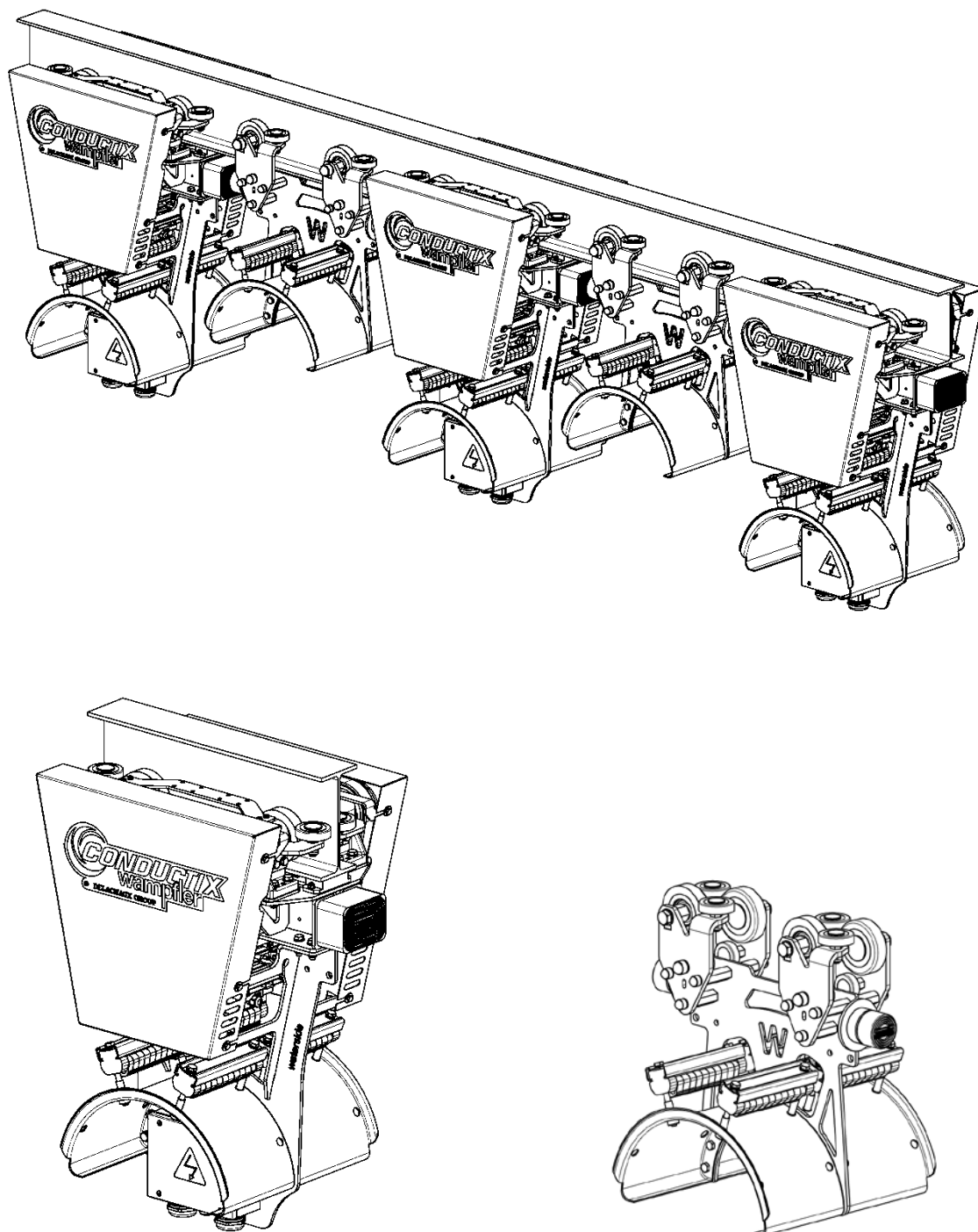


Assembly Instructions

Motorized Festoon Systems for I-beams Program 0380



Motorized Festoon Systems for I-beams Program 0380

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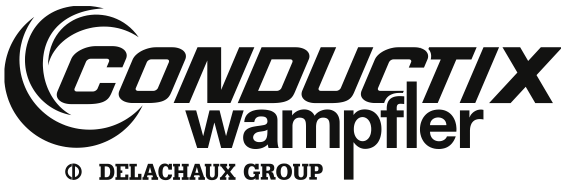
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1 General notes

1.1 Information about these mounting instructions

These assembly instructions allow the safe, efficient use of the festoon system.

The assembly instructions are a component of the festoon system and must be kept in the immediate vicinity of the festoon system and accessible to personnel at all times. Personnel must carefully read and understand these assembly instructions before starting any work. The basic prerequisite for safe work is compliance with all safety and operating guidelines in these assembly instructions.

Furthermore, local accident protection regulations and general safety regulations apply for the area of use of the festoon system.

Illustrations are provided for basic understanding and may deviate from the actual implementation of the festoon system.

In addition to these assembly instructions, the attached instructions for installed components also apply.

1.2 Limitation of liability

All data and information in these assembly instructions has been compiled while taking the valid standards and regulations as well as the state-of-the art and our long years of experience and knowledge into consideration.

The manufacturer is in no way liable for damages resulting from:

- Failure to comply with assembly instructions
- Improper use
- Employment of untrained personnel
- Unauthorized modifications
- Technical changes
- Use of unauthorized replacement parts or accessories.

The actual scope of delivery may differ from the explanations and illustrations here depending on special implementations, the inclusion of additional order options, or due to the latest technical changes.

The obligations specified in the scope of delivery, the general terms of business, and the delivery terms of the manufacturer apply, along with the legal regulations valid at the time of conclusion of the contract.

All products are subject to technical changes during the process of improvement of characteristics of use and continued development.

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1.3 Copyright

These assembly instructions are subject to copyright and exclusively intended for internal use.

Provision of the assembly instructions to third parties, duplications in any form - even in part - as well as the reuse and/or disclosure of their content are not permitted without the written approval of the manufacturer, except for internal use.

Violations will result in the obligation to compensate for damages. Other rights reserved.

1.4 Spare parts



Safety risk due to wrong spare parts!

Wrong or faulty spare parts can impair safety as well as result in damages, malfunctions or complete failure.

→ Use only original spare parts of the manufacturer!

Obtain spare parts from licensed dealers or directly from the manufacturer. See the last page of these operating instructions for the address.

1.5 Warranty and guarantee

The terms of warranty and guarantee are part of the general terms of business of the manufacturer.

1.6 Customer service

Our customer service is available for technical information. See the last page of these operating instructions for contact information.

Our employees are also always interested in new information and experience from use that can be valuable for the improvement of our products.

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2 Safety instructions

2.1 General safety information

Safety and hazard information is identified in these assembly instructions by symbols. Signal words are used in these safety instructions to indicate the degree of hazard. Always observe safety and hazard information and work carefully to avoid accidents, bodily harm or property damage!



DANGER!

... indicates an immediately hazardous situation, which if not avoided, may result in death or serious injury.



WARNING!

... indicates a possibly hazardous situation, which if not avoided, may result in death or serious injury.



WARNING!

... indicates a possible danger of burning if not avoided.



WARNING!

... indicates a possible danger from electricity, which if not avoided, may result in death or serious injury.



CAUTION!

... indicates a possibly hazardous situation, which if not avoided, may result in moderate or minor injury and property damage.



NOTICE!

Tips and recommendations:

... refers to useful tips and recommendations as well as information for efficient and trouble-free operation.

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2.2 Personnel requirements

2.2.1 Qualifications



Injury due to insufficient qualifications!

Improper use can result in serious injury to person and property.

→ Allow only qualified personnel to carry out all activities!

The following qualifications have been mentioned in these operating instructions for different areas of operation:

- **Trained personnel/operators**
have been instructed by the operator about the tasks assigned to them and the possible hazards resulting from improper use.
- **Qualified specialists**
Due to their technical education, knowledge, and experience as well as knowledge of the applicable specifications, are capable of carrying out the tasks assigned to them and to detect and avoid possible dangers independently.
- Personnel may only be authorized if it can be expected that they carry out their work reliably. Personnel whose reactions are influenced by drugs, alcohol, or medications may not be authorized.
- Locally applicable age and qualification regulations must be followed during selection of personnel.

2.2.2 Unauthorized personnel



Danger due to unauthorized personnel!

Unauthorized personnel who do not meet the requirements described here do not understand the danger in the work area.

- Keep unauthorized persons away from the working area.
- In case of doubt, address the persons and direct them away from the working area.
- Stop work as long as unauthorized persons are in the working area.

2.2.3 Instruction

Before commissioning, the personnel must be instructed by the operator. For better tracking, log the performance of this instruction as follows:

Date	Name	Type of instruction	Instruction given by	Signature

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2.3 Personal protective equipment

Always wear: For all work, always wear:



Work safety clothing

is close-fitting work clothing that has a low tearing strength with tight arms and no parts that protrude. It is mostly used as protection from getting caught by moving machine parts.

Do not wear any rings, chains or any other jewelry!



Safety shoes

used to protect from falling heavy parts and slipping on slippery floors.

For special tasks, wear:

When carrying out particular tasks, special safety gear is required. The individual sections of these instructions specify this gear in detail. The following particular safety gear is explained below:



Protective gloves

for the protection of hands from friction, scrapes, stabbing, or deep wounds, as well as from contact with hot surfaces.



Hard hat

for protection from falling and flying parts and materials.



Protective goggles

for eye protection.

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2.4 Intended use

The motorized festoon system is exclusively designed and built for the intended use described here.

Motorized festoon systems program 0380 are intended for the installation and operation of an electrical supply line for track-based mobile consumers, such as cranes and lifting gears in industrial environment. Other uses are only permitted after written approval by Conductix-Wampfler.



Possible injury resulting from improper use!

Any application that deviates from or goes beyond the intended use described here can result in a hazardous situation.

- The motorized festoon system may only be used as intended.
- Strictly comply with all specifications of these installation and operating instructions.
- Do not use the equipment for any other purpose than described here.

The following use of the motorized festoon system is forbidden. Non-intended use particularly includes the following:

- Using the motorized festoon system with unapproved accessories or accessories not authorized by the manufacturer.
- Operation of the motorized festoon system by untrained personnel.
- Operation of the motorized festoon system when installed on an improper foundation / base.
- Exceeding projected load capacities
- Exceeding projected speeds
- Excessive acceleration
- Use of unsuitable cables
- Operation under conditions other than the agreed environmental and operating conditions (including a change to projected physical location).

Claims of any kind due to damages from improper use are excluded.

The operator bears sole liability for any damages due to unintended use.

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2.5 Protective measures to be taken by the operator/user

The motorized festoon system is used in an industrial setting. The operator of the motorized festoon system is thus subject to legal requirements related to workplace safety. In addition to the safety guidelines in these assembly instructions, the safety, accident protection, and environmental protection regulations applicable to the place of operation of the festoon system must be followed. This particularly implies that:

- The operator must ensure that the motorized festoon system will only be used for its intended purpose.
- The operator must be informed of applicable workplace safety regulations and carry out a risk assessment to detect additional dangers resulting from the specific working conditions in the place of operation of the motorized festoon system. This must be implemented in the form of operating instructions for the operation of the motorized festoon system.
- For the entire period of use of the motorized festoon system, the operator must check whether the operating instructions prepared correspond to the current state of regulations, and update the operating instructions as needed.
- The operator must clearly regulate and determine responsibilities for installation, operation, troubleshooting, and maintenance.
- The operator must ensure that all employees involved with the motorized festoon system have read and understood these assembly instructions. Moreover, the operator must train personnel at regular intervals and inform them of the dangers.
- The operator must provide personnel with the protective gear required.

Furthermore, the operator is responsible for ensuring that the festoon system is always in a technically perfect condition. The following thus apply:

- The operator must ensure that the maintenance schedule described in these assembly instructions is followed.
- The operator must regularly have all safety systems checked for functionality and completeness.

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2.6 Particular risks

The following section lists residual risks determined based on a risk assessment.

- Follow the safety instructions listed here and the warnings in other sections of these assembly instructions in order to reduce health hazards and avoid dangerous situations.



WARNING!

Danger of death due to hanging loads!

When lifting loads, there is a danger of death from falling parts or those swinging out of control.

- Never step under hanging loads.
- Move loads only under supervision.
- Follow the specifications for the attachment points provided.
- Do not attach to projecting machine parts or to eyes on installed components. Be sure the connection elements are firmly seated.
- Use only authorized lifting accessories and connection elements with sufficient load capacity.
- Do not use torn or worn ropes or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Set down the load when leaving the workplace.



WARNING!

Danger of injury from moving components!

Incautious handling of the festoon system can lead to severe injury or damage to the festoon system.

- Be sure that the festoon system does not start by itself.
- While it is moving, do not reach into moving parts, particularly the interface between the buffer and buffer plate.
- Block off the dangerous area under the system.



DANGER!

Danger of injury due to electric shock!

Danger of severe injury or death from electric current.

- Before working on the festoon system, the system must be disconnected from power using the main switch, and secured against unauthorized, unintentional, and/or erroneous activation.
- In special cases where there is no main switch, the power disconnection must be carried out according to the specifications of the system manufacturer.
- Check parts disconnected from power, then ground and short-circuit them. Insulate neighboring parts that are connected to power.
- Before each commissioning, an insulation test must be carried out in accordance with the local technical standards, guidelines, and law.

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WARNING!

Danger of burning!

Danger of burning when using insufficiently dimensioned cables!

→ Always comply with the necessary cross-section of cables.



CAUTION!

Danger of tripping on projecting parts!

When working on the motorized festoon system, there is a risk of tripping.

→ When walking in the work and danger area, be careful of projections and depressions in the floor.
No loose objects may be left on the floor.



WARNING!

Danger of crushing!

When moving the motorized festoon system, there is a danger of crushing limbs between the buffer and buffer plate, as well as between the running gear and the track beam.

→ When the system is moving, do not enter the danger area of the motorized festoon system.



WARNING!

Danger of crushing!

During installation of a motorized festoon system, there is a danger of crushing limbs between the load carrier and the track beam.

→ During installation, do not enter the danger area of the motorized festoon system.



CAUTION!

Trap!

When the festoon system is moving, there is a danger of being trapped within it.

→ When the system is moving, do not enter the danger area of the motorized festoon system.

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2.7 Safety devices

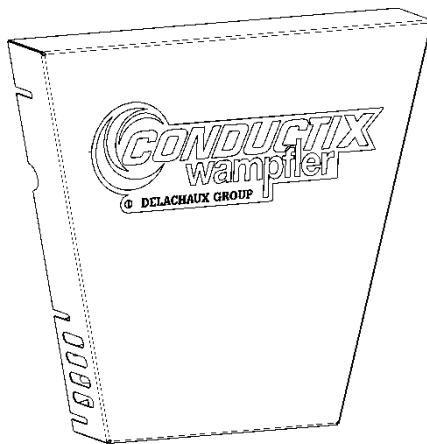


WARNING!

Danger of life due to non-operation of safety devices!

Safety is only guaranteed provided safety devices are intact.

- Prior to commencing work, check that the safety systems and covers are in working order and properly fitted.
- Never put safety systems out of order.



■ Protective cover for tooth belt drive

Fig. 1: Protective cover for tooth belt drive

2.8 Behavior in case of accidents and malfunctions

Measures to be taken in case of accident:

- Secure the location of the accident.
- Take first-aid measures.
- Keep personnel out of the danger area.
- Inform responsible parties at the place of operation.
- Alarm the rescue services.
- Make access ready for rescue vehicles.

Measures to be taken in case of malfunction:

- Secure the work area against entry.
- Involve qualified personnel for fault analysis.
- Involve authorized personnel for maintenance and repair.
- Shut down the system and secure it against unauthorized, unintentional, and/or erroneous activation.
- If injury to person and property can occur during breakdowns then Conductix-Wampler must be informed immediately.

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3 Technical data

3.1 General information

Designation	Value	Notes
Max. load capacity	350 - 800 kg	Depending on the roller diameter
Max. travel speed	300 m/min	Depending on system layout

3.2 Interfaces

Mechanical:

Machine	Component
Beam construction	End clamp, cable trolley, towing trolley, motorized cable trolleys
Towing arm	Towing trolley, towing clamp
Cables	Support, cable clamps, guide ring

Electrical, data and media:

Machine	Component
Switching cabinet	Cables
Media supply	Cables
Consumer	Cables

3.3 Operating conditions

Environment:

Designation	Value	Notes
Temperature range	-30°C to +50°C.	
Relative humidity, maximum	90%	100% possible after adaptation
Max. allowed wind speed (operating)	< 21 m/sec	
Max. allowed wind speed (non-operating)	< 33 m/sec	

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3.4 Type plate



Fig. 2: Example of type plate

The type plate is fixed at the trolley frame of the motorized cable trolley and includes the following information:

- Type
- Year of manufacture
- Order number
- Manufacturer
- Manufacturer address

NOTICE!

Tips and recommendations:

In case of inquiries with regard to the motorized festoon system, always indicate the data on the type plate.

3.5 Track beam

The operator is responsible for ensuring that the track beam is securely fastened as well as checking it for wear, corrosion or defects.

The following procedures are to be observed when installing the track beam:

- Generally track beams are to be protected from corrosion using appropriate measures.
- The running surfaces of the main rollers and the horizontal guide rollers must be plane, clean and free of objects that might damage the rollers (scratches, cracks, holes, uneven segments etc.).
- If multiple beams are welded together, they must all have the same measurement, shape and positional tolerances.
- The beam flanges are to be aligned with particular care in horizontal and vertical planes.
- Track beams that have been damaged during transport or rolling etc. are not permitted.
- Modified (welded, ground etc.) areas on the track beam are to be protected from corrosion with appropriate measures.
- Disturbing elements in the traveling area and below the track beam are not allowed.

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3.5.1 Smoothing of welded track beams

Edges and uneven areas on all sides of the welded track beams are to be corrected all-around over a length of 100 mm.

i
NOTICE!

Required tools and auxiliaries:

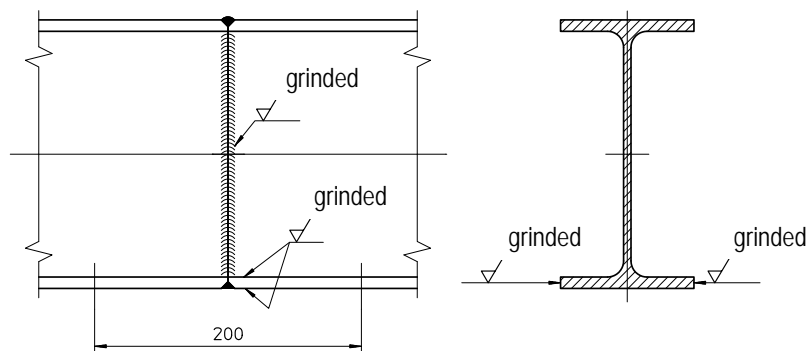


Fig. 3: Smoothing of welded track beams

3.5.2 Use of even welded track beams

Welded joints on the track beams must be **even** at points that could come into contact with the chassis. Mounting elements and suspended objects that could come into contact with the trolleys are not permitted.

No uneven areas, mounting elements, suspended objects, etc.

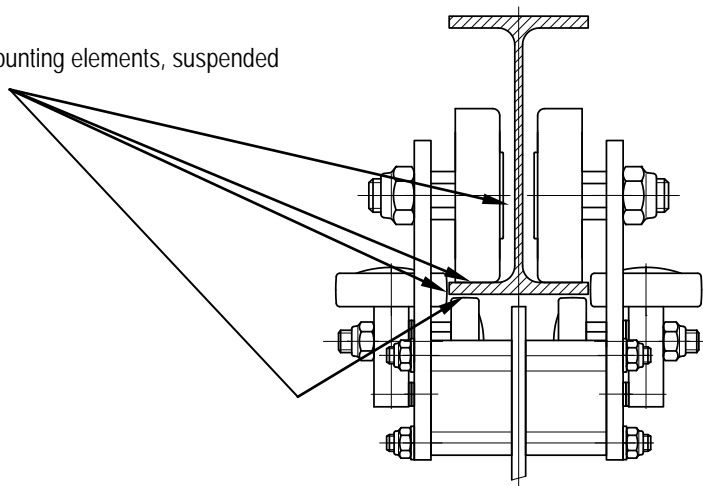


Fig. 4: Use of even welded track beams

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3.5.3 Beam joint on non-welded track beams

On non-welded beam joints, the gap between beams must not exceed **8 mm**. The cut is at a **45°** angle.

i
NOTICE!

Required tools and auxiliaries:

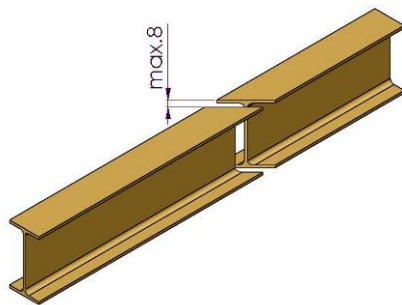


Fig. 5: Beam joint on non-welded track beams

For non-welded beam joints, the horizontal and vertical deviation of the opposed joint must not exceed **2 mm**. Transitions must be ground smooth within **approx. 100 mm** from the beginning of the cut. All transitions must be **beveled and rounded**.

i
NOTICE!

Required tools and auxiliaries:

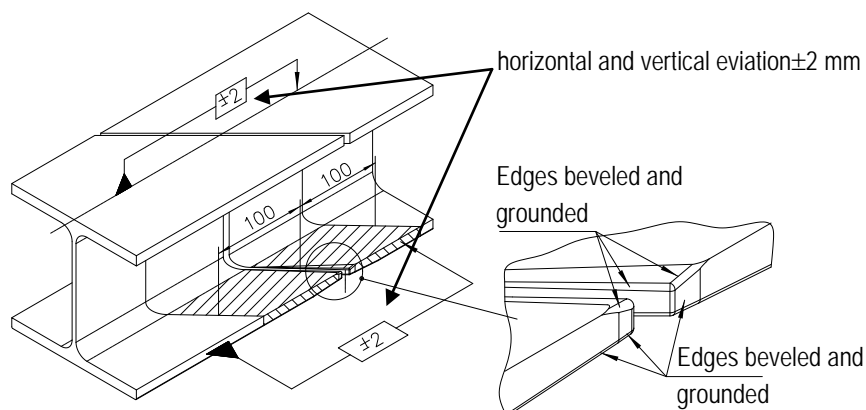


Fig. 6: Beam joint on non-welded track beams

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3.5.4 Horizontal deviation at the track beam

The horizontal deviation over the total length of the track beam may not exceed ± 5 mm, for lengths shorter than 2 m, deviation may not exceed ± 2 mm.

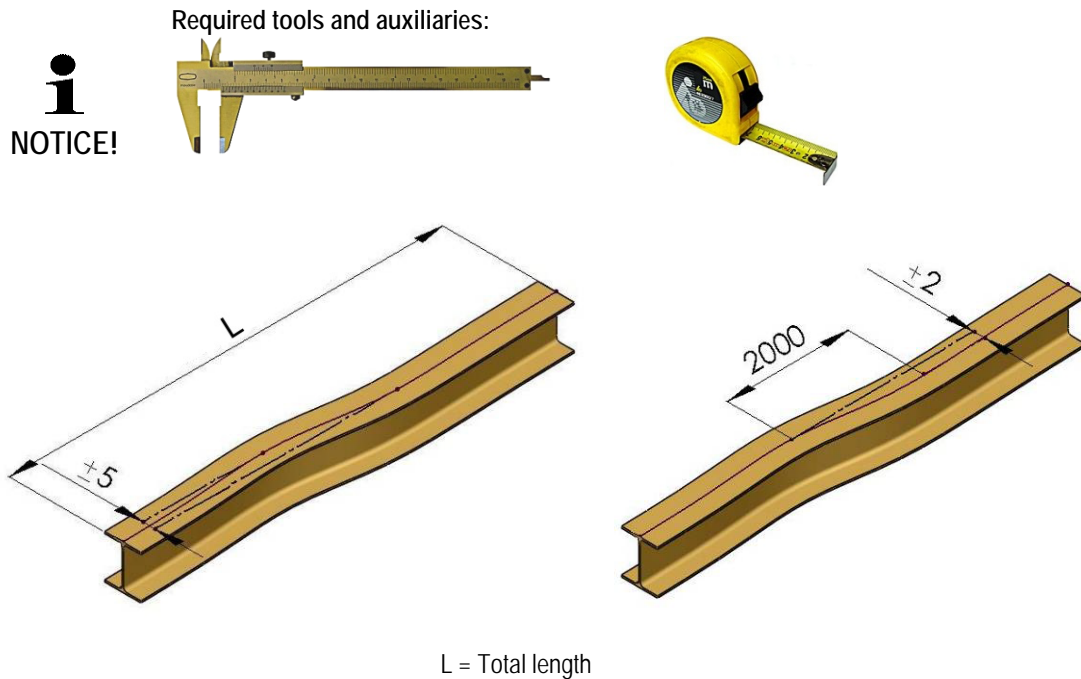


Fig. 7: Horizontal deviation at the track beam

3.5.5 Horizontal deviation at the track beam

The vertical deviation over the total length of the track beam may not exceed ± 5 mm, for lengths shorter than 2 m, deviation may not exceed ± 2 mm.

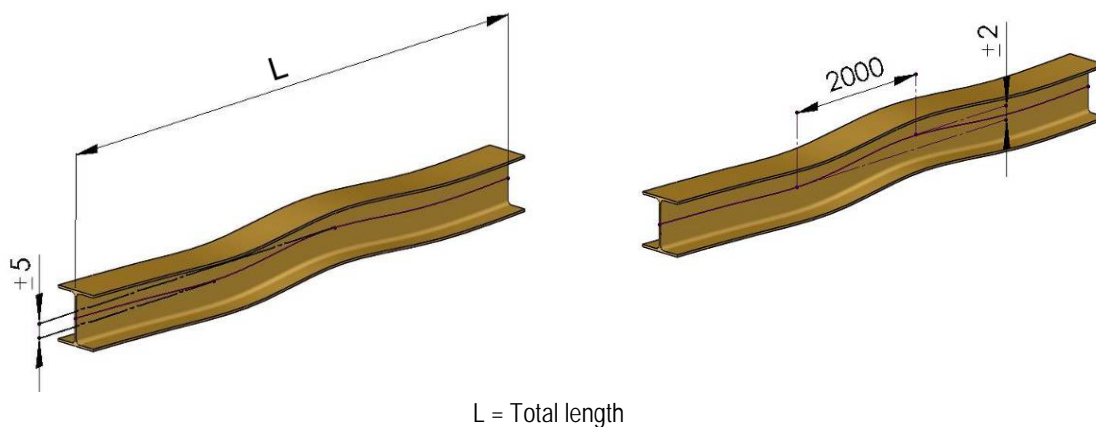


Fig. 8: Vertical deviation at the track beam

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3.5.6 Horizontal alignment deviation between the crane beam and the track beam

The horizontal alignment deviation between the crane beam and the track beam must not exceed $\pm 7,5$ mm. This tolerance should include a possible alignment deviation of the trolley chassis.

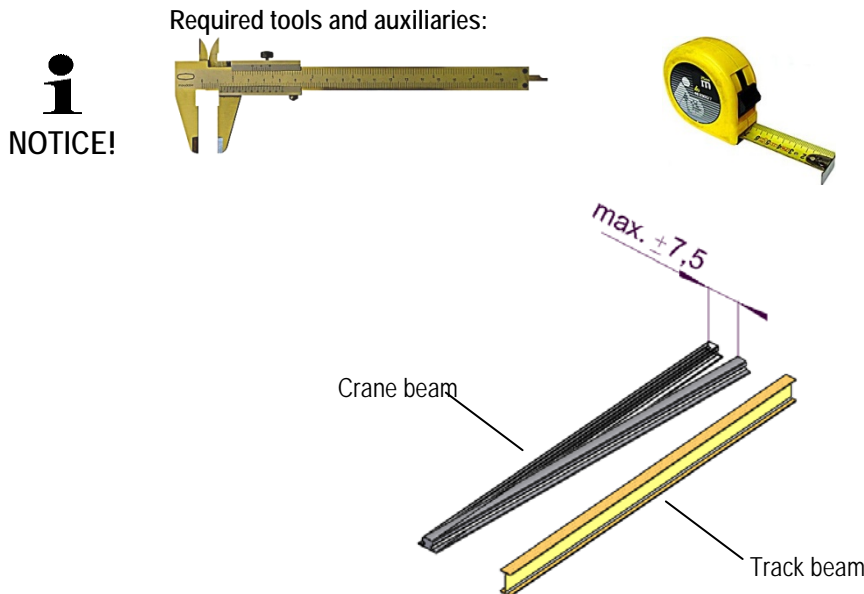


Fig. 9: Horizontal alignment deviation between the crane beam and the track beam

3.5.7 Vertical alignment deviation between the crane beam and the track beam

The alignment deviation between the crane beam and the track beam must not exceed ± 15 mm. This tolerance should include a possible alignment deviation of the trolley chassis.

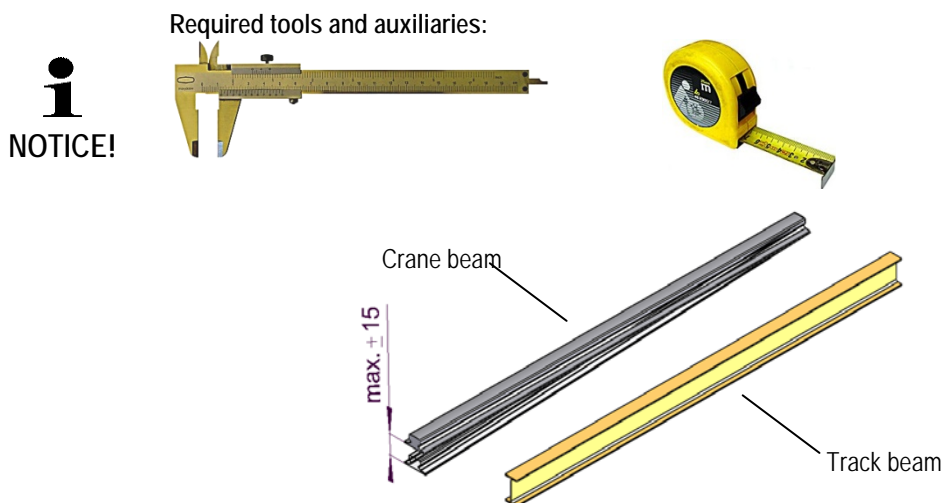


Fig. 10: Vertical alignment deviation between the crane beam and the track beam

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4 Product Description and Mode of Operation

4.1 Dimensions

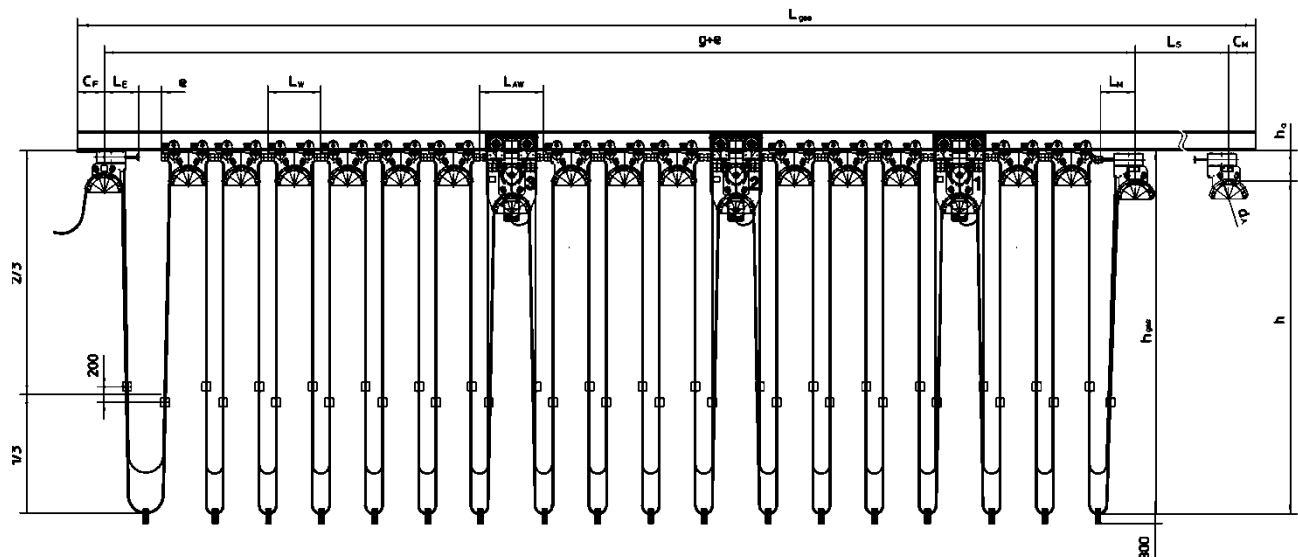


Fig. 11: System layout of program 0365 with program 0380

Active travel	l_s	m
Cable trolley storage	g	m
Free space within the storage distance	e	m, mm
Cable trolley storage including free space	$g + e$	m
Beam clearance end clamp side	C_E	m, mm
Beam clearance towing side	C_M	m, mm
Track beam length	l_{ges}	m
Cable system length	L_{SYST}	m
Installation length end clamp side	L_{instE}	m
Installation length, towing side	L_{instM}	m
Cable trolley height from lower edge of beam to upper edge of cable support	h_a	m, mm
Cable loop depth from lower edge of beam to loop bottom	h_{ges}	m
Cable loop depth	h	m, mm
Cable support diameter (top support)	d_A	mm
Cable trolley length	l_w	m, mm
Towing trolley length	l_m	m, mm
Motorized cable trolley length	l_{AW}	m, mm

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4.2 Brief description

A motorized festoon System consists of end clamp, cable trolleys, towing trolley or towing clamp, cables and motorized cable trolleys. A towing arm (not included in the scope of delivery) couples the towing trolley or the towing clamp to the mobile consumer. The towing trolley and the motorized cable trolleys pull or push the following cable trolleys. Depending on the project 2 to 3 motorized cable trolleys can be installed in a festoon system. With the application of motorized cable trolleys higher speeds and a more smooth movement of the cables can be reached. Moreover towing ropes, damping devices and round or flat cable clamps and guide rings may also be used. The dimensions of the motorized festoon system can be found in the project-specific dimension sheet.

4.3 Overview motorized cable trolley

The cable trolley is adjusted ex works for the corresponding track beam profile. Subsequent adjustment is not necessary.

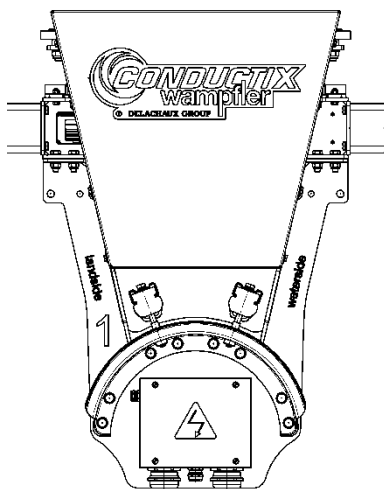


Fig. 12: Installation situation motorized cable trolley

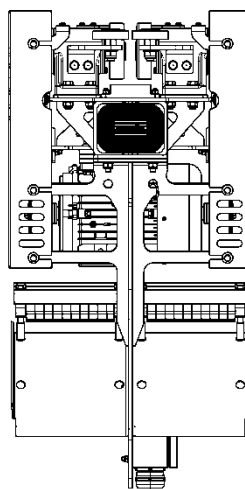


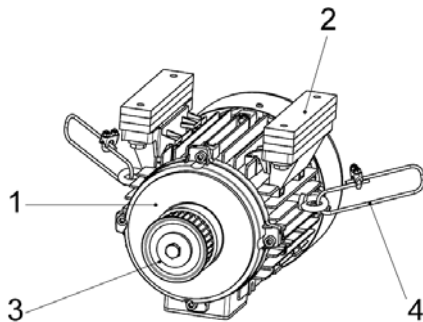
Fig. 13: Overview motorized cable trolley

Item	Designation	Item	Designation
1	Drive motor	7	Tooth belt
2	Bearing housing	8	Cellular buffer
3	Shaft for main roller	9	Anti-lift plate
4	Roller complete	10	Cable support
5	Tooth belt pulley shaft	11	Clamping bar
6	Tooth belt pulley motor	12	Protective cover

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4.4 Description of assemblies

Version 1.95 KW until 10/2012



■ Drive unit consisting of:

- 1) Drive motor
- 2) Motor mounting
- 3) Tooth belt pulley
- 4) Retaining device

Version 1,95KW and 3KW from 10/2012

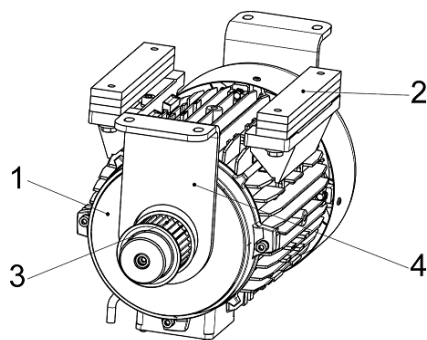
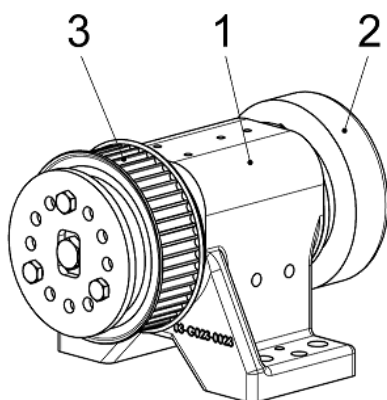


Fig. 14: Motor unit

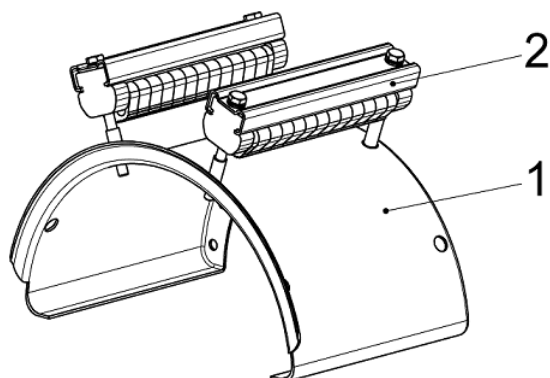


■ Bearing housing consisting of:

- 1) Housing
- 2) Shaft for main roller
- 3) Tooth belt pulley

Fig. 15: Bearing housing

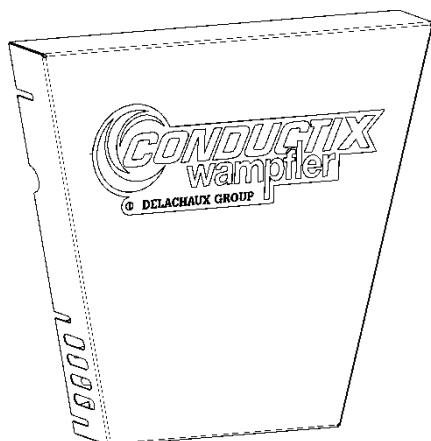
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■ Complete cable support consisting of:

- 1) Cable support
- 2) Clamping bar

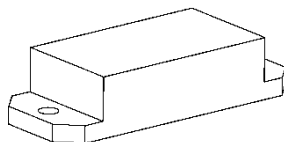
Fig. 16: Support complete



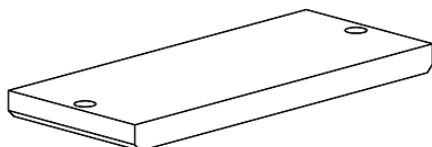
■ Protective cover with belt catch

Fig. 17: Protective cover with belt catch

Version 1.95 KW



Version 3KW



■ Anti-lift plate

Fig. 18: Anti-lift plate

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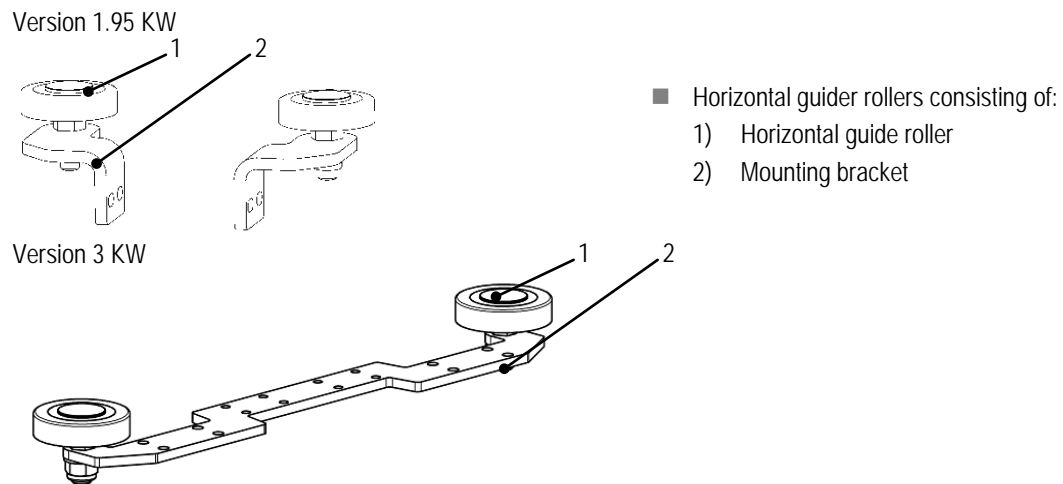


Fig. 19: Horizontal guide rollers

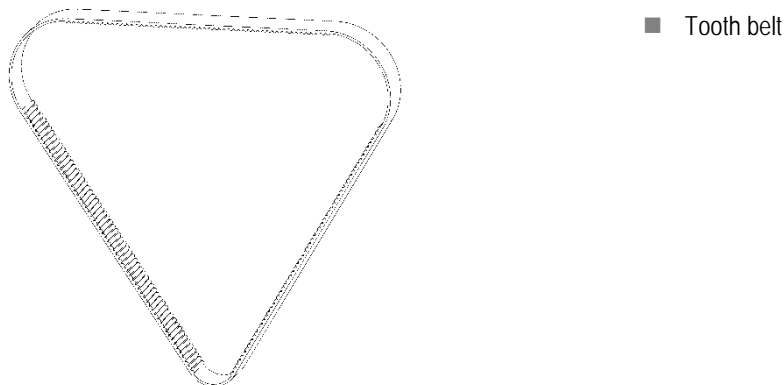


Fig. 20: Tooth belt

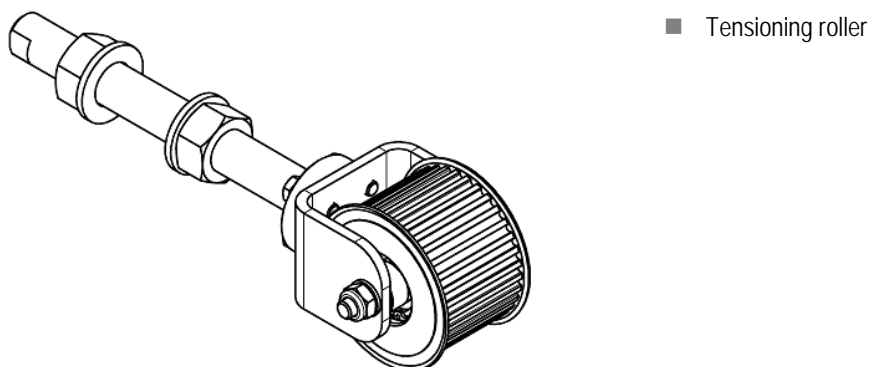


Fig. 21: Tensioning roller

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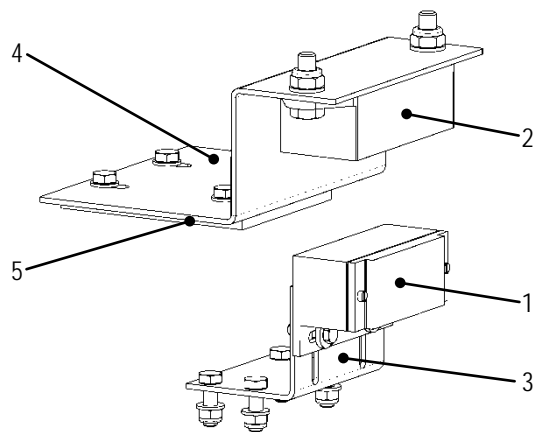


Fig. 22: Switching assembly "water side"

■ Switching assembly "water side" consisting of:

- 1) Magnetic limit switch
- 2) Magnet
- 3) Mounting for magnetic limit switch
- 4) Mounting magnet
- 5) Mounting plate

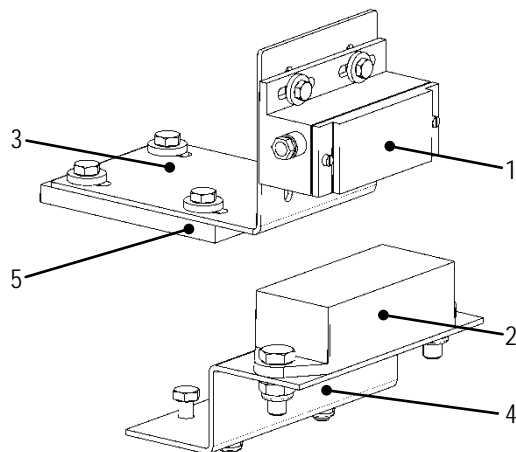


Fig. 23: Switching assembly "land side"

■ Switching assembly "land side" consisting of:

- 1) Magnetic limit switch
- 2) Magnet
- 3) Mounting for magnetic limit switch
- 4) Mounting magnet
- 5) mounting plate

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4.5 Working and danger areas

The following illustration shows the working area of the festoon system. There is a danger of injury from moving parts in this area.

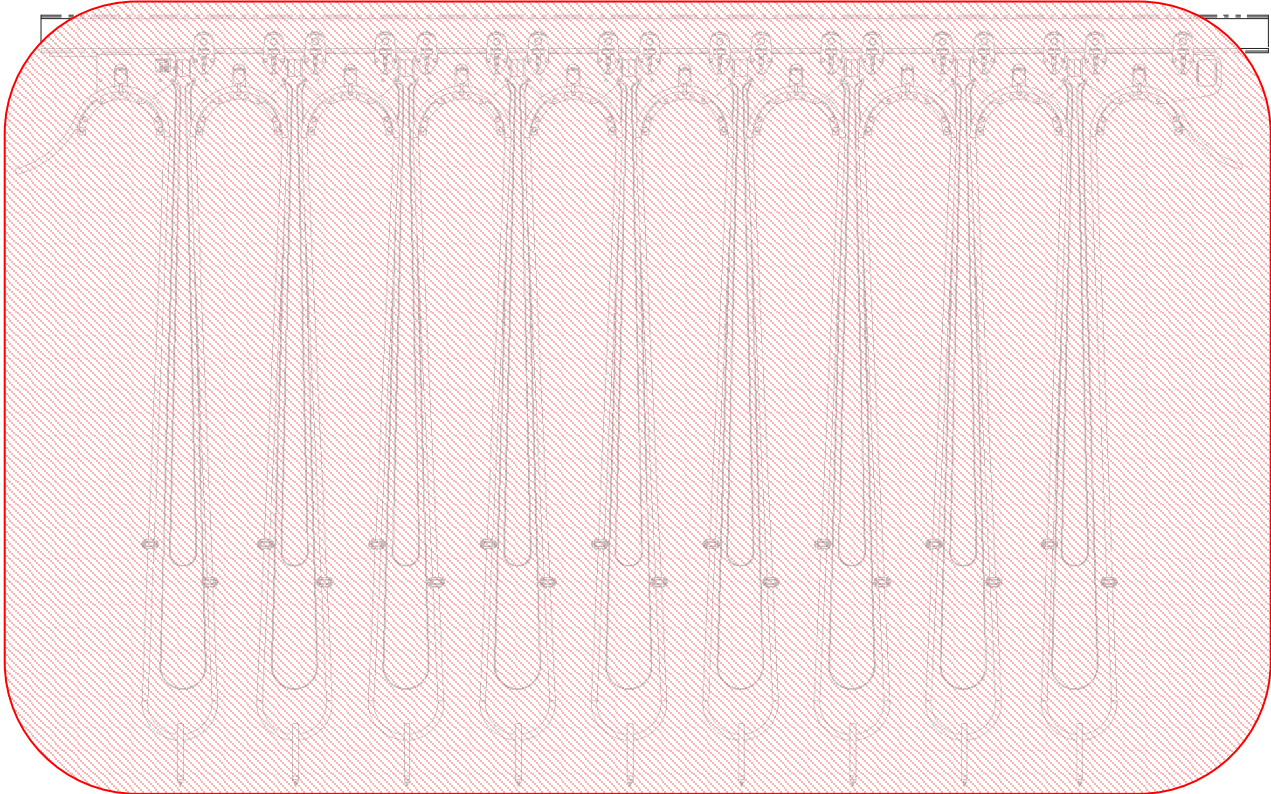


Fig. 24: Working and danger area

Working and danger area:

- Between buffer and buffer plate
- Between carriage and track beam
- Between load carriers and track beam
- Between tooth belt and tooth belt pulley
- In the area of the cables



Danger of injury from moving components!

Contact with the motorized festoon system during operation can lead to severe injuries and damage to the motorized festoon system.

- During automatic operation, no-one may be located in or under the working area of the motorized festoon system.
- In manual operation, the operator must ensure that no-one is in or under the working area of the motorized festoon system.
- Block off the dangerous area under the system.

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4.6 Operating modes

The motorized festoon system can be operated in one of two modes:

- Automatic operation
- Manual operation

4.6.1 Automatic operation

The standard operating mode is automatic operation, in which the motorized festoon system is operated via the consumer's controller. In this mode, no person may be in or under the working area of the motorized festoon system. The customer must block off the working area.

4.6.2 Manual operation

Manual operation is used for commissioning, maintenance, and repair. It may be necessary to make adjustments directly at the motorized festoon system and to monitor them.

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5 Transport, packaging and storage

5.1 Transport

5.1.1 Safety instructions for transport



Danger of death due to hanging loads!

When lifting loads, there is a danger of death from falling parts or those swinging out of control.

- Never step under hanging loads.
- Block off the dangerous area under the system.
- Follow the specifications for the attachment points provided.
- Do not attach to projecting machine parts or to eyes on installed components. Be sure the connection elements are firmly seated.
- Use only authorized lifting accessories and connection elements with sufficient load capacity.
- Do not use torn or worn ropes or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.



Possible damage from improper transport!

Improper transport can result in substantial property damage.

- Act with care when unloading packaged parts upon delivery as well as during internal transport, and observe the symbols and the hazard information on the packaging.
- Use only the attachment points provided.
- Wait to remove packaging material until just before installation.

5.1.2 Transport inspection

Check the delivery for completeness and transport damage immediately upon receipt.

If transport damage is externally visible, proceed as follows:

- Do not accept delivery, or accept it only with reservations.
- Note the scope of damage on the transport documents or on the transporter's delivery note.
- File a complaint.



Damage compensation claims may only be made within the applicable claim periods.

- Claim every defect as soon as it is detected.

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5.2 Packaging

The individual packaged parts must be packed according to the transport conditions to be expected. Only environmentally friendly materials have been used for packaging.

The packaging must protect the individual components from transport damages, corrosion, and other damage until installation. Thus do not destroy the packaging and remove it only just before installation.

Handling packaging materials:

Dispose of packaging material according to valid legal regulations and local guidelines.



Environmental damage due to improper disposal!

Packaging material is a valuable resource and can be reused, processed or recycled in many cases.

- Dispose of packaging materials in an environmentally appropriate manner.
- Comply with locally applicable disposal guidelines; if necessary, engage a specialist with disposal.

5.3 Storage of packed parts

Store packed parts under the following conditions:

- Do not store outdoors.
- Store in a dry, dust-free place.
- Do not expose to aggressive media.
- Protect from direct sunlight.
- Avoid mechanical vibrations.
- Storage temperature: +5° to +40°C.
- Relative humidity: < 90%, avoid condensation.
- When storing for more than 3 months, check the general condition of all parts and the packaging at regular intervals.



Under some circumstances, there may be instructions for storage on the packed parts which go beyond the requirements listed here.

- Follow them appropriately.

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6 Installation and commissioning

6.1 Safety

Personnel:

- Installation and commissioning may only be carried out by specially trained technicians.

Wear the following protective gear during all work of installation and commissioning:

- Work safety clothing
- Protective helmet
- Protective footwear
- Protective gloves



Danger of death due to suspended loads!

When lifting loads, there is a danger of death from falling parts or those swinging out of control.

- Never step below suspended loads.
- Block off the dangerous area under the system.
- Move loads only under supervision.
- Follow the specifications for the attachment points provided.
- Do not attach to projecting machine parts or to eyes on installed components. Be sure the connection elements are firmly seated.
- Only use authorized lifting accessories and connection elements with sufficient load capacity.
- Do not use torn or worn ropes or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Put down the load when leaving the workplace.



Injury due to improper installation and commissioning!

Improper installation and commissioning can result in serious injury to person and property damage.

- Before starting work, ensure sufficient space for assembly.
- Handle open, sharp-edges components carefully.
- Maintain order and cleanliness in the assembly area! Loosely stacked or scattered components and tools are danger sources.
- Mount components properly. Comply with specified screw tightening torques.
- Secure components so that they cannot fall or tip over.

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6.2 Preparations

Required tools:

- Drilling machine
- Metal drill
- Flat wrench
- Corrosion protection
- Lubricant
- Gauge

6.3 Installation

Personnel:

- May only be carried out by trained technicians
- At least two people



Danger of tripping on projecting parts!

When working on the motorized festoon system, there is a risk of tripping.

- When walking in the work and danger area, be careful of projections and depressions in the floor.
No loose objects may be left on the floor.



Danger of crushing!

When moving the motorized festoon system there is a danger of crushing limbs between the buffer and the buffer plate, the carriage and the track carrier and between tooth belt and tooth belt pulleys.

- When the system is moving, do not enter the danger area of the motorized festoon system.

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6.3.1 Unpacking instructions motorized cable trolley

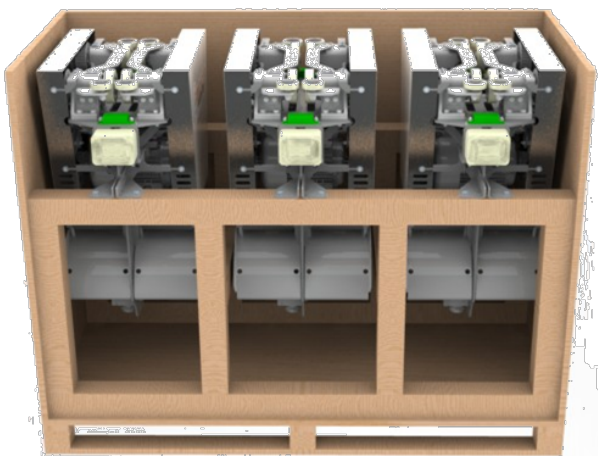


NOTICE!

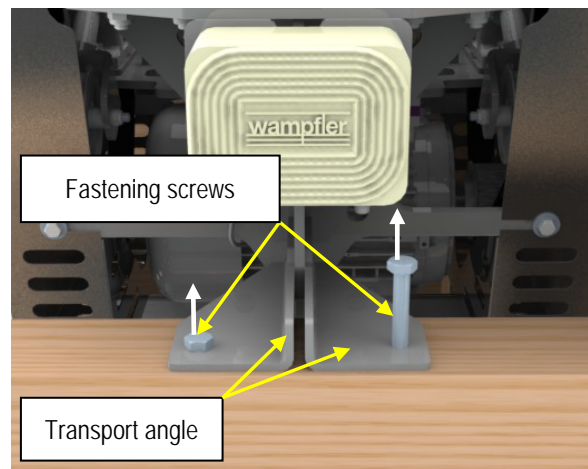
The motorized cable trolley is adjusted ex works for the corresponding track beam profile. Subsequent adjustment is not necessary.

The motorized cable trolleys are delivered in a wooden box. In order to avoid damage at the motorized cable trolleys proceed as follows:

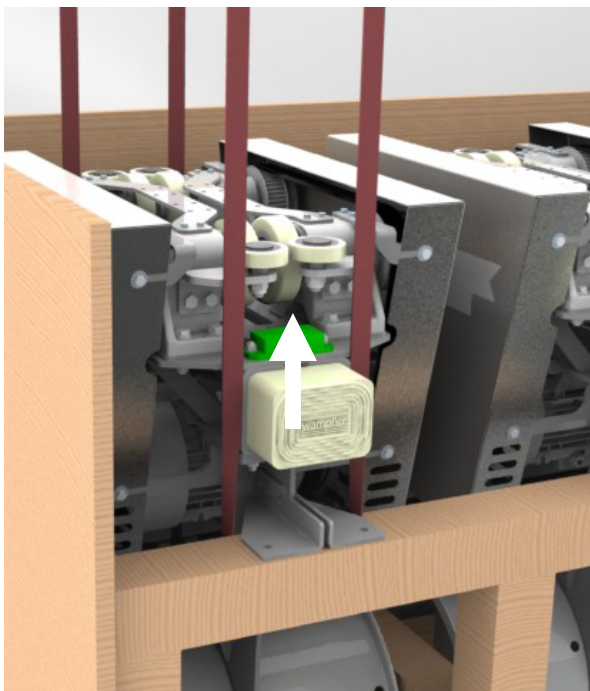
Step 1: Remove cover.



Step 2: After having removed the cover take off the front side.



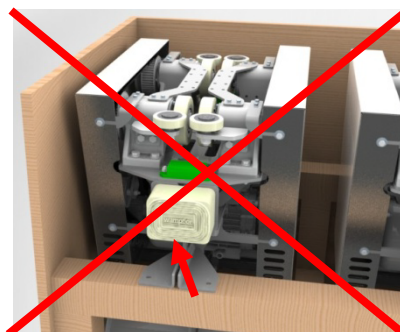
Step 3: Remove fastening screws (4 pc. per motorized cable trolley)



Step 4: Install straps (see figure) and lift out motorized cable trolleys vertically.



Wrong!
Do not lift the motorized cable trolleys at the guide rollers or the buffers!



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i NOTICE!

The cable trolleys are marked with "1", "2" or "3", according to their position in the system drawing.

! CAUTION!

The sequence of the motorized cable trolleys on the track beam is obligatory!
→ The mounting position according to the system drawing must be observed.

Step5: Push the motorized cable trolleys onto the track beam from the front side (observe numbering in system drawing).

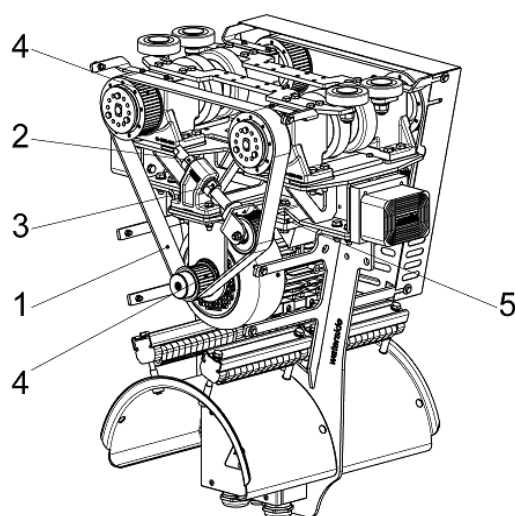
Step 6: After the installation of the motorized cable trolley on the track beam dismount the transport angle (4 pc./motorized cable trolley).

6.3.2 Belt drive

i NOTICE!

Assembly works at the tooth belt drive must comply with the particularities of the belt design. The better the manufacturer's recommendations are observed, the better the operating behavior, the rate of utilization and the lifetime.

The tooth belt requires a well-defined pretension during operation. An unnecessarily high pretension reduces the lifetime of the drive unit, increases the bearing load and the wear of the teeth. If the pretension is too low the belt teeth will not engage properly, which might cause overleaping of the belt in case of heavy stress.



■ Belt drive consisting of:

- 1) Tooth belt
- 2) Nut
- 3) Clamping nut
- 4) Tooth belt pulleys
- 5) Motor mounting

Fig. 25: Arrangement of the belt drive components

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The motorized cable trolleys are delivered with pre-tensioned tooth belts (1). During disassembly or replacement of the belt it is required to detach the tightened nuts (2, 3, 4), so that the belt can be pulled laterally over the flange of the tooth belt pulleys (5) and (4). The installation is made in reverse order. The bolted connections must be secured with LOCTITE 243. See also Chapter 8.

6.3.3 Electric motor



→ For all works at the electric motor it is essential to observe the operating instructions of motor manufacturer.



Connection and maintenance of the electric drive must only be carried out by qualified specialists, that are familiar with the respective prescriptions. The respective instructions for accident prevention must be observed as well.

The drive unit must only be operated, if the details on the specification plate of the DC motor are in conformance with the supply voltage. Different voltage for exciter winding and armature winding must be observed.

For outdoor application the motors are provided with a corrosion resistant varnish. Any damage to the varnish (e.g. at the clamping box) must be repaired.

It must be observed that both the incoming and the outgoing supply lines will be guided underneath both terminal strips, in order to prevent tensile load onto the bolted connections.

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6.3.4 Mounting switching assembly in general



Improper installation and commissioning of the assembly group will result in damage to the machines and the festoon system.

→ Connection and maintenance of the magnet limit switch must only be carried out by qualified electric specialists, who are familiar with the relevant prescriptions. The accident prevention regulations must be observed as well.

By means of the magnet limit switch the driving command will be switched off at the motorized cable trolleys at the end position. Switch-off is effected in both travel directions and is independent of the consumer. The switch-off guarantees a safe operation of the motorized festoon system, even under extreme conditions.

Each motorized cable trolley is assigned a specific magnet limit switch.

The assembly positions of the magnet limit switches can be taken from the system drawing and must be observed exactly.

Land side

Water side

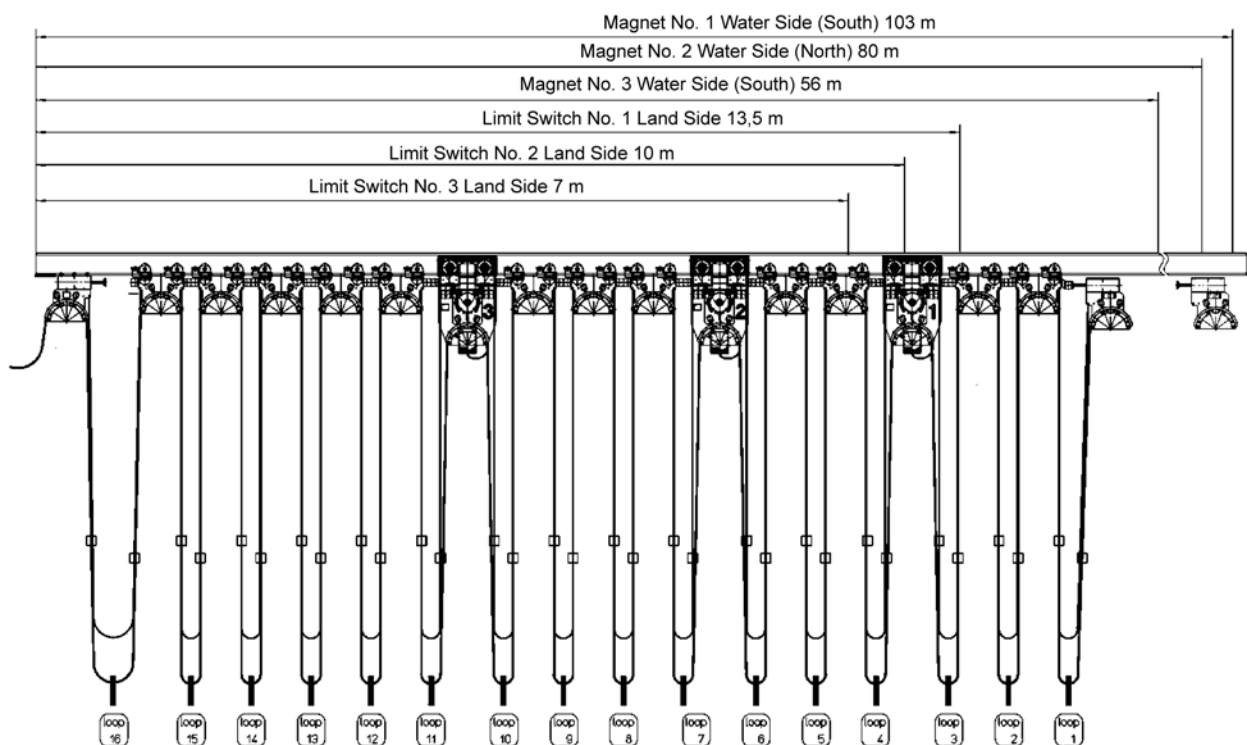


Fig. 26: Assembly position magnetic limit switch

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The viewing direction during the mounting of the switching assembly: from the end clamp into the direction of the towing clamp/trolley.

The magnet with the description "trolley 1" is assigned to the first motorized cable trolley, etc.

The magnets have been premounted ex works at the motorized cable trolley at the provided position:

Trolley 1 - south;

trolley 2 - north;

trolley 3 - south; magnet with low distance

For the installation of the magnet limit switch at the support, observe the position dimensions. The observation of the distance measure (distance to the magnet) is obligatory for correct switching. Here it has to be ensured that a collision will not be produced between magnet and limit switch when trolley 1 travels under limit switch 3!

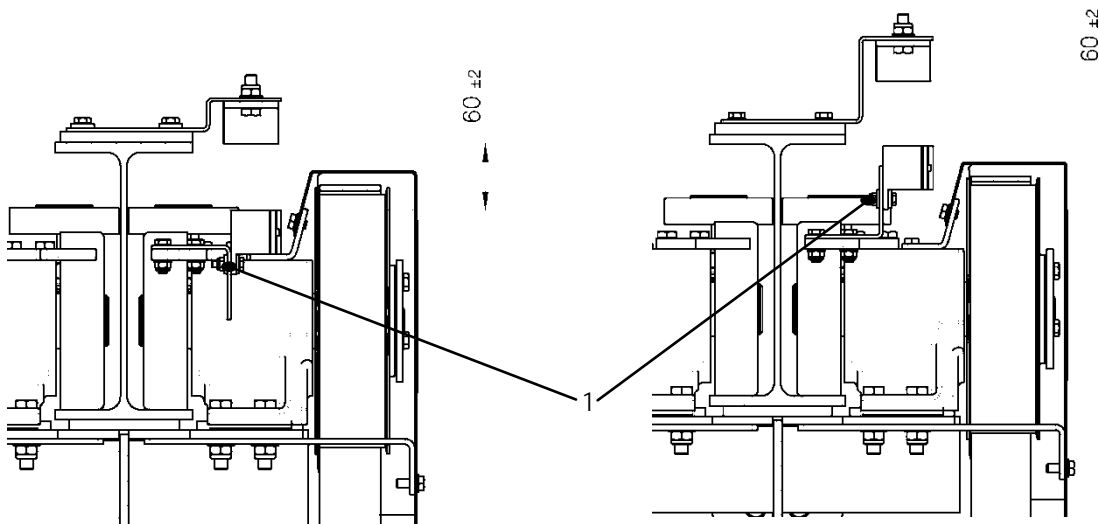


Fig. 27: Limit switch water side

By detaching the screwed connection (1) the limit switch can be shifted vertically. It must be adjusted to the indicated dimension, 60 mm.

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6.3.5 Installation switching assembly motorized cable trolley HTR Ø125

Land side: View from end clamp into the direction of the towing clamp/trolley

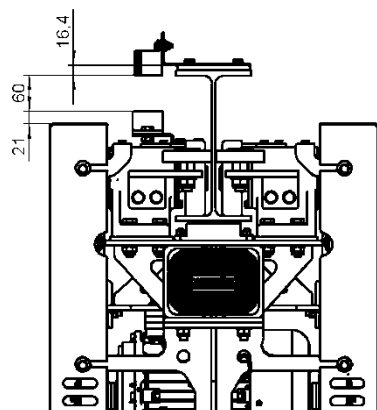


Fig. 28: Trolley 1

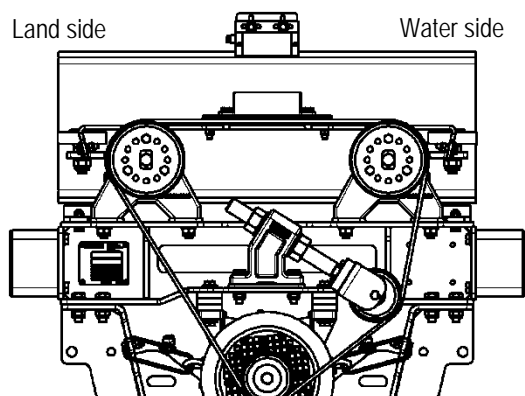
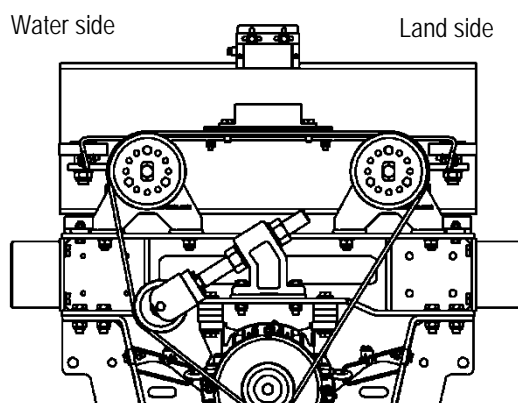


Fig. 29: Trolley 2

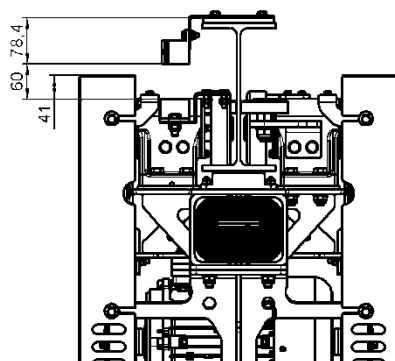
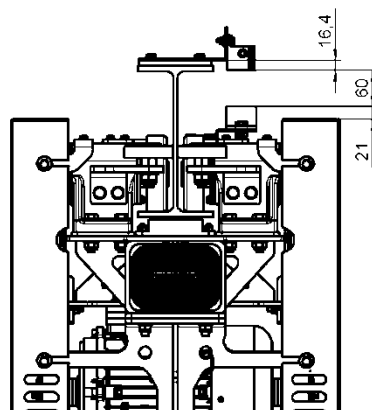
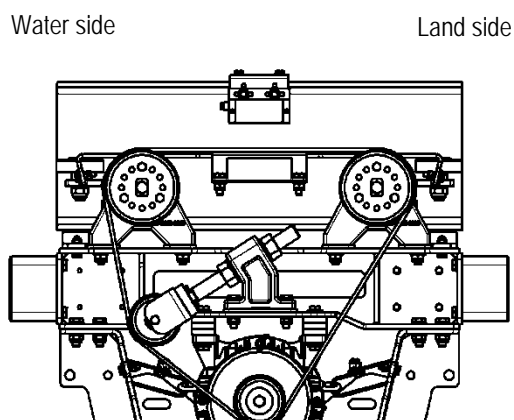


Fig. 30: Trolley 3



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The magnet limit switches are fixed at the track beam by means of angle brackets. For the installation of the switches at the track beam, a drilling pattern must be drilled into the beam.

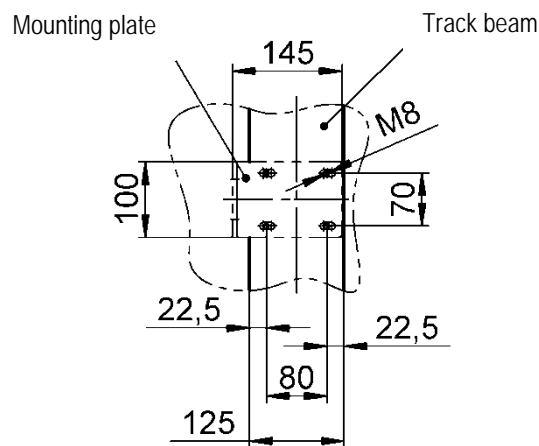


Fig. 31: Drilling pattern for attachment

As demonstrated in Fig. 31, there are 2 possibilities: on the right side you can see the attachment with threaded holes M8 and on the left side the attachment with through-holes, and here the screw must be secured with a lock nut. Through the elongated holes in the mounting plates, the magnet switch can be adjusted to the motorized cable trolley during the assembly.

The limit switches are connected and supplied by the control unit via the clamping bar. The required cable for the electrical connection of the magnet limit switches is not included in the scope of delivery of Conductix-Wampler. The required cable for the electric connection is provided by the customer.

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Water side View from end clamp in direction to the towing clamp / towing trolley

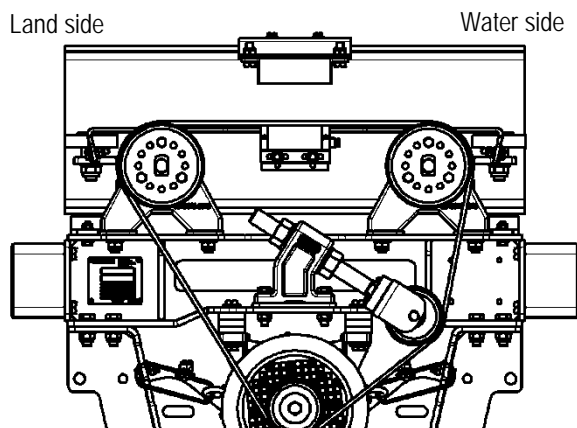


Fig. 32: Trolley 1

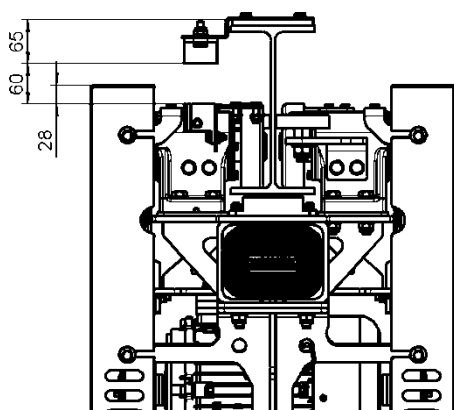
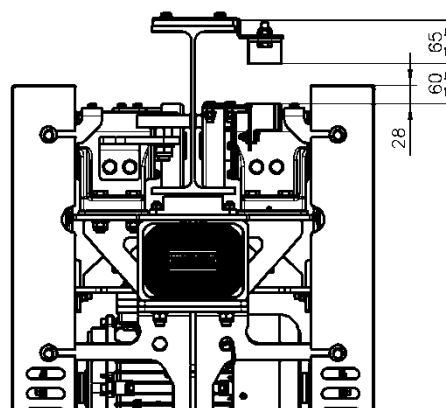


Fig. 33: Trolley 2

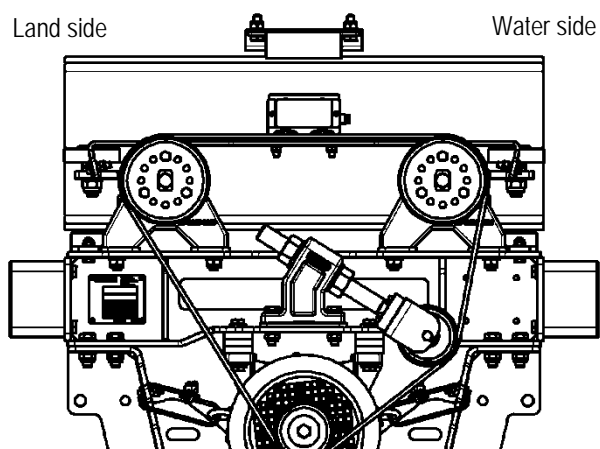
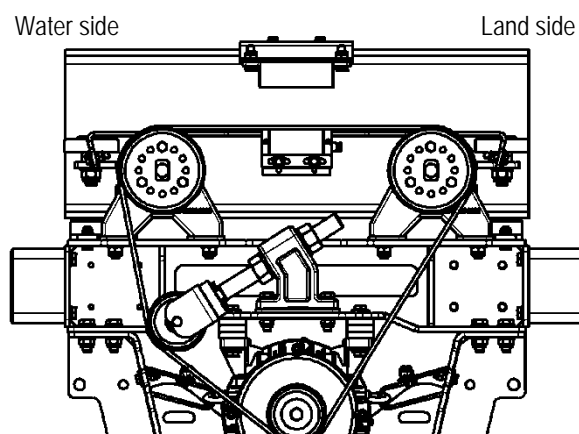
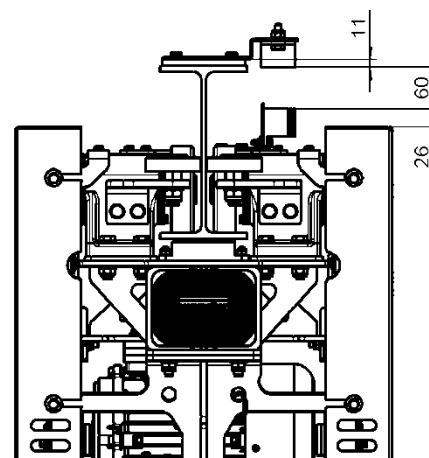


Fig. 34: Trolley 3



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6.3.6 Arrangement of round cables



Danger of burning!

Danger of burning when using insufficiently dimensioned cables!

→ Always comply with the necessary cross-section of cables.



Danger due to improper installation of cables!

Improper arrangement of cables in the cable packet and in loops can damage the cables and lead to death by electric shock.

→ The cables may only be connected by an electrician.

→ Inspect the cables regularly for wear and damage.

The projected cable setup for the motorized festoon system is to be maintained. The following rules apply:

- Place the cable package towards the middle of the track beam so that the torque is in balance.
- Cables with large copper diameters are to be placed towards the center of the trolley and arranged symmetrically.
- When using cable trolleys with multiple cable support, the heaviest cables are to be placed on the uppermost support.
- When using cable trolleys with multiple cable support, the uppermost cables should be made slightly shorter than the cables below. Each layer of cables should be given somewhat less play than the cables below them.
- Each layer of cables should be given somewhat less play than the cables below them. When using round cable clamps, cables should be arranged on the outer surface of the supports that are suitable for anchoring the round cable clamps. Unshielded cables with a large copper diameter are preferred.
- The clamping braces of the layers must be screwed into place tightly enough to prevent thin cables from being pulled through during operation, while still not damaging the cables due to excessive clamping. If necessary, clamping pieces can be used.

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i NOTICE!

Diameter differences:

The diameter of the round cables should be fairly uniform. This helps to ensure that they are tightly clamped on the cable supports.

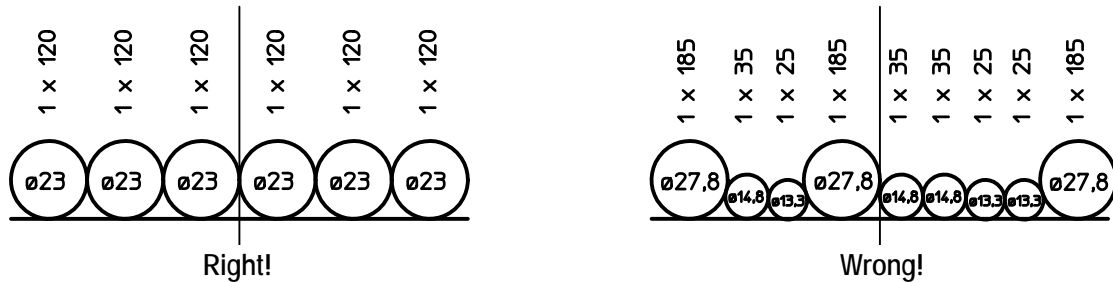


Fig. 35: Diameter differences

i NOTICE!

Clamping pieces:

→ For differences in diameter of neighboring cables by more than 15 mm, clamping pieces should be used for tight clamping.

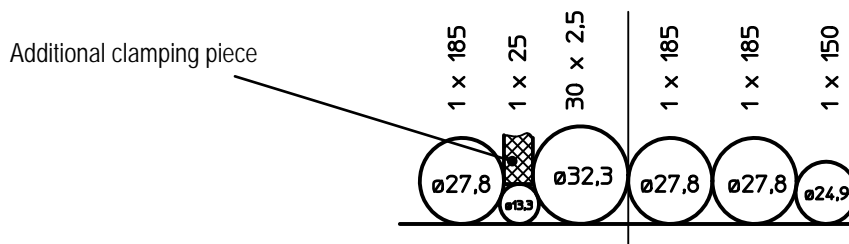


Fig. 36: Using clamping pieces

i NOTICE!

Cable balance:

→ Pay attention to the torque balance when positioning the cables. The thicker, heavier cables should be placed in the middle.

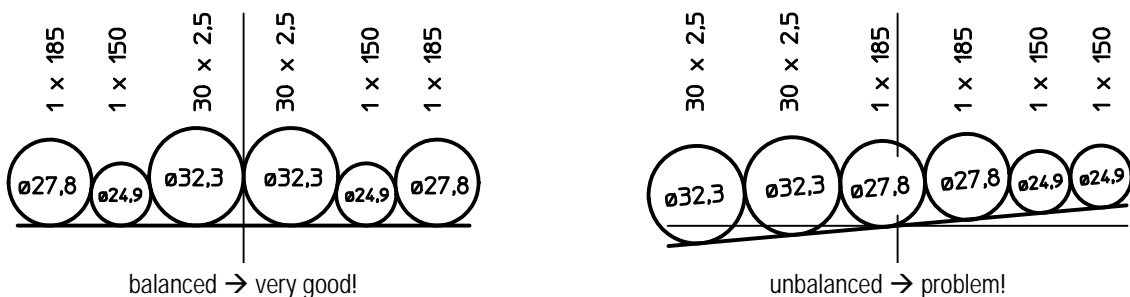


Fig. 37: Cable balance

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6.3.7 Mounting round cable clamps



- Improper positioning of the round cable clamps will lead to damage of the cables and festoon system.
- Improper mounting and arrangement of cables in the round cable clamp will damage the cables and the festoon system.

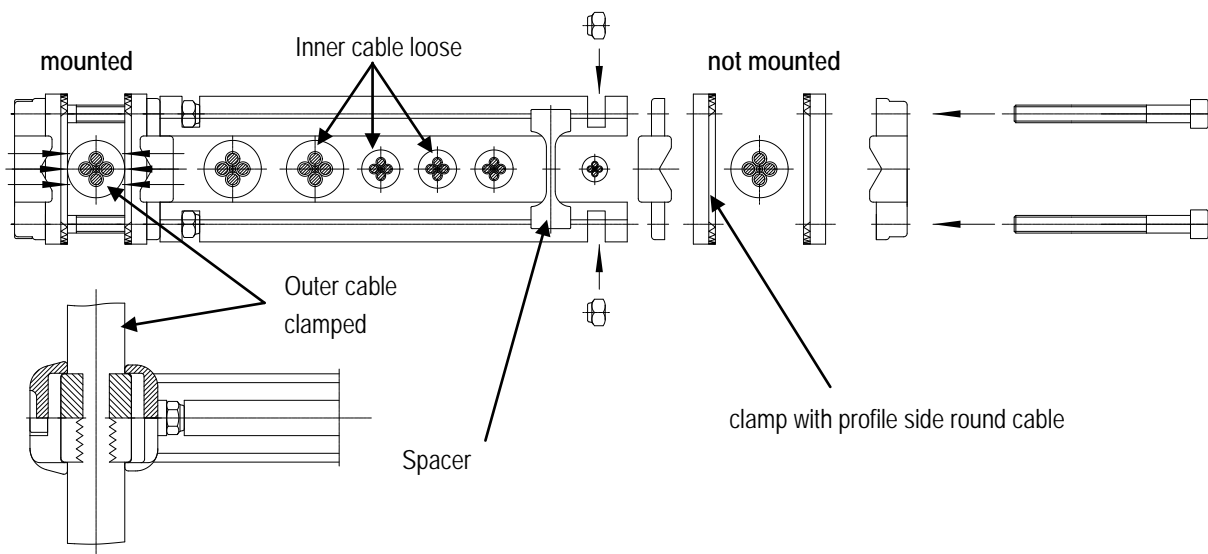


Fig. 38: Mounting round cable clamp



- It is recommended to preassemble the round cable clamp as shown in the symbol sketch, in order to get two identical halves.

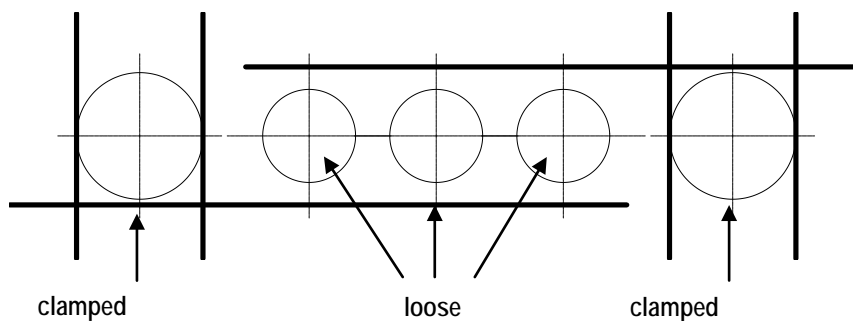


Fig. 39: Symbol sketch for preassembly round cable clamp

The outer left and right cables are clamped between the rubber profiles.

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Ensure that the inner cables can move freely in the round cable clamp window.

If spacers need to be used (in order to prevent turning and superimposition of cables), insert them before closing the cable clamp.

The use of spacers depends on the diameter of the cables. The cable clamp screws must be lubricated. Screws must be tightened crosswise.

i
NOTICE!

Spacers:

Improper positioning or removal of spacers in round cable clamps can cause damage to the cables or the cable trolley system.

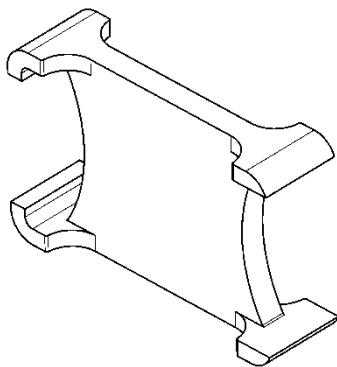


Fig. 40: Spacer

6.3.8 Mounting the towing rope

i
NOTICE!

→ It is important to ensure that the shackles and thimbles can move freely once assembled.

The towing rope is installed between two cable trolleys, end clamp and cable trolley, or between towing trolley/clamp and cable trolley. Ensure that the shackles can be easily moved after tightening the locking nut. The shackles must be maintained at regular intervals (see Chapter 8).

If towing ropes are supplied with clamping sleeves, the clamping sleeves must be pressed or hammered into the respective drill hole in the center plate.

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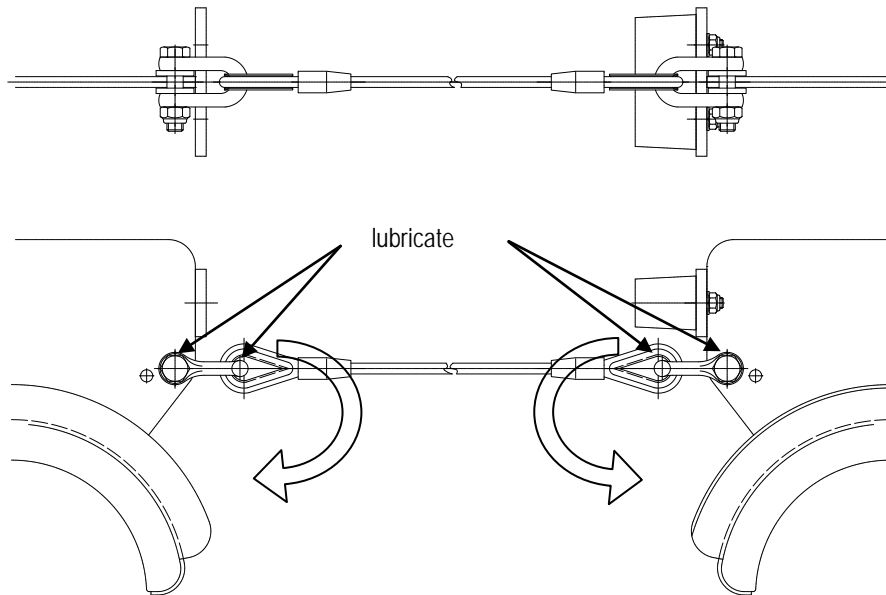


Fig. 41: Towing rope clamping sleeve

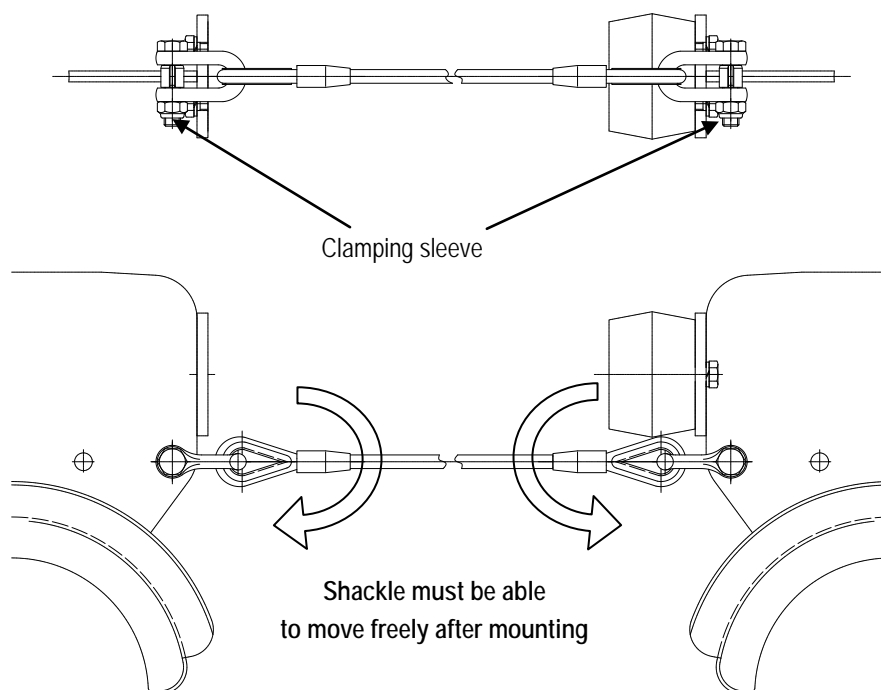


Fig. 42: Towing cable with clamping sleeve

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6.3.9 Damping device



→ Be sure that the fastening eyes can still be moved slightly after having tightened the locking nut, or in the case of slack shock cords, can tip over on its own.



CAUTION!

Risk of injury

→ Before approaching systems with damping devices, they must first be released.

The damping device is installed between 2 cable trolleys, end clamp and cable trolley, or between a towing trolley / towing clamp and a cable trolley. Be sure that the fastening eyes can still be moved slightly after having tightened the locking nut, or in the case of slack shock cords, can tip over on its own.

Project-related damping devices can be used with 2, 4 and 6 shock cords.

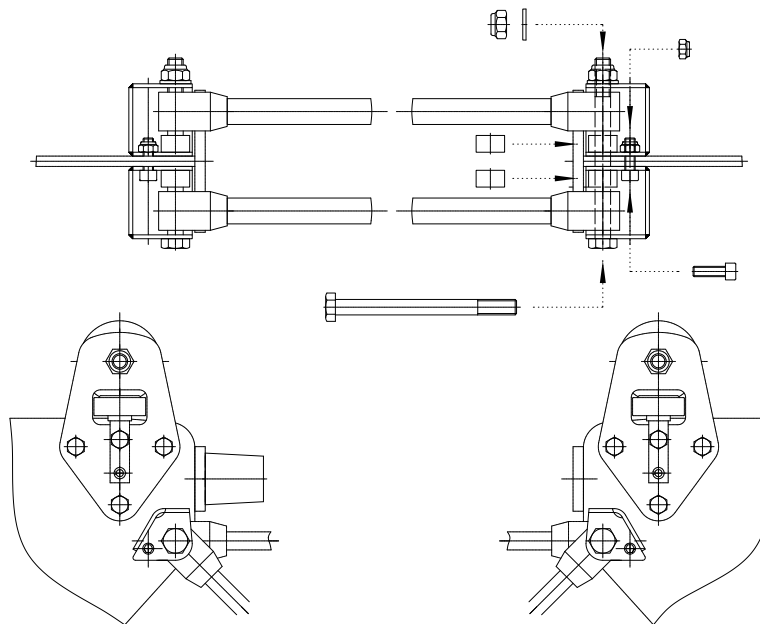


Fig. 43: Damping device with 2 shock cords for main rollers $\varnothing 50$ and 63 mm

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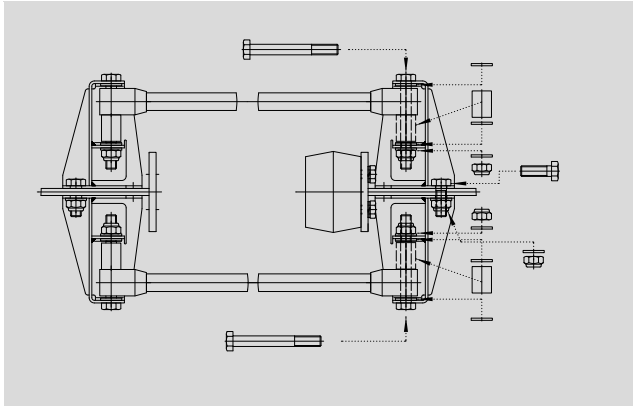


Fig. 44: Damping device with 2 shock cords, for main rollers \varnothing 80, 100, 112, 125 and 160 mm

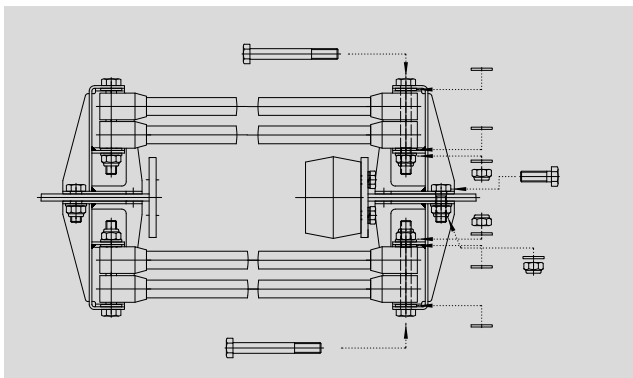


Fig. 45: Damping device with 4 shock cords, for main rollers \varnothing 80, 100, 112, 125 and 160 mm

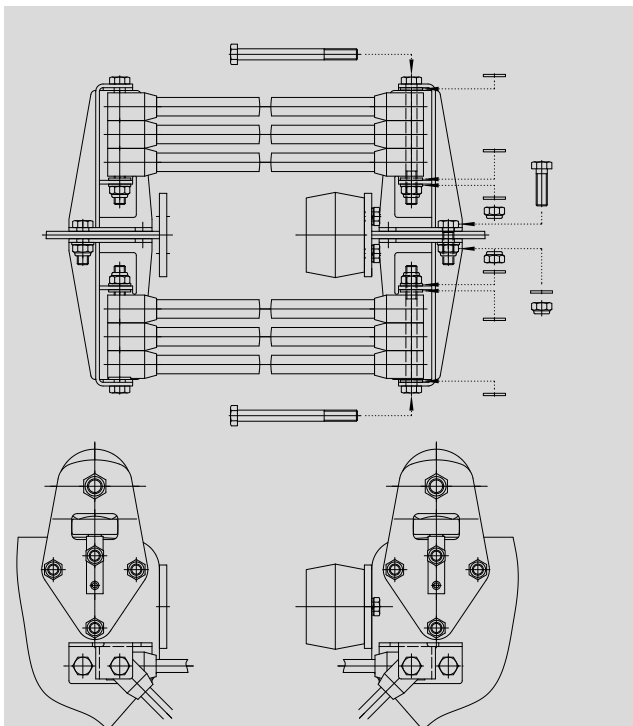


Fig. 46: Damping device with 6 shock cords, for main rollers \varnothing 80, 100, 112, 125 and 160 mm

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6.3.10 Installation of wind retaining device

i NOTICE!

The installation is preferably made when the motorized festoon system is retracted.

The wind retaining device provides a direct connection between towing rope and cable package, so that even under strong lateral forces, like strong winds, the towing rope can no longer drift out to the side.

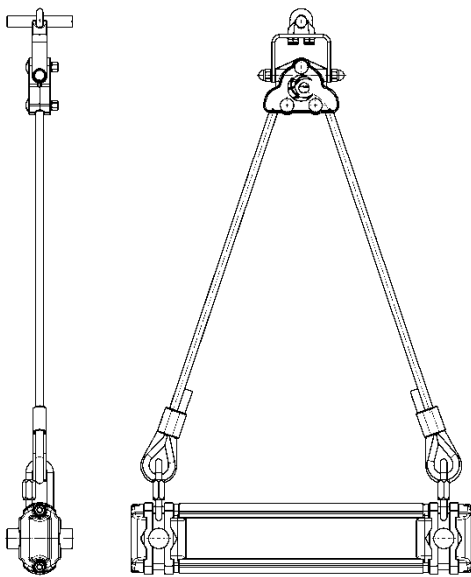


Fig. 47: Wind retaining device

After successful installation of the round cable clamps the wind retaining device is mounted into the loop at the lower round cable clamp. As shown in Fig. 48, the rope clip of the wind retaining device is fixed at the towing rope with an upward offset of 100 mm. The screwed chain links at the shock cord provide the elastic connection between the round cable clamp and the appropriate rope clip.

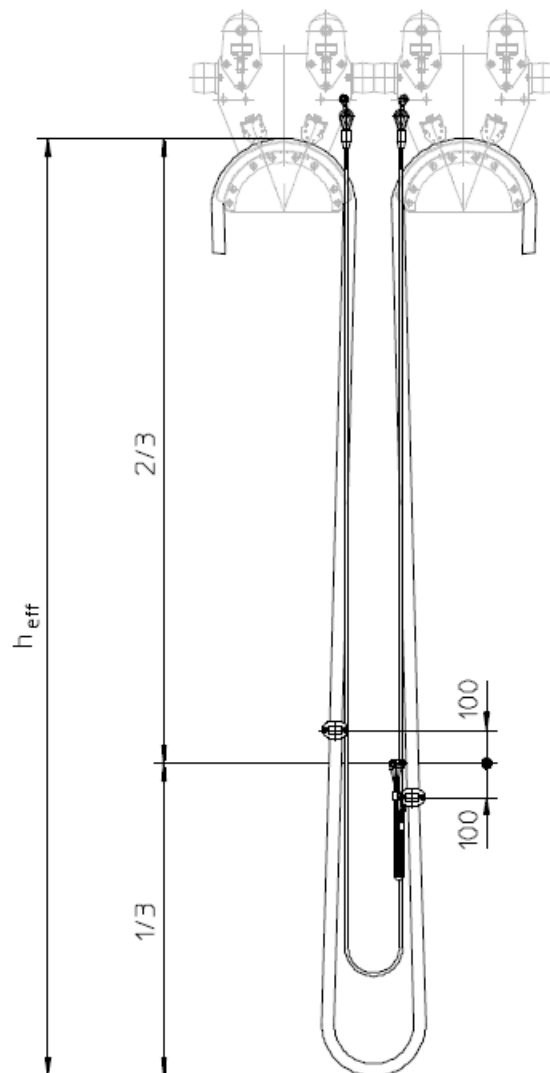


Fig. 48: Mounting position wind retaining device

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6.4 Testing and commissioning



WARNING!

Danger of injury due to improper commissioning!

Improperly performed commissioning can lead to dangerous situations for the personnel.

- Before commissioning, carry out the tests in the test list of the manufacturer.
- Never start the festoon system without testing according to the manufacturer's test list.
- Before commissioning, perform a visual check and carry out the prescribed tests.
- Any procedures that could threaten safety are to be avoided.
- Notify the responsible person immediately of any damage to the festoon system.
- The motorized festoon system should be secured against unintended or unauthorized use.
- It is forbidden to enter the operating area of the motorized festoon system.



CAUTION!

Danger of tripping on projecting parts!

When working on the motorized festoon system, there is a risk of tripping.

- When walking in the work and danger area, be careful with projections and depressions in the floor. No loose objects may be left on the floor.



WARNING!

Danger of crushing!

When moving the motorized festoon system there is a danger of crushing limbs between the buffer and the buffer plate, the carriage and the track carrier and between tooth belt and tooth belt pulleys.

- When the system is moving, do not enter the danger area of the motorized festoon system.



CAUTION!

Trap!

When the festoon system is moving, there is a danger of being trapped within it.

- Then the system is moving, do not enter the danger area of the motorized festoon system.

A motorized festoon system is usually commissioned by Conductix-Wampfler (CXW) Commissioning Engineers together with the Crane Manufacturer/ Crane Control Manufacturer. A separate checklist is available for guiding through the full Mechanical and Electrical commissioning of a motorized festoon system. After the commissioning has been successfully completed, a Final Acceptance Certificate (FAC) will be signed by both parties, certifying that the commissioning corresponds to all specified requirements.

- The completed and signed Checklist for Mechanical and Electrical Commissioning must be sent by e-mail to:
service.de@conductix.com.

- This e-mail must include the following data:

- Frequency converter parameters,
- Complete actual PLC-Program with the latest parameter changes included.

- Safely store the signed original Checklist hardcopy together with the Final Acceptance Certificate (FAC).

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6.4.1 Inspections on the motorized festoon system after installation

- Check cable trolley for proper condition, proper function, proper mobility, firm fit, deformation.
- Check electrical connections and cable for safe guidance and safe fit.
- Check functioning of track beam.
- Check steel construction for interfering edges, firm fit and mobility

6.4.2 Emergency operation on motorized festoon systems



Severe system damage from continuation of operation!

- In case of any fault of a drive unit of a festoon system, it is required to immediately **restrict the speed of the crane trolley to a max. of 50% and to less than 120 m/min** by means of the superior control / crane control and to visualize the fault in the CMS.
- Further crane operation in this emergency mode is only allowed temporary for max. 1 shift until the completion of the ship loading / unloading cycle.
- The fault has to be analyzed, followed by a visual inspection of all relevant parts.
- Conductix-Wampller has to be informed in writing without delay.
- After corrective actions as service or repair, the fault reset must only be given by authorized service staff.
- It is recommended to position the reset button near the storage of the festoon system.

Assembly Instructions

Motorized Festoon Systems for I-beams

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Commissioning Checklist



6.4.3 Checklist for Electrical and Mechanical Commissioning

A checklist for the full commissioning of a festoon system is available as separate file.



This checklist should be used as a guideline to ensure the safety operation of the festoon system. This checklist is intended for qualified specialists who are familiar with the requirements regarding work safety and accident prevention.

If Conductix-Wampfler performed the commissioning, the Final Acceptance Certificate must be signed!

Customer:		Cust. No.:	
		Order No.:	
Name of Customer Representative		Order No.:	
Commissioning location:		Postal code:	
Address:		Country:	
Name of system:			
Start of commissioning:		Commissioner	
End of commissioning:		Name:	
		Date:	
		Signature:	

Assembly Instructions

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Commissioning Checklist



1.	Inspections on deactivated system	OK	Not OK
1.1.	The track of the trolley corresponds to the project-specific technical documentation.	<input type="checkbox"/>	<input type="checkbox"/>
1.2.	The storage length of the festoon system corresponds to the project-specific technical documentation.	<input type="checkbox"/>	<input type="checkbox"/>
1.3.	There are no height differences - all buffers meet centrally.	<input type="checkbox"/>	<input type="checkbox"/>
1.4.	The end clamp is mounted on the track beam in proper alignment: Vertical and horizontal deviation target $\pm 1^\circ$	<input type="checkbox"/>	<input type="checkbox"/>
1.5.	The end clamp is equipped with a shear plate that has been subsequently welded on the track beam.	<input type="checkbox"/>	<input type="checkbox"/>
1.6.	The towing clamp is mounted at the right height and centrally meets the buffer of the 1st cable trolley.	<input type="checkbox"/>	<input type="checkbox"/>
1.7.	The towing clamp is mounted on the track beam in proper alignment: Vertical and horizontal deviation target $\pm 1^\circ$	<input type="checkbox"/>	<input type="checkbox"/>



The pages which are marked SAMPLE are only included to show the design of the commissioning checklist.
 In **Document No. TDB0380-0001**, you'll find the actual commissioning checklist for festoon systems with Siemens Sinamics S120 control!
 In **Document No. TDB0300-0003**, you'll find a checklist which is restricted to mechanical checkpoints.

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7 Operation

7.1 Safety



WARNING!

Danger of death due to hanging loads!

When lifting loads, there is a danger of death from falling parts or those swinging out of control.

- Never step under hanging loads.
- Block off the dangerous area under the system.
- Move loads only under supervision.
- Follow the specifications for the attachment points provided.
- Do not attach to projecting machine parts or to eyes on installed components. Be sure the connection elements are firmly seated.
- Use only authorized lifting accessories and connection elements with sufficient load capacity.
- Do not use torn or worn ropes or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Set down the load when leaving the workplace.



WARNING!

Danger of injury due to improper operation!

Improper operation can result in serious injury to person and property.

- Carry out all operating steps according to the specifications of these operating instructions.
- Before starting work, be sure that all covers and safety systems are installed and working properly.
- Never disable the safety systems during operation.
- Maintain order and cleanliness in the working area! Loosely stacked or scattered components and tools are a source of accidents.



WARNING!

Danger for unauthorized personnel!

Unauthorized personnel who do not meet the requirements described here do not understand the danger in the work area.

- Keep unauthorized personnel away from the work area.
- In case of doubt, address personnel and warn them away from the work area.
- Cease working as long as unauthorized personnel are present in the work area.



CAUTION!

Danger of tripping on projecting parts!

When working on the motorized festoon system, there is a risk of tripping.

- When walking in the work and danger area, be careful of projections and depressions in the floor. No loose objects may be left on the floor.

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WARNING!

Danger of crushing!

When moving the motorized festoon system there is a danger of crushing limbs between the buffer and the buffer plate, the carriage and the track carrier and between tooth belt and tooth belt pulleys.

→ When the system is moving, do not enter the traveling area of the festoon system.



CAUTION!

Trap!

When the motorized festoon system is moving, there is a danger of being trapped within it.

→ When the system is moving, do not enter the traveling area of the festoon system.

Personnel:

- The system may only be operated by trained personnel!

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7.2 Function



WARNING!

Severe system damage from continuation of operation!

- In case of any fault of a drive unit of a festoon system, it is required to immediately **restrict the speed of the crane trolley to a max. of 50% and to less than 120 m/min** by means of the superior control / crane control and to visualize the fault in the CMS.
- Further crane operation in this emergency mode is only allowed temporary for max. 1 shift until the completion of the ship loading/unloading cycle.
- The fault has to be analyzed followed by a visual inspection of all relevant parts.
- Conductix-Wampfler has to be informed in writing without delay.
- After corrective actions as service or repair, the fault reset must only be given by authorized service staff.
- It is recommended to position the reset button near the storage of the festoon system.

A towing arm (not included in the scope of delivery) couples the towing trolley or the towing clamp to the mobile consumer. The towing trolley and the motorized cable trolleys pull or push the following cable trolleys. Depending on the project, towing ropes, shock cord, and round or flat cable clamps and cable organizers may also be used. The cables are held on the supports with clamping bars. For improved shock absorption of the trolleys, buffers are placed on the festoon system. The dimensions of the motorized festoon system can be found in the project-specific dimension sheet.

The system is to be checked for changes in running noise and irregularities during operation.

If irregularities are determined during operation, then the system is to be stopped immediately. The cause of the fault is to be determined using the fault table (see Chapter 9).

The fault table includes the causes for the disturbance as well as the recommendations for their remedy. If the cause cannot be determined or if there is no way to repair the system with the company's resources, then we recommend that you request a service technician from our customer service.

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8 Maintenance and service

8.1 Safety



WARNING!

Danger of injury due to improperly executed maintenance tasks!

Improper maintenance can result in serious injury to person and property.

- Before starting work, ensure sufficient space for assembly.
- Maintain order and cleanliness in the assembly area! Loosely stacked or scattered components and tools are a source of accidents.
- If components have been removed, be careful to reinstall them properly, replace all fastening elements, and comply with screw tightening torques.



WARNING!

Danger of injury from moving components!

Incautious handling of the festoon system can lead to severe injury or damage to the festoon system.

- Be sure that the motorized festoon system does not start by itself.
- While it is moving, do not reach into moving parts, particularly the interface between the buffer and buffer plate.
- Block off the dangerous area under the system.



CAUTION!

Danger of tripping on projecting parts!

When working on the motorized festoon system, there is a risk of tripping.

- When walking in the work and danger area, be careful of projections and depressions in the floor. No loose objects may be left on the floor.



WARNING!

Danger of crushing!

When moving the motorized festoon system, there is a danger of crushing limbs between the buffer and buffer plate, as well as between the running gear and the track beam.

- When the system is moving, do not enter the danger area of the festoon system.



WARNING!

Danger of crushing!

During assembly of the motorized festoon system, there is a danger of crushing limbs between load carrier and the track beam.

- During assembly, do not enter the danger area of the festoon system.



CAUTION!

Trap!

When the motorized festoon system is moving, there is a danger of being trapped within it.

- When the system is moving, do not enter the danger area of the festoon system.

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8.2 Maintenance / inspection plan

The next sections describe the maintenance tasks required for optimum, trouble-free operation. If regular inspections reveal increased wear, the corresponding maintenance intervals should be shortened in accordance with the actual signs of wear.

Where there are 2 **maintenance intervals** stated for one maintenance task, the maintenance interval which is reached first is valid.

Example: Maintenance interval "After 300 hours of operation or every month".

If 300 hours of operation are reached before one month has elapsed, the maintenance task has to be performed after 300 hours. If the installation has been operated less than 300 hours in one month, the maintenance task has to be performed when one month has gone by since the last servicing.

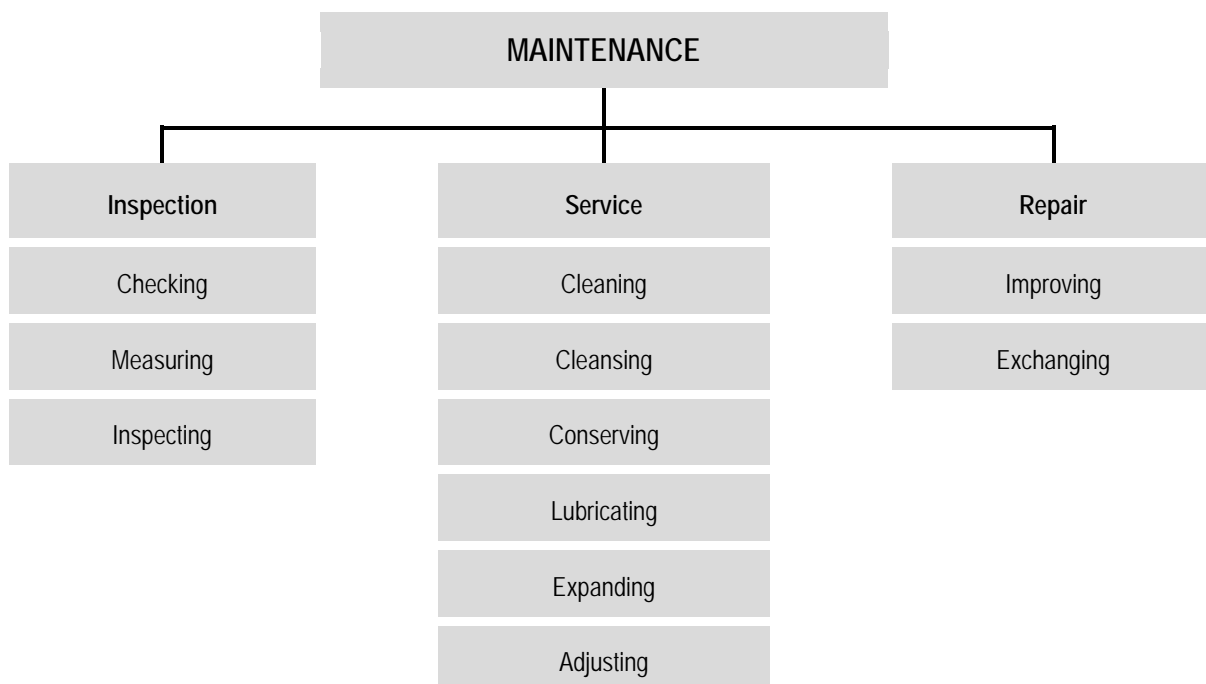
Contact the manufacturer with any questions about maintenance tasks or intervals.

In order to retain the warranty rights and to avoid damage, the system operator is responsible for performing the following maintenance tasks. Inspection, service and repair are to be performed and documented by trained and qualified specialists.

NOTICE!

The intervals indicated for maintenance are dependent for the most part on operational conditions of the motorized festoon system. Therefore only mean values can be indicated here.

The following tasks fall under the category "Maintenance":



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8.2.1 Inspection on deactivated system



CAUTION!

- Protect the festoon system from unexpected switch-on.
- Any safety devices that have been removed during inspection of the system at a standstill must be refitted and tested immediately on completion of the work.
- Any used measuring tools must be cleaned up / collected after completion and their inventory must be checked.
- Before approaching systems with damping devices, they must first be released.

Inspection measures

Interval	Components	Measure	Description
After 300 hours of operation or every month See Chapter 8.2	Rollers	Visual inspection	<ul style="list-style-type: none"> - for good condition - for proper functioning - for proper movement - for tight fit - for deformation - for wear - for damage - for degree of contamination - for corrosion
	Buffer		
	Center part		
	Cable supports		
	Fasteners		
	Cables		
	Cable clamps		
	Fixed laying		
	Connections with the installation		
	Towing ropes		
	Damping device		
	Towing devices		
	End stops		
	Track beam		
	Magnetic limit switch		
	Tooth belt		

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8.2.2 Inspection of towing rope and criteria for replacement



CAUTION!

→ In case of defect, towing ropes must be removed from use immediately. They must be replaced.

A towing rope must be replaced if one or more of the following criteria are fulfilled:

1. Wire breakage
2. Structural changes
3. Corrosion
4. Abrasion

The following steel cable deformations are leading to a necessary replacement:

- Corkscrew-like deformation: Replace the cable if it has corkscrew deformations with waves that measure more than a third of the cable diameter.
- Fraying: Replace the cable if it starts to fray.
- Loop formation: Replace the cable if loop formation has led to significant changes in the cable structure.
- Loosening: Replace if wires are loosened due to rust or abrasion.
- Node formation: Replace if nodes- points where the cable is widened- form in the steel cable.
- Constrictions: Replace in case of severe constrictions in the cable.
- Curling: Replace the towing rope if permanent deformations are present such as those caused by being pulled over a corner.
- Kinks: Replace if kinks form after tension is applied to cable loops.
- Bends: Replace the towing rope if it has been bent by an external force.

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8.2.3 Inspection on moving system



- Any procedure that could threaten safety must be avoided.
- The system should only be commissioned with functional protective gear and safety devices.
- It is forbidden to enter the operating area of the motorized festoon system.

Inspection measures

Interval	Components	Measure	Description
After 300 hours of operation or every month See Chapter 8.2	Rollers	Functional check	Easy and unobstructed running of the main rollers, horizontal guide rollers, anti-lift rollers on the track beam running surfaces. Visible wear, damage.
	Cable trolleys		Proper entry and exit of the cable trolleys in the storage area.
	Towing device		Reliable operation of the towing device considering the required horizontal and vertical compensatory movements.
	Buffer unit towing or end clamp		Functionality of the damping device, especially when entering the storage area.
	Towing ropes Damping devices		Functionality of the towing ropes and damping devices, especially when the system is completely extended.
	Track beam and system		Track beam and complete system, if degree of contamination and corrosion have an influence on functionality.
	Motorized cable trolley		Proper operation
	Magnetic limit switch		Proper functioning
	Tooth belt		Proper operation

Should problems be identified during inspection, maintenance work is urgently required.

8.2.4 Logging

The results of inspections as well as the remedies performed are to be documented in written reports. Conductix-Wampfler must be informed immediately of defects and malfunctions during the test phase and the warranty period.

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8.2.5 Maintenance of the motorized festoon system



CAUTION!

- Turn off power supply and ensure that no inadvertent activation is possible.
- When installation tasks are carried out above eye level, use proper climbing aids and working platforms.
- Do not use machine components as climbing aids.
- Ensure that exhaust, collection and disposal of process materials is done in a safe and environmentally-friendly manner.
- Safety devices that were removed for installation, service or repair must be immediately remounted and inspected after work is completed.
- Observe the inspection and maintenance intervals described in the maintenance instructions.
- Ensure that sufficient space for maintenance work (danger area) is available.
- Ensure that the festoon system is not inadvertently activated during maintenance work.
- Ensure that detached parts do not fall.
- Screw joints that are disconnected during maintenance work are to be reattached (with suitable torque) and secured as instructed.
- Fasteners and seals that cannot be reused are to be replaced (such as self-locking nuts, disks, splints, O-rings, glued or microencapsulated screws).
- Lubrication points that are cleaned or wiped during maintenance and repair work must be re-lubricated as instructed.
- After finishing work, collect all tools and materials and check that all are present.
- Disassembled parts and components that were exchanged are to be collected, stored in a safe place, recycled or sent back.
- Before approaching systems with damping devices, these must be released.

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Maintenance measures

Interval	Components	Measure	Description
After 300 hours of operation or every month See Chapter 8.2	Roller mounting	Maintenance measure	Tighten all fasteners.
	Cable attachment		Tighten all fasteners on clamping bars and cable clamps.
	Towing device		Replace worn parts if necessary.
	Damping device		Replace shock cords if necessary.
	Tooth belt		Inspection for wear and for correct belt tension (reference value: see drawing). Replace belt after 6.000 crane operating hours.
Every 3 months	Towing ropes		Tighten mounting screws. Lubricate shackles.
	Buffer unit towing or end clamp		Tighten all fasteners. Replace worn parts if necessary.
	Three-phase motor		See separate operating instructions of the motor manufacturer.
	Magnetic limit switch		Check for proper function and position. Replace, if necessary.
	Tooth belt pulleys		Check the tooth belt pulley for wear. Replace, if necessary.
	Protective cover for tooth belt drive		Check the attachment, replace, if necessary. Replace damaged protective cover, if necessary.
	Motor mounting		Check for corrosion or the metal starting to loosen from rubber. Replace, if necessary.
After 6000 hours of operation or excessive wear	Tooth belt		Replace tooth belt.

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Interval	Components	Measure	Description
Annually (Dependent on external influences)	Surface/ corrosion protection Corrosion coating	Repair/replace	Refinish hot-dip galvanized surfaces with zinc coating. Refinish lacquered surfaces.

NOTICE!

If motors are subject to great fluctuations in temperature or extreme climatic conditions, humidity can condense inside the motor.

→ Depending on operating conditions, the drain hole must be opened to remove the condensed water and closed again.

8.2.6 Wear parts

Wear parts are excluded from the warranty. This includes:

- All trolley rollers including main rollers, horizontal guide rollers, anti-lift rollers
- Expander cords (rubber cords) at the damping devices
- Special damping devices in the towing trolley window
- Rubber or cellular buffers
- Tooth belt and tooth belt pulleys

Other definitions require a written documentation.

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8.2.7 Wear limits

Components	Wear limit has been reached if
Rollers	<ul style="list-style-type: none"> - the diameter of the roller has been reduced from the nominal diameter by 2 mm - sharp impressions are visible - cracks, broken-off pieces, or embrittlements have been formed on PU-rollers, or if initial signs appear that the bandage is detaching from the core - increased bearing play occurs due to worn ball bearings - significant lubrication leakage is visible - the rollers do not run smoothly
Buffer	<ul style="list-style-type: none"> - cracks, breaks or embrittlements are visible.
Center plates and side shields	<ul style="list-style-type: none"> - corrosion protection is no longer existing.
Cable supports	<ul style="list-style-type: none"> - corrosion protection is no longer existing - initial signs of cracks are visible in the supports - the riveting nut does not provide sufficient clamping for the cable clamp/cables.
Fasteners	<ul style="list-style-type: none"> - corrosion protection is no longer existing - security of the connections (screwed connection, clamp connection, glued connection) is no longer ensured.
Cables	<ul style="list-style-type: none"> - wire, shielding or jacket breakage is visible - corkscrews have formed.
Cable clamps	<ul style="list-style-type: none"> - corrosion protection is no longer existing - cracks and embrittlements are visible in the clamping rubber - sufficient clamping of the cables is not ensured any longer.
Towing ropes	<ul style="list-style-type: none"> - in case of wire breaks, structural changes, corrosion and abrasion.
Towing devices	<ul style="list-style-type: none"> - corrosion protection is no longer existing - deformations are visible in the window of the towing trolley - cracks appear in the welding joints
Tooth belt	<ul style="list-style-type: none"> - has reached 6.000 crane operating hours or shows excessive wear or defects
Motor mounting	<ul style="list-style-type: none"> - Corrosion, or the metal starting to loosen from rubber
End clamp	<ul style="list-style-type: none"> - corrosion protection is no longer existing - attachment to the track profile is no longer ensured
Damping devices and rubber cords	<ul style="list-style-type: none"> - corrosion protection is no longer existing - severe constrictions in the rubber cords occur - the sheathing of the rubber cords is torn, even if only partially - fraying strands are visible on the rubber cord - mechanical deformations are visible on the rubber cord consoles
Track beam	<ul style="list-style-type: none"> - corrosion protection is no longer existing - significant tracks and grooves from the rollers of the festoon system become visible

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8.2.8 Repeat inspections



→ Devices and systems must be periodically inspected by an expert.

Generally, visual and functional checks are to be performed. The condition of components with regard to damage, wear, corrosion or other damage is to be determined. Generally speaking, the completeness and functionality of the safety equipment is evaluated. To better evaluate wear and tear parts, disassembly may be required.

→ All regular inspections are to be initiated by the operator!

Every operator must properly record all inspection, service and maintenance works in a machine book. This is to be confirmed by a technical expert. Warranty expires in case of inaccurate or missing entries.

8.2.9 Repair

Request a customer service technician from Conductix-Wampfler for all repairs.

If qualified service technicians from the system operator perform the repairs themselves, all information contained in these operating instructions must be observed.

Conductix-Wampfler accepts no liability or responsibility for damages and production faults that result from failure to follow these operating instructions.

For maintenance and repair, only use

- suitable tools in good working order
- only original replacement parts from Conductix-Wampfler or replacement parts explicitly authorized by Conductix-Wampfler.

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8.2.10 Replacement of the tooth belts



→ After 6.000 crane operating hours both tooth belts must be replaced. This replacement must be triggered by the PLC/ CMS through a warning signal to the crane operator.

Assembly works at the tooth belt drive must comply with the particularities of the belt design. The better the manufacturer's recommendations are observed, the better the operating behavior, the rate of utilization and the lifetime.

→ In case of worn out or defective tooth belt, always replace **both tooth belts**.



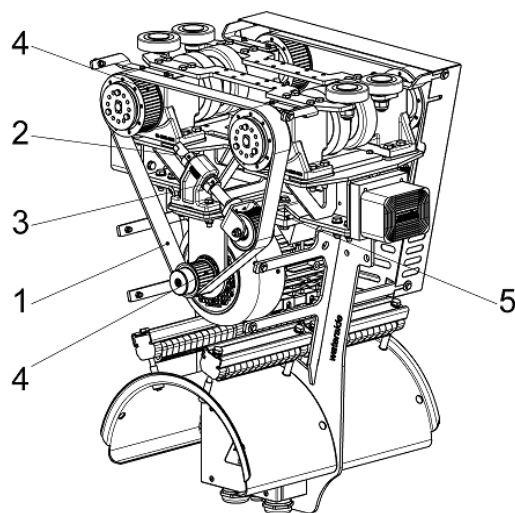
→ Secure the motorized festoon system from unexpected switch-on.

→ Safety devices that have removed must be immediately remounted and inspected after works have been completed.

→ Any used measuring tools must be cleaned up/collected after completion and their inventory must be checked.

→ Before approaching systems with damping devices, they must first be released.

During operation, the tooth belts needs a certain pretension, in order to achieve a secure engagement even with intermittent loads. An unnecessarily high pretension reduces the lifetime of the drive unit, increases the bearing load and the wear of the teeth. If the pretension is too low the belt teeth might not engage properly and overleap in case of excessive load.



■ Tooth belt drive consisting of:

- 1) Tooth belt
- 2) Nuts
- 3) Clamping nut
- 4) Tooth belt pulleys
- 5) Motor mounting

Fig. 49: Arrangement of the drive components

The motorized cable trolleys are delivered with pre-tensioned tooth belts (1). During disassembly or replacement of the belt it is required to detach the tightened nuts (2, 3), so that the belt can be pulled laterally over the flange of the tooth belt pulleys (4). The installation is made in reverse order. The bolted connections must be secured with LOCTITE 243.

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Disassembly / assembly steps:

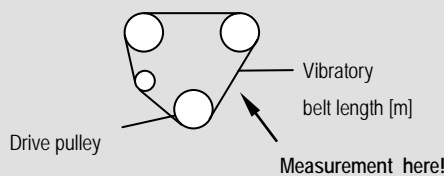
1. Dismount protective cover.
2. Detach nuts (2 and 3) until the belt loses its pretension and retract tensioning roller.
3. Lift the tooth belt above the tooth belt pulleys (4). Do not apply force.
4. Installation of the new or undamaged old tooth belt.
5. Generate pretension of the belt by tightening the nut (3).
6. Test belt tension with a tensiometer (e.g. WF tensiometer of Walther Flender).
7. Secure by tightening the nut (2).
8. Remount protective cover.

After the assembly the drive should be put into operation for a few minutes, so that the belt will be put down completely and possible tension differences can be compensated in the different sections of the belt before the measurement.

Hold the measuring head of the device over the backside of the belt (not the toothed side) at a distance of 3 - 20 mm. The measurement must be made in the middle of the free section length and at the section between the drive roller and the first driven roller (see the following figure: "Measurement of the belt tension").

Design variation 1:

Motor without gear unit, drive pulley installed in the center:



Design variation 2:

Motor with gear unit, excentric drive pulley:

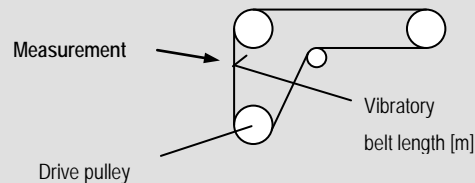


Fig. 50: "Measurement of the belt tension"

Set the belt into vibration by hand. The measuring device starts to measure. This process will only last for a few seconds. After successful completion of the measurement the measurement result will be indicated. In addition there will be an acoustic message. The measurement should be made approx. 3 times in order to confirm the measured value.

Due to a relatively low-expandable tension-inlay, tooth belts must never been pulled by force onto the tooth belt pulleys and must under no circumstances been rolled over the flanged coupling pulley by force. The tooth belt drive must be checked during the control intervals.

The measured frequency must be compared with the prescribed frequency (f_{set} = setpoint frequency) and the belt tension must be adjusted respectively. If the frequency is too high, the belt must be released, if the frequency is too low, it must be tensioned. Adjustment and subsequent measurement will be repeated until the belt tension is within the required tolerances. The measured belt tension frequency must be between f_{min} and f_{max} . If just one reporting frequency is indicated, a tolerance of ± 2 Hz must be observed.

The prescribed frequency (f_{set}), or the prescribed frequency range ($f_{\text{min}}/f_{\text{max}}$), is indicated in the drawing of the respective motorized cable trolley.

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8.2.11 Replacement of the three-phase motor



Improper installation and commissioning of the three-phase motor will cause damage at the machine and the festoon system.

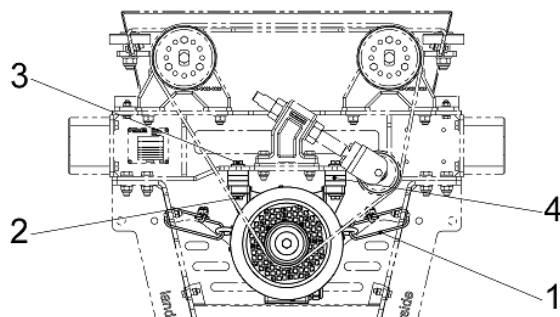


- Connection and maintenance of the three-phase motor must only be carried out by qualified electric specialists, that are familiar with the relevant prescriptions. The accident prevention regulations must be observed as well.
- The supply line to the motor must be disconnected.
- Secure the motorized festoon system from unexpected switch-on.
- Safety devices that have been removed must be immediately remounted and inspected after works have been completed.
- Any used measuring tools must be cleaned up/collected after completion and their inventory must be checked.
- Before approaching systems with damping devices, they must first be released.

Disassembly steps:

1. Dismount protective cover.
2. Dismount tooth belt (see "Replacement of the tooth belt"):
3. Remove additional retaining device (1). (Until 10/2012 safety rope; since 10/2012 sheet metal retaining device. Loosen retaining device screw (5)).
4. The motor can be removed from the side after having detached the screws (3) with the damping element (4). During the disassembly/ assembly, an appropriate retaining device must be used.

Until 10/2012



From 10/2012

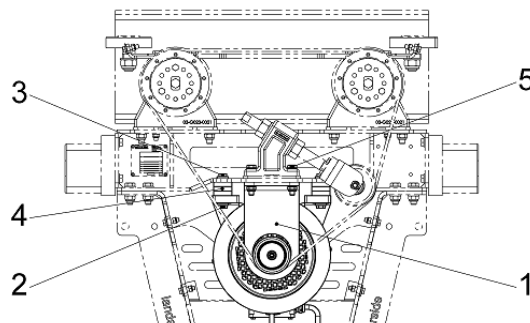


Fig. 51: Motor assembly group

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Assembly steps:

5. Reattach the motor to the trolley frame with the screws (2 or 3). Secure the screws with LOCTITE 2701.



Machine/property damage to the tooth belt drive!

If the tooth belt is not aligned properly, this will increase the wear of the tooth belt and strongly reduce the lifetime of the components.

- Before definitely tightening the system, the three-phase motor must be put into such a position that the tooth belt drive is in parallel alignment and the tooth belt does not touch the flange of the tooth belt pulley.

6. Mount additional motor retaining device (1), if available.
7. Mount tooth belt (see "Replacement of the tooth belt", see Chapters 8.2.9 and 8.2.10):
8. Mount protective cover.



Machine/property damage!

- Connecting the cable must be carried out by an electrician.
- Observe the rotation direction of the motor.
- Before connecting the motor cable, compare the supply voltage to the nominal motor voltage and check the terminal connections.

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8.2.12 Replacement of shaft for main roller and bearing

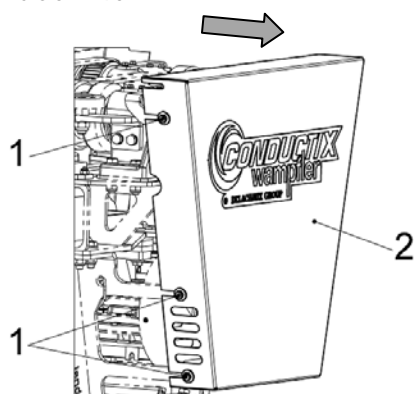
i
NOTICE!

The main roller can only be replaced together with the shaft for the main roller.

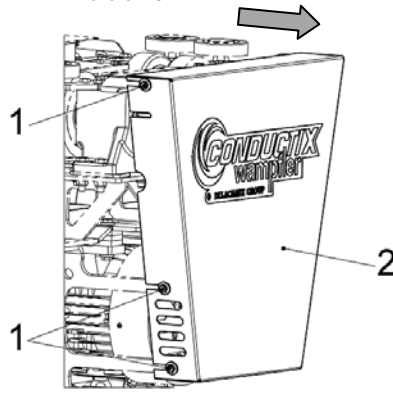
Disassembly steps:

1. Dismount protective cover.
Loosen the 6 screws (1) 3 turns and dismount the cover.

Version 1.95 KW

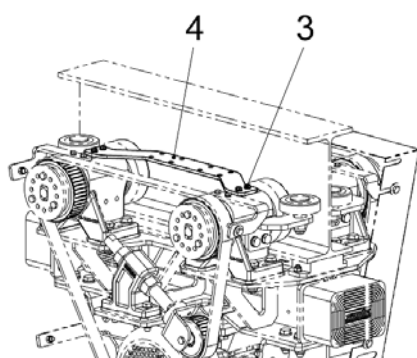


Version 3KW

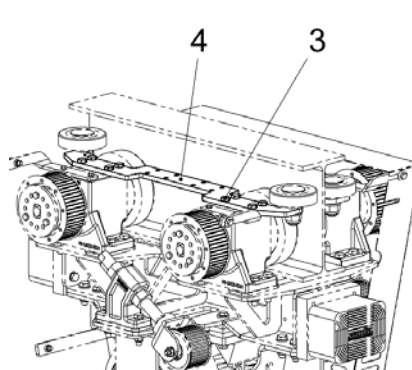


2. Dismount tooth belt (see "Replacement of the tooth belt"):
3. Remove screws (3) and dismount bracket (4).

Version 1.95 KW



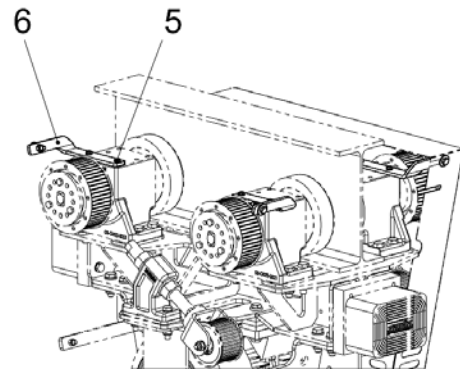
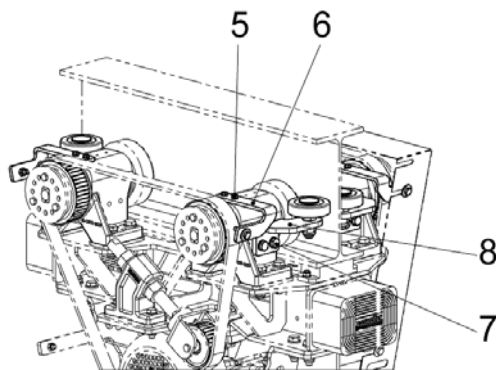
Version 3KW



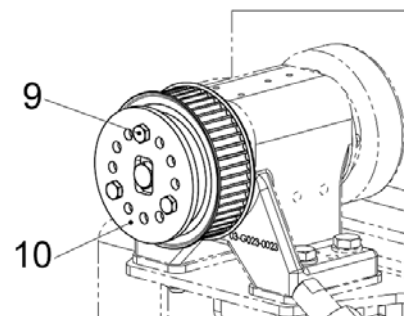
Assembly Instructions

Motorized Festoon Systems for I-beams Program 0380

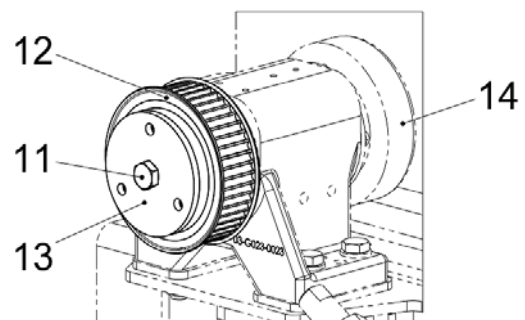
4. Remove screws (5) and bracket (6) for protective cover.
Remove screws (7) and bracket (8) for guide roller (only 1.95 KW).



5. Remove screws treated with chemical thread (9) and dismount locking washer (10).

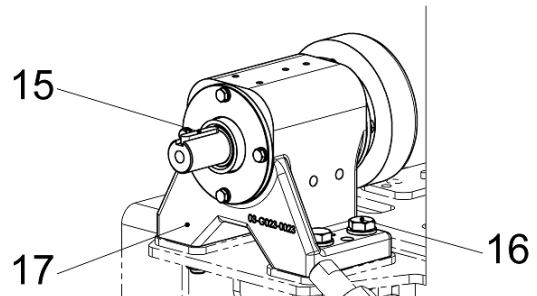


6. Remove screw (11) and take off toothed lock washer (12) with covering disk (13).
7. Lift up the motorized cable trolley until the main roller to be replaced (14) (HTR) is no longer positioned on the track beam.

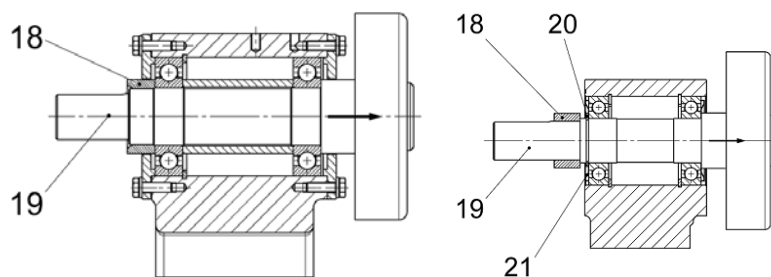


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8. Remove feather key (15).
9. Remove screws (16) and dismount complete bearing housing (17).



10. Remove distance sleeve (18).
Dismount safety ring (21). Remove nilos-ring (only 3 KW)
11. Push drive shaft (19) out of the bearing housing in the direction of the arrows.



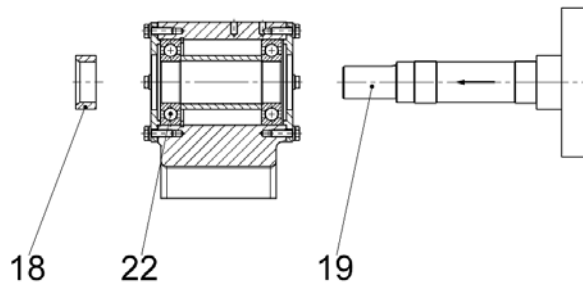
Motorized Festoon Systems for I-beams Program 0380

Assembly steps:

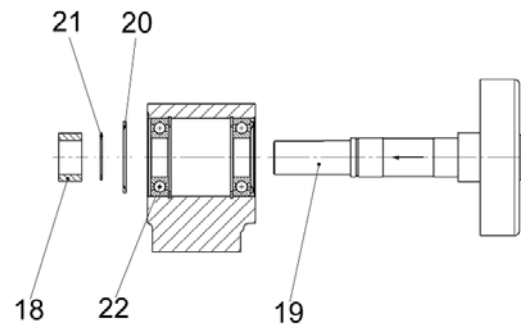
The assembly is made in reverse order. Use the new standard and connecting elements.

1. Press new drive shaft (19) into the bearing housing. To do this support the bearing housing on the inner ring of bearing 1 (22).
2. Mount nilos-ring (20) and safety ring (21) (only 3 KW). Afterwards press on the distance sleeve (18)

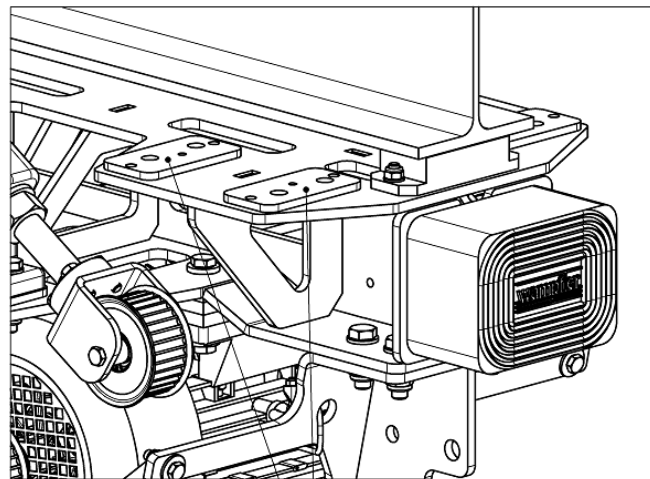
Version 1.95 KW



Version 3 KW

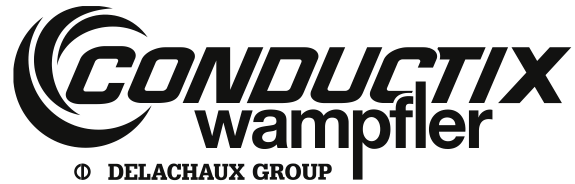


3. Clean contact surfaces. The surfaces must be absolutely clean.



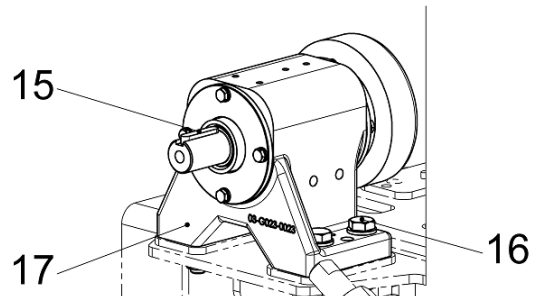
Contact surfaces

Assembly Instructions

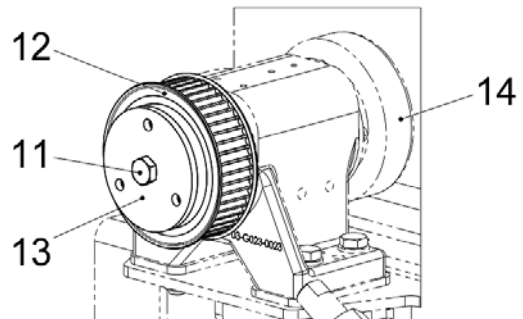


Motorized Festoon Systems for I-beams Program 0380

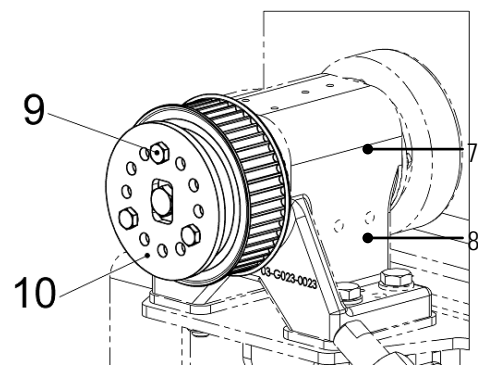
4. Install the bearing housing (17), it aligns via the two cylindrical pins.
5. Mount the screws (16).
6. Place the feather key (17) into the feather key groove.



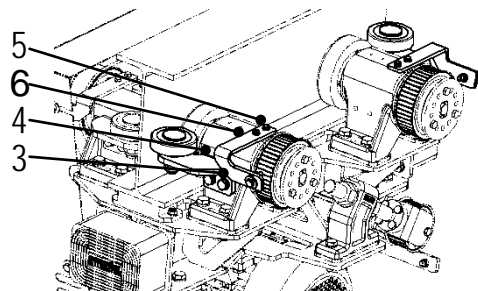
7. Push toothed lock washer (12) onto the drive shaft.
8. Mount cover disk (13) with screw (11).



9. Mount locking washer (10) with screws treated with chemical threadlocker (9).
10. Put down the motorized cable trolley on the beam.

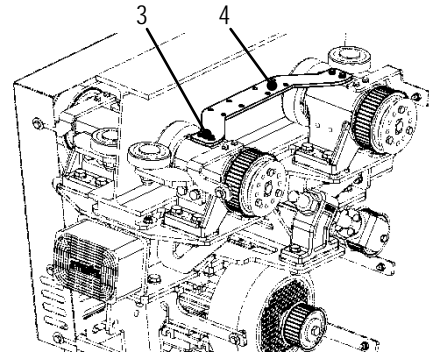


11. Mount bracket (6) for guide roller with screws (5) (only 1.95 KW).
12. Mount bracket (4) for protective cover with screws (3). Lock the screws with LOCTITE 243.



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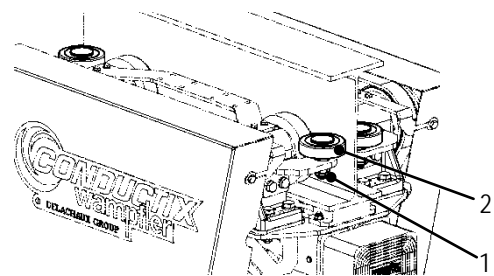
13. Mount bracket (4) with screws (3). Lock the screws with
LOCTITE 243.



14. Mount tooth belt (see "Replacement of the tooth belt"):
15. Mount protective cover.

8.2.13 Replacement of horizontal guide rollers

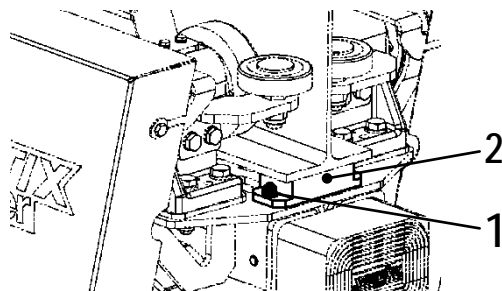
Detache nut (1) and dismount horizontal guide rollers (2).
For the installation use new lock nut, which is supplied together with
the replacement part.



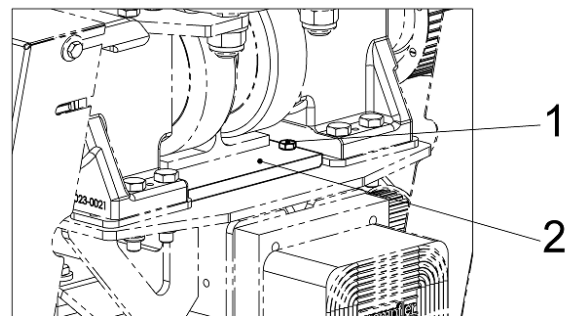
8.2.14 Replace the anti-lift plate

Dismount screws (1) on both sides and replace counter-pressure
plate (2).
For the installation use new lock nut, which is supplied with the
replacement part.

Version 1.95 KW



Version 3 KW

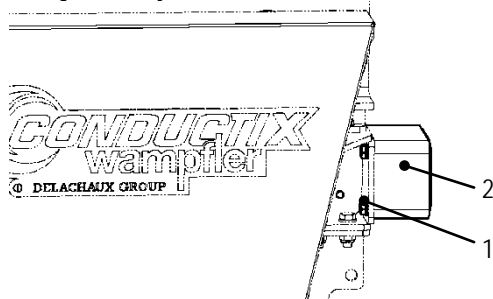


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8.2.15 Replacement of the buffer

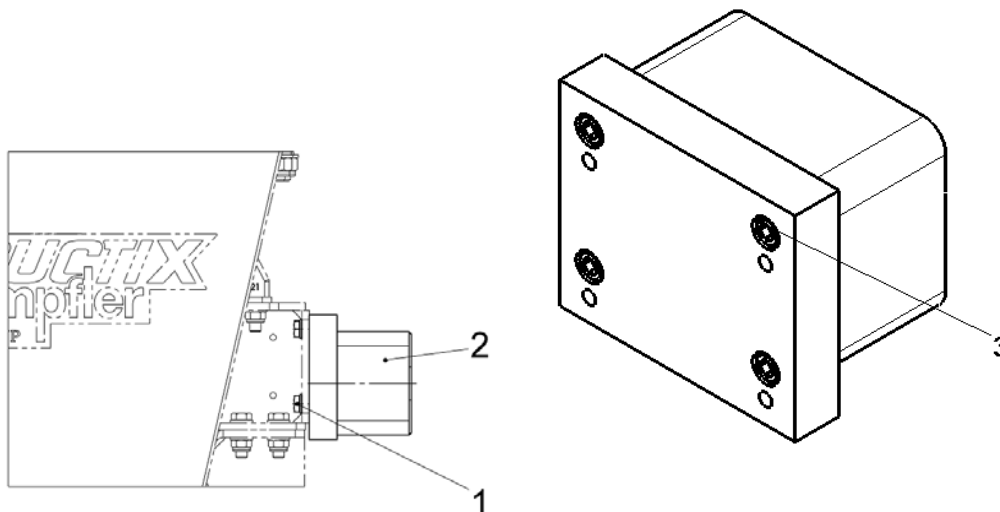
Version 1.95 KW:

Dismount screws (1) on both sides and replace buffer (2).
During assembly, lock the screws with LOCTITE 243.



Version 3 KW:

Dismount screws (1) on both sides and remove buffer together with the buffer adaptor. Afterwards dismount screws treated with chemical threadlocker (3) und remove buffer from the adaptor plate.



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9 Troubleshooting



WARNING!

Danger of injury due to improper troubleshooting!

Improper troubleshooting can result in serious injury to person and property.

→ Contact the manufacturer in case of malfunction.

→ Allow troubleshooting to be carried out only by personnel from or authorized by the manufacturer.



CAUTION!

Improper use can result in serious injury to person and property.

Elimination of faults may only be performed by qualified specialists.

Faults	Cause	Solution
Towing rope torn	Overstress Wear ¹⁾	Exchange towing rope
Shock cord torn	Overstress Wear ¹⁾	Exchange shock cord
Buffer is defective	Overstress Wear ¹⁾	Exchange buffer
Roller function impaired	Overstress Wear ¹⁾	Exchange roller
Noticeable mechanical strain of the components (bending, tear, wear)	Malfunction ²⁾	Exchange the corresponding component

¹⁾ The cause of overstress must be identified and corrected.

²⁾ If injury to person and property can occur during breakdowns then Conductix-Wampfler must be informed immediately.

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10 Disassembly and disposal

10.1 Safety



WARNING!

Danger of injury due to improper disassembly!

Stored energy, sharp components, points, and edges on and in the festoon system or the tools needed can cause injury.

- Before starting work, ensure sufficient space.
- Handle open, sharp-edges components carefully.
- Maintain order and cleanliness in the work area! Loosely stacked or scattered components and tools are a source of accidents.
- Dismount components properly. Note the high weight of some components. If necessary, use lifting gear.
- Secure components so that they cannot fall or fall over.
- Involve the manufacturer in case of any unclear points.



WARNING!

Danger of injury from moving components!

Incautious handling of the festoon system can lead to severe injury or damage to the festoon system.

- Be sure that the festoon system does not start by itself.
- While it is moving, do not reach into moving parts, particularly the interface between the buffer and buffer plate.
- Block off the dangerous area under the system.



CAUTION!

Danger of tripping on projecting parts!

When working on the festoon system, there is a risk of tripping.

- When walking in the work and danger area, be careful of projections and depressions in the floor. No loose objects may be left on the floor.



WARNING!

Danger of crushing!

When moving the festoon system, there is a danger of crushing limbs between the buffer and buffer plate, as well as between the running gear and the track beam.

- When the system is moving, do not enter the danger area of the festoon system.

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10.2 Disassembly

After the system is no longer in use, the festoon system must be disassembled and environmentally friendly disposal carried out.

Before starting disassembly:

- Remove operating and auxiliary materials as well as residual processing material, and dispose of them in an environmentally appropriate manner.

Then clean the assemblies and components properly and disassemble them as required by applicable local workplace safety and environmental protection regulations.

Personnel:

- May only be carried out by trained technicians
- At least two people

Tools needed:

- Crescent wrench
- Securing tools



→ Loads are to be carefully fastened onto suitable hoists or load-carrying devices that are technically intact and have sufficient load capacity.

10.3 Disposal

Properly disassembled components are to be recycled if no return or disposal agreement has been made.

- Scrap metals.
- Take plastic elements for recycling.
- The other components are to be disposed of according to their material composition.



Environmental damage due to improper disposal!

Electrical waste, electronic components, lubricants, and other auxiliary materials are subject to hazardous waste disposal regulations and may only be disposed of by authorized specialists.

Local community officials or special disposal companies can provide information about environmentally appropriate disposal.

11 Additional Documents

11.1 Declaration of incorporation

The declaration of incorporation is available as a separate document.

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11.2 Documentation for electrical equipment

See separate electrical documentation.

11.3 Spare parts list



Keeping a stock of the most essential spare and wear parts at the place of installation ensures constant operational readiness of the system.



Safety risk due to wrong spare parts!

Wrong or faulty spare parts can result in damage, malfunction or complete failure as well as impair safety.

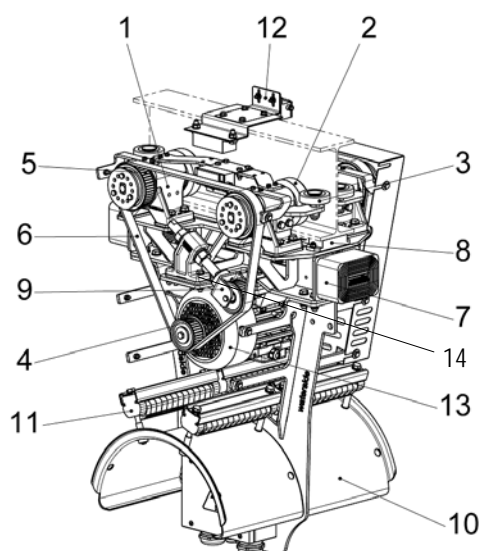
Therefore:

→ - use only original spare parts of the manufacturer!

No liability is accepted or warranty given for damages that occur from the use of spare parts and accessories which are not authorized or not original spare parts.

For spare part orders, please indicate the following data:

- Order No. (s.a. type plate at the end clamp)
- Type designation (s.a. type plate at the end clamp)
- Part No. (s.a. spare parts list order documentation)
- Designation
- Quantity
- Requested shipping method (postal mail, freight, sea, air, express)
- Shipping address



- Replacement parts available:
1. Bearing housing complete
 2. Drive shaft complete
 3. Horizontal guide rollers
 4. Motor assembly group complete
 5. Tooth belt pulleys
 6. Tooth belt
 7. Buffer
 8. Counterpressure plate
 9. Anti-lift plate
 10. Support, complete with clamping strip and mounting material
 11. Clamp profile, complete with C-rail and mounting material
 12. Switch group
 13. Motor assembly group complete
 14. Motor mounting

Fig. 52: motorized cable trolleys with item numbers for spare parts

The exact replacement part designation can be found in the project-specific spare parts list.

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11.4 Product observations

We strive to observe our products after delivery in order to further improve them and better meet your needs.
Please use the form on the following pages to communicate your experiences and issues to us that could be of interest for our improvement process.
Thank you very much for your help.

Please fax the filled out form to: ++49 7621 662 284

For example

- Changed configuration data
- Experiences with the motorized festoon system
- Recurrent errors
- Problems with the documentation

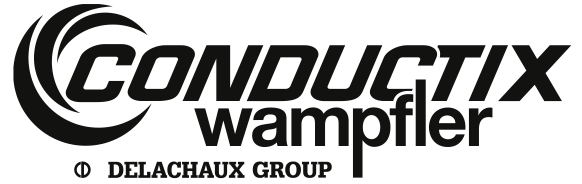
Your contact data

Customer	
Company:	No.:
Department:	
Contact person:	
Address:	Zip code:
PO Box:	
City:	
Phone:	Fax:
Email:	

Your experiences and observations:

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[illegible]

Assembly Instructions



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12 Final Acceptance Certificate (PFR05-15-02-E)

Customer:	Customer No.:
	Purchase No.:
	CXW Order No.:
	CXW Assembly Order No.:

Installation Site	Project Name/ Installation Site:		
	Address:		
	Post code:	City:	
	Contact person / Phone no.:	Meeting point:	
Start of installation (on-site):		End of installation (on-site):	
Needed installation time (in h):		Needed travel time (in h):	

The installation of above mentioned project has been completed today by Conductix-Wampfler and meets all requirements for final acceptance. From today, the risk is transferred to the customer

The acceptance has been confirmed on a separate customer specific acceptance protocol.	yes	<input type="checkbox"/>
	Enclosure:	

Maintenance instructions have been handed over:	yes	<input type="checkbox"/>
CE-label is fixed:	yes	<input type="checkbox"/>

Following works were performed:

Following works, included in the order, were not performed:

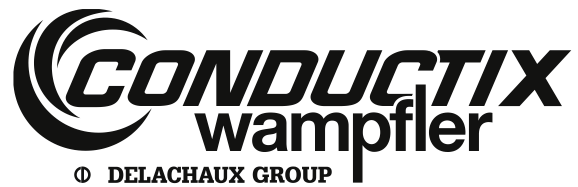
Customer Claims:

Supplier claims (CXW):

Installation supervisor supplier (Conductix-Wampfler)		Installation supervisor customer	
Name:		Name:	
Date:	Signature:	Date:	Signature:

Assembly Instructions

Motorized Festoon Systems for I-beams Program 0380



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