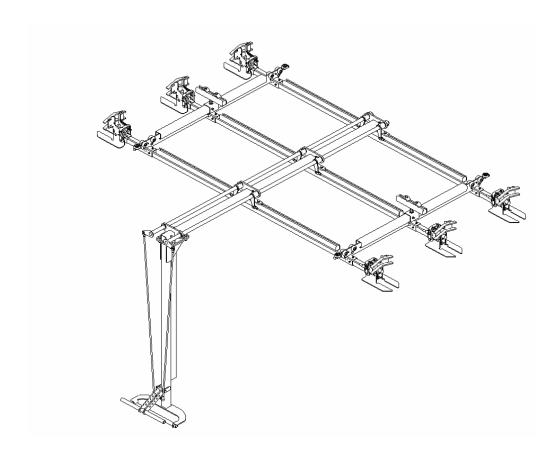


# **Switching bridge**



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# Switching bridge

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## Switching bridge

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### 1 General notes

### 1.1 Information about these installation and operating instructions

This Installation and Operating Manual facilitates safe and efficient handling and use of the equipment.

The Installation and Operating Manual is an integral part of the equipment and must be kept in its immediately vicinity to allow access by personnel at any time. Prior to commencing any work, personnel must have carefully read through and understood this Installation and Operating Manual. It is a basic requirement for safe working that all safety and procedural instructions contained in this Installation and Operating Manual are complied with.

Local accident protection regulations and general safety guidelines for the area of use of the device also apply. Illustrations in this documentation are provided for basic understanding and may deviate from the actual implementation of the unit.

In addition to these installation and operating instructions, the attached instructions for installed components also apply.

### 1.2 Limit of warranty and liability

All information and instructions in this Installation and Operating Manual have been compiled with due regard to the standards and regulations in force, best engineering practice, and the findings and experience we have accumulated over many years.

Guarantee and liability claims for injury and property damage are excluded if they originate from one or more of the following causes:

- Use of the switching bridge for anything other than its intended use.
- Improper installation, commissioning, operation, or servicing of the switching bridge.
- Operation of the switching bridge with defective safety systems or safety and protective mechanisms that have not been properly installed or are not operable.
- Failure to follow the instructions in the operating manual regarding the transport, storage, installation, commissioning, operation, maintenance, and setup of the switching bridge.
- Independent modification of the switching bridge or its components and interfaces.
- Failure to monitor machine parts subject to wear.
- Improperly performed repairs.

Wear parts such as support and guide rollers are excluded from the guarantee.



### Switching bridge

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#### Structural changes to the switching bridge:

- No changes, additions, or rearrangement of the switching bridge may be made without the approval of Conductix-Wampfler GmbH. This particularly applies to welds to load bearing parts.
- All modifications require the written confirmation of Conductix-Wampfler.
- Replace components in imperfect condition immediately.
- Only use original replacement and wear parts.
- When parts are purchased from third parties, it is not guaranteed that they are designed and fabricated in a manner appropriate to the stress or safety requirements!

The actual scope of delivery may differ from the explanations and illustrations described here for special variants, if additional order options are utilized, or due to the latest technical changes.

The obligations agreed upon in the delivery agreement and our General Terms of Business apply, as do the delivery conditions of the manufacturer and all regulations applicable at the time the contract was concluded.

All products are subject to technical modifications in the context of improvement of function and further development.

### 1.3 Copyright

Copyright to this operating manual remains with Conductix-Wampfler. This operating manual is only intended for the operator and personnel. It contains rules and instructions that, in full or in part, may not be

- Copied
- Distributed
- Or otherwise disclosed.

Violations will be subject to damages. This will not exclude additional claims.

### 1.4 Spare parts



#### Safety risk due to wrong spare parts!

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

#### Therefore:

- Use only original spare parts of the manufacturer!

Order replacement parts from your contracted dealer or directly from the manufacturer. See the last page of these operating instructions for the address.

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### Switching bridge

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## 2 Safety instructions

### 2.1 General safety information

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



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



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



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



#### Tips and recommendations:

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

### 2.2 Personnel requirements

#### 2.2.1 Qualifications



#### Injury due to insufficient qualifications!

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

- All activities may only be performed by qualified personnel

The operating instructions must always be kept at an on-site location near the switching bridge where they can be readily accessed. In addition to the operating manual, the general legal regulations for accident protection, employer insurance ordinances pertaining to workplace safety, and regulations of environmental protection must also be followed.



## **Switching bridge**

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- The basic prerequisite for working with this switching bridge in a safe, problem-free manner is knowledge of the basic safety instructions and safety regulations.
- This operating manual contains the most important instructions for operating the switching bridge safely.
- This operating manual, particularly the safety instructions, must be followed by all personnel that work on the switching bridge.
- Moreover, the accident prevention rules and regulations applicable for its use must be followed.

#### Obligation of the operator:

The operator is obligated only to permit personnel to work on the switching bridge who

- ...are familiar with the basic regulations of workplace safety and accident prevention and trained in working with the switching bridge.
- ...have read the safety chapter and warning instructions in this operating manual and have understood them and acknowledged by signature.

Moreover, the operator is also obligated:

- ...to test the safety-conscious work of personnel at regular intervals.
- ...to ensure that the working area of the switching bridge is kept free.

#### Obligation of personnel:

Personnel working on this switching bridge are obligated before starting work:

- ...to follow the basic regulations of workplace safety and accident prevention.
- ...to read the safety chapter and the warning instructions in this operating manual and to confirm by signature that they have understood them.

#### 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 working area.

#### Therefore:

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

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### Switching bridge

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#### 2.2.3 Instruction

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

Date	Name:	Type of instruction	Instruction given by	Signature

Fig. 1: Example of instruction log

#### 2.3 Intended use

A switching bridge is used for the movement of suspension trolleys perpendicularly to the rail directory, for example to route multiple trolleys in a narrow space without using switches and arcs. The goal is optimum use of space. The switching bridge serves as the connection between different track segments, to whose safety catch individual bridges can be connected. Suspension trolleys can be inserted into the connected bridge rails and moved to parallel tracks with the switching bridge. The use of switching bridges is restricted to commercial applications.

This switching bridge for manual hanger tracks is built according to the state of the art. Danger to life and limb of the user or third parties and/or damage to the system or other property values can still result if it is used in a manner other than its intended use. The following are examples of intended us:

- Operation is only permitted with the safety systems in working order.
- Manual operation only.
- The switching bridge is exclusively intended for the use of Conductix-Wampfler suspension trolleys.
- Permitted loads may not be exceeded.
- Only static loads may be transported (no operation with hoisting equipment).
- The presence of personnel in the working area and/or under loads is forbidden!
  The working area must be kept free!
- Operation only within parameters approved by Conductix-Wampfler (load capacity, track width, hanger spacing, etc.).
- Transport carriages must be accelerated and braked by hand.
- It is not permitted to allow transport carriages to be stopped only by end stops or safety systems.

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Any use other than or beyond this is considered non-intended use. Conductix-Wampfler cannot bear liability for any resulting damages.

The following are also part of intended use:

- Compliance with all instructions in the operating manual.
- Observance of inspection and maintenance tasks.



#### Possible injury resulting from improper use!

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

#### Therefore:

The device may only be used as intended.

- Comply strictly with all specifications of these installation and operating instructions.
- Maximum permitted loads may not be exceeded.
- The following uses of the device are forbidden. Non-intended use particularly includes the following:
- Using the device with unapproved accessories not authorized by the manufacturer.
- Operation of the device by untrained personnel.
- Operation of the device outdoors.
- Operation of the device when installed on an improper building framework.

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

The operator bears sole liability for all damages resulting from unintended use.

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## Switching bridge

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### 2.4 Protective measures to be taken by the operator / user

Hazard areas must be identified with warning signs and be protected with barriers. Ensure that hazard area notices are observed. The work area under the switching bridge must be marked in color and kept free.

Observe the required safety distance:

- At least 500 mm between the work area of the switching bridge and standing objects.
- Rails at least 2500 mm above the floor.

The device is used in the commercial sector. The operator of the device is thus subject to legal obligations for workplace safety. In addition to the safety guidelines in these installation and operating instructions, the safety, accident protection, and environmental protection regulations applicable to the place of operation of the unit must be followed. This particularly includes:

- The operator must be informed of applicable workplace safety guidelines and identify any additional hazards that result from the special working conditions at the location of use of the device. These must be expressed in the form of operating instructions for operation of the device.
- The operator must verify during the entire time the device is in use that the operating instructions provided still correspond to the current state of regulations, and adapt the instructions as necessary.
- The operator must clearly regulate and determine responsibilities for installation, operation, troubleshooting, and maintenance.
- The operator must ensure that all employees involved with the unit have read and understood these installation and operating instructions. He must furthermore train personnel at regular intervals and inform them of hazards.
- The operator must provide personnel with all required safety gear.

The operator is furthermore responsible for ensuring that the device is always in a technically trouble-free condition. The following thus applies:

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



# **Switching bridge**

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### 2.5 Specific hazards

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 installation and operating instructions in order to reduce health hazards and avoid dangerous situations.



#### Danger of death due to hanging loads!

Falling loads can lead to severe injuries or death.

#### Therefore:

- Never step under hanging loads.
- Move loads only under supervision.



#### Danger of injury from moving components!

Incautious handling of the switching bridge can lead to severe injury or damage to the unit. Therefore:

- While it is moving, do not reach into moving parts, particularly the interface between the locking unit and the safety catch.

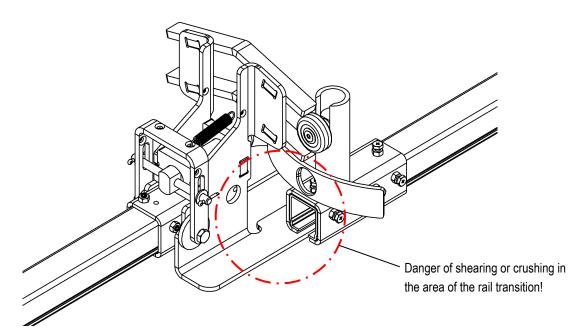


Fig. 2: Danger area



# **Switching bridge**

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### 2.6 Safety devices

#### 2.6.1 Derailing stop

Derailing stops must be attached by the customer between parallel tracks and over the entire length of the movement path. They prevent the suspension trolleys from falling out if the switching bridge is not connected to a safety catch. End stops must be installed at the rail ends (parallel tracks).



#### Danger of death from disabling or malfunction of the safety systems.

Transport carriages can derail accidentally from the rail segment and fall. The switching bridge must be placed out of service if a safety mechanism is not working perfectly.

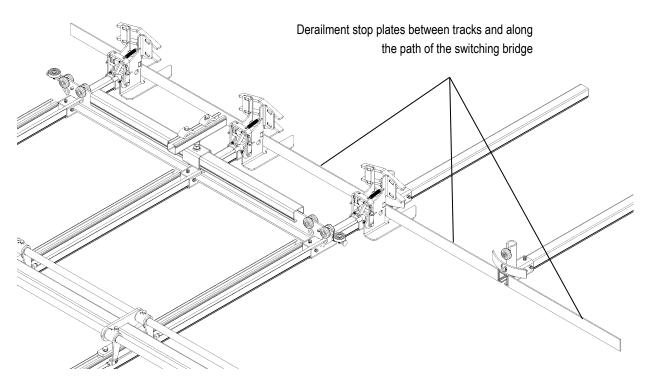


Fig. 3: Derailing stop



# **Switching bridge**

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### 2.6.2 Interlock

The interlocks are a component of the switching bridge. They are used to connect the switching bridge with the parallel tracks. For this to be possible, the interlock and safety catch must be in perfect working order.

The projecting forks of the interlock also prevent the switching bridge from being moved when a suspension trolley is in the rail transition between the parallel track and the switching bridge.

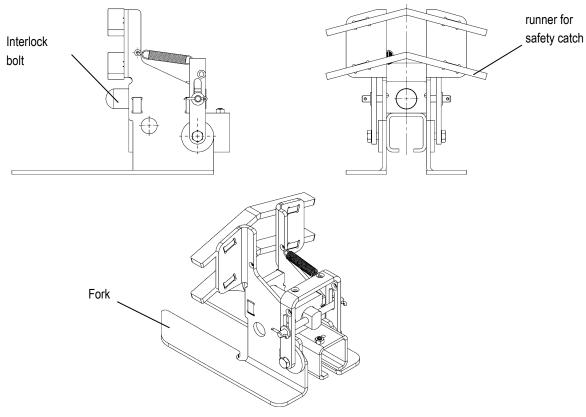


Fig.4: Interlock



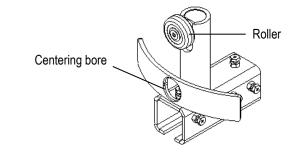
## **Switching bridge**

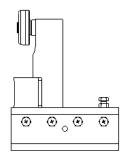
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### 2.6.3 Safety catch

The safety catch represents the interface between the interlock unit and the parallel track. The bolts of the interlock unit engage in the center bore of the safety catch, preventing the switching bridge from moving away. At the same time, the safety catch serves as a derailment stop on the parallel tracks, in that the locking bolts block until the switching bridge is engaged and the roller of the safety catch is lifted by the runner of the interlock.

Item			Order number	
Rail type	40x40	50x50	63x63	80x80
Safety catch	145964	146964	147964	148964





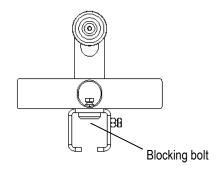


Fig. 5: Safety catch



# **Switching bridge**

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### 2.7 Actions in the event of accidents and faults

#### Measures in the event of accidents:

- 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:

- Lock system / secure against startup.
- Secure load.
- Determine fault.
- Have technicians correct fault.
- Have technicians check safety systems.
- Approval by technicians.

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## Switching bridge

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## 3 Technical specifications

#### 3.1 General information

The switching bridge is approved for the following application conditions:

Mode	lode Manual operation		
Rail load capacity	Depends on order - see order drawing		
Total load capacity	Depends on order - see order drawing		
Travel speed	30 m/min		
Environment	Only indoors		
Environment	No aggressive atmosphere		
Temperature	+5°C to +80°C (deviations are possible depending on the order)		

#### 3.2 Interfaces

The building framework represents an interface to the switching bridge to which the rails of the switching bridge are fastened. The framework must be designed for the loads that occur. The hanger spacing of the rails is determined on a system-specific basis using loads and rail sizes. The rails of the switching bridge must be equipped with end stops in order to prevent the switching bridge from derailing. Furthermore, safety catch from Conductix-Wampfler represent the interface between the neighboring parallel rails and the switching bridge. They must be installed correctly to the parallel tracks with working safety systems. The switching bridge may not be operated without the safety catch.

## 3.3 Safe distance / working area of the switching bridge

The area to be marked consists of the working area of the switching bridge and an additional safety distance (per DIN EN 34) of 500 mm. This area must be kept free of obstacles, then marked with appropriate means (e.g. adhesive tape in warning colors). To prevent danger from shearing, crushing and the like, the rail system must be attached at a minimum height of 2500 mm above the ground.

### 3.4 Type plate



Fig.6: Type plate

The type plate is on the carrier rail and includes the following information:

- Max. load capacity
- Model
- Year of construction
- Manufacturer
- Manufacturer address



## Switching bridge

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# 4 Product description and mode of operation

The switching bridge consists of rails that can be moved perpendicular to their direction of travel. It is compatible with manual rail systems from Conductix-Wampfler. The load capacity per rail segment and/or total load capacity is determined separately for each order.

#### The switching bridge consists of:

- Controller: Push handle with operating lever.
- Load rails connected to the bridge chassis and the operator part.
- The interlock unit on each end (which is adjacent to a parallel track) of the load rails.
- End stops at either end of the rail segments that do not border on parallel tracks.

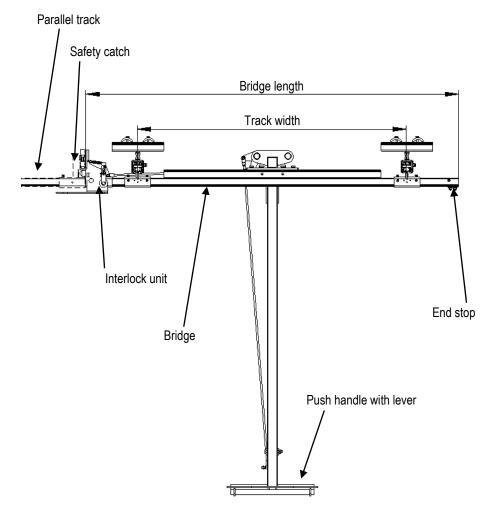


Fig. 7: Schematic diagram of a switching bridge with interlock on one side (front view)



# Switching bridge

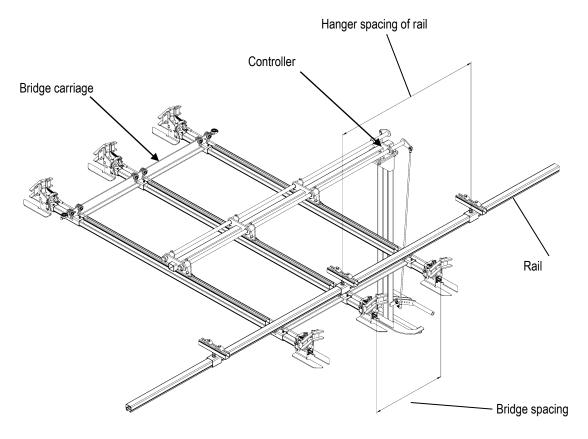


Fig. 8: Isometric drawing of the switching bridge with interlocks on both side



## **Switching bridge**

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## 5 Transport, packaging and storage

### 5.1 Shipment

#### 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. Therefore:

- Never step under hanging loads.
- 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.

Therefore:

- 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.
- 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.



Claim every defect as soon as it is detected. Damage compensation claims may only be made within the applicable claim periods.



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### 5.2 Packing

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.

### 5.3 Storage

#### 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°C to +50°C.
- Relative humidity: max. 60%.
- When storing for more than 3 months, check the general condition of all parts and the packaging at regular intervals. If necessary, add or replace the preservative.



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 initial commissioning may only be carried out by specially trained technicians.

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

- Work safety clothing
- Protective headgear
- Protective footwear
- Protective gloves

### 6.2 Preparation

#### Tools needed:

- Torque wrench with use for AF across flats 19
- Fork keys AF13, AF17, AF19

#### Screw tightening torques:

M8	M10	M12
25 Nm	49 Nm	85 Nm

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### 6.3 Installation



Danger of death from insufficient suitability of the steel framework or fastening points.

The building framework and fastening points must be designed in accordance with the loads.

#### Installation activities

- Screw controller to the switching bridge on the flange (see Fig. 9).
- Use self-locking washers and torque specifications. Remember: 85 Nm torque!
- Hang tension rods.
- Check setup of the tension rods and readjust the fork head if necessary.
- Push switching bridge into the rails.
- Attach end stops to the rails.
- Orient the switching bridge and parallel tracks to one another.

#### Personnel:

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

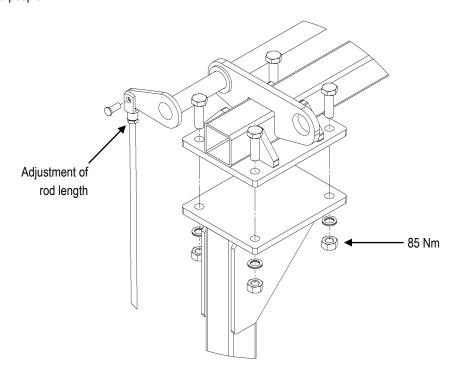


Fig. 9: Assembly of control part



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### 6.4 Testing and initial commissioning

#### Initial commissioning

- Before initial commissioning, the safety catch must be adjusted to the interlock units of the switching bridge.
- It must be assured that the bolts of the safety catch unit opens and closes the parallel track perfectly.
- The bolts of the interlock unit must engage each safety catch perfectly and be pulled back far enough upon actuation of the control lever in order to release the switching bridge (setting using the rods and different holes in the operating lever).



#### Danger of injury due to improper commissioning!

The controller, end stops, and all other safety systems must be installed properly and may not be malfunctioning.

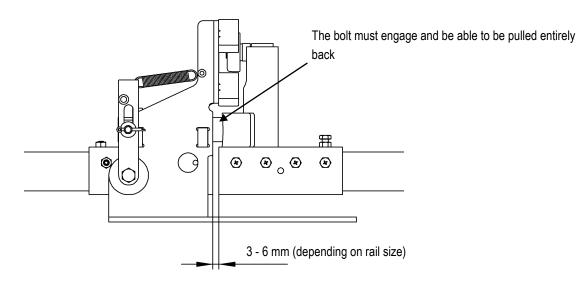


Fig. 10: Side view of interlock and safety catch



# Switching bridge

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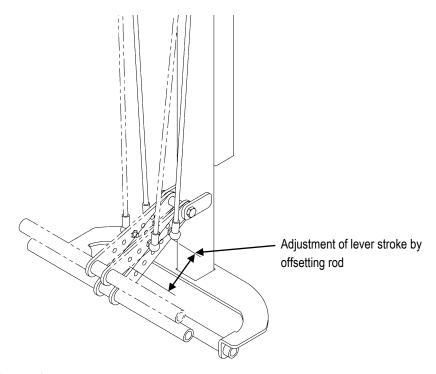


Fig. 11: Operating lever for setting the lever stroke

#### Commissioning:

- Before commissioning each day, perform a visual check and carry out the prescribed tests.
- Test safety-relevant components and mechanisms (interlock units, blocking mechanism, operating mechanisms, etc.).
- Any procedures that could threaten safety are to be avoided.
- The system should only be operated with functional protective gear and safety devices.
- Report damage to the system to the responsible person immediately.
- Secure system against unintentional and unauthorized use.



### Switching bridge

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### 7 Operation

#### 7.1 Overview

The switching bridge is used for the movement of suspension trolleys perpendicularly to their actual direction of travel, in order to move the suspension trolleys into other parallel tracks.

The derailment stop opens automatically in the locked state. Suspension trolleys can be moved into and out of the switching bridge. The suspension trolleys should be placed in the centre, but at least be positioned between the derailment stop of the switching bridge and if necessary fastened in the optionally provided positioning device. To be able to move the bridge, no transport carriages may be at the height of the derailment stop, otherwise it will not be possible to move the bridge. When the operating lever is pressed, the interlocks are released. The operating lever must remain pushed down during the procedure. If the bridge is positioned at the safety catch, the interlock engages when the lever is released. The derailment stop only opens if the switching bridge is interlocked into a parallel track.

### 7.2 Operation and operating steps

Operation takes place at the pushing handle onto which the operating lever is fastened.

The suspension trolleys to be moved with the switching bridge are pushed into one or more of the rail segments of the switching bridge (note load capacity of the rail segments and the switching bridges!).

To be able to move the switching bridge, the operating lever is pressed down. The interlock into the parallel track is deleted. Once the switching bridge has reached the desired position and come to a complete stop, the operating lever can be released. The interlock engages in the parallel track to which it is positioned and the safety catch is opened automatically. The transport carriage can then be moved into or out of.



#### Possible property damage!

If the switching bridge cannot be moved and/or the operating lever cannot be completely pushed down, check whether a transport carriage is in the area of the derailment stop.

Do not force the operating lever down. This can lead to damage to the interlock and the rods. Correct faults before restarting.

### 7.3 Safety

- The working zone of the switching bridge must absolutely be kept free
- Personnel may not remain in the work zone!
- Operate the switching bridge only if all safety mechanisms (e.g. derailment stop) are fully functional (see maintenance instructions).
- At least once a shift, inspect the switching bridge for externally detectable damages and functionality.
- For malfunctions and/or damages, the system must be stopped immediately.

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### Switching bridge

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#### Personnel:

■ The system may only be operated by trained personnel!

Personal protective clothing (this must be worn for all work):

- Work safety clothing
- Protective footwear

### 8 Service

### 8.1 Safety

For all maintenance, cleaning, and repair work, the following applies:

- Ensure that sufficient space for maintenance work is available.
- Do not use machine components as climbing aids.
- Ensure that detached parts do not fall.
- Safety devices that are removed for installation, service or repair must be remounted and inspected after work is completed.
- Observe the directions in the operating and maintenance instructions for replacing parts.
- Screw joints that are disconnected during maintenance work are to be reattached and secured as instructed.
- Fasteners that cannot be reused are to be replaced (such as self-locking nuts, disks, splints, glued or microencapsulated screws).
- Lubrication points that are cleaned or wiped during maintenance and repair work must be re-lubricated as instructed.

#### 8.2 Maintenance intervals

During maintenance and repair work, always note:

- Carry out the prescribed setting, maintenance, and inspection work on time.
- Operating personnel must be informed before maintenance and repair work.
- Secure all system parts and operating media upstream and downstream of the switching bridge, such as electrical systems, compressed air, and hydraulics.
- Carefully fasten larger assemblies to lifting equipment when replacing, and secure them.
- Tighten loose screw connections to the proper torque.
- After completion of service work, check safety systems for proper function.

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For damage, defects, or malfunctions, the system must be stopped immediately!

Only after restoration of a perfectly safe operating condition, the system may be put back into left back in the operation.

- Check general condition four months after first use.
- Expert inspection after every year of use for one-shift operation (expert = authorized representative of industrial safety authority)
- All specified maintenance and repair work must be logged with date and signature!

Assembly group	Activity	Interval for single-shift operation
General condition	Visual inspection of the switching bridge, interlock unit, derailment stop; also test of the screw connections (see below for torque specifications);  - If necessary, readjust / tighten screws - Replace damage parts	<ul> <li>Before initial commissioning</li> <li>4 weeks after commissioning</li> <li>Then every three months</li> </ul>
Interlock, derailment stop, and end stops	Functional inspection:  - Check ease of motion of interlock bolts;  - End stops present?  - Derailment stops present and in perfect condition?  - If necessary, readjust / tighten screws  - Replace damage parts	Daily at start of work
Rail system and trolleys	Functional inspection; check for damages / deformations, ease of motion of the rollers; - If necessary, readjust / tighten screws - Replace damage parts	• 3 months
Switching bridge complete	Check for contamination and dust deposits and/or deposits of paint processes (In particular the safety systems) - Clean contaminated components	3 months or as needed
Tension rods & controller	Check tension rods and their setup: Simultaneous adjustment of tension rods. Control path must be sufficient that the interlocks open wide enough; - If necessary, readjust / tighten screws	3 months or as needed

#### Torques for screw connections:

М8	M10	M12
25 Nm	49 Nm	85 Nm



# **Switching bridge**

Date	Maintenance measure	Comment	Signature



# **Switching bridge**

Program 0430

# 9 Cleaning and disposal

The materials used must be handled properly and disposed of, in particular:

- For tasks on lubrication systems and mechanisms
- When cleaning with solvents
- After the service life of the switching bridge, the components involved must be disposed of in a way corresponding to the legal requirements valid at that time.



# **Switching bridge**

Program 0430

### 10 Additional Documents

### 10.1 Additional documentation

- Order-specific drawings and documentation
- Technical data sheet for manual hanging track (TDB-0400-0041-D/E)

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