

STAHL
CraneKit

STAHL-CraneKit
Assembly instructions

➤ EN-UK

Partner of Experts

STAHL
CraneSystems



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1 General notes

1 General notes

1.1 Use of these instructions

These instructions are part of the product and contain important information on proper and safe assembly, electrical installation and factory acceptance.

The listed information, safety notes and warning messages, as well as required actions, must be observed. The user must ensure that all people who work on or with the product have fully read and understood these instructions.



The additional information in the enclosed technical documentation must be observed.



These instructions and all further applicable documents must be kept to hand and accessible at all times for later use.

1.2 Copyright notice

The contents of these instructions must be treated as confidential and are intended exclusively for personnel working with the product. It is impermissible to pass these instructions on to third parties without the written consent of the manufacturer.

The information, texts, drawings, figures and other representations contained within them are copyright protected and subject to industrial property rights.

It is prohibited to produce any form of duplicate copy, including excerpts, and to exploit and/or disclose the contents without the written consent of the manufacturer. Infringements will be subject to compensation for damages. Further rights reserved.

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1.3 Warranty

These instructions were compiled in accordance with the applicable regulations, are state-of-the-art and based on our many years of knowledge and experience.

The manufacturer accepts no liability for damage in the following cases:

- Failure to follow these instructions or the accompanying further technical documentation
- Prohibited uses of the product
- Use of untrained personnel
- Improper assembly or electrical installation
- Failure to follow the factory acceptance instructions
- Impermissible changes or modifications
- Use of impermissible mounting accessories or impermissible spare parts

The obligations agreed in the delivery contract, the General Terms and Conditions and the terms of delivery of the manufacturer apply, as well as the legal provisions valid at the time of contractual agreement.

1 General notes

1.4 Target audience and responsibilities

These instructions are aimed at competent person (crane manufacturers) who are authorised to perform assembly and electrical installation of the STAHL-CraneKit.

People under the influence of drugs, alcohol or medication that could impair reaction times are not permitted to work on or with the product.

Competent person

A competent person is anyone who, due to their professional training, professional experience and recent professional activity, possesses the requisite skills and expertise to test work equipment. Competent persons with the authority to undertake work on our products are service technicians of the manufacturer and trained, certified service technicians.

1.5 Manufacturer

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2 Safety-related information

2 Safety-related information

2.1 Layout of warning messages

2.1.1 Section warning messages

Section warning messages relate to an entire chapter or a chapter section and are structured as follows.

▲ SIGNAL WORD	
	Type and source of danger
	Possible consequences if disregarded
	➤ Measures to prevent the danger

2.1.2 Embedded warning messages

Embedded warning messages refer to one or more instructions for action and are assembled as follows.

▲ SIGNAL WORD	Type and source of danger, possible consequences if disregarded.
	➤ Measures to prevent the danger.








2.1.3 Signal words

The following signal words are used in warning messages.







Signal word	Meaning
▲ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
▲ WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
▲ CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates possible material or environmental damage.

2 Safety-related information

2.1.4 Safety alert symbols




Symbol	Meaning
	General hazard
	Risk of electric shock
	Danger due to falling parts
	Hanging load hazard
	Danger of load crash
	Fire hazard
	Danger of crushing

2.1.5 Mandatory action signs

Symbol	Meaning
	General mandatory action sign
	Information in the enclosed technical documentation must be observed
	Information on the manufacturer's website must be observed
	Work must be carried out by a competent person (qualified electrician)
	Work must be carried out by a competent person
	Bolted connections must be tightened to the prescribed tightening torques

2 Safety-related information

2.2 Further symbols

Symbol	Meaning
	Important note
	Required action
1. 2.	Required actions must be performed in the indicated order
	Result of a required action
•	List
–	List (2nd level)

2.3 Safety notes



All products from STAHL CraneSystems are constructed in accordance with the state of the art and the recognised safety rules. However, during use danger to the life and limb of the user or a third party can arise, or adverse effects can affect the product and other property.

Observe the following:

- The permissible environmental conditions must be observed.
- The work performed must be carried out by authorized personnel only.
- The information in the enclosed technical documentation must be observed.
- The national and local safety and accident prevention regulations, the occupational safety acts and environmental provisions must be observed.
- All damage and defects on the product must be reported to the supervisor responsible immediately. The product must not be used until the defects have been remedied.
- Signs, labels, or pictograms that are applied to the product must be observed and must not be removed.
- Damaged signs, labels or pictograms must be replaced by new signs, labels or pictograms.

2.3.1 Intended use

The product may only be used for the intended application in accordance with the technical documentation, the information on the rating plates of the components and any additional stickers present. Intended use also includes proper assembly, commissioning and maintenance and electrical installation.

For products that are declared as partly completed machinery, commissioning is forbidden until it is determined that the machinery into which this product is installed complies with the provisions of the EC Directives or other national and local regulations.

2 Safety-related information

2.3.2 Prohibited use

The owner, and not the manufacturer of the crane, is liable for all personal injury and material damage that arises due to prohibited use. Liability on the part of the manufacturer is excluded in this case.



Prohibited uses are:

- A failure to follow the specifications and notes provided in these instructions.
- A failure to follow information on the rating plate of the components, the additional stickers and warning labels that are applied to the product.
- Use of the components in applications for which it is not intended.
- Use of the components in hazardous areas.
- Impermissible changes and modifications.
- Improperly performed repairs.






2.3.3 Personal protective equipment

Personal protective equipment must be worn at all times during activities that can cause injuries or endanger health.

To be worn at all times

	Work protective clothing Work clothes with low tear resistance, with narrow sleeves and no protruding parts, to protect against being caught by moving machine parts. Do not wear rings, chains or other jewellery.
	Safety shoes For protection against heavy falling parts and slipping on slippery surfaces.

Wear in unusual environmental conditions

	Safety eyewear To protect the eyes from any stray flying parts and splashes of liquid.
	Hearing protection To protect against hearing damage.
	Safety helmet For protection from falling parts.
	Safety gloves (only if there is no entanglement hazard) To protect hands from friction, abrasions, punctures or deep injuries as well as from contact with hot surfaces.
	Safety harness It is necessary to provide work rigs or lifting platforms for any maintenance and repair work that cannot be carried out from floor level. Service technicians who work outside lifting platforms must be safeguarded with a safety harness.

2 Safety-related information

2.3.4 Changes and modifications

Only carry out changes and modifications to the product with written approval from the manufacturer.

2.3.5 Requirement applicable to supporting structure

It must be ensured that the supporting structure is designed for the maximum load of the product.

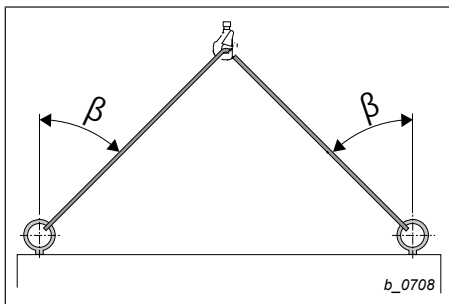
2.3.6 End stops on runway

Suitable end stops must be attached to the runways. When positioning the end stops, the safety distances in the hall must be observed.

2.3.7 Mounting accessories

Impermissible mounting accessories can impair safety. Only use original mounting accessories from the manufacturer.

2.3.8 Transport and storage



Inspect the delivery immediately upon receipt for completeness and any transport damage. Report any transport damage to the transport company immediately.

The product is delivered on a pallet. A forklift or a lift truck can be used for transport.

If the product is suspended during transport, use the lifting points provided. The inclination angle " β " during transport must not exceed 45° .

During transport, observe the following:

- Secure the danger zone.
- Only use suitable means of transport with adequate load capacity.
- Secure the product during transport.
- Do not stand under suspended loads.

The product must be stored as follows until assembly:

- Observe additional information on the product or packaging.
- Only store in closed rooms.
- Store in a dry, dust-free environment.
- Do not expose to aggressive media.
- Store within the approved service temperature range.
- Protect from direct sunlight.
- Avoid mechanical vibrations.
- Support the product against tipping and toppling.

2 Safety-related information

2.3.9 Cleaning

Clean the product as follows:

- Only clean the product with a damp cloth.
- Only use water or mild, non-abrasive and non-scratching cleaners.
- Do not use solvent-based cleaners.
- Do not use a high-pressure cleaner or compressed air.

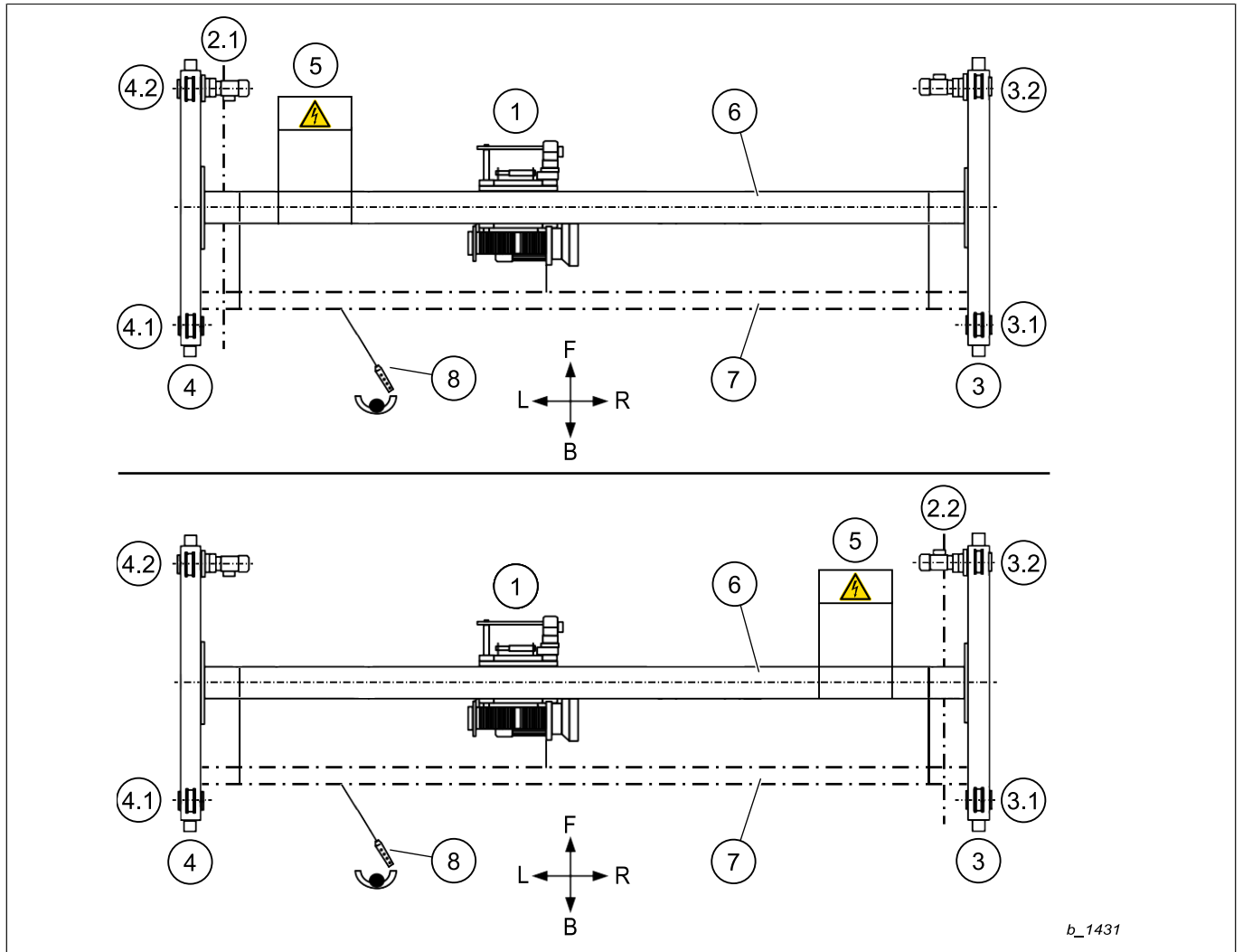
3 Product overview

3 Product overview

3.1 Standards and directives

The conformity to the standards and directives can be found in the accompanying technical documentation.

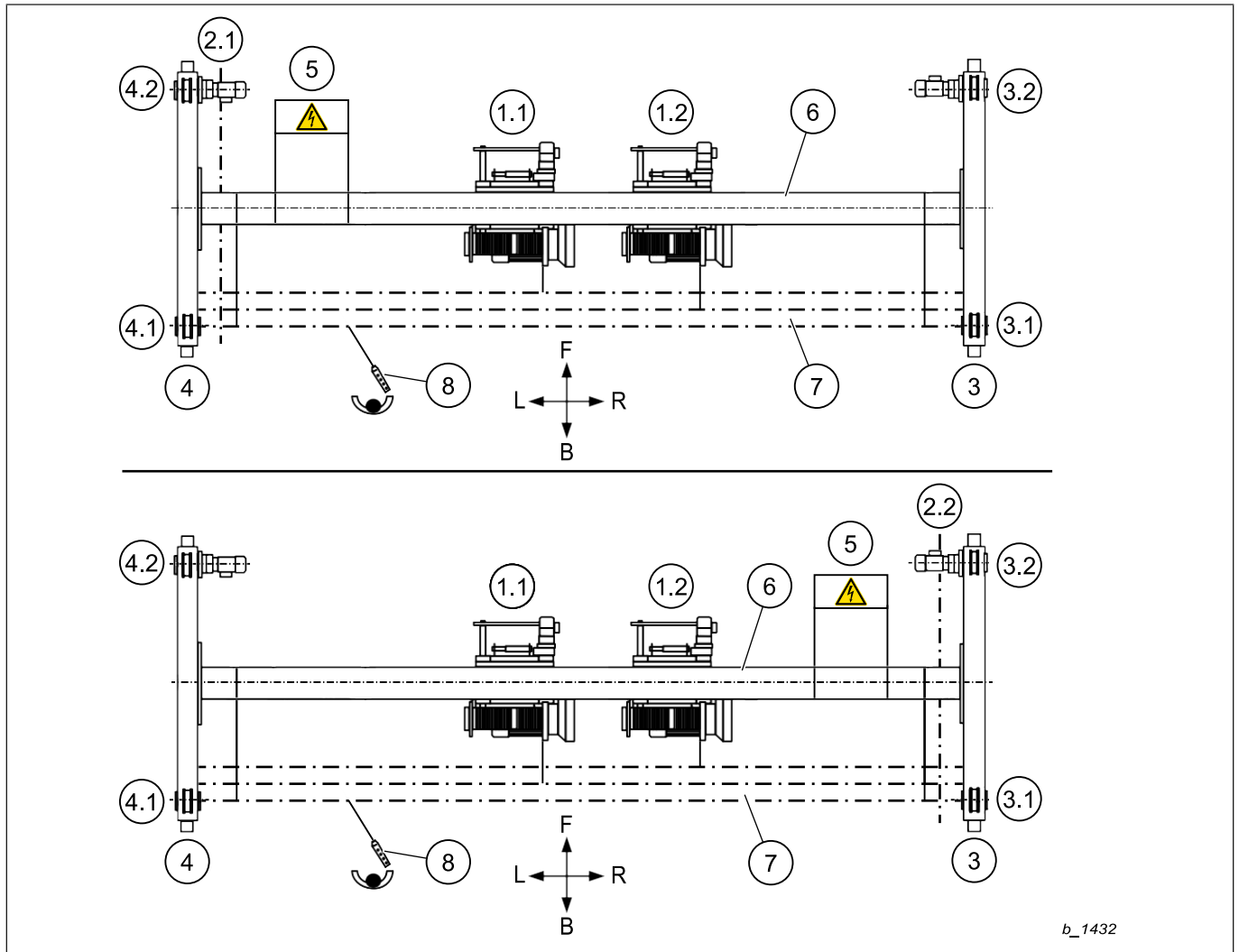
3.2 Single girder overhead travelling crane with one hoist



- | | |
|--|---|
| (1) Hoist | (4.1) Right endcarriage – left end carriage side |
| (2.1) Main power supply, left (Standard) | (4.2) Right endcarriage – right end carriage side |
| (2.2) Main power supply, right (option) | (5) Crane control |
| (3) Left endcarriage | (6) Main girder |
| (3.1) Left endcarriage – right end carriage side | (7) Trolley power supply |
| (3.2) Left endcarriage – left end carriage side | (8) Control pendant |
| (4) Right endcarriage | |
| (F) Front | (L) Left |
| (B) Back | (R) Right |

3 Product overview

3.3 Single girder overhead travelling crane with two hoists



b_1432

- (1.1) First hoist
- (1.2) Second hoist
- (2.1) Main power supply, left (standard)
- (2.2) Main power supply, right (option)
- (3) Left endcarriage
- (3.1) Left endcarriage – right end carriage side
- (3.2) Left endcarriage – left end carriage side
- (4) Right endcarriage
- (4.1) Right endcarriage – left end carriage side
- (4.2) Right endcarriage – right end carriage side
- (5) Crane control
- (6) Main girder
- (7) Trolley power supply
- (8) Control pendant
- (F) Front
- (B) Back
- (L) Left
- (R) Right

The hoists are marked as follows

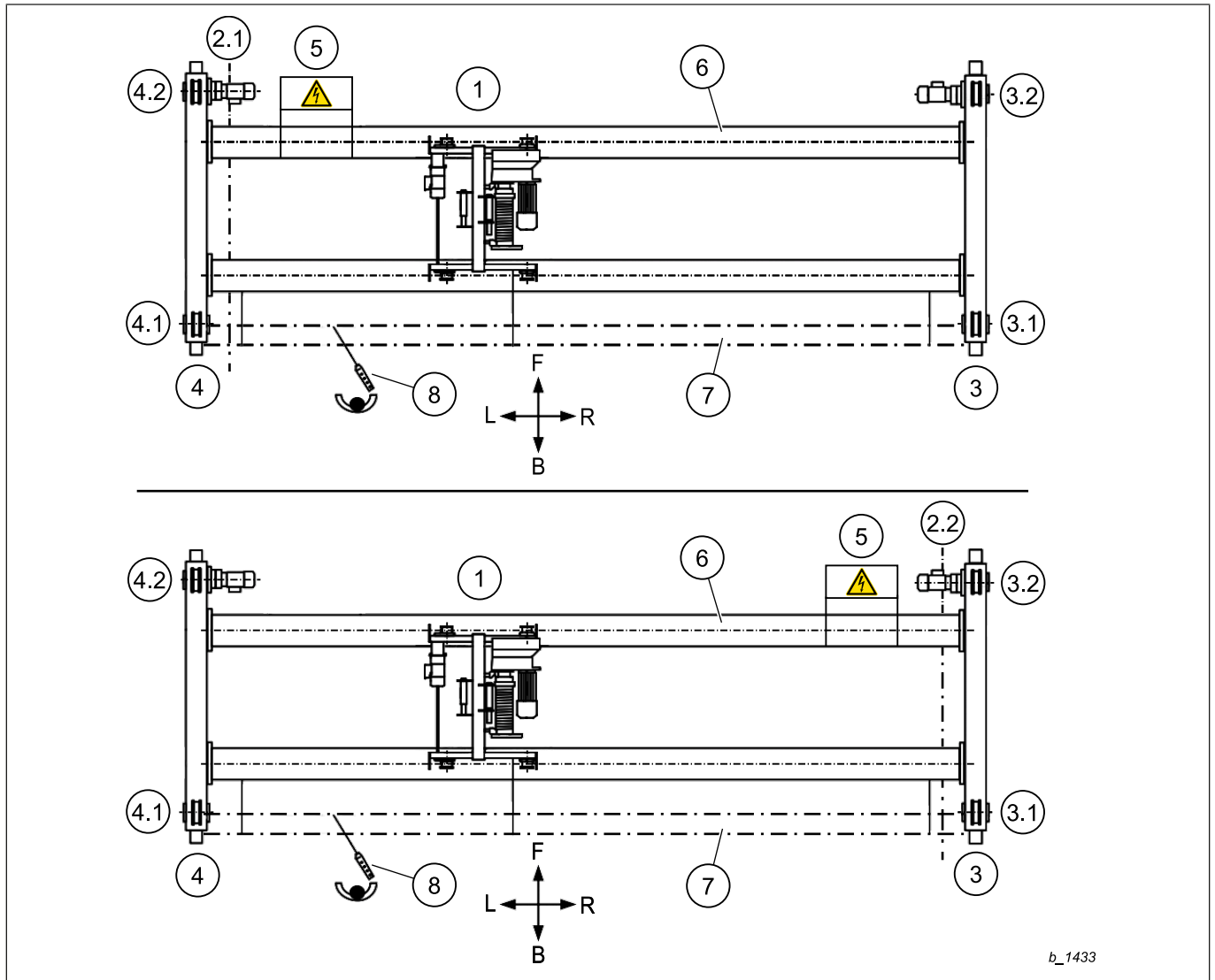
First hoist (1.1)	Second hoist (1.2)
Lower serial number 1)	Higher serial number 1)
Identification plate "I" 2)	Identification plate "II" 2)

- 1) see rating plate
- 2) see chapter 7.1 "Tandem version identification plate", page 73

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3 Product overview

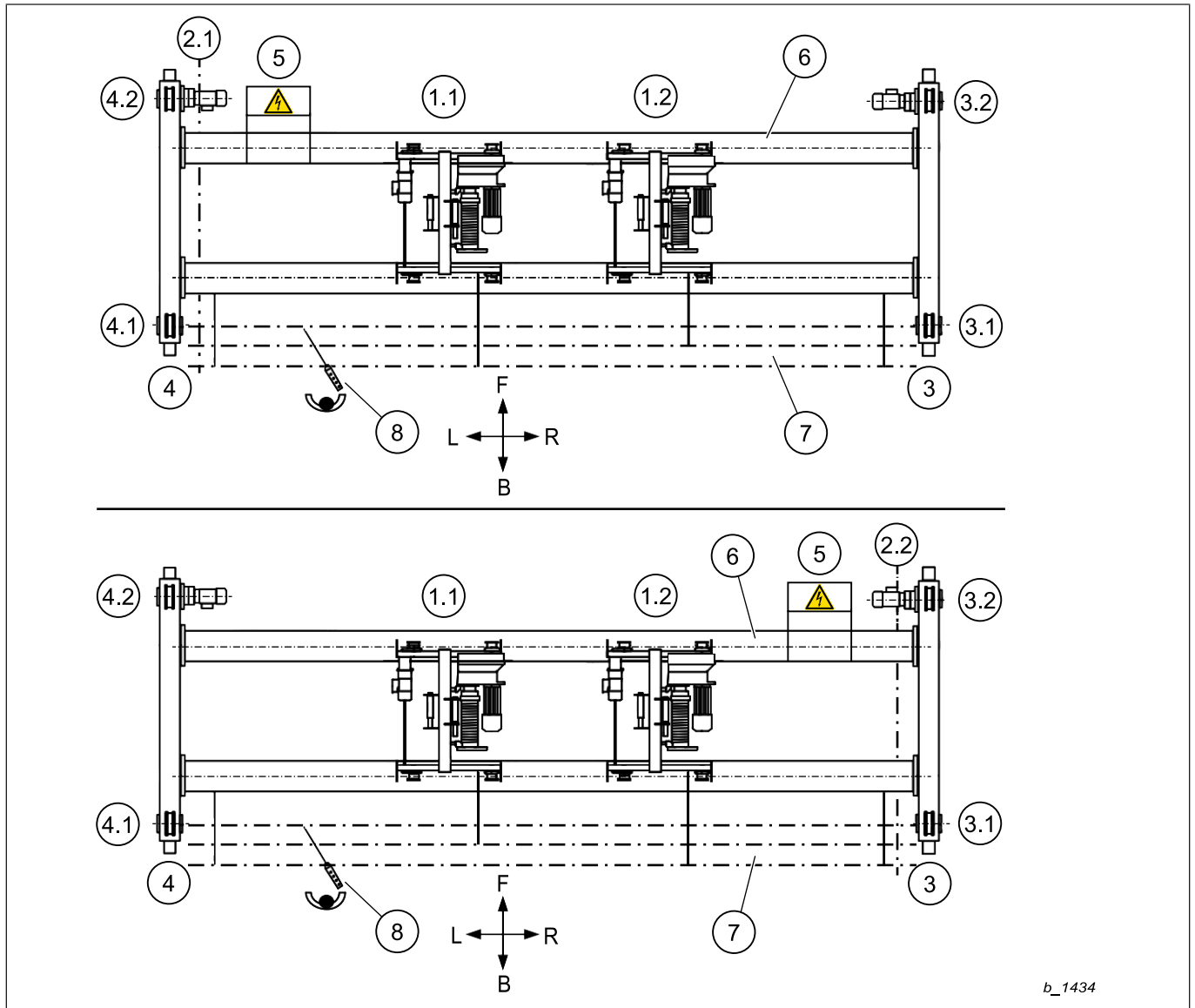
3.4 Double girder overhead travelling crane with one hoist



- | | |
|--|---|
| (1) Hoist | (4.1) Right endcarriage – left end carriage side |
| (2.1) Main power supply, left (standard) | (4.2) Right endcarriage – right end carriage side |
| (2.2) Main power supply, right (option) | (5) Crane control |
| (3) Left endcarriage | (6) Main girder |
| (3.1) Left endcarriage – right end carriage side | (7) Trolley power supply |
| (3.2) Left endcarriage – left end carriage side | (8) Control pendant |
| (4) Right endcarriage | |
| (F) Front | (L) Left |
| (B) Back | (R) Right |

3 Product overview

3.5 Double girder overhead travelling crane with two hoists



b_1434

- (1.1) First hoist
- (1.2) Second hoist
- (2.1) Main power supply, left (standard)
- (2.2) Main power supply, left (standard)
- (3) Left endcarriage
- (3.1) Left endcarriage – right end carriage side
- (3.2) Left endcarriage – left end carriage side
- (4) Right endcarriage
- (4.1) Right endcarriage – left end carriage side
- (4.2) Right endcarriage – right end carriage side
- (5) Crane control
- (6) Main girder
- (7) Trolley power supply
- (8) Control pendant
- (F) Front
- (B) Back
- (L) Left
- (R) Right

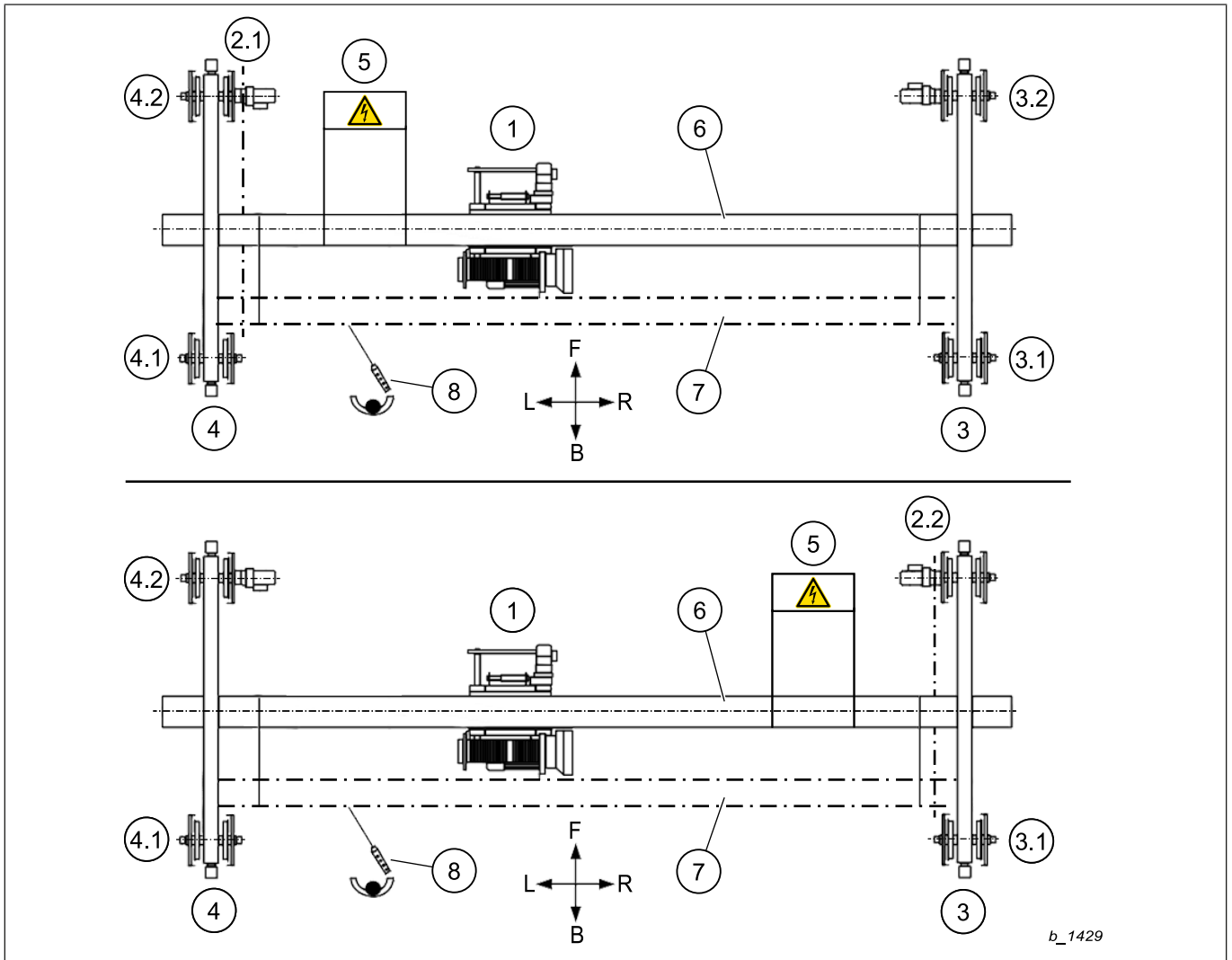
The hoists are marked as follows

First hoist (1.1)	Second hoist (1.2)
Lower serial number 1)	Higher serial number 1)
Identification plate "I" 2)	Identification plate "II" 2)

- 1) see rating plate
- 2) see chapter 7.1 "Tandem version identification plate", page 73

3 Product overview

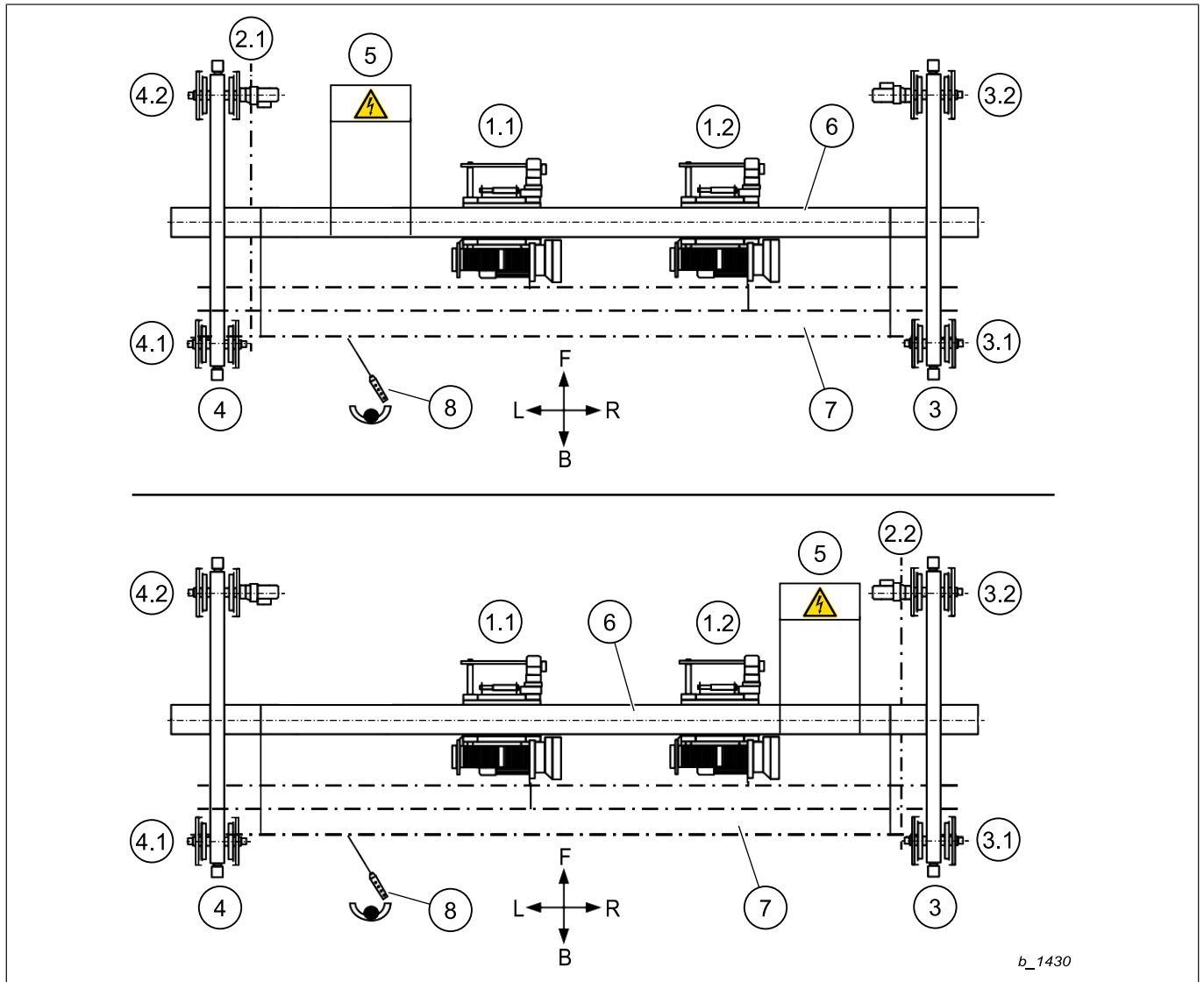
3.6 Suspension crane with one hoist



- | | |
|--|---|
| (1) Hoist | (4.1) Right endcarriage – left end carriage side |
| (2.1) Main power supply, left (standard) | (4.2) Right endcarriage – right end carriage side |
| (2.2) Main power supply, right (option) | (5) Crane control |
| (3) Left endcarriage | (6) Main girder |
| (3.1) Left endcarriage – right end carriage side | (7) Trolley power supply |
| (3.2) Left endcarriage – left end carriage side | (8) Control pendant |
| (4) Right endcarriage | |
| (F) Front | (L) Left |
| (B) Back | (R) Right |

3 Product overview

3.7 Suspension crane with two hoists



b_1430

- | | |
|--|---|
| (1.1) First hoist | (4) Right endcarriage |
| (1.2) Second hoist | (4.1) Right endcarriage – left end carriage side |
| (2.1) Main power supply, left (standard) | (4.2) Right endcarriage – right end carriage side |
| (2.2) Main power supply, right (option) | (5) Crane control |
| (3) Left endcarriage | (6) Main girder |
| (3.1) Left endcarriage – right end carriage side | (7) Trolley power supply |
| (3.2) Left endcarriage – left end carriage side | (8) Control pendant |
| (F) Front | (L) Left |
| (B) Back | (R) Right |

The hoists are marked as follows

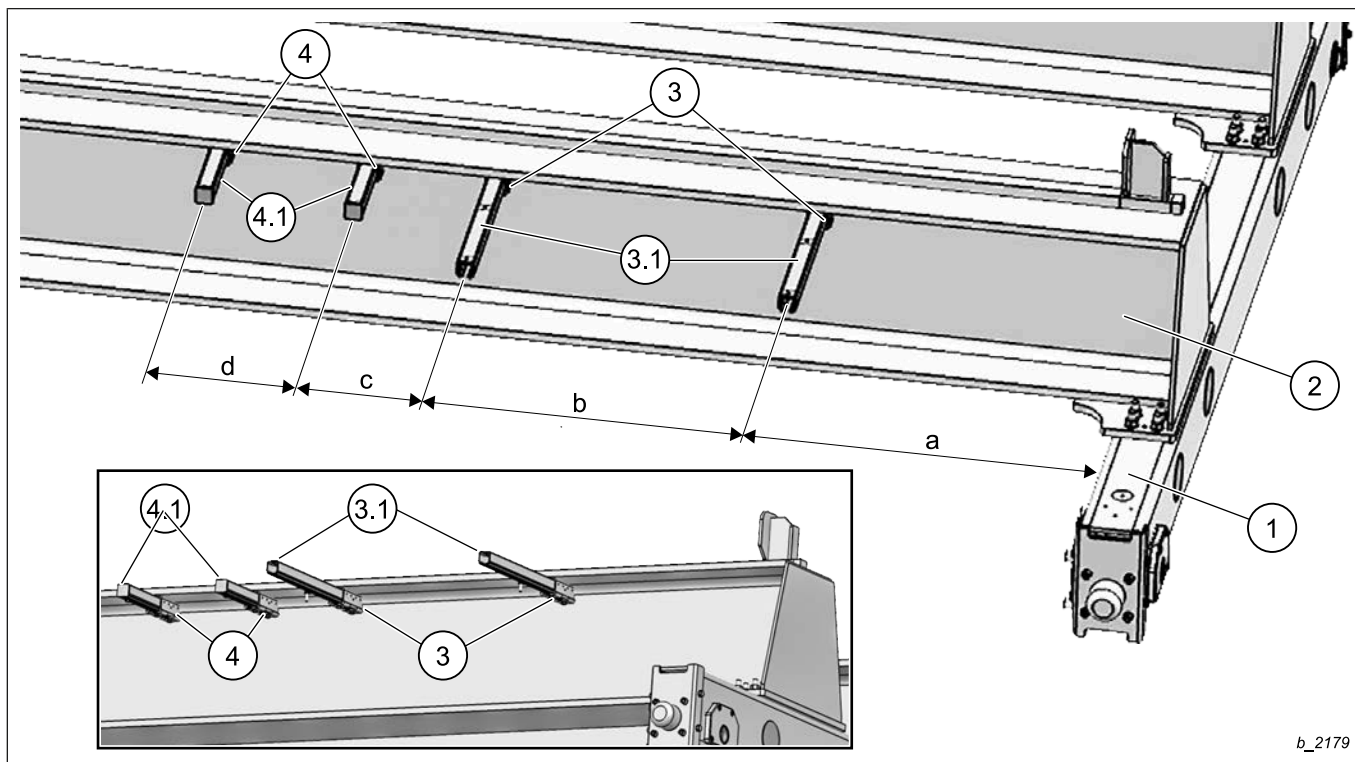
First hoist (1.1)	Second hoist (1.2)
Lower serial number 1)	Higher serial number 1)
Identification plate "I" 2)	Identification plate "II" 2)

- 1) see rating plate
- 2) see chapter 7.1 "Tandem version identification plate", page 73

4 Preparing the main girder for installation

4 Preparing the main girder for installation

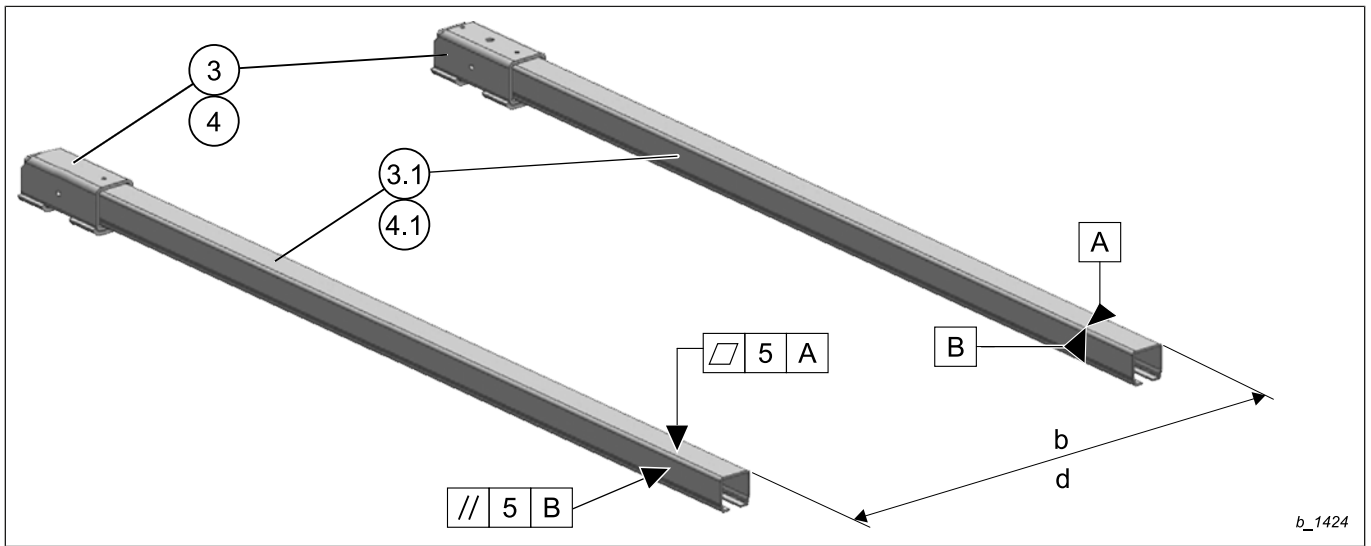
4.1 Weld on bracket for support arms (double girder overhead travelling crane)



- (1) Endcarriage
- (2) Main girder
- (3) Bracket for support arms
- (3.1) Support arms for the panel box
- (4) Bracket for support arms
- (4.1) Support arms for horn, signal light and radio receiver (option)

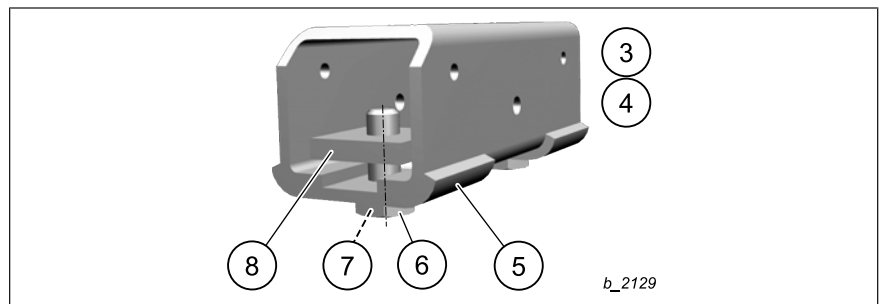
Panel box width	Distance			
	a	b	c	d
[mm]	[mm]	[mm]	[mm]	[mm]
700	≈ 700	655	320	350
800	≈ 700	755	320	350
1000	≈ 700	955	320	350

4 Preparing the main girder for installation



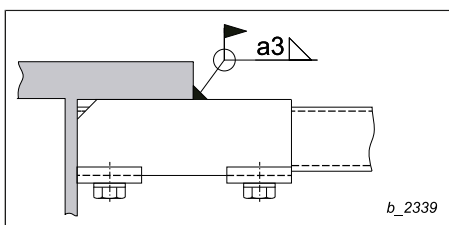
- (3) Bracket for support arms
- (4) Bracket for support arms

- (3.1) Support arm
- (4.1) Support arm



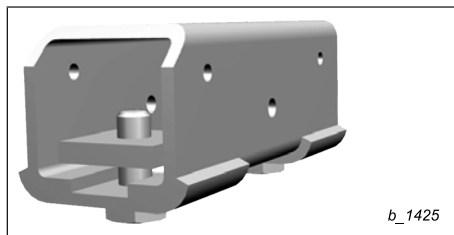
- (3) Bracket for support arms
- (4) Bracket for support arms
- (5) Clamping piece
- (6) Screw
- (7) Safety washer
- (8) Square nut

1. For alignment, have two support arms measuring 40×40 mm ready.
2. Remove the screws (6) and remove the safety washers (7), square nuts (8) and shims (5).
3. Prepare the bracket for support arms (3), (4) and the main girder for welding.
4. Use the support arms to ensure the distance “b” or “d” and the specified geometric dimensioning and tolerancing, see drawings and table above.
5. Weld on the brackets for support arms (3), (4) to the main girder with a circumferential fillet weld ($a = 3 \text{ mm}$).
6. Allow the weld seams to cool down.
7. Paint the main girder and the brackets for support arms (3), (4).
8. Fit the shims (5), square nuts (8) and screws (6) with safety washers (7) to the brackets for support arms (3), (4).



4 Preparing the main girder for installation

4.1.1 Bracket for support arms



The brackets for support arms are included in the scope of delivery. If these are required in advance, they can be obtained under Article no. A5771260.

5 Assembly

5 Assembly

WARNING



Danger due to improper mounting

Material damage, injuries or death can result.



- Ensure that a competent person carries out the assembly.
 - Keep the national and local safety and accident prevention regulations, the occupational safety acts and environmental provisions.
 - Use a lifting platform for work that cannot be carried out from the ground. Use a safety harness when performing any work outside of lifting platforms.
 - Wear the prescribed personal protective equipment.
 - Secure the danger zone.
 - Keep a sufficient safety distance from the product.
 - Use only original mounting accessories from the manufacturer.
 - Tighten bolted connections to the prescribed tightening torques with a torque wrench.
-

5.1 Note on the spare control pendant and spare radio control

WARNING



Danger if, in the event of an emergency, the inactive emergency stopping button on the spare control pendant or spare radio control is actuated instead of the active emergency stopping button on the control pendant.

Material damage, injuries or death can result.

- Remove the spare control pendant or spare radio control from the field of vision, e.g. tie it up.
-

5.2 Hoist



The instructions for mounting are given in the instructions supplied.

5.3 Suspension crane endcarriage



Observe the specifications for mounting in the enclosed instructions.

5 Assembly

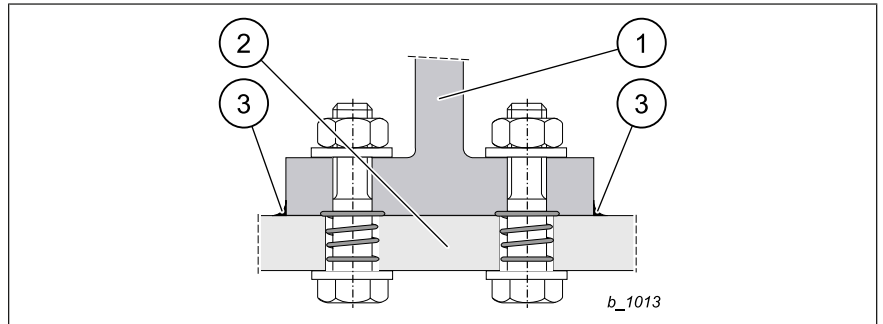
5.4 Travel drive



The instructions for mounting are given in the instructions supplied.

5.5 Use in corrosion-prone environments

5.5.1 Sealing joints (suspension crane)



- (1) Endcarriage
(2) Connection plate
Main girder
(3) Sealant

If the endcarriages are used in a corrosion-prone environment, e.g. outdoors, in electroplating plants or near the sea, the joints listed below must be sealed with sealant (3).

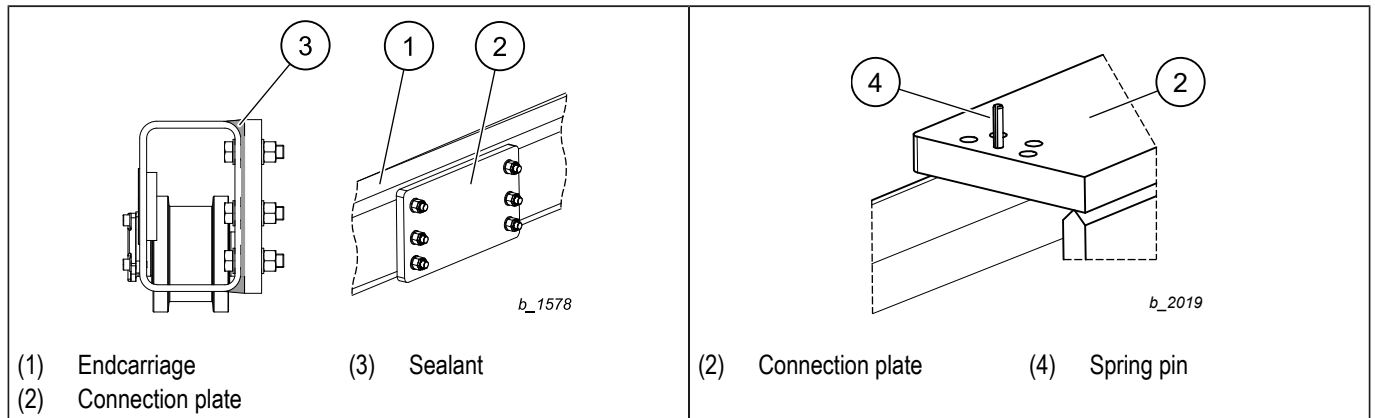
- Between the endcarriage (1) and the connection plate (2).
- Between the endcarriage (1) and the main girder (2).



We recommend using the sealant STRUCTURAL ADHESIVE, BOND + SEAL FAST from Würth or a comparable sealant.

5 Assembly

5.5.2 Sealing joints (overhead travelling crane)



If the endcarriages are used in a corrosion-prone environment, e.g. outdoors, in electroplating plants or near the sea, the joints listed below must be sealed with sealant (3).

- Between the endcarriage (1) and the connection plate (2).
- Between the connection plate (2) and the spring pins (4).



We recommend using the sealant STRUCTURAL ADHESIVE, BOND + SEAL FAST from Würth or a comparable sealant.

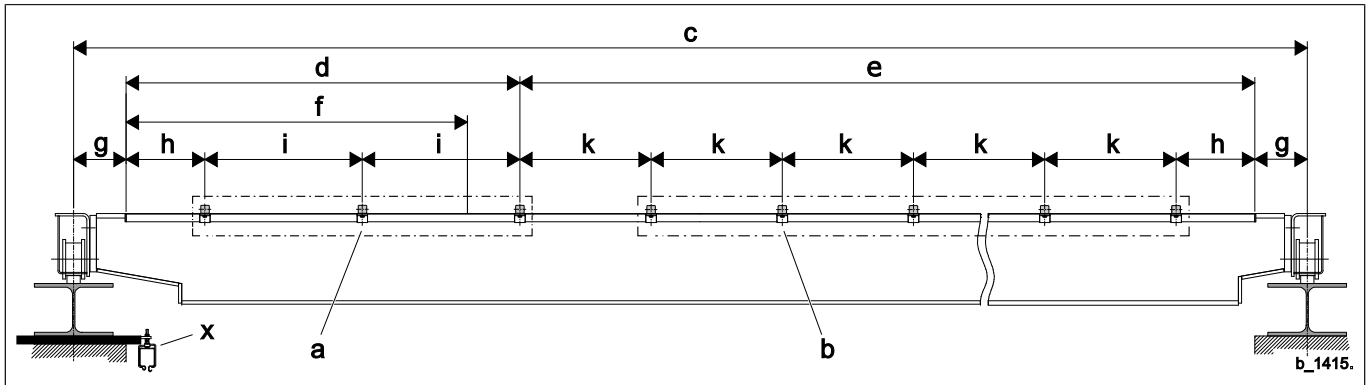
5 Assembly

5.6 Power supply for single girder overhead travelling crane/ double girder overhead travelling crane



The instructions for mounting are given in the instructions supplied.

In the figure, the main power supply “x” is installed on the left side of the crane. If the main power supply is on the right-hand side of the crane, the arrangement must be mirror-inverted.



a	b	c	d	e	f	g	h	i	k
[Qty.]	[Qty.]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
Support arms in range Cable trolley storage unit “d”	Support arms in range of travel path “e”	Span	Range Cable trolley storage unit	Range of travel path	Cable trolley storage unit 1)	0.2	0.3	0.6 2) 0.3 3)	<2

- 1) Dimension “f”: see technical documentation provided
- 2) Dimension “i”: With one hoist on the crane bridge
- 3) Dimension “i”: With two hoists on the crane bridge

5.6.1 Number of support arms (a) in the range of cable trolley storage unit (d)

[Qty.]
$a = \left\lceil \frac{f-h}{i} \right\rceil + 2$

- Round off the result in the square bracket [—].
Example: 5.3 = 5 or 5.8 = 5

5 Assembly

5.6.2 Number of support arms (b) in the range of travel path (e)

1. First calculate dimension (d) in the cable trolley storage unit range.

[m]
$d = \left(\left(\left\lfloor \frac{f-h}{i} \right\rfloor + 1 \right) \cdot i \right) + h$

- Round off the result in the square bracket [–].
Example: 5.3 = 5 or 5.8 = 5
2. Then insert (d) into the following formula.

[Qty.]
$b = \left\lfloor \frac{c-d-2g-h}{2} \right\rfloor + 1$

- Round off the result in the square bracket [–].
Example: 5.3 = 5 or 5.8 = 5

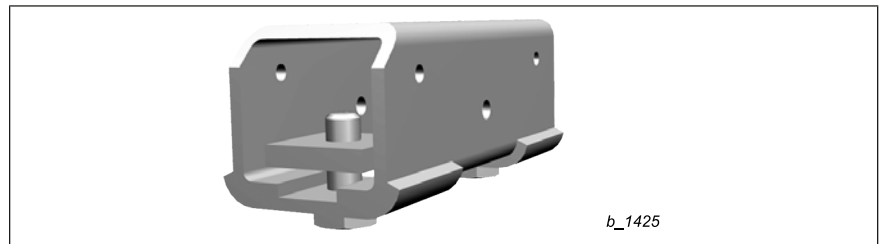
5.6.3 Gap between support arms (k) in the range of travel path (e)

Calculation of dimension (d) in the cable trolley storage unit range, see chapter 5.6.2 "Number of support arms (b) in the range of travel path (e)", page 27.

[m]
$k = \frac{c-d-2g-h}{b}$

5.6.4 Note on the double girder overhead travelling crane version

Bracket for support arms



The number of brackets for support arms required can be determined using the formulae listed above.

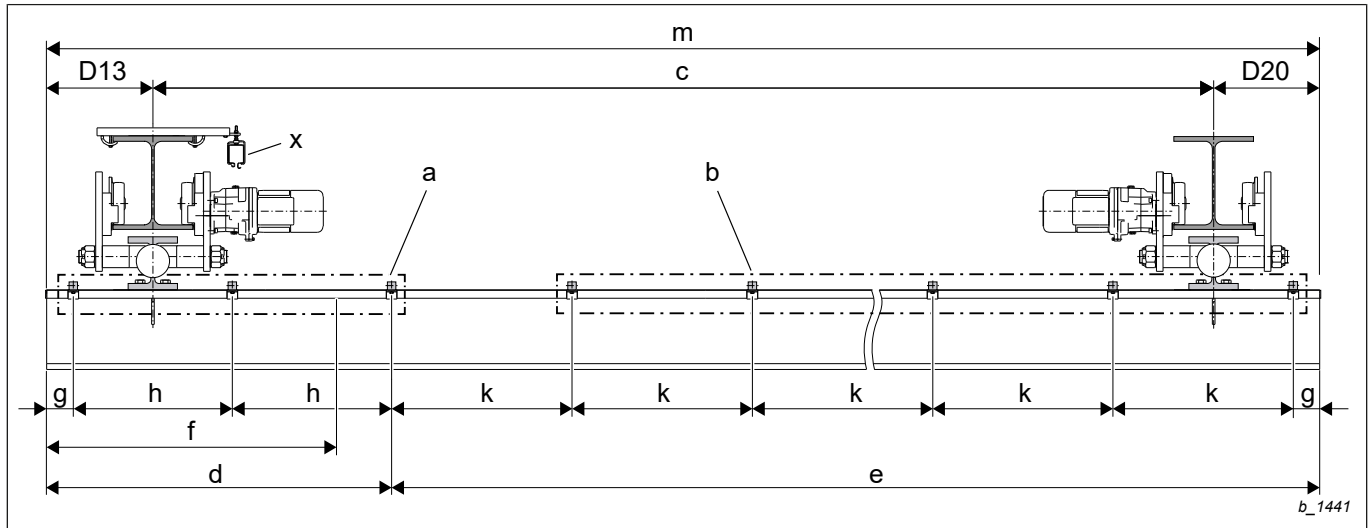
5 Assembly

5.7 Power supply for suspension crane



The instructions for mounting are given in the instructions supplied.

In the figure, the main power supply “x” is installed on the left side of the crane. If the main power supply is on the right-hand side of the crane, the arrangement must be mirror-inverted.



a	b	c	d	e	f	D13, D20	g	h	k	m
[Qty.]	[Qty.]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
Support arms in range Cable trolley storage unit “d”	Support arms in range of travel path “e”	Span	Range Cable trolley storage unit	Range of travel path	Cable trolley storage unit 1)	see general arrangement drawing provided	0.1 2)	0.6 3) 0.3 4)	<2	Crane bridge length

- 1) Dimension “f”: see technical documentation provided
- 2) Dimension “g”: If the specified distance **0.1 m** can NOT be maintained, the support arm must be positioned so that the smallest possible distance from the endcarriage is maintained.
- 3) Dimension “h”: With one hoist on the crane bridge
- 4) Dimension “h”: With two hoists on the crane bridge

The total length of the C-rail corresponds to the main girder length.

The overhangs and the span are specified in the general arrangement drawing provided.

5.7.1 Number of support arms (a) in the range of cable trolley storage unit (d)

[Qty.]
$a = \left\lfloor \frac{f-g}{h} \right\rfloor + 2$

- Round off the result in the square bracket [—].
Example: 5.3 = 5 or 5.8 = 5

5 Assembly

5.7.2 Number of support arms (b) in the range of travel path (e)

1. First calculate dimension (d) in the cable trolley storage unit range.

[m]
$d = \left(\left(\left\lfloor \frac{f-g}{h} \right\rfloor + 1 \right) \cdot h \right) + g$

- Round off the result in the square bracket [–].
Example: 5.3 = 5 or 5.8 = 5

2. Then insert (d) into the following formula.

[Qty.]
$b = \left\lfloor \frac{m-d-g}{2} \right\rfloor + 1$

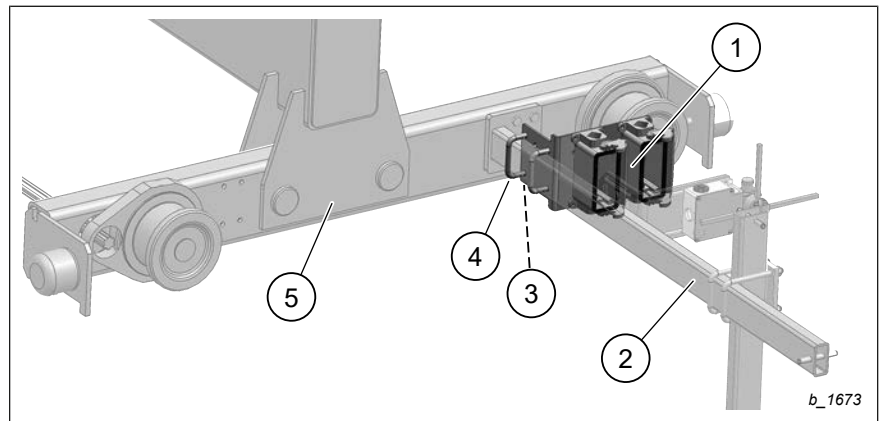
- Round off the result in the square bracket [–].
Example: 5.3 = 5 or 5.8 = 5

5.7.3 Gap between support arms (k) in the range of travel path (e)

Calculation of dimension (d) in the cable trolley storage unit range, see chapter 5.6.2 "Number of support arms (b) in the range of travel path (e)", page 27.

[m]
$k = \frac{m-d-g}{b}$

5.8 Mounting the plugs (double girder trolley)



- | | |
|-------------------|---------------------------|
| (1) Plug assembly | (4) U-bolt |
| (2) Towing arm | (5) Double girder trolley |
| (3) Nut | |

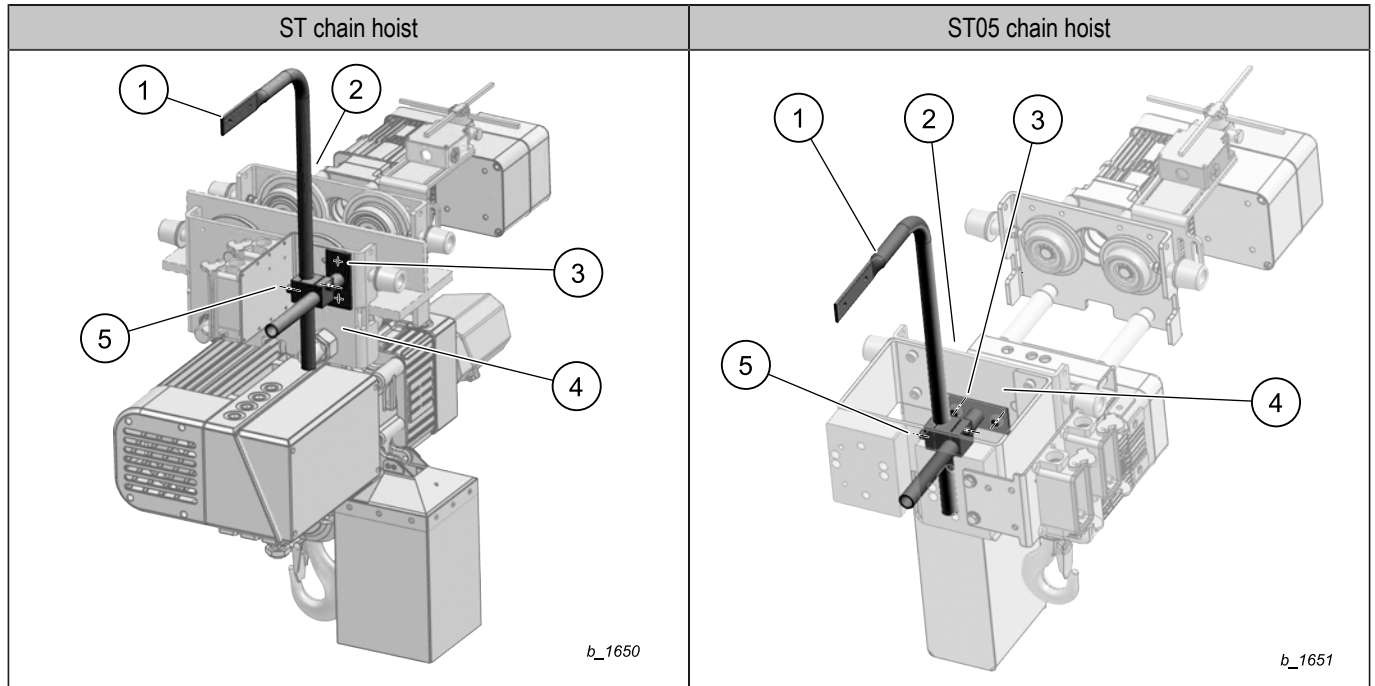
1. Position the plug assembly (1) with the U-bolts (4) on the towing arm (2) and fix it with the nuts (3).
2. Tighten the nuts (3) on the U-bolts (4) in pairs to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

5 Assembly

5.9 Assembling towing arm

5.9.1 Assembling towing arm (chain hoist with monorail trolley)

Depending on the version of the chain hoist, the position of the towing arm may differ from the presentations.



- (1) Towing arm
- (2) Chain hoist
- (3) VERBUS RIPP screw

- (4) Trolley side cheek
- (5) Screw

i The towing arm (1) is delivered with a towing arm chain as standard. If the towing arm chain is not required, it can be removed prior to mounting.

If the towing arm (1) is not yet attached:

1. Attach the towing arm (1) to the trolley side cheek (4) using the VERBUS RIPP screws (3).
2. Tighten the VERBUS RIPP screws (3) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

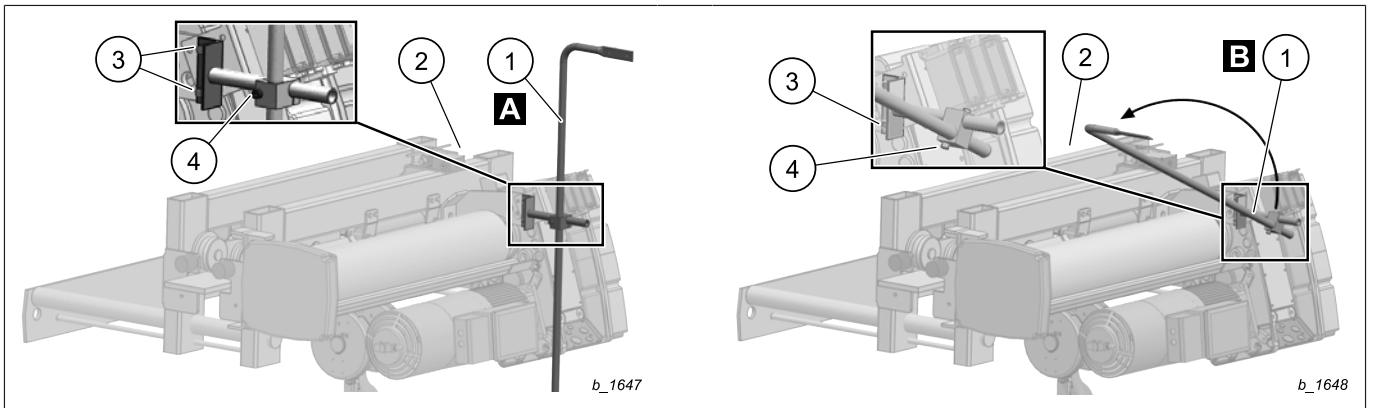
Complete assembly (without towing arm chain)

1. Loosen the screws (5).
2. Position the towing arm (1) in the towing trolley's window and use the screws (5) to fix it.
3. Tighten the screws (5) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Complete assembly (with towing arm chain)

1. Loosen the screws (5).
2. Position the towing arm (1) on the outside of the towing trolley and use the screws (5) to fix it.
3. Ensure that the towing arm (1) has enough of a gap to the towing trolley and the cables when moving.
4. Tighten the screws (5) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.
5. Connect the towing arms (1) and the towing trolley to the towing arm chain.

5.9.2 Assembling towing arm (wire rope hoist with "short headroom" monorail trolley)



- | | |
|---------------------------------------|---------------------------------------|
| (1) Towing arm | (3) Thread-forming hexagon head screw |
| (2) "Short headroom" monorail trolley | (4) Screw |

Towing arm position **A** (standard):

Position of the main power supply: On the left side of the crane.

Towing arm position **B** (option):

Position of the main power supply: On the right side of the crane.

i The towing arm (1) is delivered with a towing arm chain as standard. If the towing arm chain is not required, it can be removed prior to mounting.

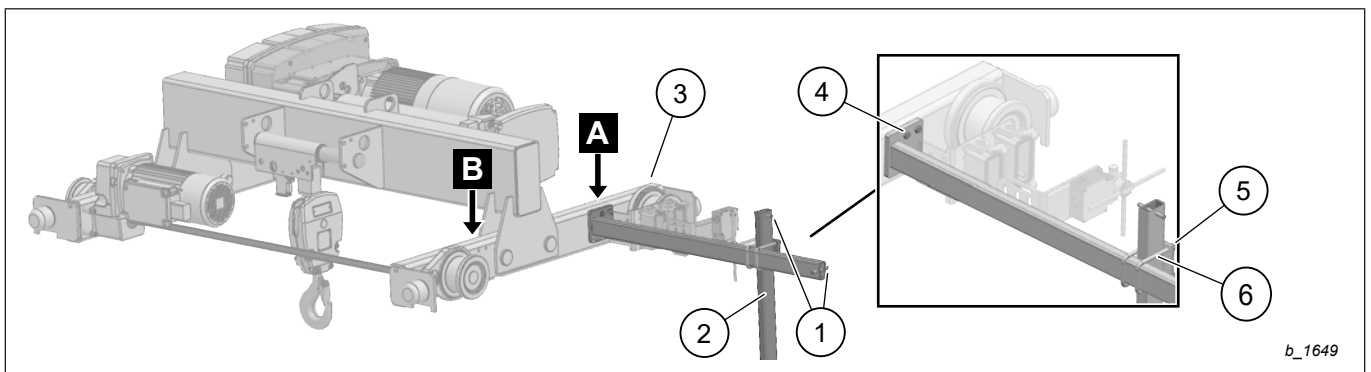
Complete assembly (without towing arm chain):

1. Loosen the screws (4).
2. Position the towing arm (1) in the towing trolley's window and use the screws (4) to fix it.
3. Tighten the screws (4) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

Complete assembly (with towing arm chain):

1. Loosen the screws (4).
2. Position the towing arm (1) on the outside of the towing trolley and use the screws (4) to fix it.
3. Ensure that the towing arm (1) has enough of a gap to the towing trolley and the cables when moving.
4. Tighten the screws (4) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.
5. Connect the towing arm (1) and the towing trolley to the towing arm chain.

5.9.3 Assembling towing arm (wire rope hoist with double girder trolley)



- | | |
|---------------------------|---|
| (1) Spring pin | (4) Thread-forming hexagon head screw (tightening torque 20 Nm) |
| (2) Towing arm | (5) Nut |
| (3) Double girder trolley | (6) U-bolt |

Towing arm position **A** (standard):

Position of the main power supply: On the left side of the crane.

Towing arm position **B** (option):

Position of the main power supply: On the right side of the crane.

i The towing arm (2) is delivered with a towing arm chain as standard. If the towing arm chain is not required, it can be removed prior to mounting.

If the towing arm (2) is not yet attached to the double girder trolley (3):

1. Attach the towing arm (2) with the screws (4) to the double girder trolley (3) in position **A** or **B**.
2. Tighten the screws (4) to the prescribed tightening torque of **20 Nm**.

⚠ WARNING



If spring pins (1) are missing, parts may fall down.
Material damage, injuries or death can result.

- If spring pins (1) are missing, knock them in with a hammer.

Complete assembly (without towing arm chain)

1. Loosen the nuts (5).
2. Position the towing arm (2) in the towing trolley's window and use the nuts (5) to fix it.
3. Tighten the nuts (5) on the U-bolt (6) in pairs to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

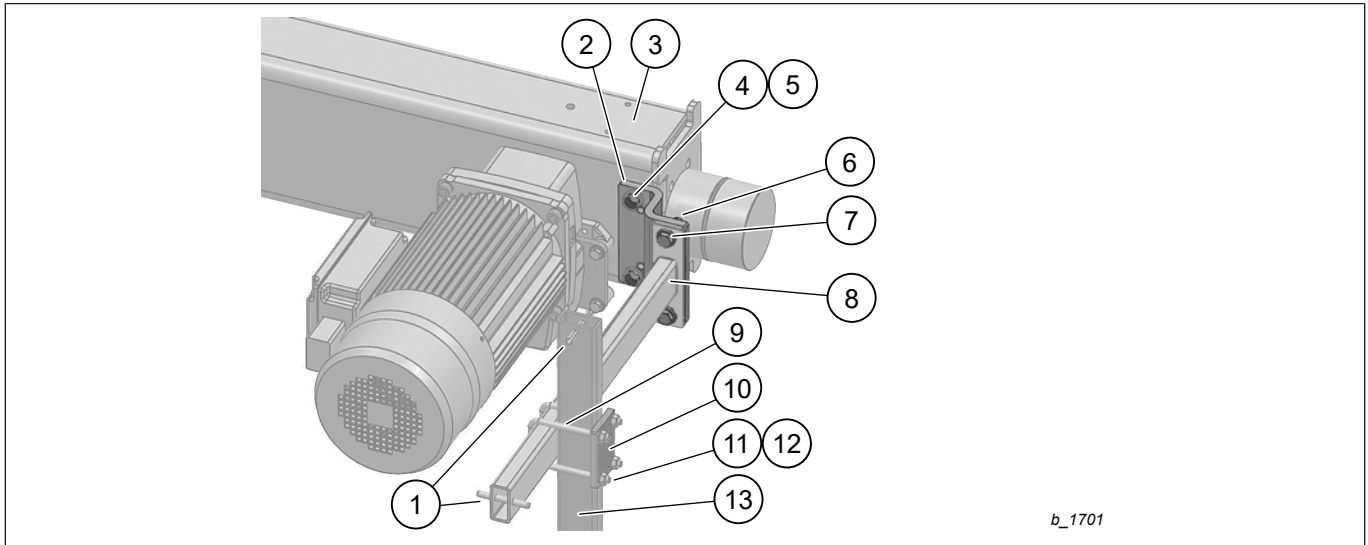
Complete assembly (with towing arm chain)

1. Loosen the nuts (5).
2. Position the towing arm (2) on the outside of the towing trolley and use the nuts (5) to fix it.
3. Ensure that the towing arm (2) has enough of a gap to the towing trolley and the cables when moving.
4. Tighten the nuts (4) on the U-bolts (5) in pairs to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.
5. Connect the towing arm (2) and the towing trolley to the towing arm chain.

5 Assembly

5.9.4 Assembling towing arm (overhead travelling crane)

Assemble towing arm with mounting set



- | | |
|---|--------------------|
| (1) Spring pin | (8) Jib |
| (2) Mounting bracket | (9) U-bolt |
| (3) Endcarriage | (10) Plate |
| (4) Safety washer (scope of delivery for endcarriage) | (11) Safety washer |
| (5) Screw (scope of delivery for endcarriage) | (12) Nut |
| (6) VERBUS RIPP nut | (13) Towing arm |
| (7) VERBUS RIPP screw | |



Mounting set: Pos. (2), (6) and (7) is included in the scope of delivery. The mounting set is only required for the endcarriages and crane travel motors listed below.

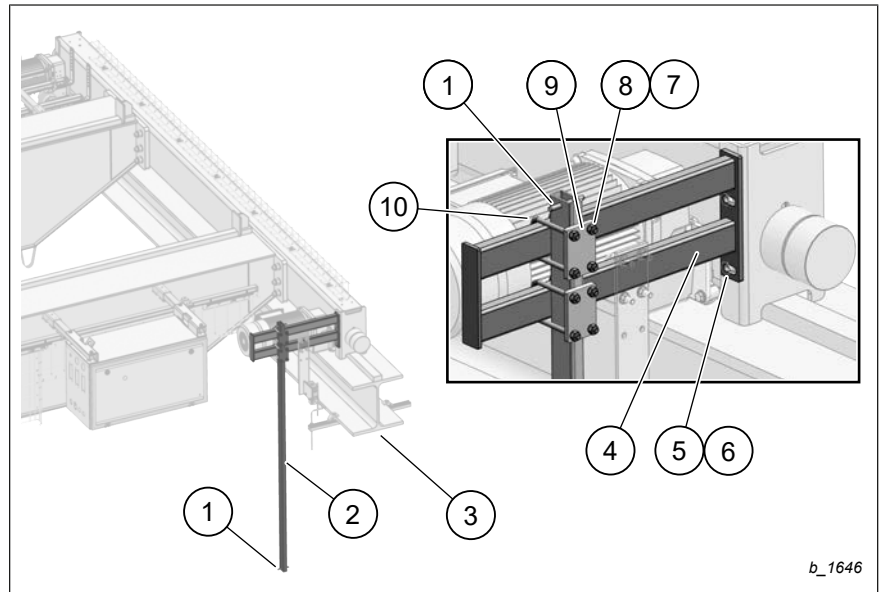
Endcarriage Type	Crane travel motor Type
LE-09	F31, F38 or A1ex
LT-09, LT-11, LT-14	
LS-09, LS-11, LS-14	

- Attach the mounting bracket (2) to the endcarriage (3) with the safety washers (4) and screws (5).
- Tighten the screws (5) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.
- Mount the jib (8) to the mounting bracket (2) with screws (7) and nuts (6).
- Tighten the nuts (6) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

Complete the mounting with the mounting set

- Position the towing arm (13) on the jib (8).
- Mount the plate (10) to the jib (8) with the U-bolts (9), safety washers (11) and safety nuts (12).
- Tighten the nuts (12) on the U-bolts (9) in pairs to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

Assemble towing arm without mounting set



- | | |
|---|-------------------|
| (1) Spring pin | (6) Screw |
| (2) Towing arm | (7) Safety washer |
| (3) Overhead travelling crane endcarriage | (8) Nut |
| (4) Jib | (9) Plate |
| (5) Safety washer | (10) U-bolt |

⚠ WARNING



If spring pins (1) are missing, parts may fall down.
Material damage, injuries or death can result.

- If spring pins (1) are missing, knock them in with a hammer.

If the towing arm (2) is not yet attached to the overhead travelling crane endcarriage (3):

1. Mount the jib (4) to the overhead travelling crane endcarriage (3) with safety washers (5) and screws (6).
2. Tighten the screws (6) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

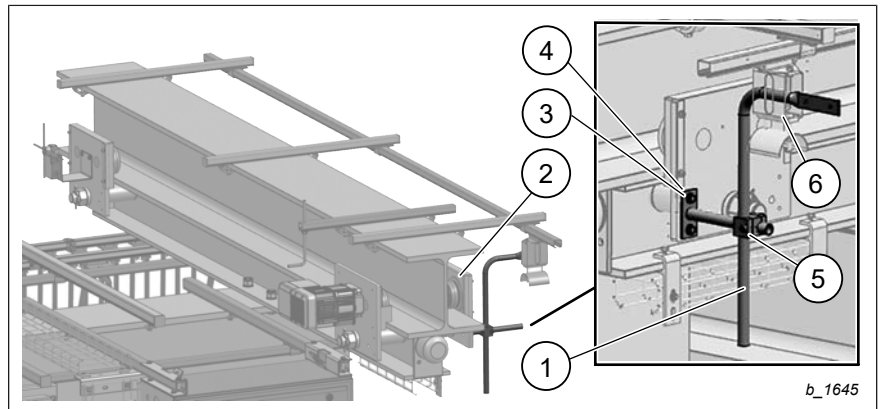
Complete the mounting without the mounting set

1. Position the towing arm (2) on the jib (4).
2. Mount the plate (9) to the jib (4) with the U-bolts (10), safety washers (7) and safety nuts (8).
3. Tighten the nuts (8) on the U-bolts (10) in pairs to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

5 Assembly

5.9.5 Assembling towing arm (suspension crane)

Towing arm position (standard): External, on driven trolley



- | | |
|----------------------------------|---|
| (1) Towing arm | (4) Thread-forming hexagon head screw (tightening torque 20 Nm) |
| (2) Suspension crane endcarriage | (5) Screw |
| (3) Safety washer | (6) Window on towing trolley |

If the towing arm (1) is not yet attached to the suspension crane endcarriage (2):

1. Attach the towing arm (1) to the suspension crane endcarriage (2) with the safety washers (3) and screws (4).
2. Tighten the screws (4) to the prescribed tightening torque of **20 Nm**.

Complete assembly

1. Loosen the screws (5).
2. Position the towing arm (1) in the towing trolley's window and use the screws (5) to fix it.
3. Tighten the screws (5) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

5.10 Assembling end stops

5.10.1 Assembling end stops (monorail trolley)

⚠ WARNING

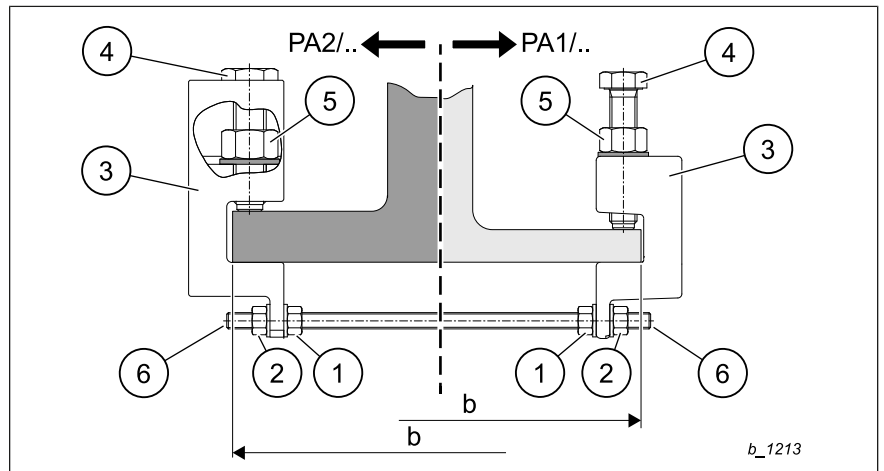


Without end stops, there is a risk of parts falling down.

Material damage, injuries or death can result.

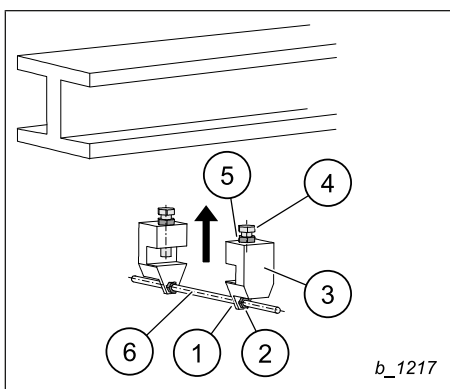
- Attach suitable end stops at the end of the runways.

5 Assembly



- | | |
|--------------|------------------|
| (1) Nut | (4) Screw |
| (2) Nut | (5) Nut |
| (3) End stop | (6) Threaded rod |

Girder Type	End stop Type	Article no.	Weight	b	Tightening torque Screw (4)	Tightening torque Nut (2)
			[kg]	[mm]	[Nm]	[Nm]
I	PA1/300	A0174057270	6.1	≤300	170	70
	PA1/500	A0174058270	6.2	300 – 500		
	PA1/1000	A0174064270	6.5	500 – 1000		
	PA2/500	A0174059270	13.9	≤500	300	
	PA2/1000	A0174065270	14.4	500 – 1000		
I	PA1/300	A0174057270 A0174000920	6.1	≤300	170	



1. Open the nuts (1) and (2) until the end stops (3) can be hooked into the girder.
2. Attach the end stops (3) onto the girder.
3. Turn the nuts (1) outwards until they are in contact. Ensure that the threaded rod (6) is positioned evenly.
4. Tighten the nuts (2) to the prescribed tightening torque, see table.
5. Align the two end stops (3) parallel to each other and at a right angle to the girder.
6. Tighten the screws (4) to the prescribed tightening torque, see table, and secure with the nuts (5).

- | |
|------------------|
| (1) Nut |
| (2) Nut |
| (3) End stop |
| (4) Screw |
| (5) Nut |
| (6) Threaded rod |

5 Assembly

5.10.2 Assembling end stops (double girder trolley)

⚠ WARNING



Without end stops, there is a risk of parts falling down.

Material damage, injuries or death can result.

- Attach suitable end stops at the end of the runways.

The end stops for double girder trolley must be manufactured and fitted by the customer. The dimensions for the position of the end stops are shown in the general arrangement drawing.

5.10.3 Assembling end stops (overhead travelling crane and suspension crane)

⚠ WARNING



Without end stops, there is a risk of parts falling down.

Material damage, injuries or death can result.

- Attach suitable end stops at the end of the runways.

The end stops for the crane must be obtained and fitted by the customer.

The specifications of the respective country-specific standards and specifications must be observed, for example:

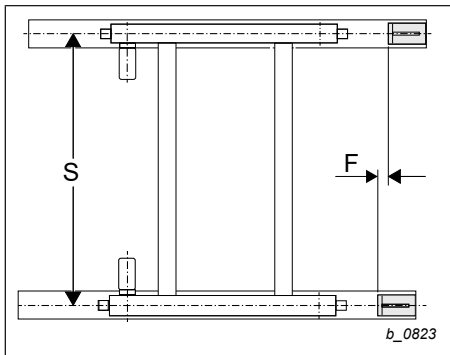
- Technical design in accordance with DIN EN 1991-3
- Tolerance F in accordance with ISO 12488-1, tolerance class 2

Tolerance F

Tolerance of parallelism of end stops or buffers on the track at right angles to the longitudinal axis.

$$F = \pm 1\% \times S \text{ [mm]}$$

$$F \leq \pm 10 \text{ mm}$$



5.11 Assembling travel limit switches

⚠ WARNING



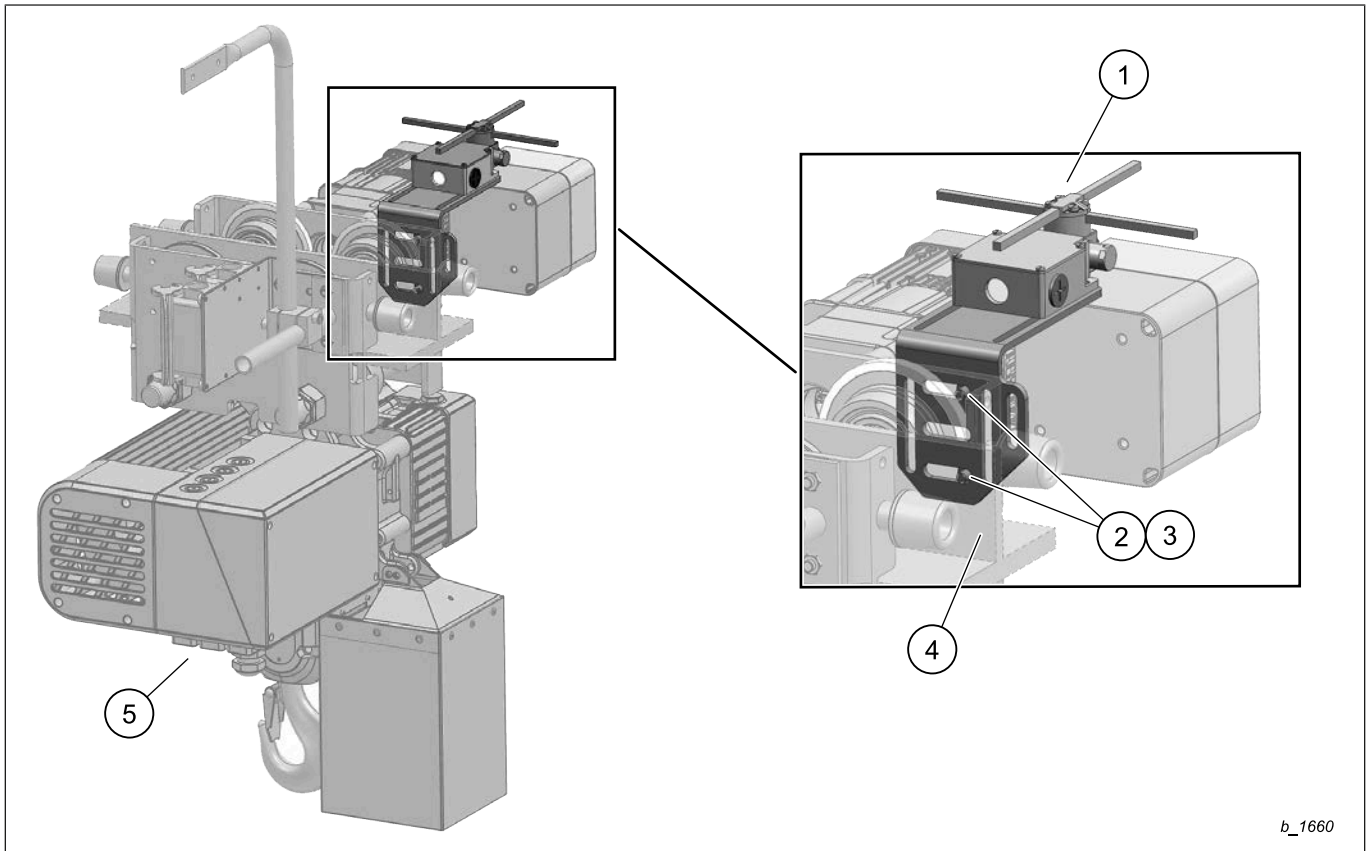
If the travel limit switches are defective, incorrectly fitted or incorrectly adjusted, the trolley moves unbraked to the end stops and parts can fall off.

Material damage, injuries or death can result.

- Check the setting and function of the travel limit switches before commissioning.

5 Assembly

5.11.1 Assembling travel limit switch (chain hoist with monorail trolley)



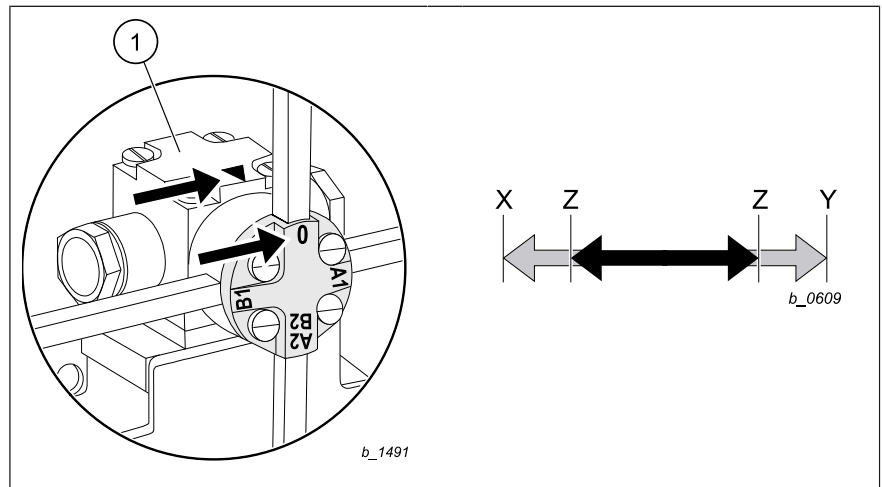
- (1) Travel limit switch
- (2) Washer
- (3) Screw

- (4) Trolley side cheek
- (5) Chain hoist

If the travel limit switch (1) is not yet attached to the chain hoist (5):

1. Fix the travel limit switch (1) to the trolley side cheek (4) with washers (2) and screws (3).
2. Tighten the screws (3) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79.*

Check the position of the switching cross



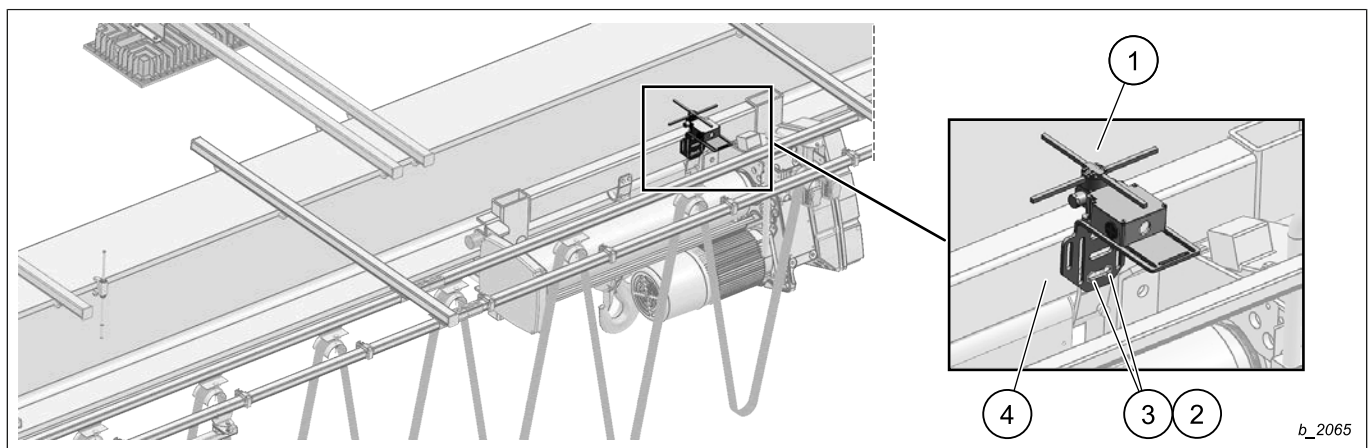
Switching function	
X, Y	Limit stop in both travel directions
Z	Pre-switching (fast-slow changeover)

1. Ensure that the arrow mark on the travel limit switch (1) corresponds to the neutral position "0" if the switch is located between the two "Z" positions (fast-slow changeover).

Electrical connection

The travel limit switch (1) is already connected to the hoist control or on the terminal box on the hoist control when delivered.

5.11.2 Assembling travel limit switch (wire rope hoist with monorail trolley)

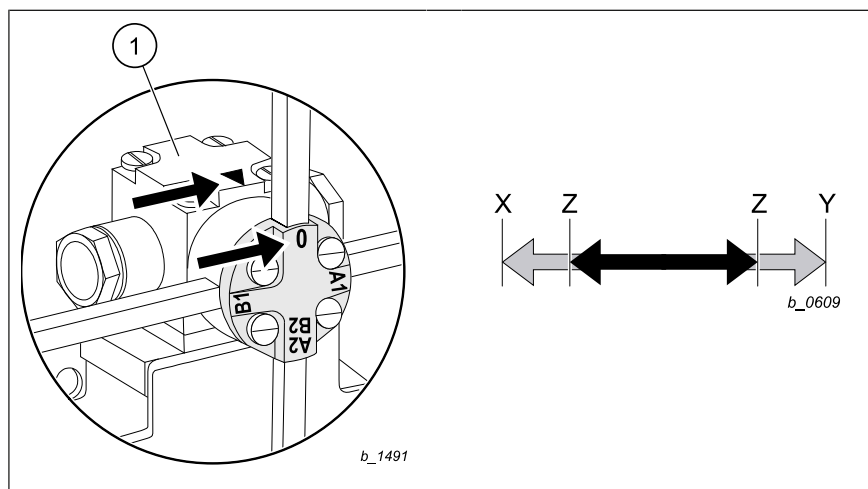


- | | |
|-------------------------|------------------------|
| (1) Travel limit switch | (3) Screw |
| (2) Washer | (4) Trolley side cheek |

If the travel limit switch (1) is not yet attached to the wire rope hoist:

1. Mount the travel limit switch (1) to the trolley side cheek (4) with washers (2) and screws (3).
2. Tighten the screws (3) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Check the position of the switching cross



Switching function	
X, Y	Limit stop in both travel directions
Z	Pre-switching (fast-slow changeover)

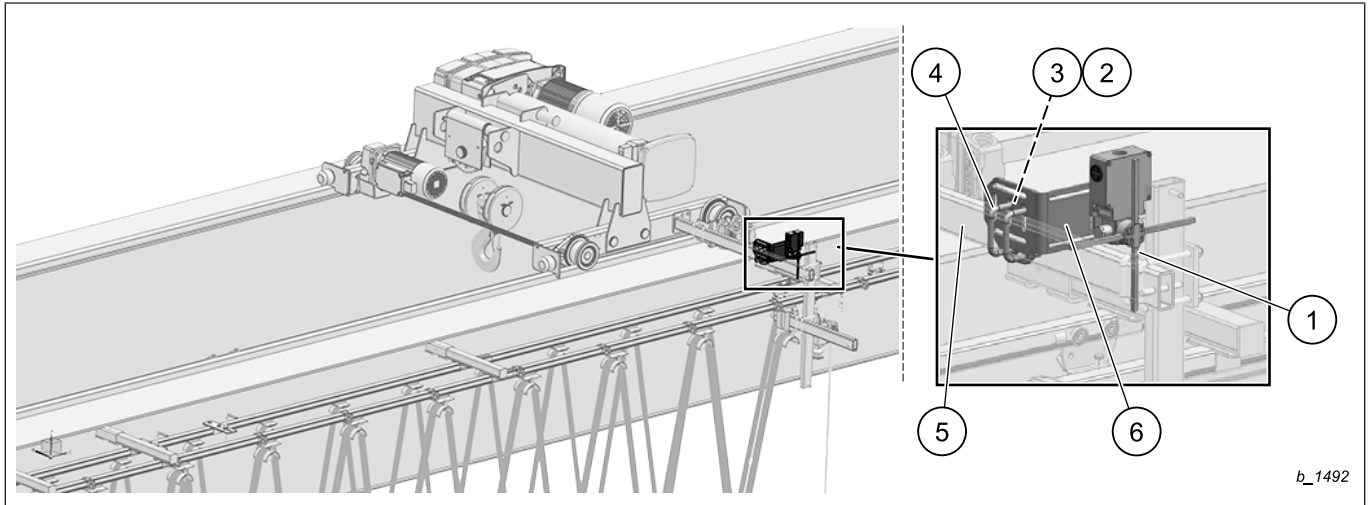
1. Ensure that the arrow mark on the travel limit switch (1) corresponds to the neutral position "0" if the switch is located between the two "Z" positions (fast-slow changeover).

Electrical connection

The travel limit switch (1) is already connected to the hoist control or on the terminal box on the hoist control when delivered.

5 Assembly

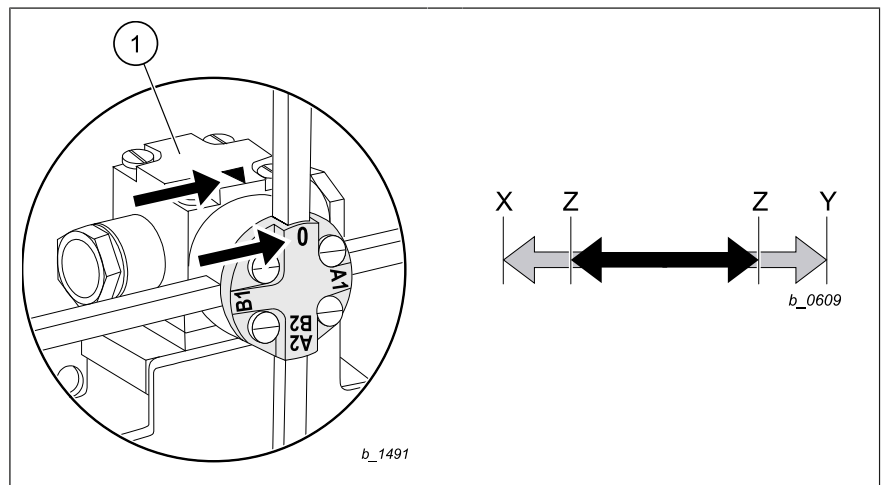
5.11.3 Assembling travel limit switch (wire rope hoist with double girder trolley)



- | | |
|-------------------------|----------------------|
| (1) Travel limit switch | (4) U-bolt |
| (2) Nut | (5) Towing arm |
| (3) Safety washer | (6) Mounting bracket |

1. Position the mounting bracket (6) with the pre-assembled travel limit switch (1) on the towing arm (5).
2. Fix the mounting bracket (6) to the towing arm (5) with the U-bolts (4), nuts (2) and safety washers (3).
3. Tighten the nuts (2) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

Check the position of the switching cross



Switching function	
X, Y	Limit stop in both travel directions
Z	Pre-switching (fast-slow changeover)

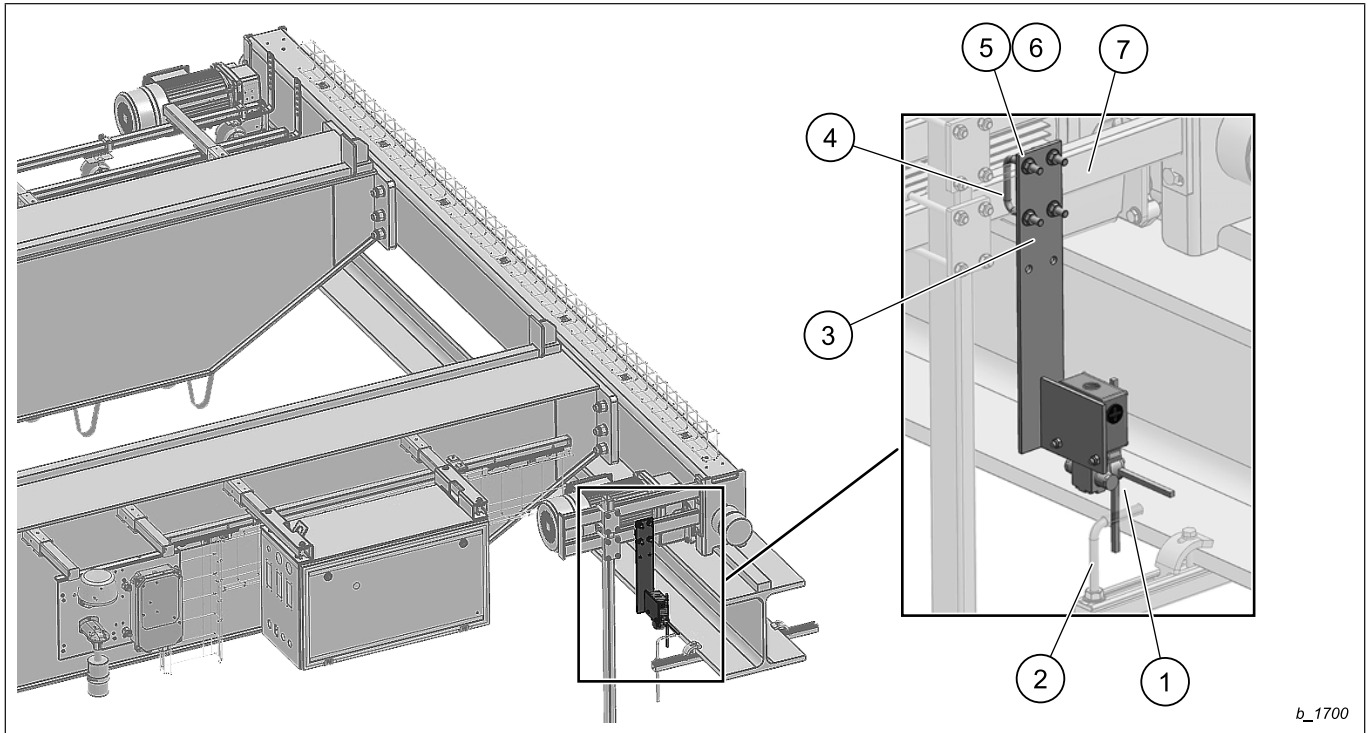
1. Ensure that the arrow mark on the travel limit switch (1) corresponds to the neutral position "0" if the switch is located between the two "Z" positions (fast-slow changeover).

5 Assembly

Electrical connection

The travel limit switch (1) is already connected to the hoist control or on the terminal box on the hoist control when delivered.

5.11.4 Assembling travel limit switch (overhead travelling crane)

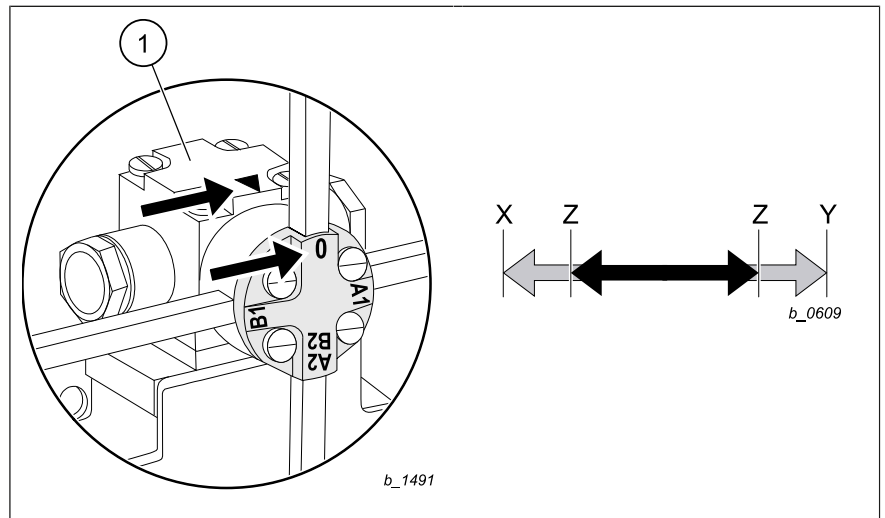


b_1700

- | | |
|-------------------------|-------------------|
| (1) Travel limit switch | (5) Nut |
| (2) Actuator | (6) Safety washer |
| (3) Plate | (7) Towing arm |
| (4) U-bolt | |

1. Position the plate (3) with the pre-assembled travel limit switch (1) on the towing arm (7).
2. Fix the plate (3) to the towing arm (7) with the U-bolts (4), safety washers (6) and safety nuts (5).
3. Tighten the nuts (5) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.
4. If the horizontal position of the travel limit switch needs to be corrected: Loosen the nuts (5) and correct the horizontal position of the travel limit switch (1), then retighten the nuts (5) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

Check the position of the switching cross



Switching function	
X, Y	Limit stop in both travel directions
Z	Pre-switching (fast-slow changeover)

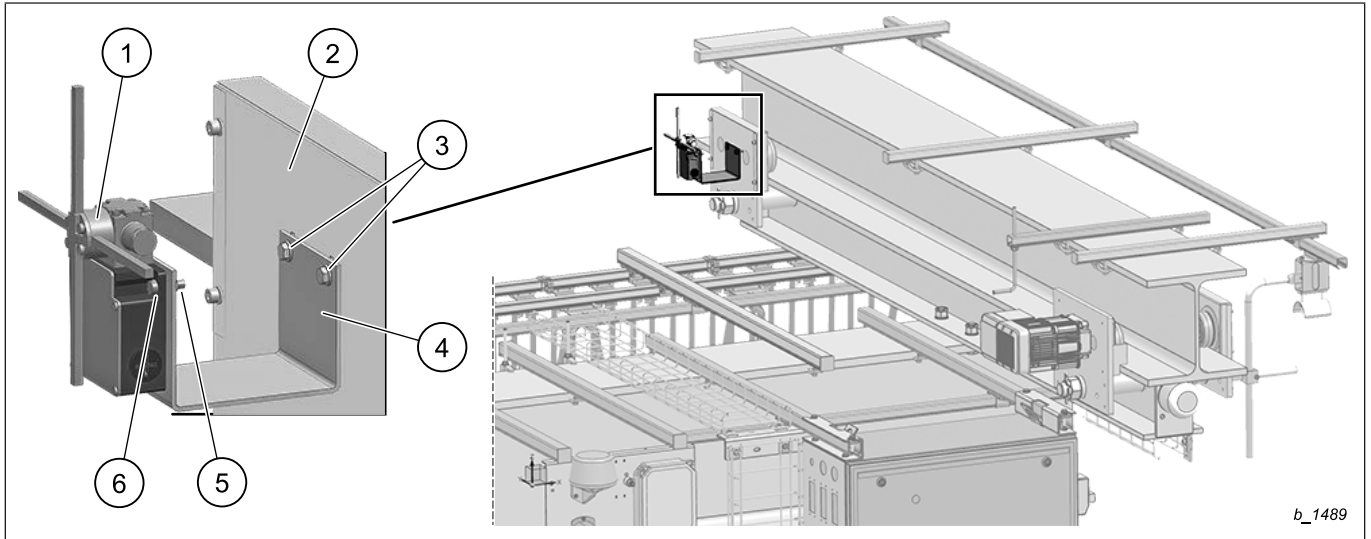
1. Ensure that the arrow mark on the travel limit switch (1) corresponds to the neutral position "0" if the switch is located between the two "Z" positions (fast-slow changeover).

Electrical connection

1. Lay the cable in the direction of the crane control.
2. Connect the cable or plug to the crane control unit.

5 Assembly

5.11.5 Assembling travel limit switch (suspension crane)

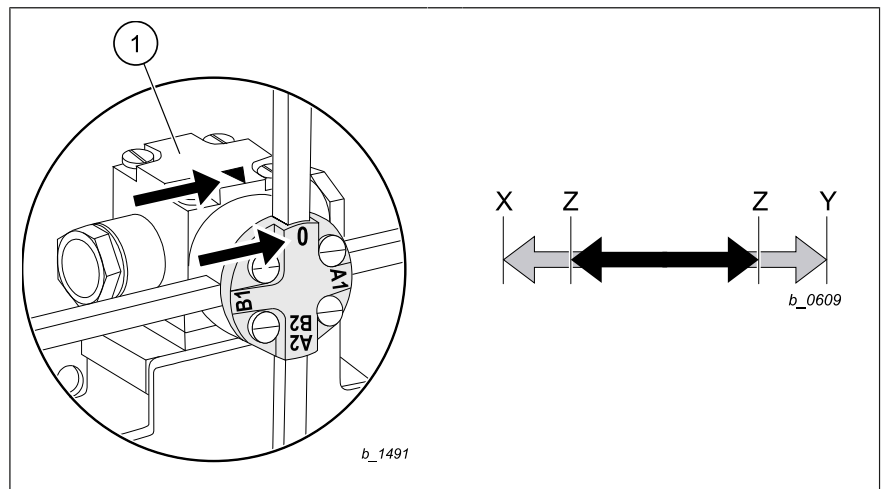


- (1) Travel limit switch
- (2) Trolley side cheek
- (3) VERBUS RIPP screw

- (4) Mounting bracket
- (5) Nut
- (6) Screw

1. Attach the mounting bracket (4) to the trolley side cheek (2) using the VERBUS RIPP screws (3).
2. Mount the travel limit switch (1) to the mounting bracket (4) with screws (6) and nuts (5).
3. Tighten the nuts (3) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Check the position of the switching cross



Switching function	
X, Y	Limit stop in both travel directions
Z	Pre-switching (fast-slow changeover)

1. Ensure that the arrow mark on the travel limit switch (1) corresponds to the neutral position "0" if the switch is located between the two "Z" positions (fast-slow changeover).

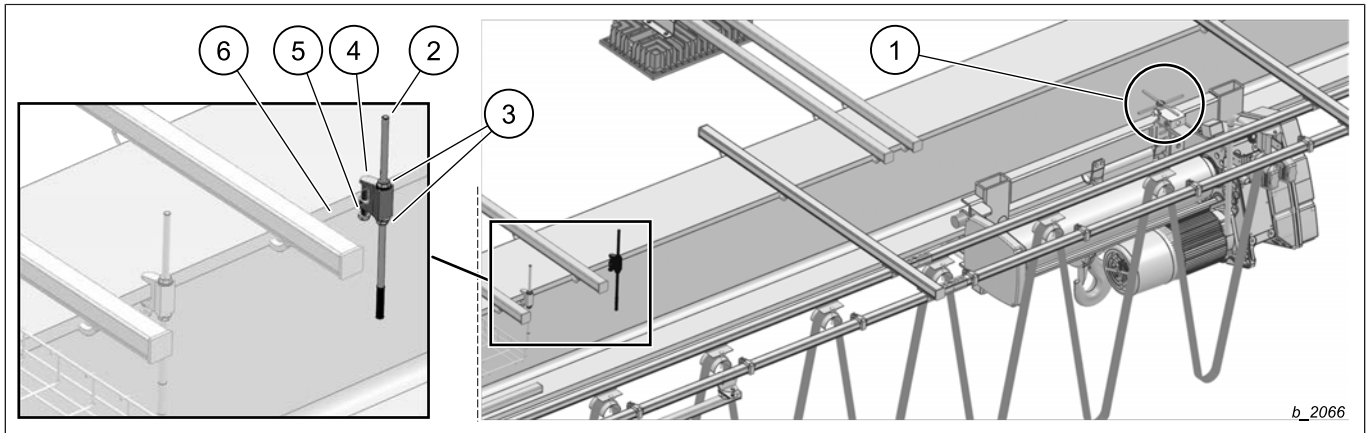
5 Assembly

Electrical connection

1. Lay the cable in the direction of the crane control.
2. Connect the cable or plug to the crane control unit.

5.12 Mounting the actuators

5.12.1 Mounting the actuator (monorail trolley)



- (1) Travel limit switch
- (2) Actuator
- (3) VERBUS RIPP nut

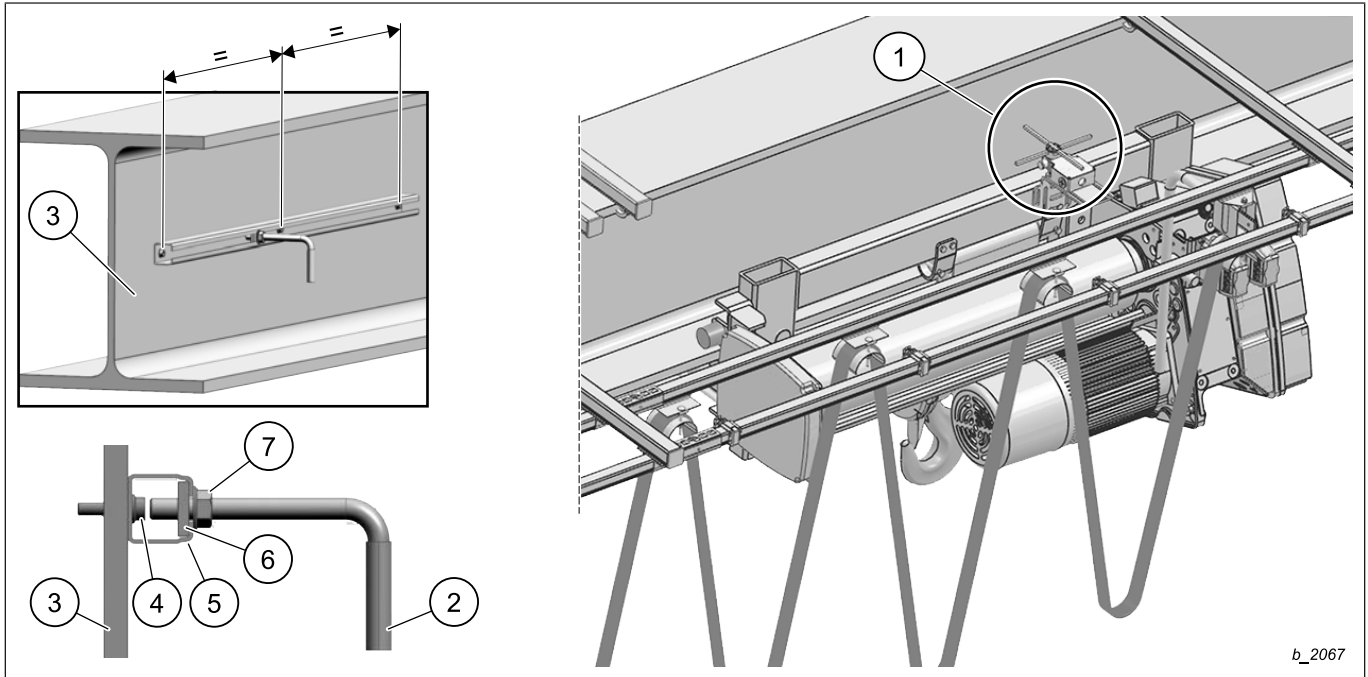
- (4) Clamping part
- (5) Bolted connection (tightening torque 8 Nm)
- (6) Top flange

i The actuator (2) must be positioned so that the travel limit switch (1) is activated before the trolley reaches the end stops at the end of the crane bridge.

1. Align the height of the actuator (2) with the travel limit switch (1) so that it is actuated correctly.
2. Open the VERBUS RIPP nuts (3) and fix the actuator (2) in the correct position.
3. Attach the clamping part (4) to the top flange (6) with the bolted connection (5).
4. Tighten the bolted connection (5) to the prescribed tightening torque **8 Nm**.
5. Tighten the VERBUS RIPP nuts (3) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections"*, page 79.

5 Assembly

5.12.2 Mounting the actuator – option, for high main girder (monorail trolley)



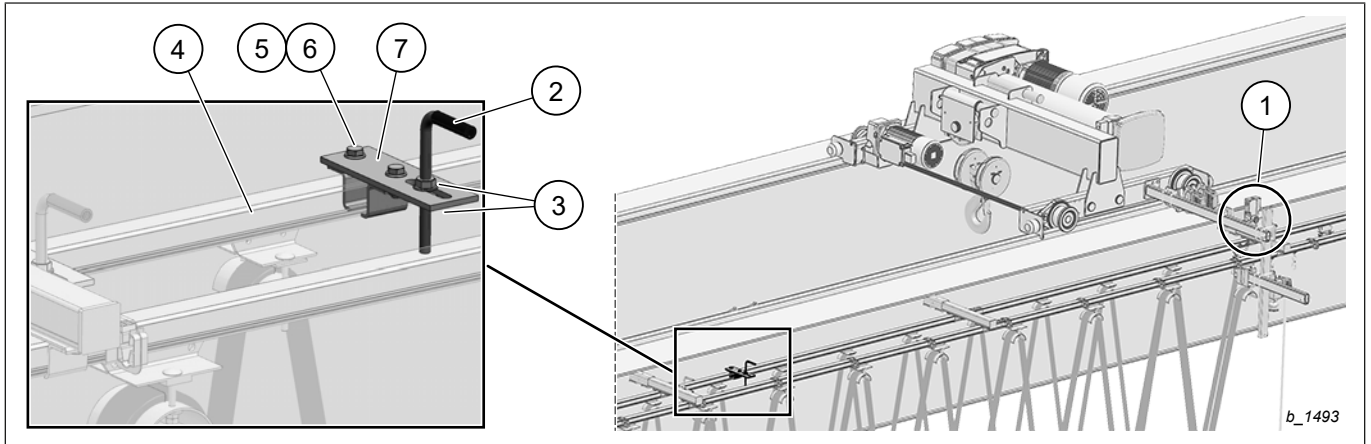
- | | |
|-------------------------|---------------------|
| (1) Travel limit switch | (5) C-rail |
| (2) Actuator | (6) Square nut |
| (3) Girder bar | (7) VERBUS RIPP nut |
| (4) Screw | |

i The actuator (2) must be positioned so that the travel limit switch (1) is activated before the trolley reaches the end stops at the end of the crane bridge.

1. On the girder bar (3), identify the positions for the threaded holes for attachment of the C-rail (5) using the travel limit switch (1) located on the hoist.
2. Pre-drill three boreholes (core hole diameter 5.2 mm) in the girder bar (3) and cut three M6 threads.
3. Use the square nut (6) and the VERBUS RIPP nuts (7) to attach the actuator (2) to the C-rail (5).
4. Fix the C-rail (5) with the three screws (4) supplied.
5. If necessary, readjust the positions of the travel limit switch and the actuator as follows:
 - The height position of the travel limit switch (1) via the slotted holes of the travel limit switch (1).
 - The horizontal position of the actuator (2) in the travel direction via the C-rail (5).
6. Tighten the screws (4) and the VERBUS RIPP nuts (7) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

5 Assembly

5.12.3 Mounting the actuator (double girder trolley)



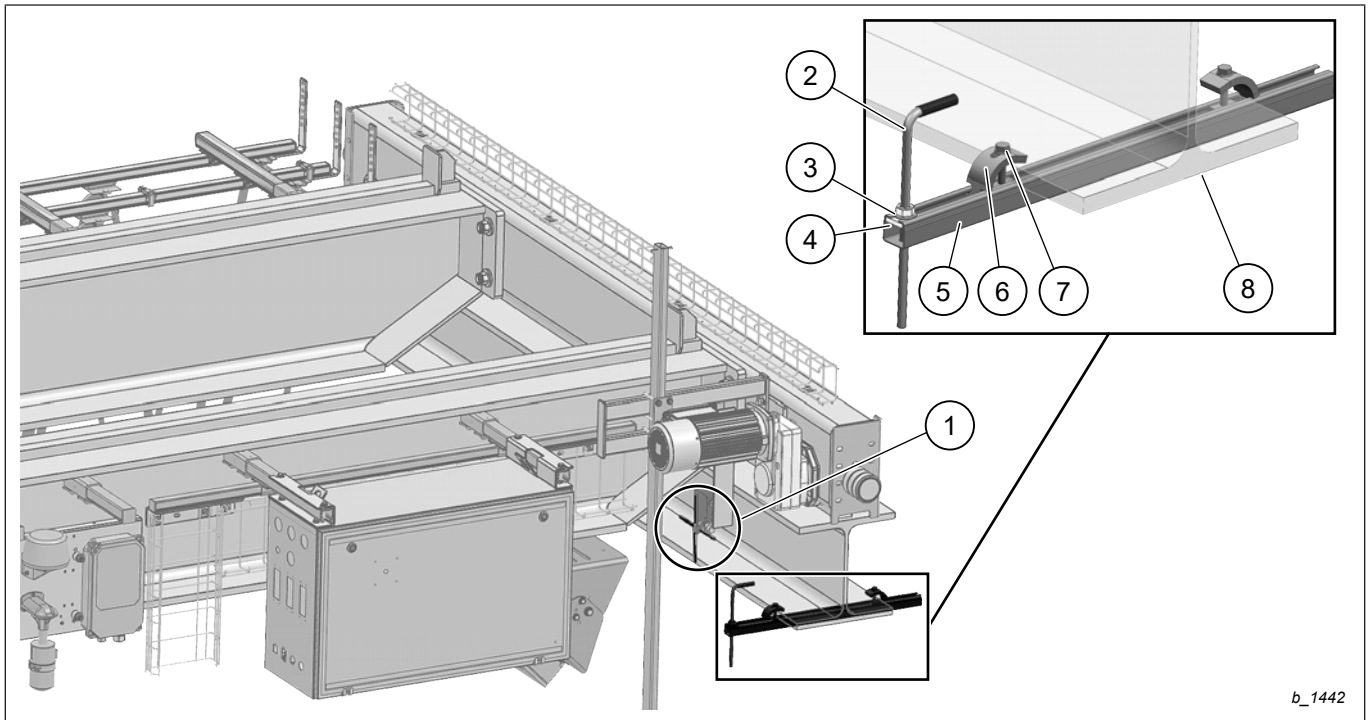
- | | |
|-------------------------|--------------------------|
| (1) Travel limit switch | (5) VERBUS RIPP screw |
| (2) Actuator | (6) VERBUS RIPP nut |
| (3) VERBUS RIPP nut | (7) Rail support bracket |
| (4) C-rail | |

i The actuator (2) must be positioned so that the travel limit switches (1) are activated before the trolley reaches the end stops at the end of the crane bridge.

1. Align the height of the actuator (2) with the travel limit switch (1) so that it is actuated correctly.
2. Attach the actuator (2) to the rail support bracket (7) with the VERBUS RIPP nuts (3).
3. Position the rail support bracket (7) on the C-rail (4) and fix with the VERBUS RIPP screws (5) and VERBUS RIPP nuts (6).
4. Tighten the VERBUS RIPP nuts (6) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

5 Assembly

5.12.4 Mounting the actuator (overhead travelling crane)



b_1442

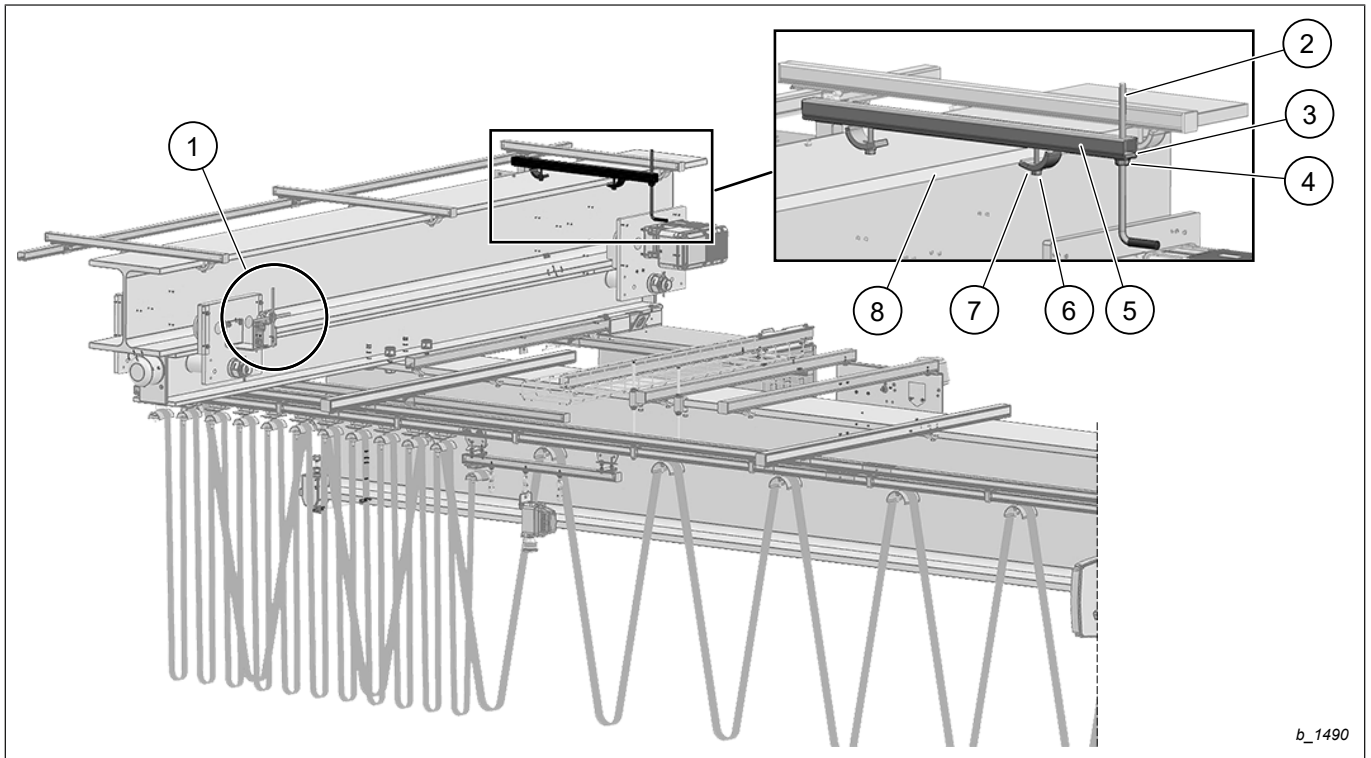
- | | |
|-------------------------|---|
| (1) Travel limit switch | (5) Fastening rail |
| (2) Actuator | (6) Clamping jaw |
| (3) Nut | (7) Bolted connection (tightening torque 14 Nm) |
| (4) Square nut | (8) Bottom flange |

i The actuator (2) must be positioned so that the travel limit switches (1) are actuated before the crane reaches the end stops at the end of the crane runway.

1. Align the height of the actuator (2) with the travel limit switch (1) so that it is actuated correctly.
2. Attach the actuator (2) with the square nut (4) and the nut (3) to the fastening rail (5).
3. Tighten the nuts (3) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.
4. Position the fastening rail (5) on the bottom flange (8) and align them straight.
5. Tighten the bolted connections (7) on the clamping jaws (6) to the prescribed tightening torque of **14 Nm**.

5 Assembly

5.12.5 Mounting the actuator (suspension crane)



- | | |
|-------------------------|---|
| (1) Travel limit switch | (5) Fastening rail |
| (2) Actuator | (6) Clamping jaw |
| (3) Square nut | (7) Bolted connection (tightening torque 14 Nm) |
| (4) Nut | (8) Top flange |

i The actuator (2) must be positioned so that the travel limit switch (1) is actuated before the crane reaches the end stops at the end of the crane runway.

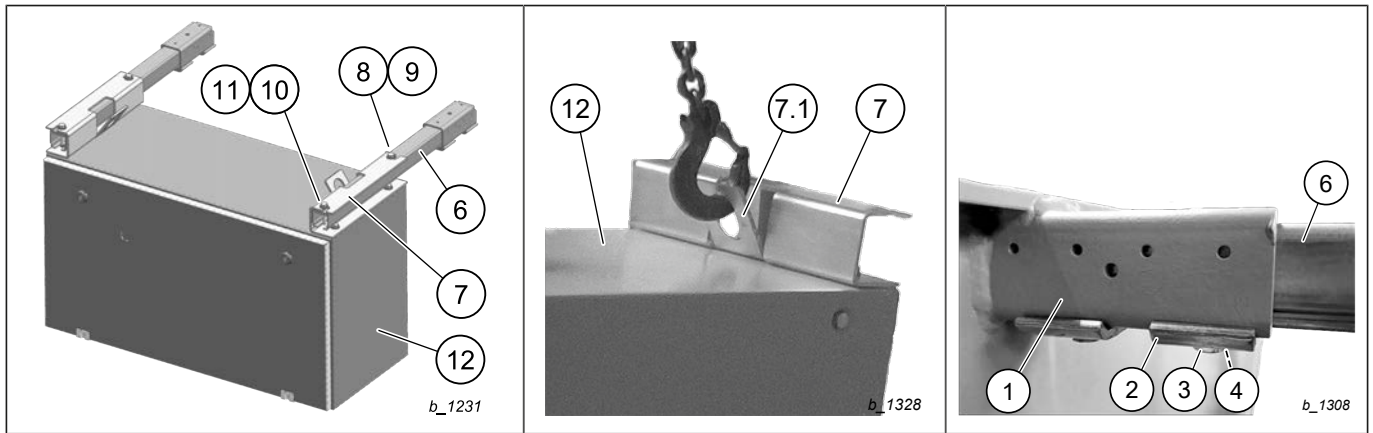
1. Align the height of the actuator (2) with the travel limit switch (1) so that it is actuated correctly.
2. Attach the actuator (2) with the square nut (8) and the nut (4) to the fastening rail (5).
3. Tighten the nuts (4) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.
4. Position the fastening rail (5) on the top flange (8) and align them straight.
5. Tighten the bolted connections (7) on the clamping jaws (6) to the prescribed tightening torque of **14 Nm**.

5.13 Mounting the panel box

5.13.1 Assembling the control box (welded version)

Follow the instructions for preparing the main girder for installation, see *chapter 4 "Preparing the main girder for installation", page 20*.

5 Assembly



- (1) Bracket for support arms
- (2) Clamping piece
- (3) Screw
- (4) Safety washer
- (6) Support arm
- (7) Angle plate

- (7.1) Transport lug
- (8) Screw
- (9) Square nut
- (10) Screw
- (11) Square nut
- (12) Panel box

i The folded sheets (7) are already attached to the panel box (12) in their delivery state.

Pre-assembly on the ground

Perform the following steps on both sides:

1. Insert the screw (8) into the support arm (6).
2. Insert the square nut (9) up to the screw (8).
3. Lift the screw (8) and position the square nut (9) under the screw (8).
4. Screw the screw (8) into the thread of the square nut (9) until the square nut (9) is pulled up.
5. Insert the support arm (6) into the angle plate (7) and fix it with the screw (8).
6. Insert the screws (10) and the square nuts (11).

Complete assembly

WARNING



If the panel box is lifted unsecured, it may fall.

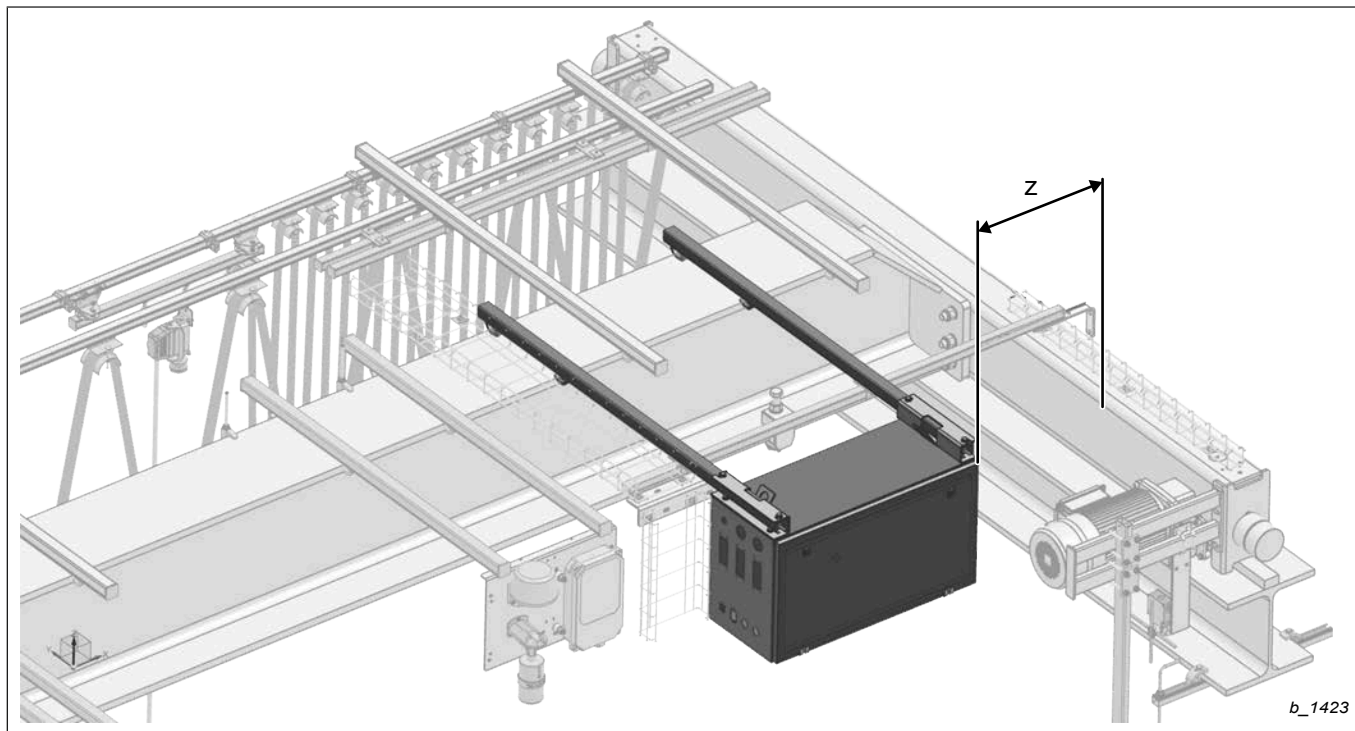
Material damage, injuries or death can result.

➤ Before lifting, secure the panel box against falling and tipping over.

1. Lift the panel box (12) by means of the transport lugs (7.1) and push the support arms (6) into the brackets for support arms (1).
2. Tighten the screws (3) by hand.
3. Tighten the screws (3), (8) and (10) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79.*

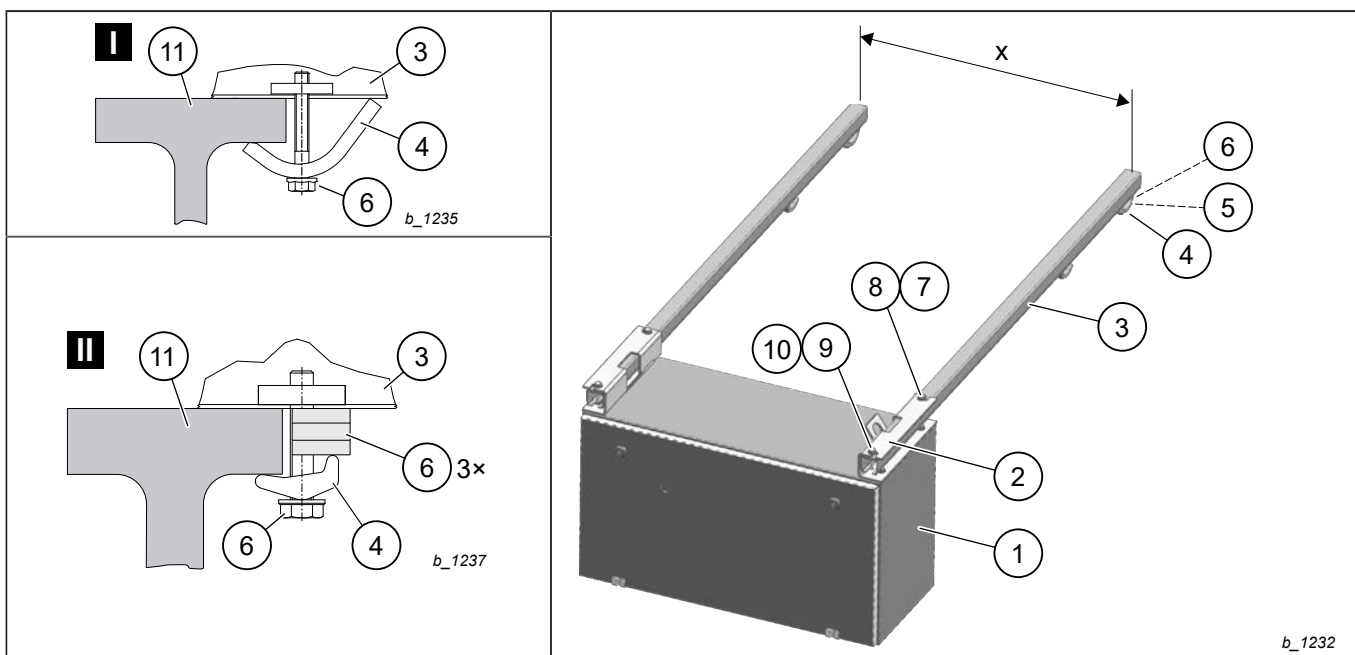
5 Assembly

5.13.2 Assembling the control box (clamped version)



b_1423

Given distance: $z \approx 700$ mm



b_1232

- (1) Panel box
- (2) Angle plate
- (3) Support arm
- (4) Clamping jaw
- (5) Bolted connection (tightening torque 14 Nm)
- (6) Clamping piece (only Version **II**)

- (7) Screw
- (8) Square nut
- (9) Screw
- (10) Square nut
- (11) Main girder

i The folded sheets (2) are already attached to the panel box (1) in their delivery state.

Panel box width	Distance 'x'	
	Support arm 40×40	Support arm 50×50
[mm]	[mm]	[mm]
700	655	645
800	755	745
1000	955	945

Pre-assembly on the ground

Perform the following steps on both sides.

1. Insert the screw (7) into the support arm (3).
2. Insert the square nut (8) up to the screw (7).
3. Lift the screw (7) and position the square nut (8) under the screw (7).
4. Screw the screw (7) into the thread of the square nut (8) until the square nut (8) is pulled up.
5. Insert the support arm (3) into the angle plate (2) and fix it with the screw (7).
6. Insert the screws (9) and the square nuts (10).
7. Fix the clamping jaws (4) to the support arms (3).

Complete the mounting

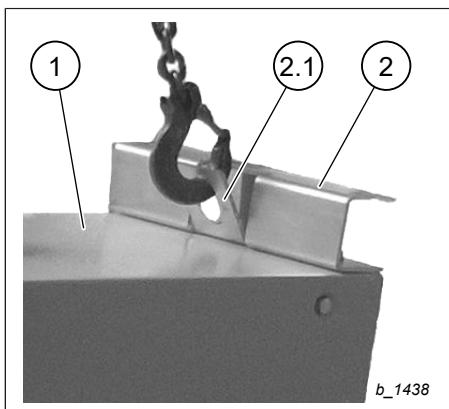
⚠ WARNING



If the panel box is lifted unsecured, it may fall.

Material damage, injuries or death can result.

- Before lifting, secure the panel box against falling and tipping over.



1. Lift the panel box (1) by means of the transport lugs (2.1) and position the support arms (3) on the main girder. Keep to the given distances 'z' and 'x'.
2. Position the clamping claws (4) on the main girder.
Version **II**: If necessary, use the supplied shims (6).
3. Tighten the bolted connections (6) on the clamping jaws (4) to the prescribed tightening torque of **14 Nm**.
4. Tighten the screws (7) and (9) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

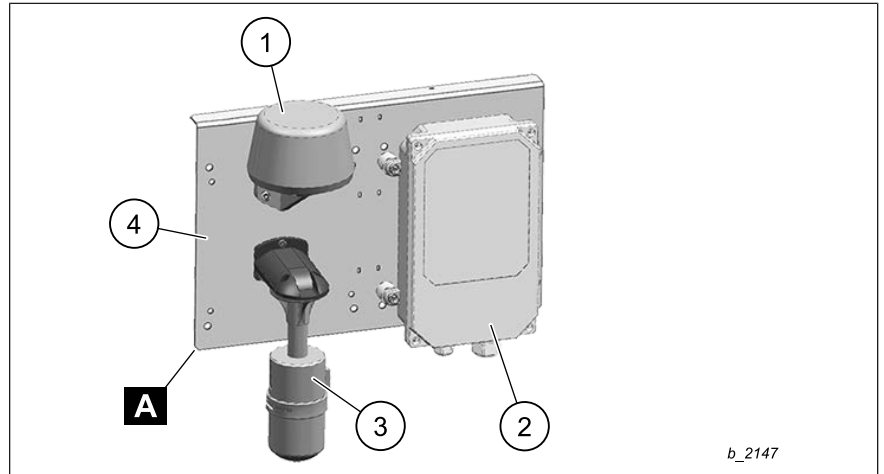
- (1) Angle plate
(1.1) Transport lug
(2) Panel box

5 Assembly

5.14 Pre-assembling the horn, signal light, radio receiver



Observe the information in the supplied instructions for the horn, signal light and radio receiver components.



- | | |
|--------------------|------------------|
| (1) Horn | (3) Signal light |
| (2) Radio receiver | (4) Fixing plate |

Assembly **A**:

1. Fix the horn (1), the radio receiver (2) or the signal light (4) to the fixing plate (4).
2. Tighten the bolted connections of the components to the prescribed tightening torque, see the instructions from the component manufacturer supplied.

5.15 Mounting the horn, signal light, radio receiver

WARNING



If the assemblies are lifted unsecured, they may fall.

Material damage, injuries or death can result.

- Before lifting, secure the pre-assembled assemblies against falling and tipping over.

5.15.1 Mounting the horn, signal light, radio receiver on the crane (welded version)

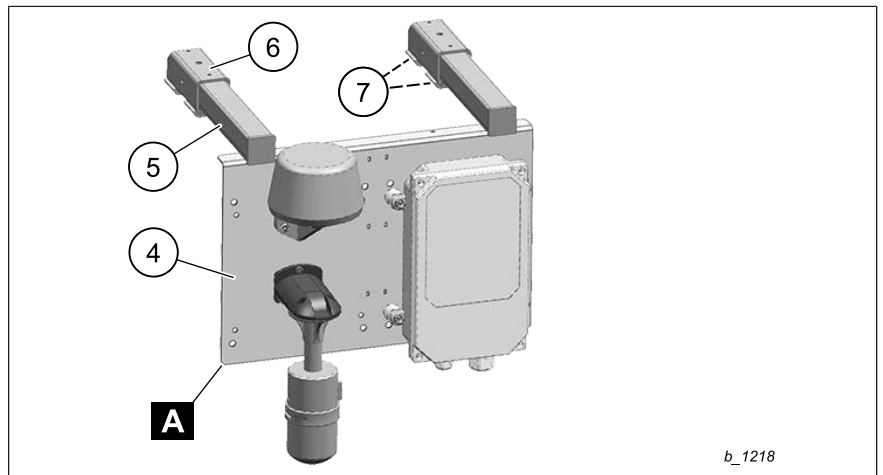
WARNING



If the assemblies are lifted unsecured, they may fall.

Material damage, injuries or death can result.

- Before lifting, secure the pre-assembled assemblies against falling and tipping over.



- | | |
|------------------|-----------------------------|
| (4) Fixing plate | (6) Bracket for support arm |
| (5) Support arm | (7) Bolts |

Assembly **A**

1. Push the support arms (5) into the brackets for support arms (6) and fix with the screws (7).
2. Tighten the screws (7) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Perform electrical installation

1. Perform electrical installation in accordance with the specifications in the circuit diagram and the instructions supplied.

5.15.2 Mounting horn, signal light, radio receiver on the crane (clamped version)

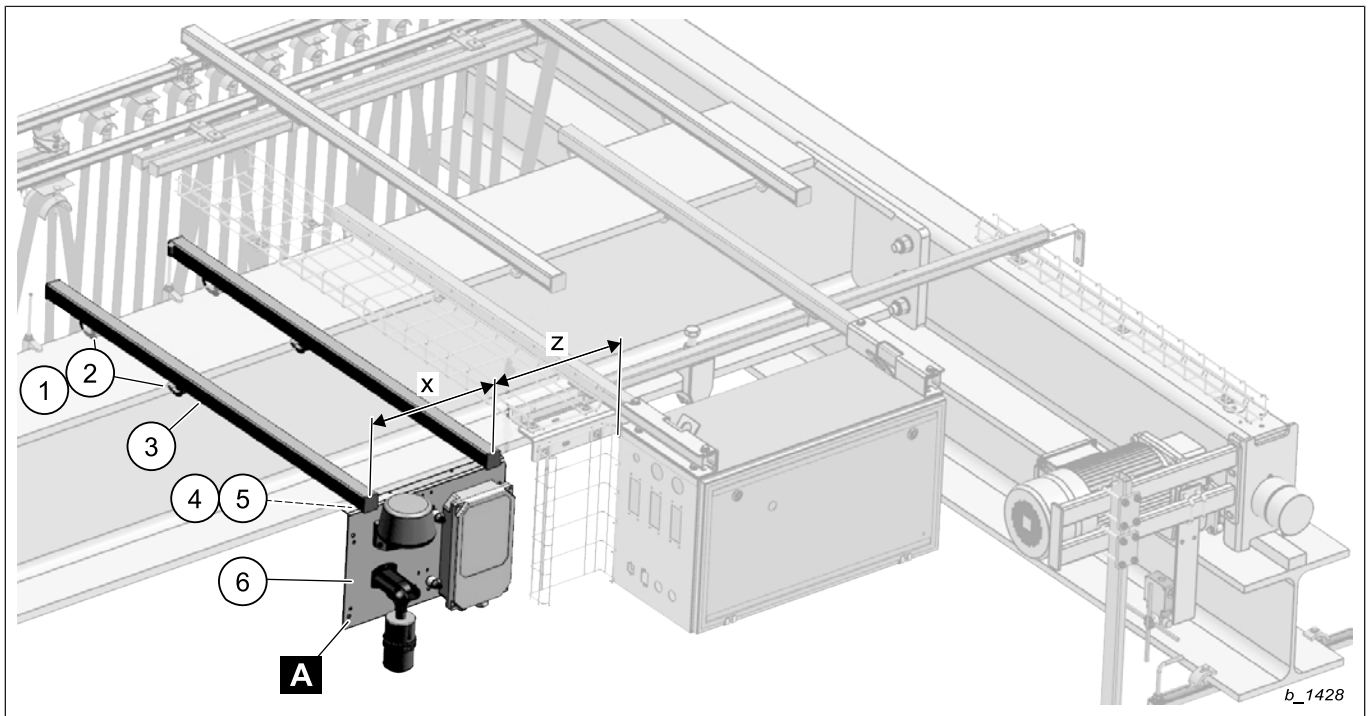
WARNING



If the assemblies are lifted unsecured, they may fall.
Material damage, injuries or death can result.

- Before lifting, secure the pre-assembled assemblies against falling and tipping over.

5 Assembly



- | | |
|-----------------------|-----------------------|
| (1) Clamping jaw | (4) Square nut |
| (2) Bolted connection | (5) VERBUS RIPP screw |
| (3) Support arm | (6) Fixing plate |

Distance	
x	z
[mm]	[mm]
350	320

Assembly **A**

1. Keep to the given distances "z" and "x".
2. Position the support arms (3) on the main girder, align so that they are straight and tighten the bolted connections (2) on the clamping jaws (1).
3. Secure assembly **A** against falling and tipping over, lift it and bring it into the correct position.
4. Use the square nuts (4) and VERBUS RIPP screws (5) to fix the fixing plate (6) to the main girder.
5. Tighten the VERBUS RIPP screws (5) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Electrical installation

1. Perform electrical installation in accordance with the specifications in the circuit diagram and the instructions supplied.

5.16 Assembling wire mesh cable trays to main girder

The wire mesh cable trays that are included in the scope of delivery must be attached on-site, see chapter 6 "Electrical installation", page 57.

6 Electrical installation

6 Electrical installation

6.1 Electrical equipment

The power supply line, main fuses and devices for disconnecting and switching the electrical supply must be present at the installation site.

6.1.1 Crane-supply-switch

A crane-supply-switch with emergency switching off or emergency stop function must be installed in a readily accessible place near the product.

The crane-supply-switch must be equipped with a padlock or key switch in accordance with DIN EN 60204-32.

6.1.2 Main fuses

NEOZED, DIAZED or NH fuses of utilization category gG may be present on-site. The fuse values must be observed so that no welding occurs at the crane switch contactor contacts in the event of a short-circuit, and for short circuit protection of the connection cable.



Observe the specifications for the values of the fuses in the circuit diagram supplied.

6.1.3 Protective devices

The protective devices included in the scope of delivery must not be removed, bypassed or replaced. Protective devices include:

- Overcurrent protective devices (fuses, circuit breakers)
- Motor-protective circuit-breakers
- Overload protections
- Thermal protection devices
- Limit switches
- Operational limit switches
- Emergency limit switches
- Spacers

6.2 Performing electrical installation

⚠ DANGER



Danger due to improper electrical installation.

Injuries or death can result.



- Ensure that a competent person (qualified electrician) carries out electrical installation.
- Before starting work, disconnect the machinery from the power supply and secure it against an unintentional restart.
- Keep the national and local safety and accident prevention regulations, the occupational safety acts and environmental provisions.
- Use a lifting platform for work that cannot be carried out from the ground. Use a safety harness when performing any work outside of lifting platforms.
- Wear the prescribed personal protective equipment.
- Secure the danger zone.
- Keep a sufficient safety distance from the product.
- Observe the specifications in the circuit diagram provided.
- Use only original mounting accessories from the manufacturer.
- Ensure that the connection cable's diameter matches the cable gland's nominal diameter.
- If the connection cable is mobile, use a cable gland with strain relief.
- Tighten the connection thread and the cap nut to the cable glands with the prescribed tightening torque, see manufacturer's information on the cable glands.
- Install the lines such that they cannot be pinched, kinked or chafed during operation.
- Ensure that the conductor insulation runs right to the terminals when stripping (observe the specifications of the terminal manufacturer for the stripping length).
- Avoid damaging the conductor when stripping the insulation.
- Tighten bolted connections to the prescribed tightening torques with a torque wrench.

NOTICE

Danger of material damage.

- Make sure that the mains voltage/mains frequency or the electrical output values of the upstream devices match the connection values of the product.
- Ensure that no foreign objects, dirt or moisture are present inside the enclosures.

6 Electrical installation

6.2.1 Clamping points

WARNING



Fire hazard due to faulty electrical connections.

Material damage, injuries or death can result.



- Observe the technical specifications of the terminals, e.g. nominal voltage, nominal current, types of conductors and cross-sections that can be used, as well as the specifications for the stripping length.
- Ensure that the conductors are connected in the clamping points with strain and pressure relief.
- Tighten the screws on the terminals with the prescribed tightening torque of the terminal manufacturer.

Connections between conductors and between conductors and connection points must ensure permanent current transmission, adequate strength and sufficient protection.

Loose connections are potential sources of error; terminals can be destroyed by connections that are too tight. In both cases, this can lead to a total failure of the connections or to a fire.

6.2.2 Panel box



See the specifications in the circuit diagram and in the enclosed instructions.

6.2.3 Protective conductor

DANGER



Risk of electric shock if the protective conductor is not connected.

Injuries or death can result.

- Connect the external protective earthing system (PE) close to the terminals of the phase conductor using a protective conductor for each mains connection.

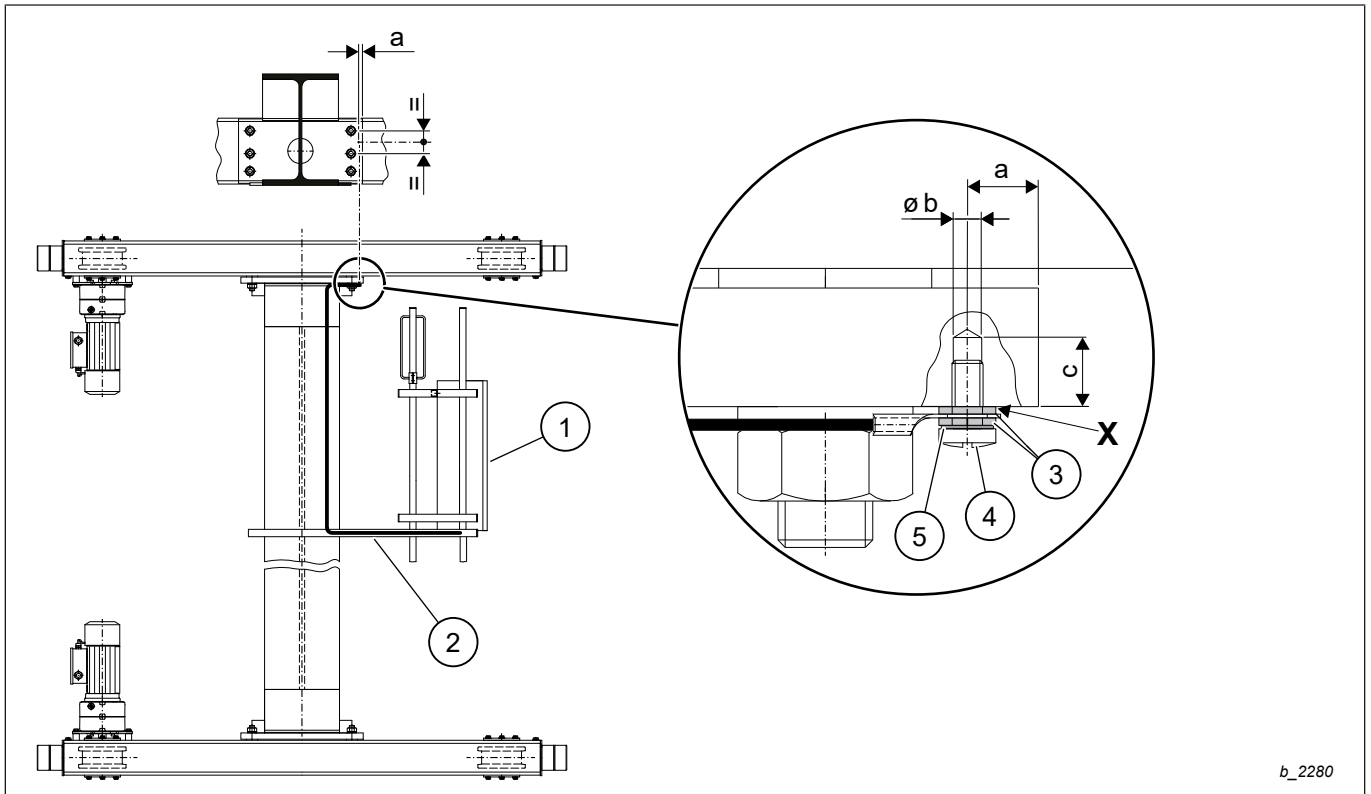
Without a protective conductor connection, malfunctions can arise during operation. The protective conductor connection facilitates protective equipotential bonding for protection against electric shocks, as well as function equipotential bonding for the avoidance of electrical interference effects on electronic systems.

6.2.4 Crane control equipotential bonding - steel structure



The equipotential bonding must be permanently effective. The connections to the equipotential bonding must be secured against loosening.

Single girder overhead travelling crane (version 1)



b_2280

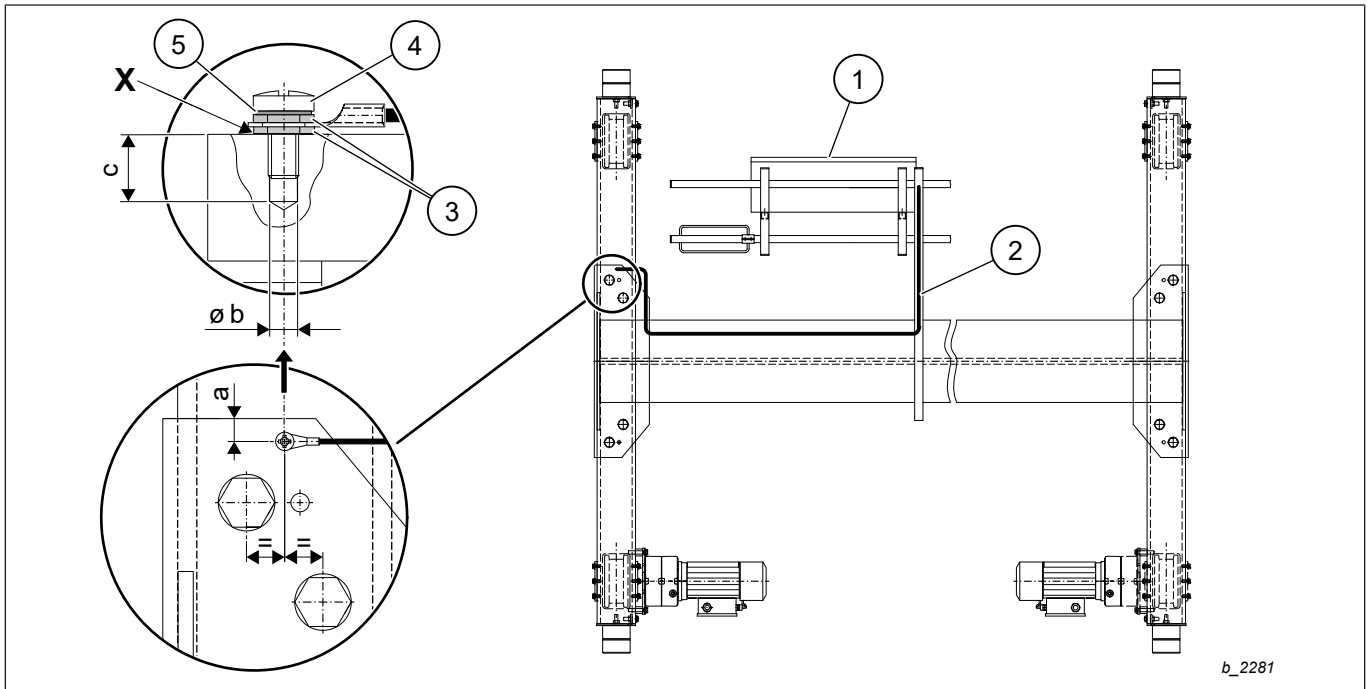
- (1) Crane control
- (2) Equipotential bonding conductor
- (3) 2× Washer
- (4) Thread-rolling screw, DIN 7500
- (5) Serrated washer

a	ø b	c
[mm]	[mm]	[mm]
15	5.5	≈ 12

1. Ensure that the contact surface “X” is free of oil, paint, rust, dust and other impurities.
2. Mark the position of the boreholes “ø b”, see specifications in the drawing and table above.
3. Drill the borehole “ø b” at the marked location.
4. Fix the equipotential bonding conductor (2) in place with the washers, serrated washer (5) and the screw (4) in the order given.
5. Tighten the screw (4) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

6 Electrical installation

Single girder overhead travelling crane (version 2)



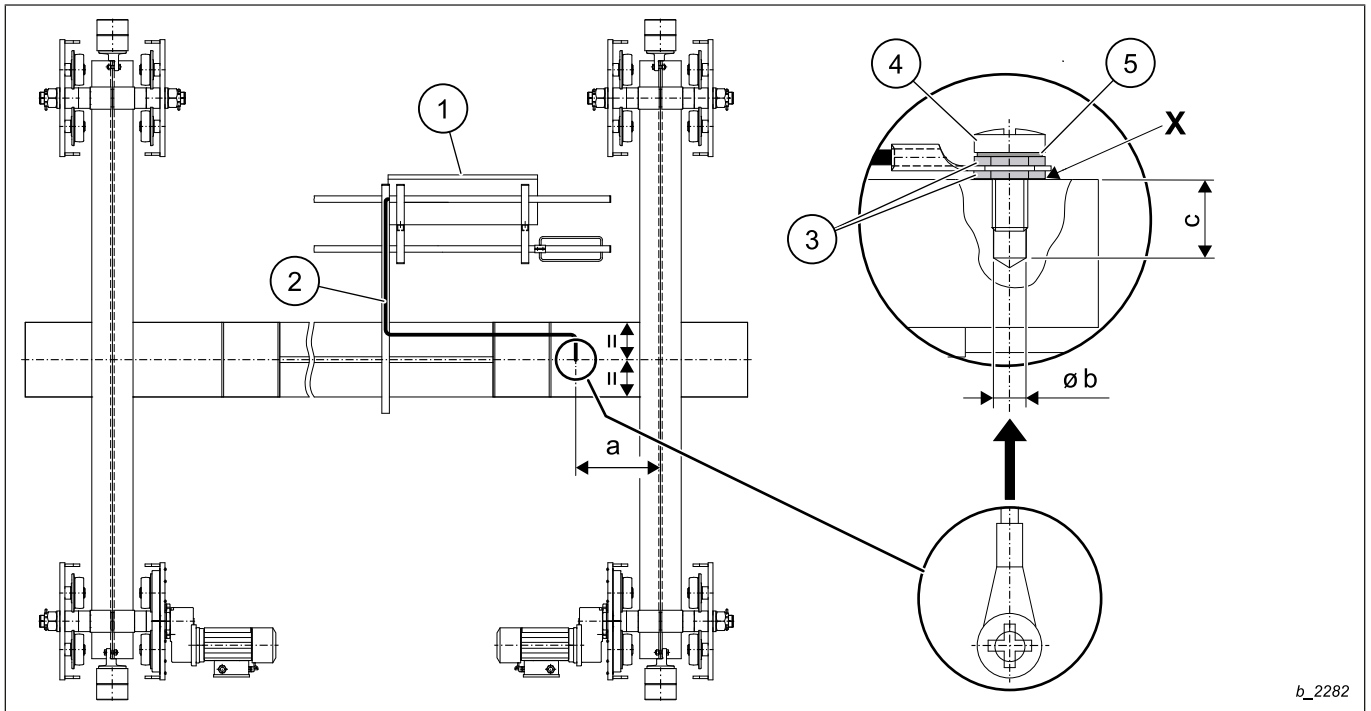
- (1) Crane control
- (2) Equipotential bonding conductor
- (3) 2× Washer

- (4) Thread-rolling screw, DIN 7500
- (5) Serrated washer

a	ø b	c
[mm]	[mm]	[mm]
15	5.5	≈ 12

1. Ensure that the contact surface "X" is free of oil, paint, rust, dust and other impurities.
2. Mark the position of the boreholes "ø b", see specifications in the drawing and table above.
3. Drill the borehole "ø b" at the marked location.
4. Fix the equipotential bonding conductor (2) in place with the washers, serrated washer (5) and the screw (4) in the order given.
5. Tighten the screw (4) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Single girder suspension crane



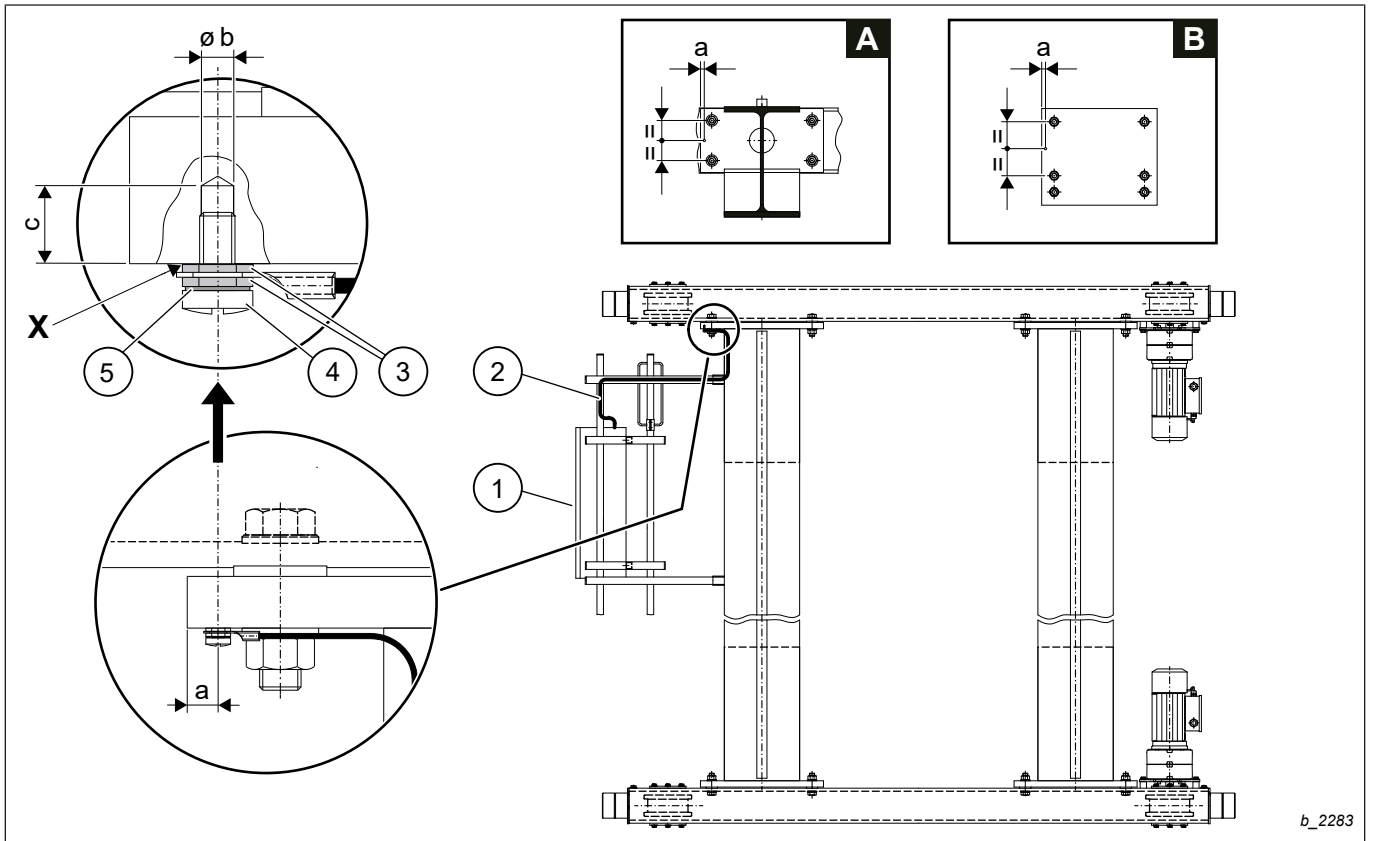
b_2282

- | | |
|-------------------------------------|------------------------------------|
| (1) Crane control | (4) Thread-rolling screw, DIN 7500 |
| (2) Equipotential bonding conductor | (5) Serrated washer |
| (3) 2× Washer | |

a	ø b	c
[mm]	[mm]	[mm]
340	5.5	≈ 12

1. Ensure that the contact surface "X" is free of oil, paint, rust, dust and other impurities.
2. Mark the position of the boreholes "ø b", see specifications in the drawing and table above.
3. Drill the borehole "ø b" at the marked location.
4. Fix the equipotential bonding conductor (2) in place with the washers, serrated washer (5) and the screw (4) in the order given.
5. Tighten the screw (4) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Double girder overhead travelling crane



- (1) Crane control
- (2) Equipotential bonding conductor
- (3) 2× Washer
- (4) Thread-rolling screw, DIN 7500
- (5) Serrated washer

A = Mounting plate example

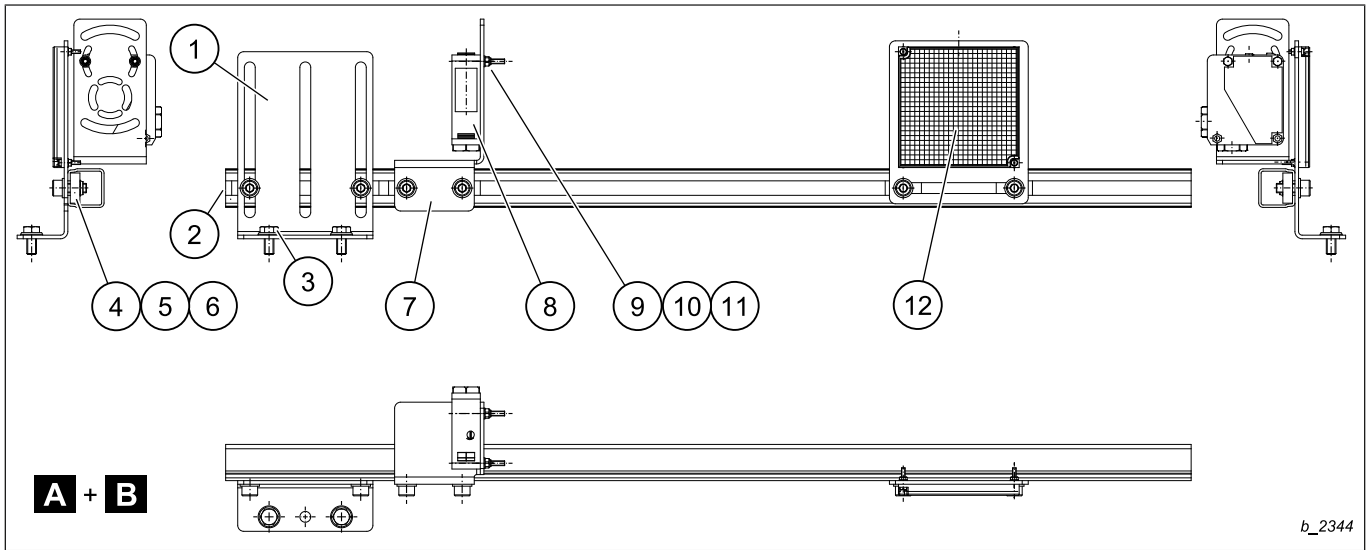
B = Mounting plate with additional boreholes example

	$\varnothing b$	c
[mm]	[mm]	[mm]
15	5.5	≈ 12

1. Ensure that the contact surface “X” is free of oil, paint, rust, dust and other impurities.
2. Mark the position of the boreholes “ $\varnothing b$ ”, see specifications in the drawing and table above.
3. Drill the borehole “ $\varnothing b$ ” at the marked location.
4. Fix the equipotential bonding conductor (2) in place with the washers, serrated washer (5) and the screw (4) in the order given.
5. Tighten the screw (4) to the prescribed tightening torque, see chapter 9 “Tightening torques for bolted connections”, page 79.

6 Electrical installation

6.2.5 Anti-collision device (overhead travelling crane)



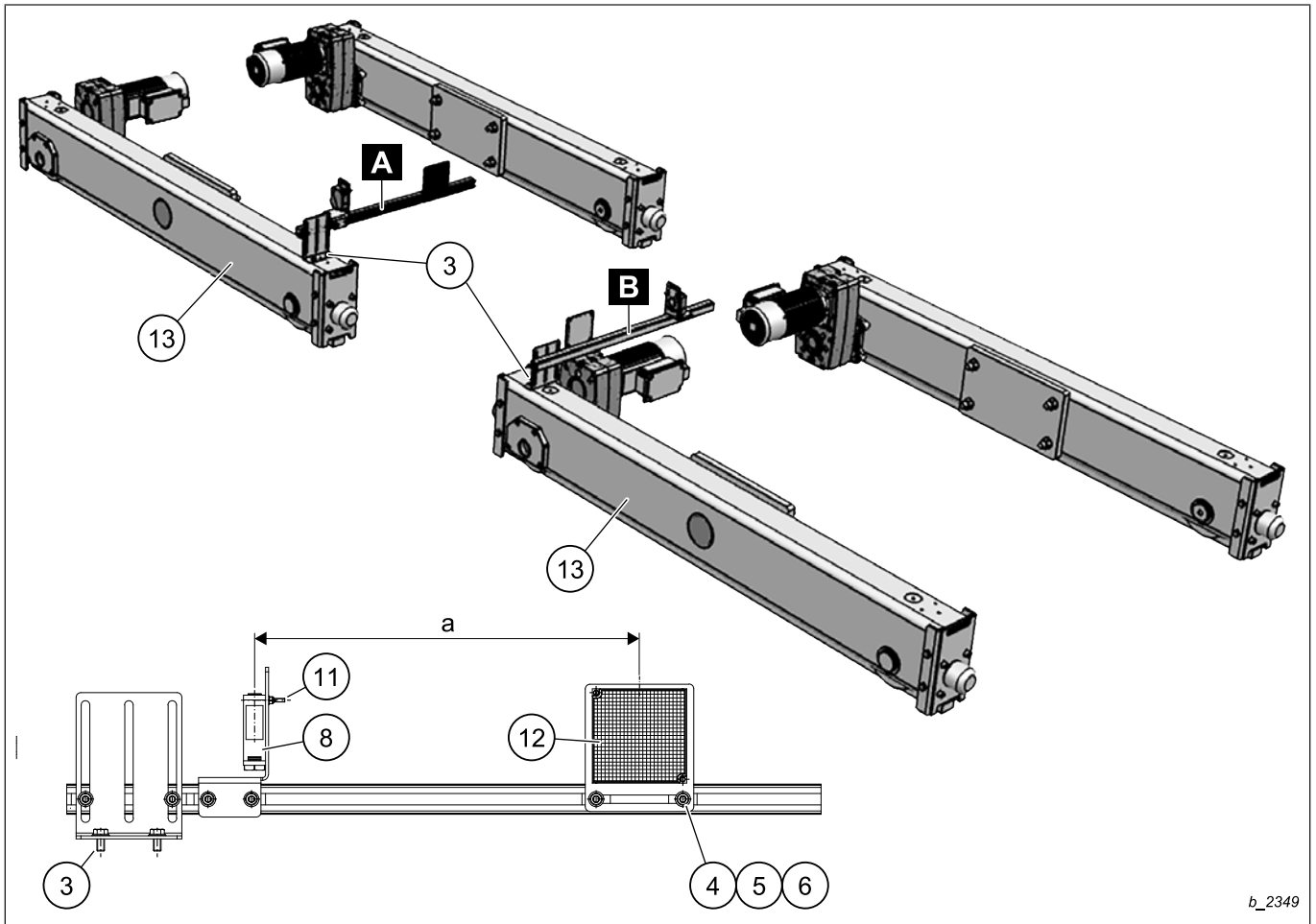
- | | |
|-----------------------|--|
| (1) Sheet | (7) Sheet |
| (2) C-rail | (8) Optoelectronic sensor WL280-2R4331 |
| (3) VERBUS RIPP screw | (9) Screw |
| (4) Screw | (10) Washer |
| (5) Washer | (11) Nut |
| (6) Square nut | (12) PL100 reflector |

The assembly **A** is to be mounted mirror-inverted to assembly **B**, see the following figure.

Premount assemblies **A** and **B** to the ground

1. Lightly fix the sensor (8) to the plate (7) with the screws (9), washers (10) and nuts (11).
2. Lightly fix the plate (7) with the pre-assembled sensor (8) to the C-rail (2) using the screws (4), safety washers (5) and square nuts (6).
3. Lightly fix the reflector (12) to the C-rail (2) with the screws (4), washers (5) and square nuts (6).
4. Lightly fix the plate (1) to the C-rail (2) with the screws (4), washers (5) and square nuts (6).

Complete the assembly



b_2349

- | | |
|-----------------------|--|
| (3) VERBUS RIPP screw | (8) Optoelectronic sensor WL280-2R4331 |
| (4) Screw | (11) Nut |
| (5) Washer | (12) PL100 reflector |
| (6) Square nut | (13) Endcarriage |

Attaching the assemblies to the endcarriages

1. Fix the two assemblies **A** and **B** to the endcarriages (13) with the VERBUS RIPP screws (3).
2. Tighten the VERBUS RIPP screws (3) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.
3. Position the sensor (8) and the reflector (12) so that the gap "a" = min. 400 mm is maintained.
4. Align the assembly **A** with assembly **B** vertically and horizontally so that the light barriers can be adjusted, see "Anti-collision device (overhead travelling crane)", page 66.
5. Tighten all screws (4) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Adjusting the light barrier



Observe the specifications in the enclosed instructions for the "SICK, WL280-2" light barrier.

The following steps must be carried out on both assemblies **A** and **B**.

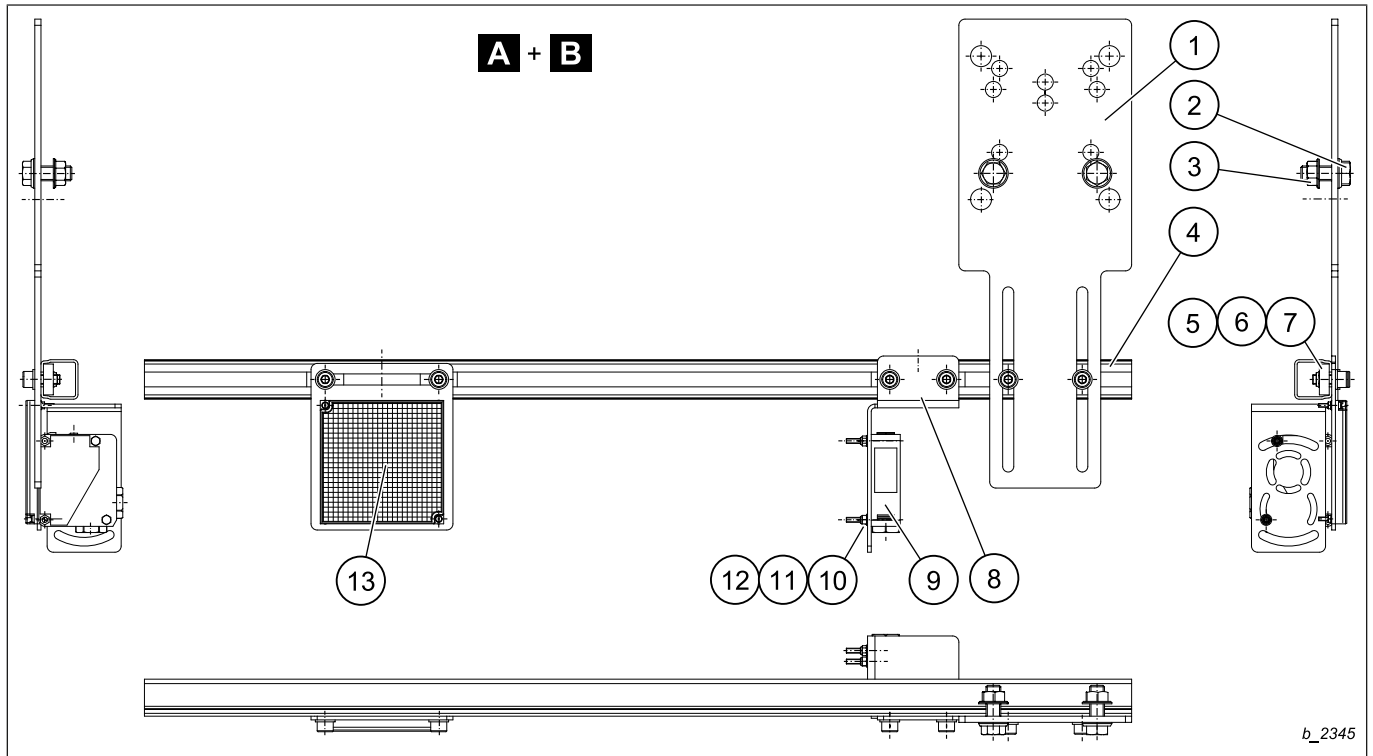
1. Apply the voltage.
2. Turn the sensor (8) to full intensity.
3. Position the crane at the required distance, i.e. switching point (quick/slow or stop).
4. Adjust the light barrier so that the light beam meets the lower edge of the reflector (12). To do this, loosen the nuts (11) and adjust the sensor (8).
5. Move the crane and adjust the sensor (8) so that the red dot remains on the reflector surface until the crane comes to a standstill.
6. Tighten the nuts (11) to the prescribed tightening torque, see *chapter 9 "Tightening torques for bolted connections", page 79*.

Cable routing

1. Execute the cable routing via the existing wire mesh cable tray or installation options.

6 Electrical installation

6.2.6 Anti-collision device (suspension crane)



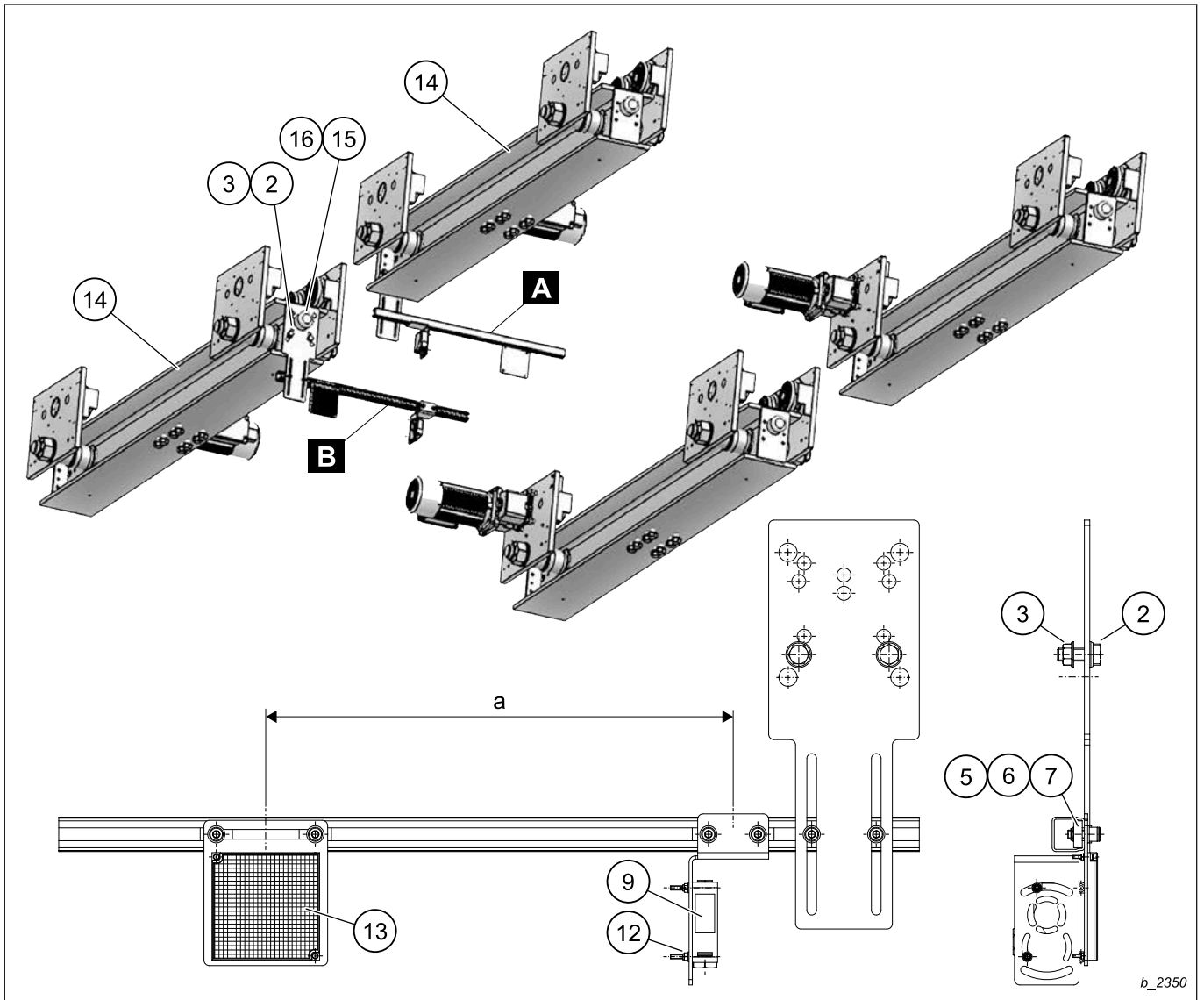
- | | |
|-----------------------|--|
| (1) Sheet | (8) Sheet |
| (2) VERBUS RIPP screw | (9) Optoelectronic sensor WL280-2R4331 |
| (3) VERBUS RIPP nut | (10) Screw |
| (4) C-rail | (11) Washer |
| (5) Screw | (12) Nut |
| (6) Washer | (13) PL100 reflector |
| (7) Square nut | |

The assembly **A** is to be mounted mirror-inverted to assembly **B**, see the following figure.

Premount assemblies **A** and **B** to the ground

1. Lightly fix the sensor (9) to the plate (8) with the screws (10), washers (11) and nuts (12).
2. Lightly fix the plate (8) with the pre-assembled sensor (9) to the C-rail (4) using the screws (5), safety washers (6) and square nuts (7).
3. Lightly fix the reflector (13) to the C-rail (4) with the screws (5), washers (6) and square nuts (7).
4. Lightly fix the plate (1) to the C-rail (4) with the screws (5), washers (6) and square nuts (7).

Complete the assembly



- | | |
|-----------------------|------------------|
| (2) VERBUS RIPP screw | (12) Nut |
| (3) VERBUS RIPP nut | (13) Reflector |
| (5) Screw | (14) Endcarriage |
| (6) Washer | (15) Buffer |
| (7) Square nut | (16) Nut |
| (9) Sensor | |

Attaching the assemblies to the endcarriages

1. Remove the buffer (15) and nut (16) and put aside for subsequent use.
2. Fix the two assemblies **A** and **B** to the endcarriages (14) with the VERBUS RIPP screws (2) and VERBUS RIPP nuts (3).
3. Tighten the VERBUS RIPP nuts (3) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.
4. Position the sensor (9) and the reflector (13) so that the gap "a" = min. 400 mm is maintained.

5. Align the assembly **A** with assembly **B** vertically and horizontally so that the light barriers can be adjusted, see "Anti-collision device (overhead travelling crane)", page 66.
6. Tighten all screws (5) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Adjusting the light barriers



Observe the specifications in the enclosed instructions for the "SICK, WL280-2" light barrier.

The following steps must be carried out on both assemblies **A** and **B**.

1. Apply the voltage.
2. Turn the sensor (9) to full intensity.
3. Position the crane at the required distance, i.e. switching point (quick/slow or stop).
4. Adjust the light barrier so that the light beam meets the lower edge of the reflector (13). To do this, loosen the nuts (3) and adjust the sensor (9).
5. Move the crane and adjust the sensor (9) so that the red dot remains on the reflector surface until the crane comes to a standstill.
6. Tighten the nuts (12) to the prescribed tightening torque, see chapter 9 "Tightening torques for bolted connections", page 79.

Assembling the buffer

1. Place the nut (16) on the end plate of the endcarriage (14) and hold it tight.
2. Turn the buffer (15) in and tighten to a tightening torque of **approx. 25 Nm**.

Cable routing

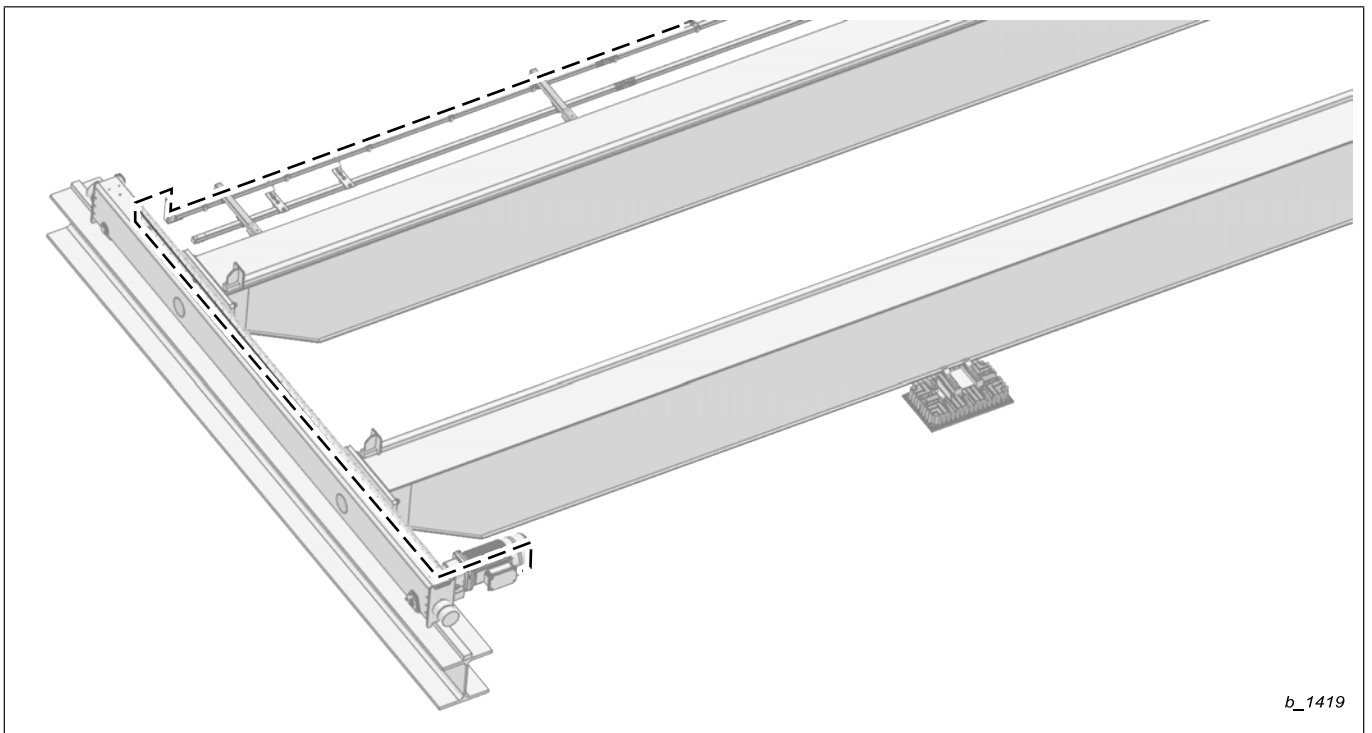
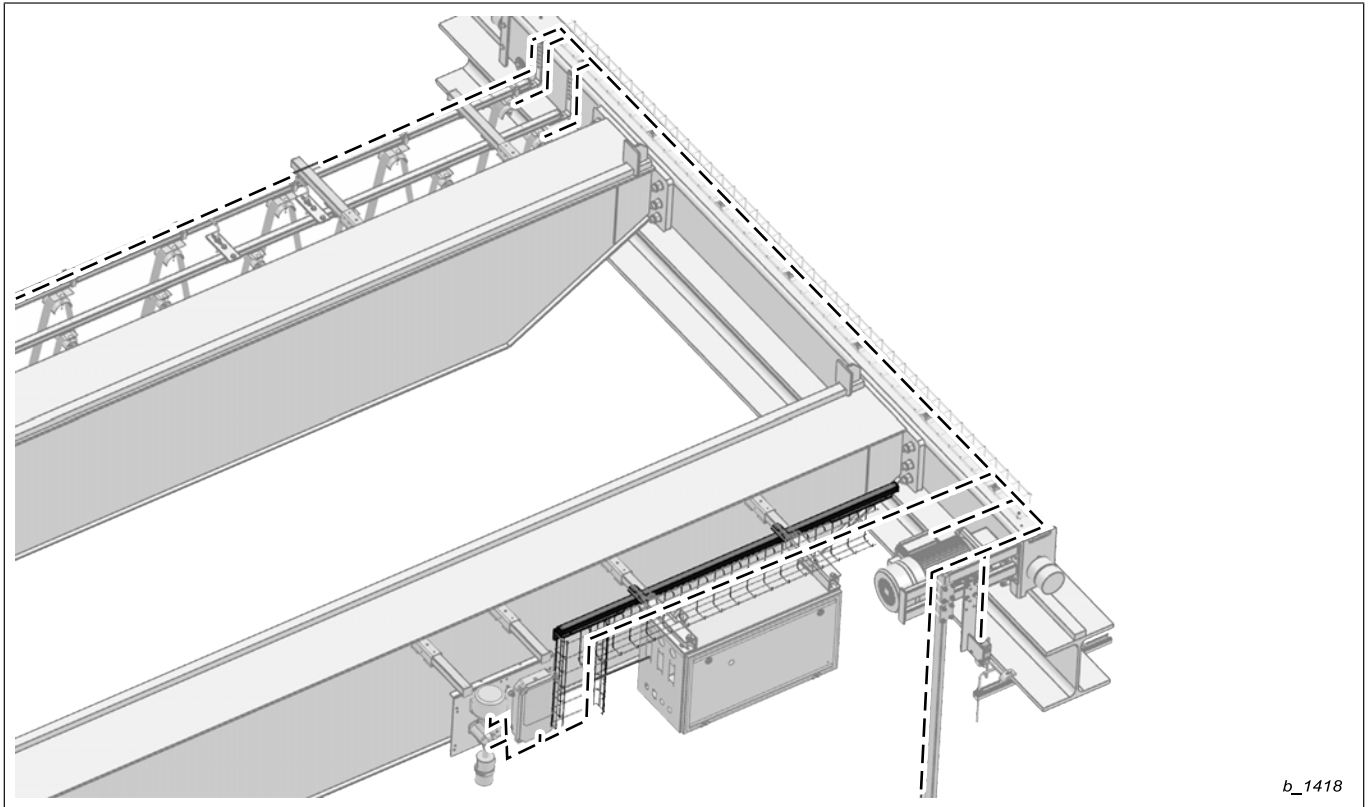
1. Execute the cable routing via the existing wire mesh cable tray or installation options.

6.2.7 Single girder overhead travelling crane with frequency-controlled hoist

- Observe the specifications, see chapter 6.2.12 "Single girder overhead travelling crane and suspension crane with frequency-controlled hoist", page 72.

6 Electrical installation

6.2.8 Wire mesh cable tray and cable routing (double girder overhead travelling crane)

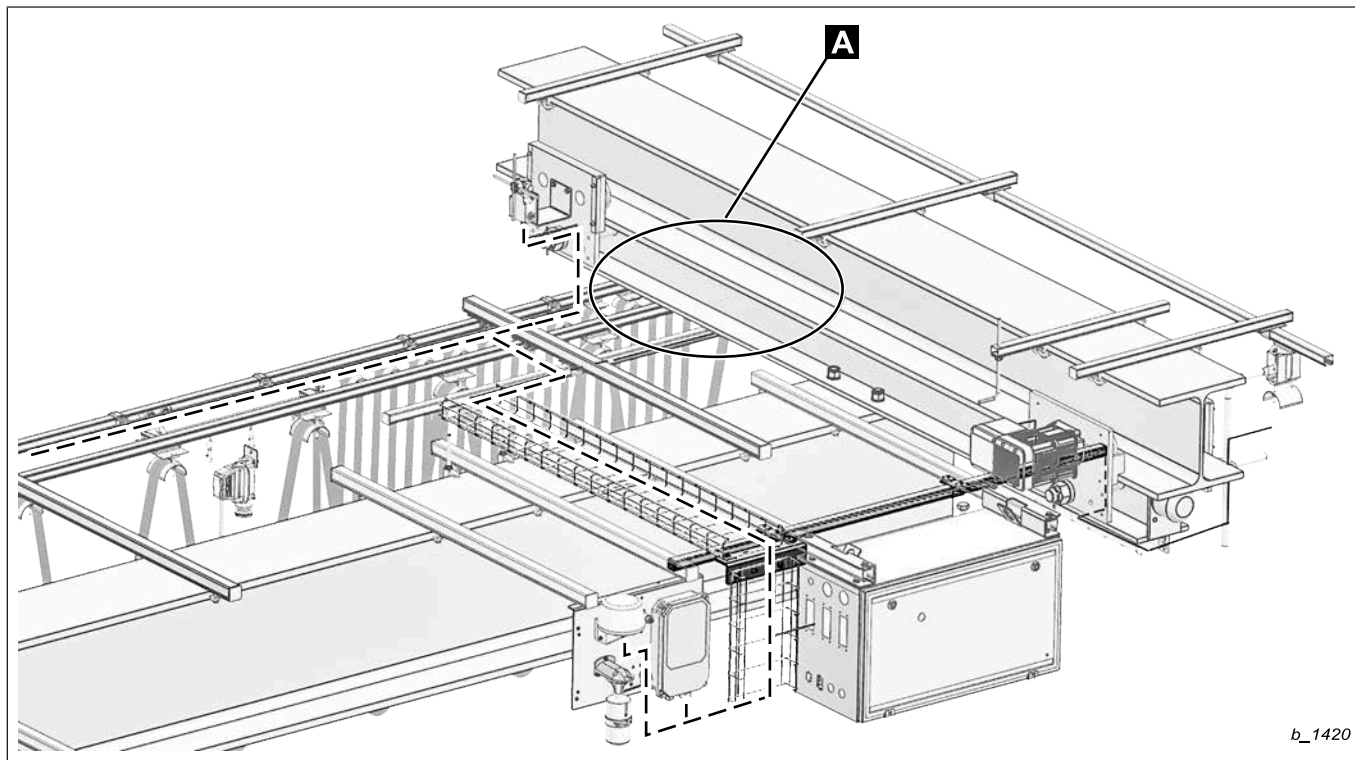


6.2.9 Double girder overhead travelling crane with frequency-controlled hoist

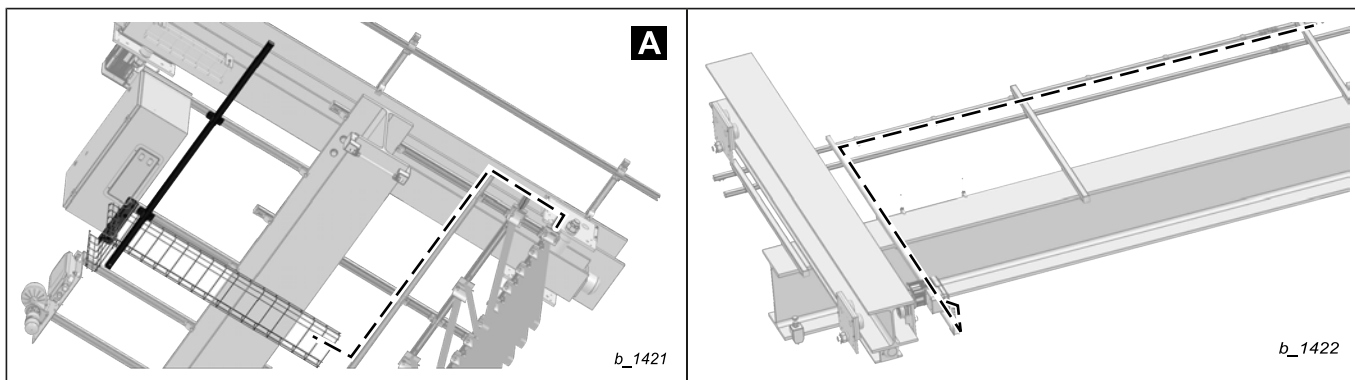
- ⚠ WARNING** Fire hazard due to heat generation of the braking resistor.
- Ensure that there are no flammable materials near the braking resistor.

6 Electrical installation

6.2.10 Wire mesh cable tray and cable routing (suspension crane)



----- For cable laying in area **A**, see the figure below.

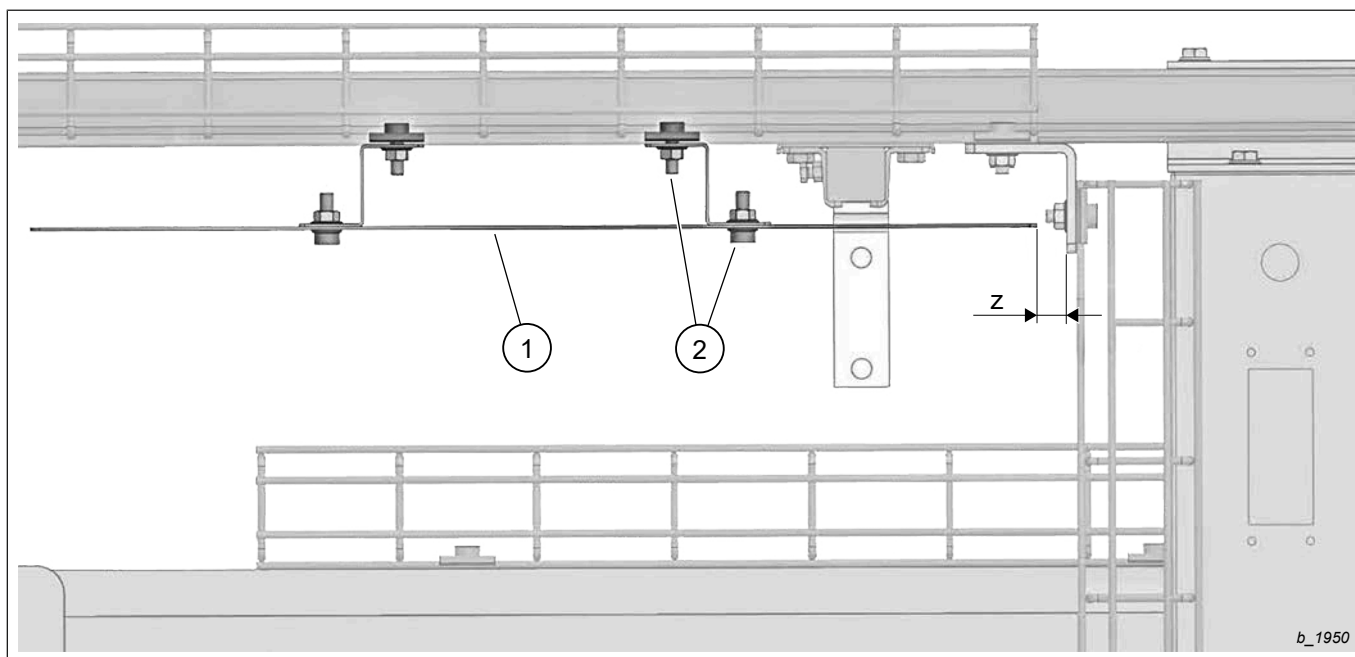
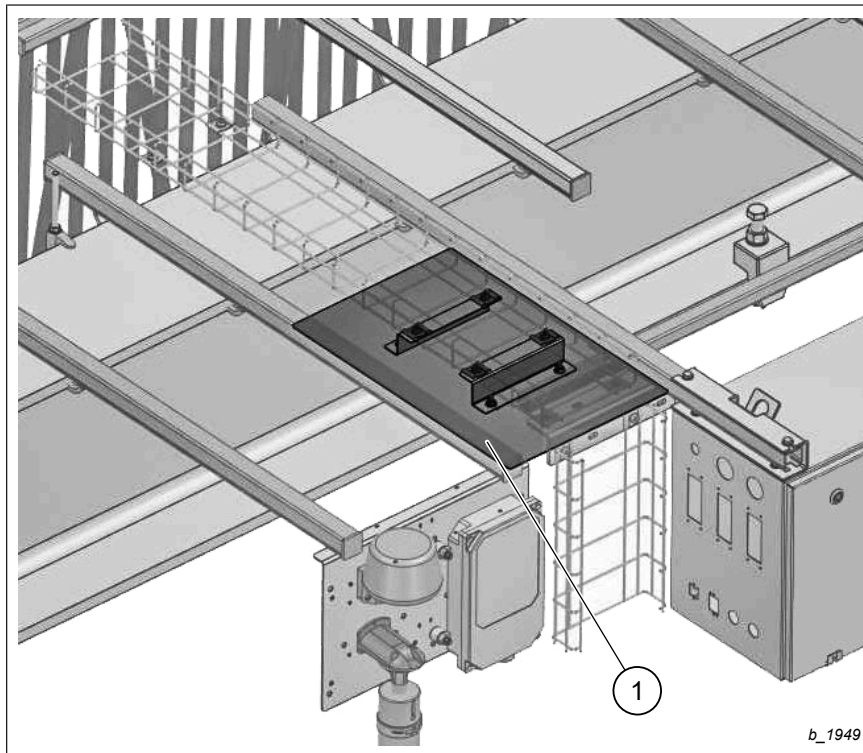


6.2.11 Suspension crane with frequency-controlled hoist

- Observe the specifications, see chapter 6.2.12 "Single girder overhead travelling crane and suspension crane with frequency-controlled hoist", page 72.

6 Electrical installation

6.2.12 Single girder overhead travelling crane and suspension crane with frequency-controlled hoist



- (1) Hitzeschutzblech
- (2) Befestigungsmaterial

(z) Abstand zum Winkel der Gitterrinne $z \leq 15 \text{ mm}$

⚠ WARNING Fire hazard due to heat generation of the braking resistor.

1. To protect the cables, fix the heat protection sheet (1) with the fastening material (2). Keep the specified distance to the angle of the wire mesh cable tray $z \leq 15 \text{ mm}$.
2. Ensure that there are no flammable materials near the braking resistor.

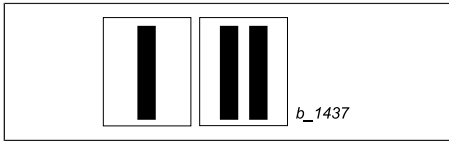
7 Signs and stickers

7 Signs and stickers

7.1 Tandem version identification plate

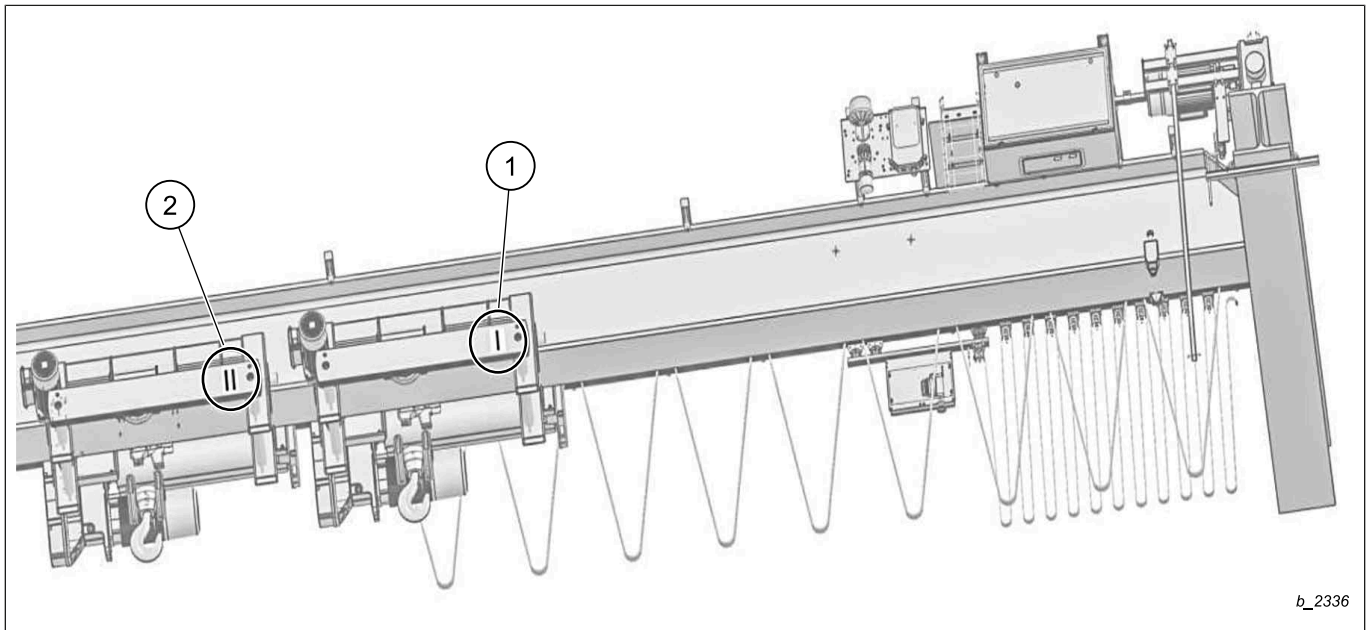
Identification plates for the first and second hoist

The first hoist is marked with the lower serial number, the second hoist with the higher serial number.



Single girder suspension crane identification plate

Figure exemplary

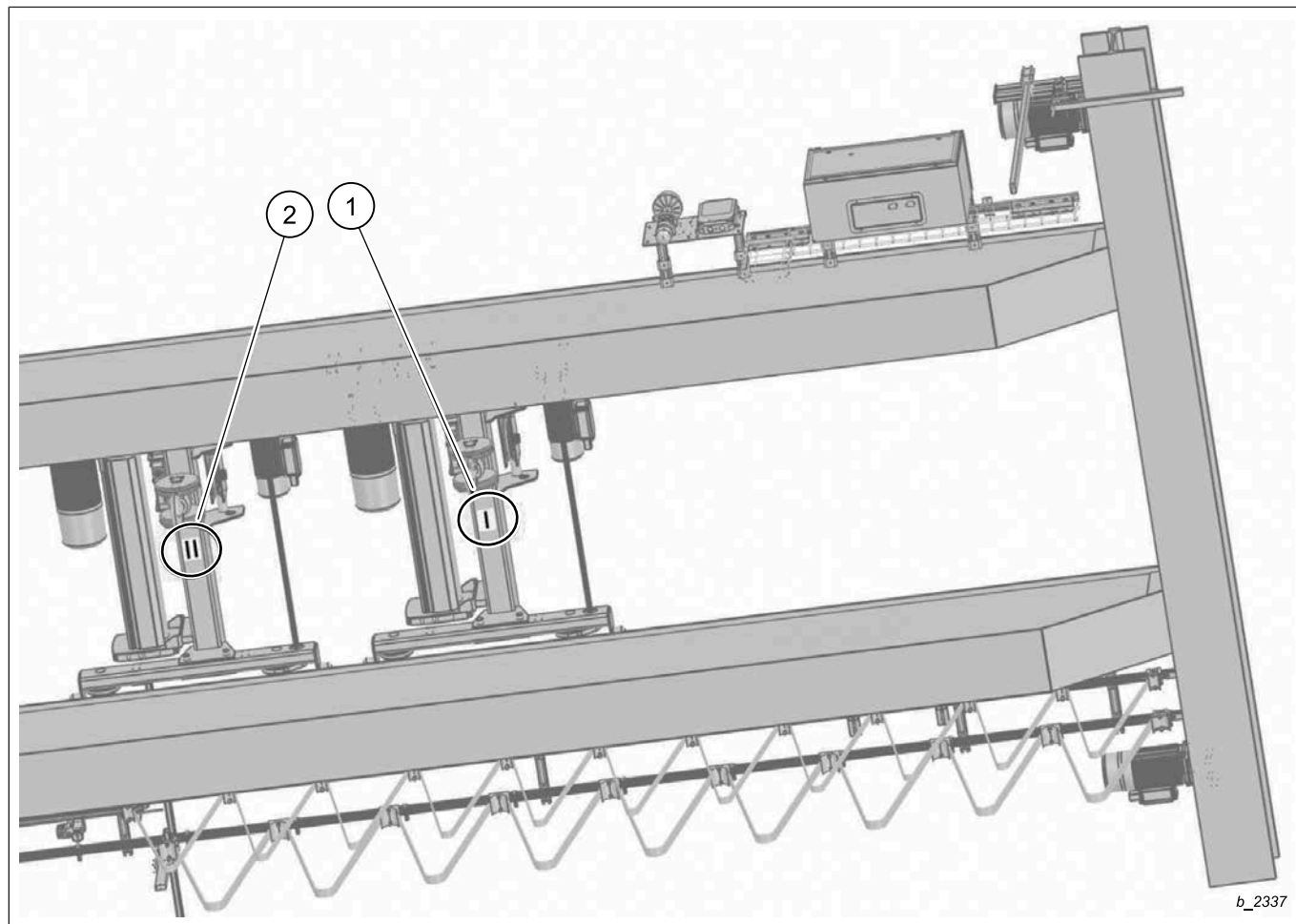


(1) Identification plate for the first hoist

(2) Identification plate for the second hoist

Double girder overhead travelling crane identification plate

Figure exemplary

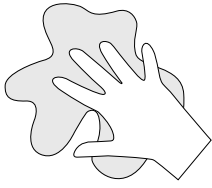


(1) Identification plate for the first hoist

(2) Identification plate for the second hoist

7 Signs and stickers

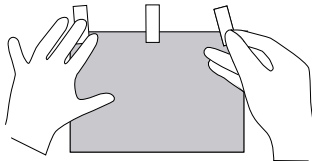
7.2 Attaching plates and stickers



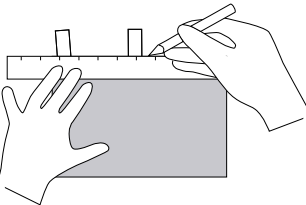
b_1346



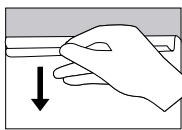
b_1347



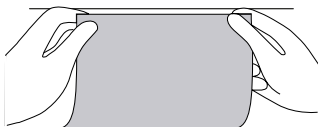
b_1348



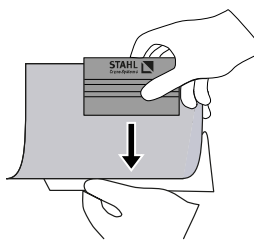
b_1349



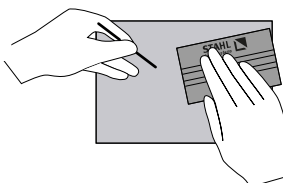
b_1350



b_1351



b_1352



b_1353

1. Thoroughly clean the substrate so that it is clean, dry and free of grease.
2. Measure and mark the adhesive position.
3. Fix the sticker provisionally with adhesive strips.
4. Draw guide lines around the sticker and remove the adhesive strips.
5. At the top of the back of the sticker, peel off the backing paper.
6. Position the upper edge of the sticker on the drawn guide line and stick it on.
7. Carefully press the sticker down with the supplied squeegee from top to bottom, at the same time removing the backing paper.
8. If air bubbles are present, prick them with a pin, then press the sticker with the squeegee or a cloth towards the edge, then press on firmly.

8 Tests after mounting

8 Tests after mounting

WARNING



Danger due to improper test.

Material damage, injuries or death can result.


- Ensure that a competent person carries out the test.
- Keep the national and local safety and accident prevention regulations, the occupational safety acts and environmental provisions.
- Wear the prescribed personal protective equipment.
- Secure the danger zone.
- Do not stand under suspended loads.
- Keep a sufficient safety distance from the product.

The tests will ensure that the product is in a safe condition, and that any defects and damage are detected and remedied.

The following tests must be performed after assembly.

When erecting the crane at its intended usage location, the additional tests in accordance with the national and local regulations must be performed.

Explanation of symbols

	Symbol
Competent person	

8 Tests after mounting

	A
Technical documentation	
– Check for completeness and conformity with the supplied equipment	○
Check the following markings according to the general arrangement drawing and/or completeness check	
– Rating plates (crane, hoist, motor)	○
– Rated capacity plate of the crane	○
– Rated capacity plate on the bottom hook block	○
– CE marking or appropriate mark of conformity	○
Checking the location and position of the following components according to the general arrangement drawing	
– Position of the control pendant and power supply of the hoist	○
– Position of the crane control	○
– Position of the hoist	○
Check non-mounted components	
– Correct version and quantity	○
Check the following measures according to general arrangement drawing	
– Double girder trolley: Track gauge of the track gauge	○
– Distance between the bearing surface of the hoist and the highest point of the hoist	○
– Inner guide roller gap (flange width or rail width plus track clearance)	○
Checking the product features	
– Control pendant	○
– Load hook	○
Checking the components	
– Girder flange width, see the component instructions provided	○
– Rope guide or chain guide, see the component instructions provided	○
– Oil level, see the component instructions provided	○
– Setting and documentation of the electronic devices e.g. SLE, SMC, see supplied instructions	○
Check the limit switch function (without test load)	
– Fast-slow changeover in the upwards and downwards direction	○
– Operational stop function in the upwards and downwards direction	○
– Pre-switching function (fast-slow changeover) of the travel limit switches in all four directions	○
– Limit stop of the travel limit switches in all four directions	○
Perform electrical tests	
– Actual values of the hoist motor at fast and slow speed	○
– Correct connection of the PTC thermistor	○
Insulation resistance	
– Perform the isolation resistance test per DIN EN 60204 part 32	○
– Check marking and correct connection of the protective conductor/electrical continuity of the protective conductor system/dielectric resistance/high-voltage test	○

8 Tests after mounting

	A
Bolted connections	
Check that screw connections are well secured, – see chapter 9 "Tightening torques for bolted connections", page 79	○

9 Tightening torques for bolted connections

9 Tightening torques for bolted connections

⚠ WARNING



If bolted connections are not tightened according to instructions, parts can come loose and fall down.

Material damage, injuries or death can result.



➤ Tighten bolted connections with a calibrated torque wrench to the prescribed tightening torques and then check them.

Deviating tightening torques are listed in the corresponding chapters of these instructions or, if available, in the following “Deviating tightening torques” chapter.

Thread size	Property class/tightening torque				
	08.8	8.8	010.9	10.9	VERBUS RIPP® 100
	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]
M5	--	6	--	--	11
M5 ¹⁾	--	1	--	--	--
M6	8.2	10.3	--	14.4	19
M8	20	25	28	35	42
M10	39	49	55	69	85
M12	69	86	98	122	130
M14	109	136	152	190	--
M16	170	210	240	300	330
M18	232	290	328	410	--
M20	330	410	472	590	--
M22	448	560	632	790	--
M24	570	710	800	1000	--
M27	832	1040	1168	1460	--
M30	1130	1410	1600	2000	--
M33	1528	1910	2160	2700	--
M36	1970	2460	2800	3500	--

¹⁾ Electrical plug-in connections



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