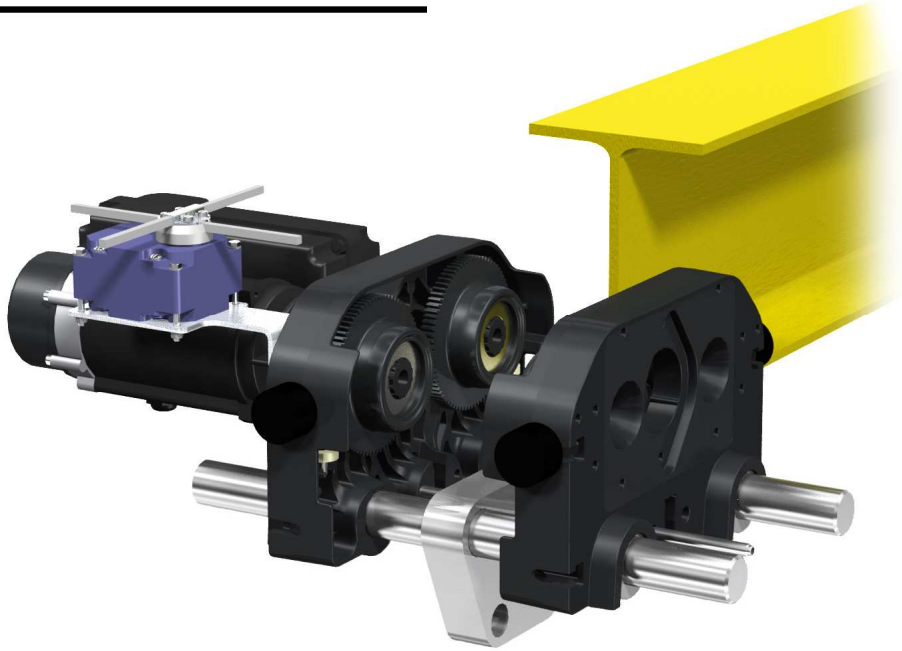
EUROCHAIN

EXPERT Crane Components



TECHNICAL GUIDE

CHAIN HOIST TROLLEYS

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LIFTING EQUIPMENT

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Original instructions

Table of contents

UPDATE HISTORY

Section	Changes	Date	Handled by
All	New technical guide for chain hoist trolleys created and published	12/2017	XLUOSAHI

1 INTRODUCTION

1.1 About this manual

1.1.1 Use of the manual

This manual presents the product range and features of electrical chain hoist trolleys.

This manual provides the following information:

- Range of trolleys available for electrical chain hoists
- Standards that are considered in the design of the product
- List of features available for the trolley range and technical details about the trolleys.

1.1.2 Terms and abbreviations

Term or abbreviation	Explanation
ANSI	American National Standards Institute
C-dimension	Distance between the running surface of the beam and the point in the hook where the hook and load are in contact.
CE marking	The CE-marking indicates that the product complies with the appropriate CE regulations.
Chain hoist	Drive mechanism for lifting and lowering the load
Check	A visual and functional assessment (not a test) of the product without dismantling
Controller	The pendant or other type of controller is used by the operator to give commands to the product.
Cs dimension	Distance between the running surface of the beam and the hoist suspension point
Electric panel	Power to the motors is controlled through the electric panel.
EP	Electronic potentiometer frequency converter control mode
Experienced service person authorized by the manufacturer	A person with service experience who is authorized by the manufacturer to perform service actions
Hand geared	Trolley drive without a motor, where user moves the trolley by repetitively pulling at one side of a closed chain ring to rotate a gear and the trolley wheels
Inching	Making very small movements by repeatedly and momentarily pressing the direction control
Inspection	Looking for defects and checking the operation of the controls, limiting and inspecting devices without loading the product. Inspection is much more than a check but does not normally require any part of the product to be dismantled other than for removal or opening of covers or housings.
ISO	International Organization for Standardization
LHT	Low headroom trolley
Main isolation switch	The main isolation switch is the power switch which the operator should normally use to turn off power.
MS	Multi-step frequency converter control mode
NHT	Normal headroom trolley
Operator	Person operating the product for the purpose of handling loads
Power supply	Power is supplied to the motors via the power supply.
Qualified personnel	Users with necessary qualifications based on theoretical and practical knowledge of hoists. A qualified person must be in a position to assess the safety of the installation in conjunction with the application. Persons with the authority to undertake certain product maintenance work include the manufacturers' service engineers and trained fitters with a corresponding certification.
Rated capacity	Load that the product is designed to lift for a given operating condition (for example, configuration, position of the load)
Reeving	Doubling the hoist lifting capacity while halving the lifting speed by use of the block and tackle principle
Runway	The product rides on or under the runway.
TMU	Traveling motor unit, which consists of a control box, gear, and motor
Trolley (hoisting unit)	The trolley (hoisting unit) moves along the main girder.

1.2 About this product

1.2.1 Product range

The following table shows the product range and compatibility matrix for different trolley types.

Trolley type		Rated capacity [kg]	Min. radius [m]	Trolley solution			Hoist frame sizes and suspension types														
							VR02			VR05 [1)]			VR12 [1)]			VR16			VR25		
				Push	Hand-geared	Motorized	Hook	Eye	Coupled	Hook	Eye	Coupled	Hook	Eye	Coupled	Hook	Eye	Coupled	Hook	Eye	Coupled
NHT	CHD 250	250	1	X			X	X		X	X										
	CHD 500	500	1	X			X	X		X	X										
	CHD 1000	1000	1.5	X						X	X		X	X							
	CHD 2000	2000	2	X									X	X							
	CHD 3000	3000	2	X										X							
	C1	1000	2	(X)	X	X			X[2)]			X[2)]			X[3)]						
	C2	2000	2	(X)	X	X									X	X		X			
	C3	3200	2	X	X	X									X			X			X
	C5	5000	N/A	X	X	X												X[4)]			X
	CT12	1250	2	X	X	X	X		X	X		X	X		X						
	CT25	2500	2	X	X	X							X		X						
	CT32	3200	2	X	X	X										X		X	X		X
LHT	CHV-HPR05	1000	N/A	X	X	X						X									
	CHV-HPR10	2000	N/A	X	X	X									X						
	CHV-HPR25	5000	N/A	X	X	X															X
Swiveling	CHV-B 32	3200	0.8			X			X			X			X			X			X
	CHV-B 50	5000	1.5			X															X[5)]

[1)] Applies also to frequency converter driven hoists.

[2)] When the autotransformer is used, the trolley is upgraded to C2.

[3)] For the loads of 1000 kg and less, only motorized or push trolley drives are available, no autotransformer is available.

[4)] Only when the height of lift (HOL) is less than 40 m in a one-fall hoist or when the HOL is less than 15 m in a two-fall hoist.

[5)] A swiveling trolley CHV-B 50 is recommended for VR25 two-fall hoists, for the rated capacity of 3200–5000 kg.

Frequency controlled TMUs

Trolley size	Rated capacity [kg]	Chain hoist [frame size]	Reeving	Traveling motor unit	Traveling speed [m/min.]	
					min.	max.[1]
CT12	320	VR02	1/1	TMU 1	3	37
	500	VR02	2/1	TMU 1	3	37
	630	VR05	1/1	TMU 1	3	37
	1000	VR05	2/1	TMU 1	3	37
	1250	VR12	1/1	TMU 2	2	20 (24)
CT25	2500	VR12	2/1	TMU 2	2	20 (24)
CT32	1600	VR16	1/1	TMU 2	2	20 (24)
	2500	VR25	1/1	TMU 2	2	20 (24)
	3200	VR16	2/1	TMU 2	2	20 (24)
	3200	VR25	2/1	TMU 2	2	20 (24)
C1 [2]	320	VR02	1/1	TMU 1	3	37
	500	VR02	2/1	TMU 1	3	37
	630	VR05	1/1	TMU 1	3	37
	1000	VR05	2/1	TMU 1	3	37
C2	1250	VR12	1/1	TMU 2	2	20 (24)
	1600	VR16	1/1	TMU 2	2	20 (24)
C3	2500	VR12	2/1	TMU 2	2	20 (24)
	2500	VR25	1/1	TMU 2	2	20 (24)
	3200	VR16	2/1	TMU 2	2	20 (24)
	3200	VR25	2/1	TMU 2	2	20 (24)
C5	5000	VR25	2/1	TMU 2	2	20 (24)
CHV-HPR05	500	VR05	1/1	TMU 1	3	37
	1000	VR05	2/1	TMU 1	3	37
CHV-HPR10	1000	VR12	1/1	TMU 1	3	37
	2000	VR12	2/1	TMU 2	2	20 (24)
CHV-HPR25	2500	VR25	1/1	TMU 2	2	20 (24)
	5000	VR25	2/2	TMU 2	2	20 (24)
CHV-B 32	320	VR02	1/1	TMU 1	3	37
	500	VR02	2/1	TMU 1	3	37
	630	VR05	1/1	TMU 1	3	37
	1000	VR05	2/1	TMU 1	3	37
	1250	VR12	1/1	TMU 2	2	20 (24)
	1600	VR16	1/1	TMU 2	2	20 (24)
	2500	VR12	2/1	TMU 2	2	20 (24)
	2500	VR25	1/1	TMU 2	2	20 (24)
	3200	VR16	2/1	TMU 2	2	20 (24)
	3200	VR25	2/1	TMU 2	2	20 (24)
CHV-B 50	5000	VR25	2/1	TMU 2	2	20 (24)

[1] Values in brackets are valid for supply voltage 460V–480V.

[2] When the autotransformer is used, the trolley is upgraded to C2.

Contactor-controlled TMUs (two-speed)

Trolley size	Rated capacity [kg]	Chain hoist [frame size]	Reeving	Traveling motor unit	Traveling speed [m/min.]	
					min. 50/60 Hz	max. 50/60 Hz
CT12	320	VR02	1/1	TMU 2	5 / 6	20 / 24
	500	VR02	2/1	TMU 2	5 / 6	20 / 24
	630	VR05	1/1	TMU 2	5 / 6	20 / 24
	1000	VR05	2/1	TMU 2	5 / 6	20 / 24
	1250	VR12	1/1	TMU 2	5 / 6	20 / 24
CT25	2500	VR12	2/1	TMU 2	5 / 6	20 / 24
CT32	1600	VR16	1/1	TMU 2	5 / 6	20 / 24
	2500	VR25	1/1	TMU 2	5 / 6	20 / 24
	3200	VR16	2/1	TMU 2	5 / 6	20 / 24
	3200	VR25	2/1	TMU 2	5 / 6	20 / 24
C1	320	VR02	1/1	TMU 1	5 / 6	20 / 24
	500	VR02	2/1	TMU 1	5 / 6	20 / 24
	630	VR05	1/1	TMU 1	5 / 6	20 / 24
	1000	VR05	2/1	TMU 1	5 / 6	20 / 24
C2	1250	VR12	1/1	TMU 2	5 / 6	20 / 24
	1600	VR16	1/1	TMU 2	5 / 6	20 / 24
C3	2500	VR12	2/1	TMU 2	5 / 6	20 / 24
	2500	VR25	1/1	TMU 2	5 / 6	20 / 24
	3200	VR16	2/1	TMU 2	5 / 6	20 / 24
	3200	VR25	2/1	TMU 2	5 / 6	20 / 24
C5	5000	VR25	2/2	TMU 2	5 / 6	20 / 24
CHV-HPR05	500	VR05	1/1	TMU 1	5 / 6	20 / 24
	1000	VR05	2/1	TMU 1	5 / 6	20 / 24
CHV-HPR10	1000	VR12	1/1	TMU 1	5 / 6	20 / 24
	2000	VR12	2/1	TMU 2	5 / 6	20 / 24
CHV-HPR25	2500	VR25	1/1	TMU 2	5 / 6	20 / 24
	5000	VR25	2/2	TMU 2	5 / 6	20 / 24
CHV-B 32	320	VR02	1/1	TMU 1	5 / 6	20 / 24
	500	VR02	2/1	TMU 1	5 / 6	20 / 24
	630	VR05	1/1	TMU 1	5 / 6	20 / 24
	1000	VR05	2/1	TMU 1	5 / 6	20 / 24
	1250	VR12	1/1	TMU 2	5 / 6	20 / 24
	1600	VR16	1/1	TMU 2	5 / 6	20 / 24
	2500	VR12	2/1	TMU 2	5 / 6	20 / 24
	2500	VR25	1/1	TMU 2	5 / 6	20 / 24
	3200	VR16	2/1	TMU 2	5 / 6	20 / 24
	3200	VR25	2/1	TMU 2	5 / 6	20 / 24
CHV-B 50	5000	VR25	2/1	TMU 2	5 / 6	20 / 24

1.2.2 Operating conditions

The following operating conditions apply:

Operating environment	Only for indoor use
Operating temperature	-10 °C … +40 °C (with frequency converter)
	-20 °C… +40 °C (with two-speed contactor control)
	-20 °C… +50 °C (fully manual)
Humidity	90 % relative humidity (no condensation)
Protection class	IP66 for TMU 1 and TMU 2 as standard
Sound level	70 dB at 1 m

1.2.3 Technical regulations

Certifications, standards, and other technical documents

These products fulfill the requirements of the following standards:

European Machine Directive

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2006/95/EC
- EMC Directive 2014/30/EU
- RoHS Directive 2002/95/EC

EN

- EN 60034-1 Rotating electrical machines: Rating and performance
- EN 60034-5 Rotating electrical machines: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification
- EN 60034-9 Rotating electrical machines: Noise limits
- EN 60034-14 Rotating electrical machines: Mechanical vibration of certain machines with shaft height 56 mm and higher – Measurement, evaluation and limits of vibration severity
- EN 12100-1 and 2 machine safety: basis
- EN 60204-32 Machine safety: electrical equipment
- EN 818-7 Choice of the chain
- EN 61 000-6-4 second environment EMC emissions levels to industrial
- EN 61 000-6-2 second environment EMC immunity levels to industrial
- EN 61 800-3 A11 2000 second environment EMC emissions levels to industrial
- EN14492-2 Winches and hoists
- EN 13001-3 & 4 Crane Safety – General Design
- EN 60529 IP code

FEM

- FEM 9.511 Classification of the mechanisms
- FEM 9.755 Steps to be taken to determine the operating periods for mass-produced motorized lifting mechanisms (S.W.P.)

CSA

- CSA-C22.2 n°33 Building and testing of cranes and hoists
- CSA-C22.2 n°4 Enclosed switches
- CSA-C22.2 n°14 Industrial Control Equipment
- CSA-C22.2 n°100 Motors and generators

ASME

- ASME B30.16 Overhead Hoist
- ASME HST 1 Performance Standard for Electric Chain Hoist

1.2.4 Product safety requirements

When evaluating trolleys and their operating environment, keep in mind the following safety requirements:

- Beams must match trolley loads and geometry.
- Following risks in the operating conditions must be evaluated case by case at the customer's site:
  - Traveling speed is suitable
  - Beam is not weak or short
  - Trolley is not too fast
  - End stops are in place
  - Traveling limit switches are in use.
- Pulling to one side creates extra forces on trolleys, and is therefore forbidden.

2 PRODUCT DESCRIPTION

2.1 Trolley solution overview

Different work spaces require different trolley solutions: normal headroom trolleys for normal work spaces, low headroom trolleys for more challenging working heights and swiveling trolleys for curved beams.

2.1.1 Normal headroom trolley

Normal headroom trolley (NHT) is the basic trolley solution, which is designed for workspaces where there is enough space to lift the loads without difficulty. In the NHT solution, the trolley, hoist, and hook are positioned in a straight line underneath each other.

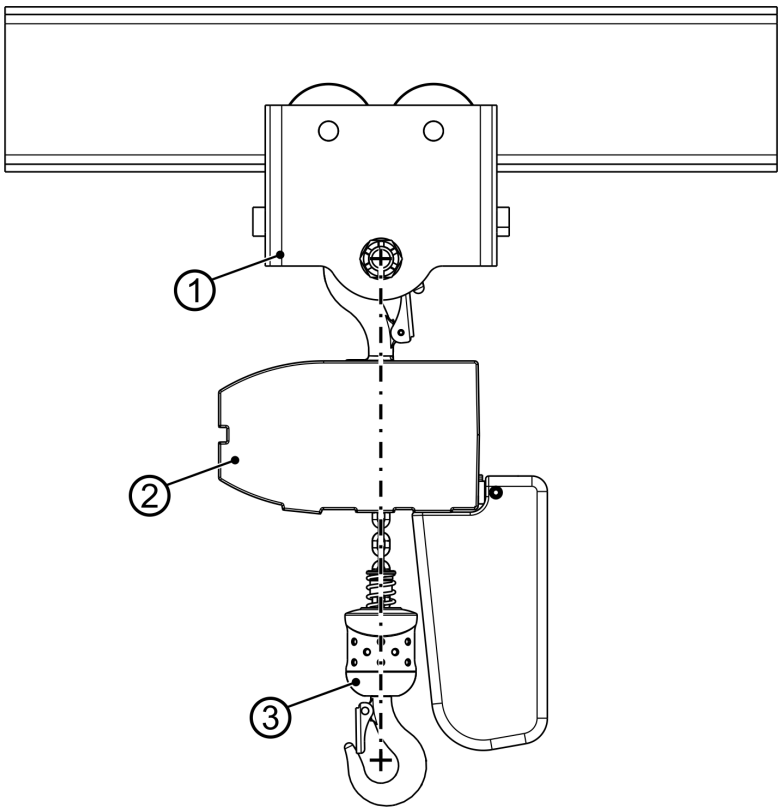


Figure 1. Normal headroom trolley setup: the trolley (1), hoist (2), and hook (3) are in straight line underneath each other.

2.1.2 Low headroom trolley

Low headroom trolleys (LHT) are trolleys that are designed for workspaces where the lifting height is challenging.

In the low headroom trolley design, the hook is placed on the side of the hoist, instead of below it. This is possible due to two chain deflections that utilize sprockets, which are incorporated into the trolley frame. This way the hook is lifted as close to the beam or ceiling as possible and the lifting height is maximized.

Functional description of motorized low headroom trolley solution

Chain hoist (1) is mounted to the low headroom trolley hoist suspension point in a normal position, leaving the chain output at the bottom. The chain (2) is deflected by two idle chain sprockets (3), and guided inside the LHT-traverse. The second idle sprocket is placed in the upmost position under the beam to achieve the maximum lifting height. LHT-traverse contains a limit switch (4) for the lifting movement. This replaces the hoist's internal limit switch for the upper end stop.

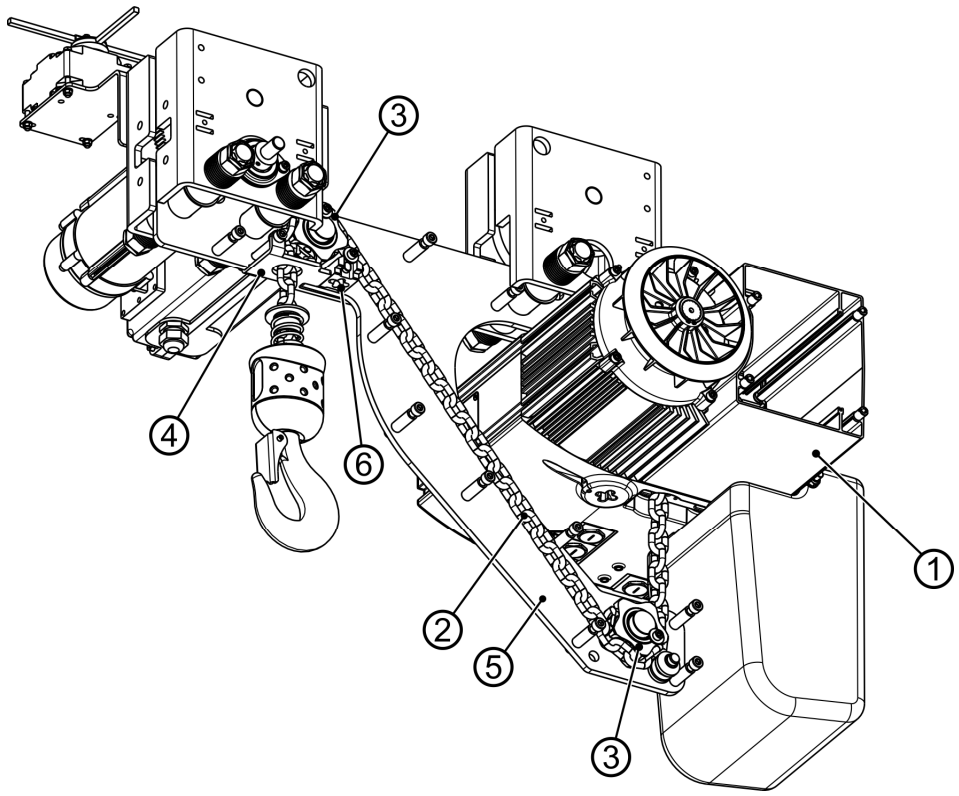


Figure 2. Function of a motorized low headroom trolley (showing an optional traveling limit switch)

Pos.	Description
1	Hoist
2	Chain
3	Idle sprocket
4	Limit switch activator for upper lifting position
5	Low headroom traverse
6	Fixing point for 2/1 reeving

2.1.3 Swiveling trolley

Swiveling trolleys are designed for workspaces where a hoist needs to move along a curved track.

Swiveling trolleys are available as a motorized version only. For the hand-geared and manual versions, contact the sales support.

Functional description of motorized swiveling trolley

A swiveling trolley consists of two motorized trolleys that are connected to a hoist suspension frame with two swiveling axes. Both trolleys can rotate within a given angle allowing a hoist to travel along straight and curved tracks.

Two motorized trolleys (1 and 2) are mounted using swiveling axes to the main trolley frame. Swivel points allow the trolleys to align to a bending track profile. Adjustable guide rollers (4) on all sides of the trolleys support the alignment process and reduce the friction between the trolley wheel flanks and the beam profile while traveling through curves.

Trolley type	Rated capacity [kg]	Minimum curve radius [mm]
CHV-B 32	3200	800
CHV-B 50	5000	1500

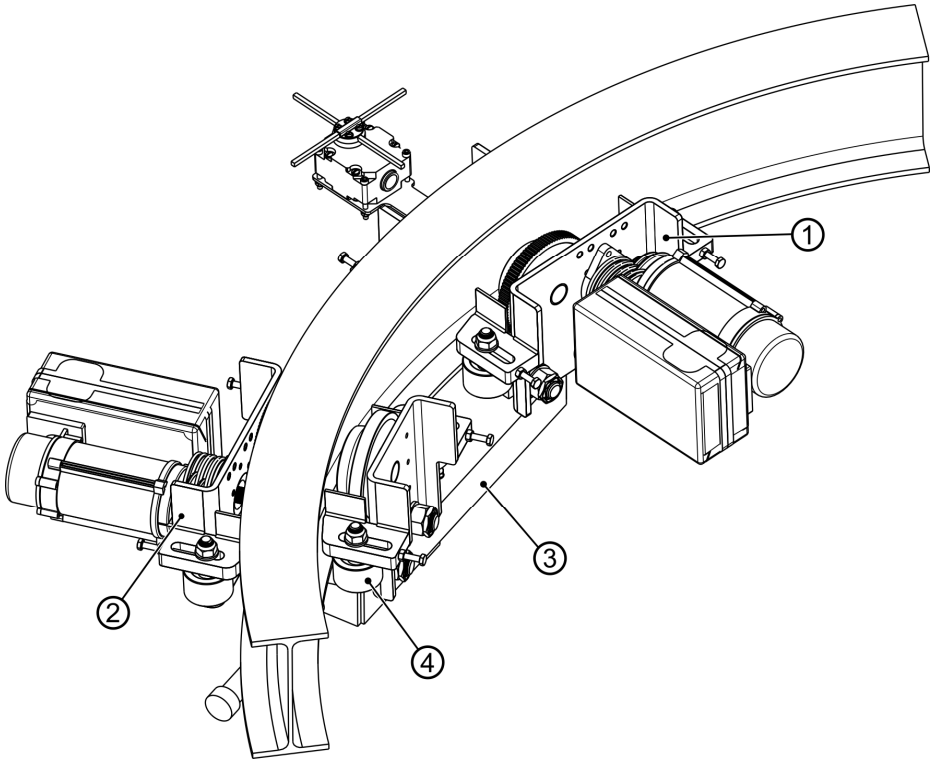


Figure 1. Function of a motorized swiveling trolley

Pos.	Description
1	Motorized trolley
2	Motorized trolley
3	Hoist suspension frame
4	Adjustable guide rollers

2.2 Trolley type overview

Normal headroom trolley, low headroom trolley, or a swiveling trolley can be implemented with the trolley types shown in the table below.

Trolley solution	C-trolley	CT	CHD	Special trolley
Normal headroom	X	X	X	
Low headroom		X		X
Swiveling				X

CT trolleys and C-trolleys are available as motorized, hand-geared, and manually operated push variants. The manually operated CHD trolley is available only as a push trolley.

2.2.1 CT trolley

CT trolleys are used for attaching a hoist to I-beam girders and runways. They consist of four steel wheels that are mounted between two side plates, which are made of injection molded aluminum. These trolleys are available for the rated capacity of 3200 kg and beam flange widths between 55–310 mm, depending on the trolley size.

CT trolleys are directly connected to a hoist without an additional coupling part and, therefore, the distance between the hoist and beam or ceiling is smaller than in C-trolleys. This hoist connection is rigid and flanges can be adjusted steplessly.

CT trolleys are designed to be flexible, for example, the casted CT32 trolley side plates can be used for different hoist ranges by changing the connection components. Auxiliary equipment, such as traveling motors (TMU 1 and TMU 2) or traveling limit switches are compatible with all CT trolley models.

2.2.2 C-trolley

C-trolleys are used for attaching hoists to I-beam girders and runways. They consist of four steel wheels that are mounted between two side plates, which are made of bent steel plates. These trolleys are available for the rated capacity of 5000 kg and beam flange widths between 57–310 mm, depending on the trolley size. Hoists are connected to trolleys using a coupling part between the hoist and the trolley.

2.2.3 CHD manual trolley

CHD manual trolley is a simple push trolley for basic use with manually operated traveling motion. There are no special options available. This trolley is used with the manual hoists and electrical chain hoists up to the rated capacity of 2500 kg and flange widths up to 310 mm. The hoist suspension can be a hook suspension or an eye suspension. There are limitations in some cases. For more information, see the compatibility table in chapter Product range.

2.2.4 Trolleys' drive variants

Trolleys have three drive variants:

- Trolley without a drive unit, that is, a manually operated trolley (1)
- Trolley driven with a traveling motor unit (TMU) (2)
- Trolley driven with a hand gear (3).

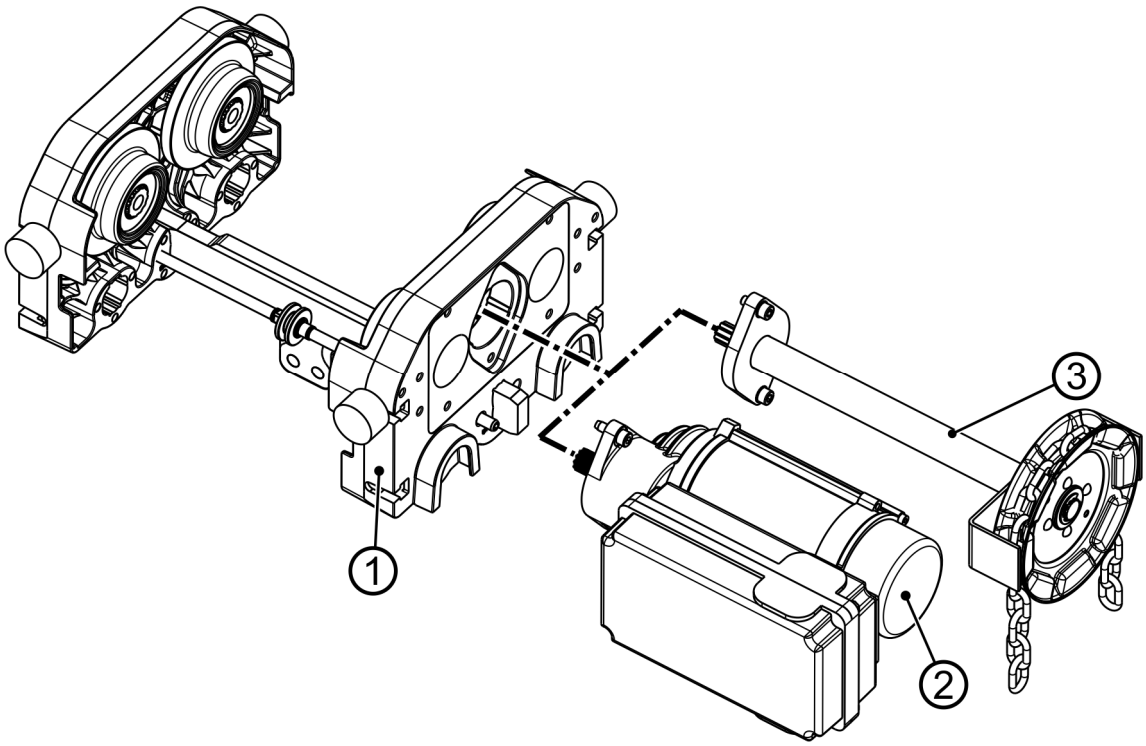


Figure 2. Trolley drive variants: manual, motor, and hand gear. This is an example of a CT trolley.

2.2.5 Counterweights

Counterweights are needed in cases where elements, such as a traveling motor unit (TMU), limit switches, or hand gear assemblies are attached to a trolley, and they make the trolley tilt to one side. Because of the tilting, the trolley can get stuck or it may run with increased wear if the beam flange width is too narrow for the attached weight. The number of required counterweights varies depending on the weight of the attached elements and the beam width.

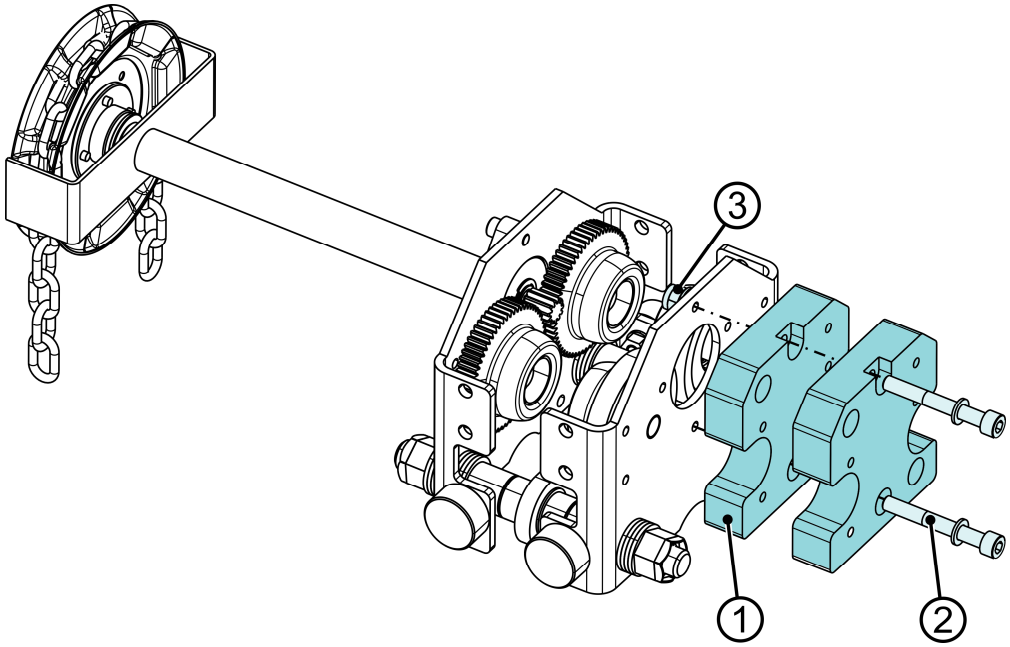


Figure 3. Hand-geared trolley with counterweights

Pos.	Description
1	Counterweight(s)
2	Fixing screw
3	Fixing nut

CT trolley counterweights

CT trolley does not require counterweights if there is a TMU, but it requires a counterweight when there is a hand gear. However, there is one exception with a TMU: when the flange width is less than 100 mm in the CT12 + VR02 hoist combination, a counterweight is needed even with a TMU.

The table below lists only those trolley and hoist combinations that require a counterweight. If a certain trolley and hoist combination is not listed, it does not require a counterweight. The number of counterweights apply only to those combinations, counterweights for a trolley alone are not given.

Trolley type	Chain hoist [frame size]	TMU	Beam flange width [mm] DIM03	Number of counterweights	Counterweight in total [kg]	Hoist weight* [kg]
CT12	VR02	Yes	55 – 100	1	3.1	26
	VR05	Yes	55 – 100	1	3.1	38
	VR02	No	55 – 89	1	3.1	26
	VR05	No	55 – 89	1	3.1	38
	VR12	No	55 – 89	2	6.2	56

*The hoist weight without the chain weight.

Motorized C-trolley counterweights

The table below lists only those trolley and hoist combinations that require a counterweight. If a certain trolley and hoist combination is not listed, it does not require a counterweight.

Trolley type	Chain hoist [frame size]	Beam flange width [mm] DIM03	Number of counterweights	Counterweight in total [kg]	Hoist weight [kg]
C1	VR02	55 – 65	2	6.2	26
		66 – 84	1	3.1	
	VR05	55 – 62	1	3.1	38

Hand-geared trolley counterweights

The following table lists those C-trolley or CT trolley and hoist combinations that require counterweights. If a certain trolley and hoist combination is not listed, it does not require a counterweight.

Trolley type	Chain hoist [frame size]	Hand chain length [m]	Height of operation* [m]	Adjusted beam flange width [mm] DIM03	Nbr of counter weights	Counterweight in total [kg]	Hoist weight** [kg]
C1 CT12	VR02	6	2 – 3	55 – 73	1	3.1	26
		8	3 – 4	55 – 67	2	6.2	
		8	3 – 4	68 – 88	1	3.1	
		10	4 – 5	55 – 80	2	6.2	
		10	4 – 5	81 – 104	1	3.1	
		12	5 – 6	55 – 69	3	9.3	
		12	5 – 6	70 – 93	2	6.2	
		12	5 – 6	94 – 120	1	3.1	
		14	6 – 7	55 – 80	3	9.3	
		14	6 – 7	81 – 106	2	6.2	
		14	6 – 7	107 – 135	1	3.1	
		16	7 – 8	55 – 67	4	12.4	
		16	7 – 8	68 – 91	3	9.3	
		16	7 – 8	92 – 119	2	6.2	
		16	7 – 8	120 – 151	1	3.1	
C1 CT12	VR05	8	3 – 4	55 – 66	1	3.1	38
		10	4 – 5	55 – 62	2	6.2	
		10	4 – 5	63 – 78	1	3.1	
		12	5 – 6	55 – 64	2	6.2	
		12	5 – 6	73 – 90	1	3.1	
		14	6 – 7	55 – 64	3	9.3	
		14	6 – 7	65 – 82	2	6.2	
		14	6 – 7	83 – 101	1	3.1	
		16	7 – 8	55 – 73	3	9.3	
		16	7 – 8	74 – 93	2	6.2	
		16	7 – 8	94 – 113	1	3.1	

*)The height of operation of a hand-geared trolley (feature code DIM31).

**)The hoist weight without the chain weight.

2.3 I-beam

Electrical chain hoist trolleys run on globally sold commercial I-beams.

Note the following about the beams:

- Make sure that there is space for the traveling wheels to allow the trolley travel smoothly
- No gaps are allowed in the beam connection points
- The end of the beam must be equipped with an end stop (to avoid crashes).

Limitations of I-beam:

- Running surface angle is limited to 14 % in the I-beam
- Climbing inclination of traveling surface is max. 5 %, with a TMU driven trolley.

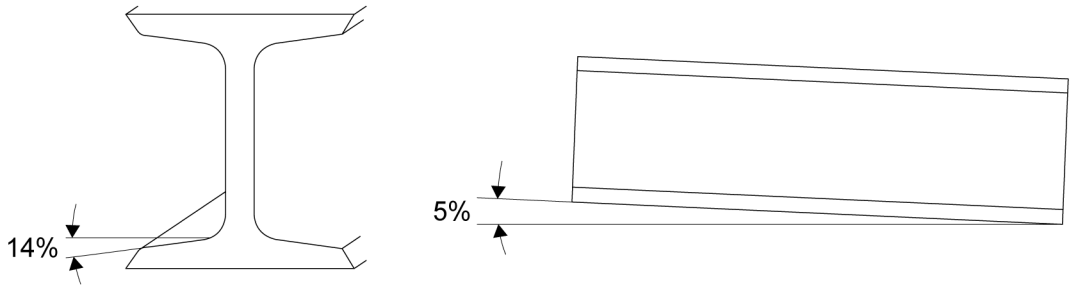


Figure 4. Maximum allowed angles in I-beam

3 NORMAL HEADROOM TROLLEY

Normal headroom trolleys are available as CT trolleys and as C-trolleys. Both trolley types are available as motorized, hand-geared and push trolley variants. In addition, there is also a manually operated CHD trolley available to complete the push trolley range.

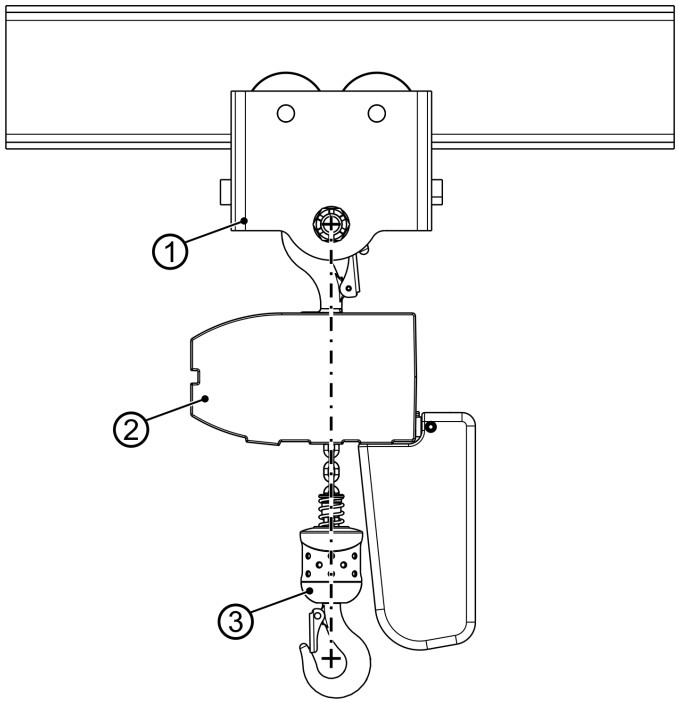


Figure 5. Normal headroom trolley setup: the trolley (1), hoist (2), and hook (3) are in straight line underneath each other.

3.1 Normal headroom trolley features

The following drive selections and dimensions are common to normal headroom trolleys and their motorized, hand-geared, and push trolley variants.

3.1.1 Drive selections

Drive selection for CT trolley

Trolley type	Rated capacity [kg]	Chain hoist [frame size]	Drive		
			Push trolley	Traveling motor	Chain drive
CT12	≤ 1000	VR02 VR05 VR12	X	TMU 1	X
CT12	1001–1250	VR12	X	TMU 2	X
CT25	1251–2500	VR12	X*	TMU 2	X
CT32	2501–3200	VR16 VR25	–	TMU 2	X

*)Check the local regulations. Pulling force limitations are country-specific.

Drive selection for C-trolley

Trolley type	Rated capacity [kg]	Chain hoist [frame size]	Drive		
			Push trolley	Traveling motor	Chain drive
C1	≤ 1000	VR02 VR05 VR12	–	TMU 1	X
C2	1001–2000	VR12	–	TMU 2	X
C3	2001–3200	VR12 VR16 VR25	X*	TMU 2	X
C5	3201–5000	VR16 VR25	X	TMU 2	X

*)Only for the hoist frame sizes VR16, VR25.

Drive selection for manually operated CHD trolley

Trolley type	Rated capacity [kg]	Chain hoist [frame size]	Drive		
			Push trolley	Traveling motor	Chain drive
CHD250	≤ 250	VR02 VR05	X	–	–
CHD500	251–500	VR05 VR12	X	–	–
CHD1000	501–1000	VR05 VR12	X	–	–
CHD2000	1001–2000	VR12	X	–	–
CHD3000	2001–2500	VR12	X	–	–

3.1.2 Dimensions

Trolley dimensions include a Cs dimension, which marks the distance between the running surface of the beam and the hoist suspension point. The figure below shows the Cs dimension measuring points in electrical chain hoist trolleys.

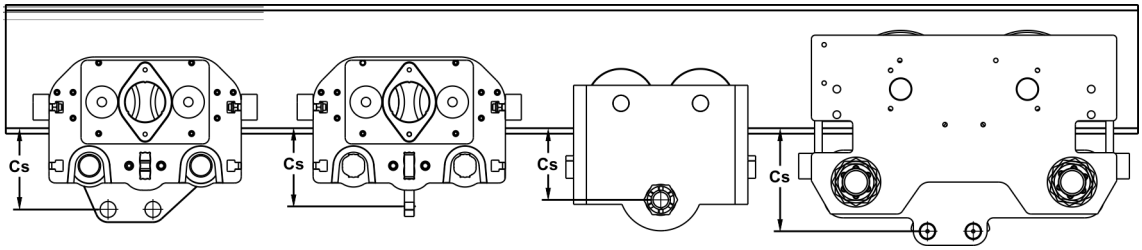


Figure 6. Cs dimension measuring points in trolleys from left to right: CT32 for VR16 and VR25, CT25 for a two-fall VR12 (also valid for CT12), CHD trolley (sample illustration for all sizes), and C5 for VR25 (sample illustration for all sizes).

Dimensions for CT trolley

Trolley type	Suspension type	Chain hoist [frame size]	Rated capacity [kg]	Beam flange width [mm]	Cs [mm]
CT12	T-suspension	VR02	500	55 – 180	90 *
				181 – 310	
				311 – 360 **	
	T-suspension	VR05	1000	55 – 180	97 *
				181 – 310	
				311 – 360 **	
	T-suspension	VR12	1250	55 – 180	100 *
				181 – 310	
				311 – 360 **	
	Hook suspension	–	1250	55 – 180	131
				181 – 310	
CT25	T-suspension	VR12	2500	82 – 180	121 *
				181 – 310	
CT32	Bolt suspension	VR16 VR25	2500	66 – 300	129
	Hook suspension	–	3200	66 – 300	109

*)Additional rain cover: +16 mm.

**)Purchase to order (PTO) product, not in stock at the factory.

As to the beam height, make sure that there is enough space for the traveling wheels between the flanges.

Dimensions for C-trolley

Trolley type	Rated capacity [kg]	Cs dimension with hook suspension [mm]	Cs dimension with coupled suspension [mm]	Chain hoist [frame size]	Beam flange width [mm]
C1	1000	92	45	VR02 VR05 VR12	57 – 103
					104 – 153
					154 – 201
					202 – 259
					260 – 307
					308 – 310
					311 – 350
C2	2000	116	65	VR02 VR05	64 – 127
					128 – 191
					192 – 255
					256 – 310
					311 – 361
				VR12	64 – 127
					128 – 191
					192 – 255
					256 – 310
					311 – 350
C3	3200	NA	72	VR12	82 – 137
					138 – 195
					196 – 253
					254 – 310
			123	VR16 VR25	82 – 137
					138 – 195
					196 – 253
					254 – 310
					311 – 350
C5	5000	NA	160	VR16 VR25	82 – 110
					111 – 150
					151 – 200
					201 – 257
					258 – 310
					311 – 350

Dimensions for manually operated CHD trolley

Trolley type	Rated capacity [kg]	Beam flange width [mm]	Cs [mm]
CHD250	250	50 – 202	67
CHD500	500	50 – 202	73
		188 – 310	
CHD1000	1000	65 – 202	93
		188 – 310	
CHD2000	2000	88 – 202	112
		188 – 310	
CHD3000	3000	100 – 202	130
		188 – 310	

3.2 Motor trolley

3.2.1 Motorized CT trolley

Identifying key parts of motorized CT trolley

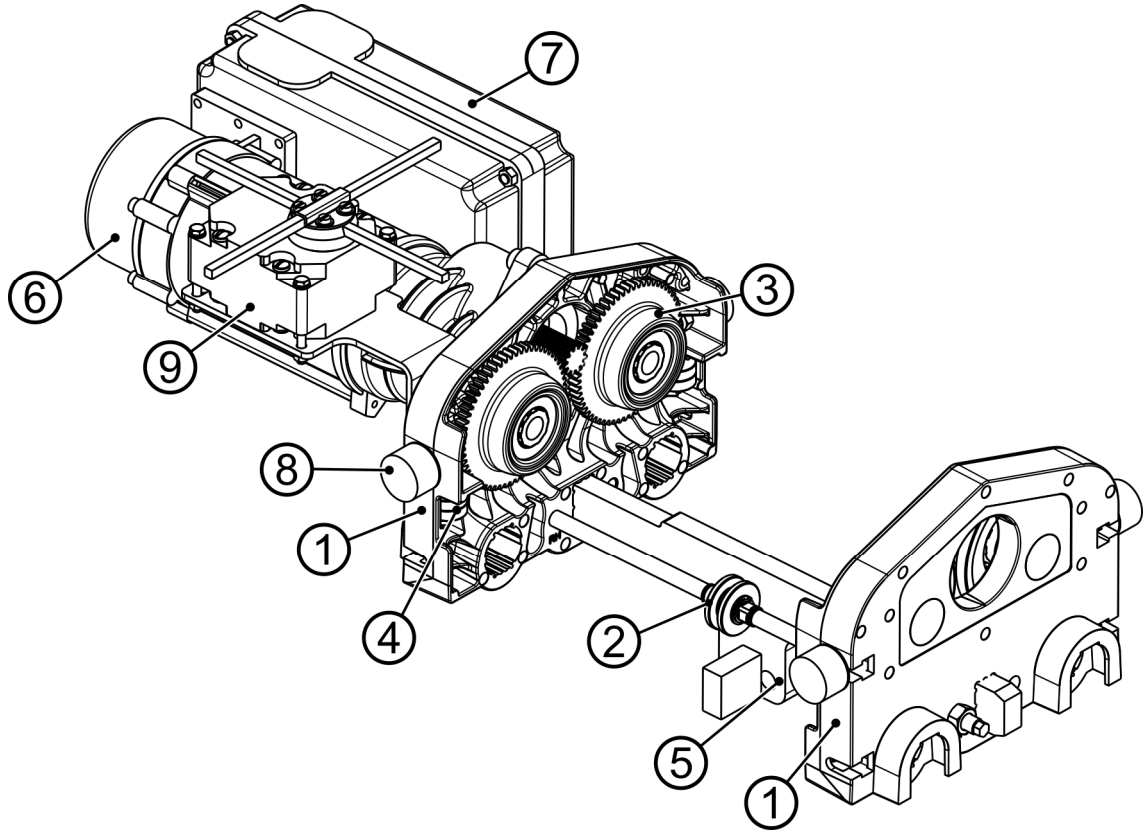


Figure 7. Motorized CT trolley, CT12

Pos.	Description	Material	Surface treatment
1	Trolley side plate (casted aluminum)	Aluminum	Electrophoretic dip coating RAL 9005 / black
2	Flange width adjustment	Steel	Zinc coating ISO 2081 – Fe/Zn8/B
3	Traveling wheels	Casted iron	-
4	Guide rollers	Bearing	-
5	Hoist suspension (T-suspension)	Steel	Zinc plating ISO 2081 – Fe/Zn8/B
6	Traveling motor unit	Aluminum profile / aluminum flange	Anodized 10µm, black / powder coating 50µm RAL7021 / black
7	TMU electrical cubicle	Aluminum	Paint, powder epoxy 50 µm, black
8	Buffers	Elastomer Vibrachoc	Black
9	Traveling limit switch (optional)	-	-

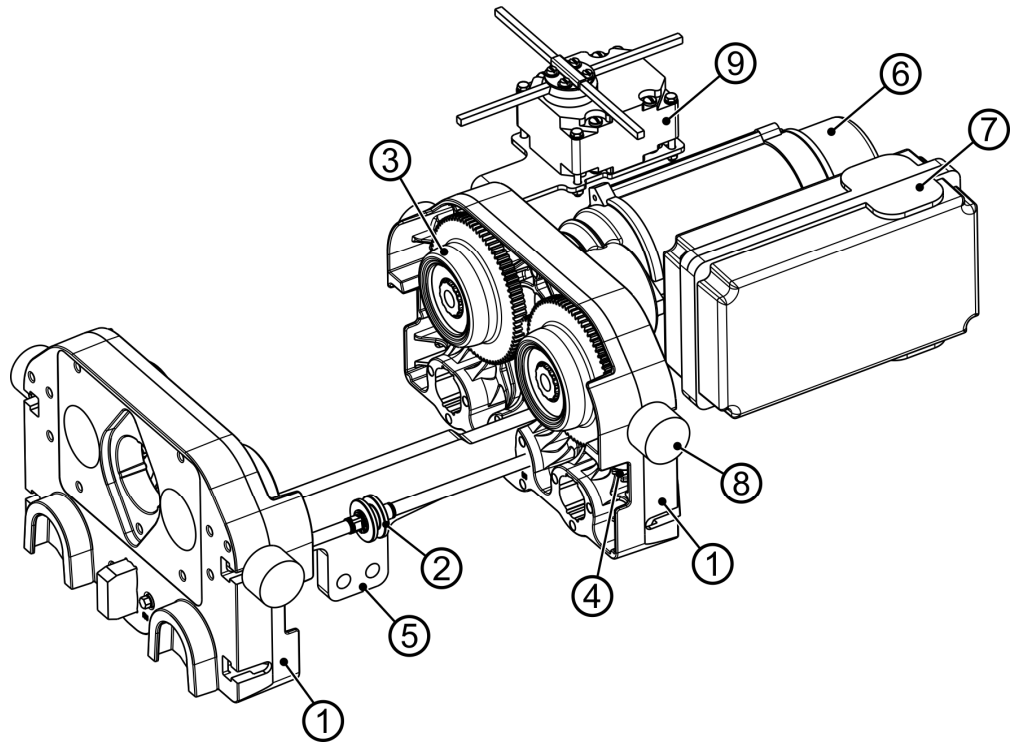


Figure 8. Motorized CT trolley, CT25

Pos.	Description	Material	Surface treatment
1	Trolley side plate (casted aluminum)	Aluminum	Electrophoretic dip coating RAL 9005 / black
2	Flange width adjustment	Steel	Zinc coating ISO 2081 – Fe/Zn8/B
3	Traveling wheels	Casted iron	-
4	Guide rollers	Bearing	-
5	Hoist suspension	Steel	Zinc plating ISO 2081 – Fe/Zn8/B
6	Traveling motor unit	Aluminum profile / aluminum flange	Anodized 10µm, black /pPowder coating 50µm RAL7021 / black
7	TMU electrical cubicle	Aluminum	Paint, powder epoxy 50µm, black
8	Buffers	Elastomer Vibrachoc	Black
9	Traveling limit switch (optional)	-	-

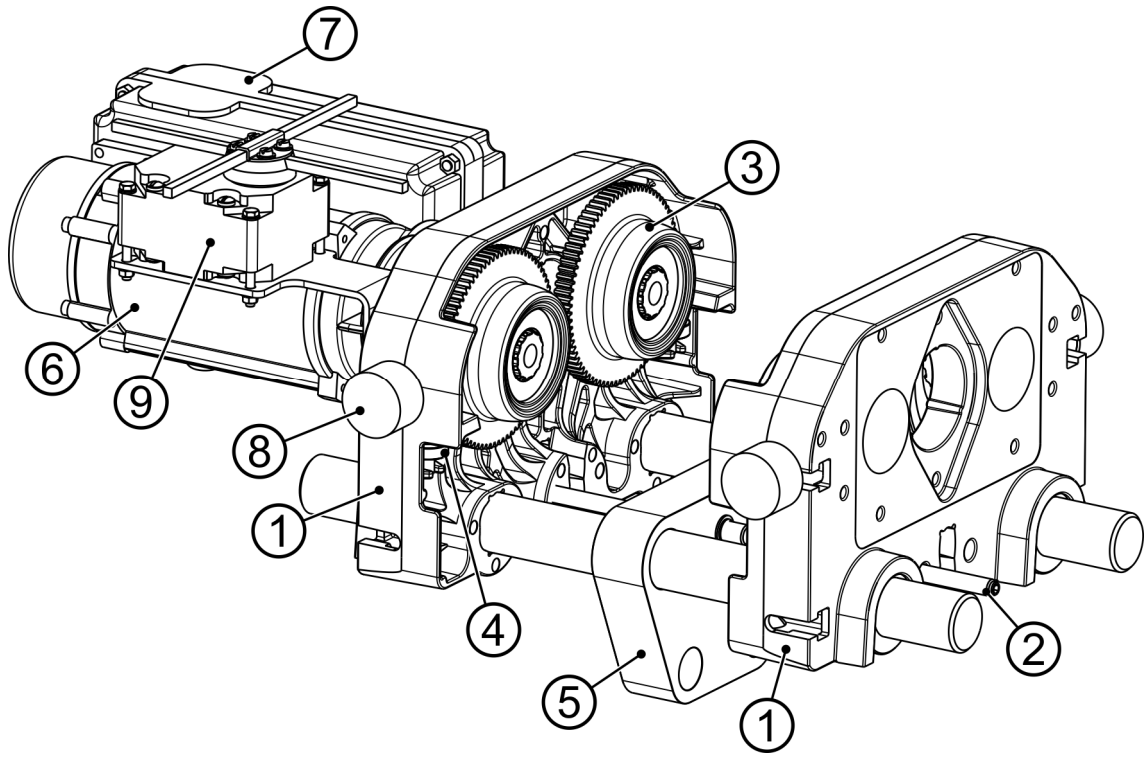


Figure 9. Motorized CT trolley, CT32

Pos.	Description	Material	Surface treatment
1	Trolley side plate (casted aluminum)	Aluminum	Electrophoretic dip coating RAL 9005 / black
2	Flange width adjustment	Steel	Zinc coating ISO 2081 – Fe/Zn8/B
3	Traveling wheels	Casted iron	-
4	Guide rollers	Bearing	-
5	Hoist suspension	Steel	ISO 2081 – Fe/Zn8/B / dip paint coating (KTL) 20µm black
6	Traveling motor unit	Aluminum profile / aluminum flange	Anodized 10µm, black / powder coating 50µm RAL7021 / black
7	TMU electrical cubicle	Aluminum	Paint, powder epoxy 50 µm, black
8	Buffers	Elastomer Vibrachoc	Black
9	Traveling limit switch (optional)	-	-

Standard features in motorized CT trolley

When available, the corresponding technical feature code is given in brackets.

- Stepless flange width adjustment, using threaded bar or adjusting rings (DIM39, Flange width range for trolley)
- Iron-casted drive wheels
- Motor driven wheels with toothing on wheel flange
- Guide rollers for track guidance
- Fall protection for the trolley and side plates
- Electrophoretic coating
- Rigid hoist suspension: no tilting, less vibration (DES54, Hoist suspension type)
- Corrosion resistant aluminum trolley side plates
- Buffers
- Counterweights to balance the trolley in narrow beam width cases
- Dual traveling speed (20 and 5 m/min. in 50 Hz)
- Minimum curve radius:
  - CT12 = 2000 mm
  - CT25 = 2000 mm
  - CT32 = 2000 mm

Optional features in motorized CT trolley

When available, the corresponding technical feature code is given in brackets.

- Traveling limit switch, (one-step stop, LIM21 MXST), (one-step slowdown, LIM21 MXSD), (two-step slowdown-stop, LIM21 MX25)
- Autotransformer for special voltages, only in USA (ELE68, Transformer for the hoist traveling control)
- Slow variable traveling speed (3 … 10 m/min. in 50 Hz)
- Worm gearbox used for reducing the horizontal width
- Towing arm for connecting the hoist power supply to the trolley (AC03, Hoist towing arm)
- X-head for hook suspension
- Rain cover
- Food safety lubricant

3.2.2 Motorized C-trolley

Identifying key parts of motorized C-trolley

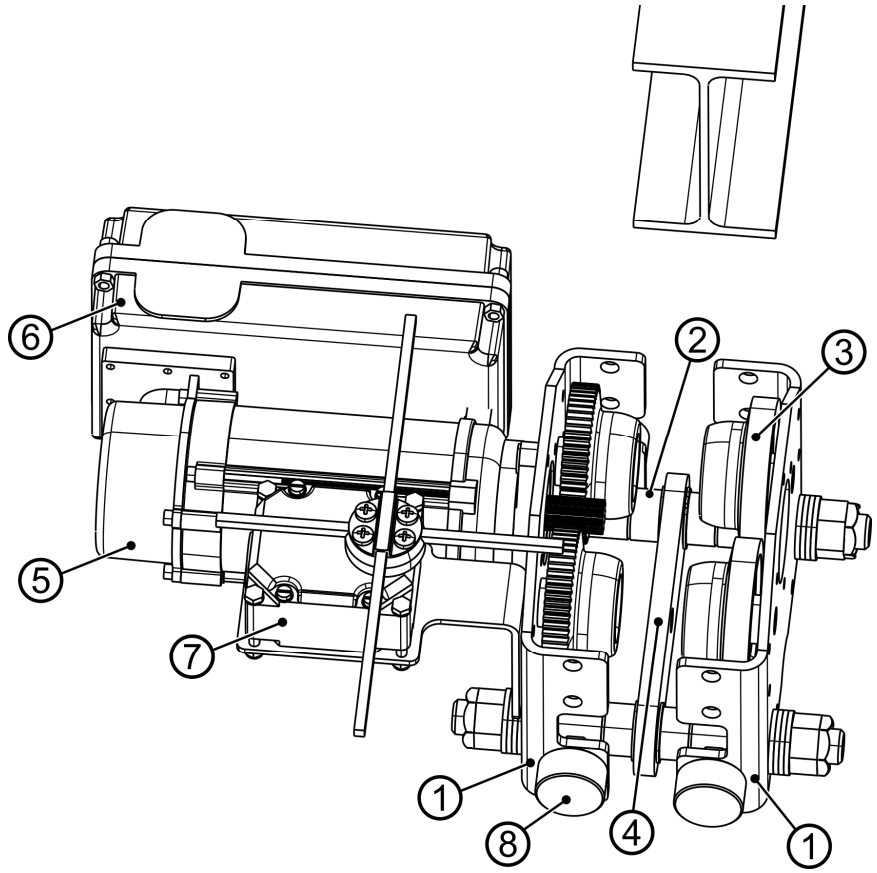


Figure 10. Motorized C-trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plates (bent steel plate)	Steel	Paint PU, RAL7021
2	Connection set (flange width adjustment) / tie rod	Steel	Zinc plating / chromation, 15/20µm
3	Traveling wheels	Steel	Paint, powder epoxy black
4	Hoist suspension	Steel	Coating ISO 2081 – Fe/Zn8/B
5	Traveling motor	Aluminum profile / aluminum flange	Anodized 10µm, black / powder coating 50µm RAL7021 / black
6	TMU electrical cubicle	Aluminum	Paint, powder epoxy 50µm, black
7	Traveling limit switch (optional)	-	-
8	Buffers	Elastomer Vibrachoc	Black

Standard features in motorized C-trolley

- Adjustment based on different connection kits
- Iron-casted drive wheels
- Motor driven wheels with toothing on wheel flange
- Fall protection for the trolley and side plates
- Coating: Epoxy powder paint (trolley side plates, coupling part), zinc-plated tie rods
- Buffers
- Dual traveling speed (20 and 5 m/min. in 50 Hz)
- Minimum curve radius:
  - C1 = 2000 mm
  - C2 = 2000 mm
  - C3 = 2000 mm
  - C5 = only straight track

Optional features in motorized C-trolley

- Traveling limit switch (one-step stop, LIM21 MXST), (one-step slowdown, LIM21 MXSD), (two-step slowdown-stop, LIM21 MX25)
- Autotransformer for special voltages, only in USA (ELE68, Transformer for the hoist traveling control)
- Slow variable traveling speed (3 … 10 m/min. in 50 Hz)
- Worm gearbox used for reducing the horizontal width
- Towing arm for connecting the hoist power supply to the trolley (AC03, Hoist towing arm)
- X-head for hook suspension
- Rain cover
- Food safety lubricant

3.3 Hand-geared trolley

3.3.1 Hand-geared CT trolley

Identifying key parts of hand-geared CT trolley

Below is an example of a hand-geared CT trolley. The same trolley and hoist combinations are available for the hand-geared CT trolleys as are available for the motorized CT trolley.

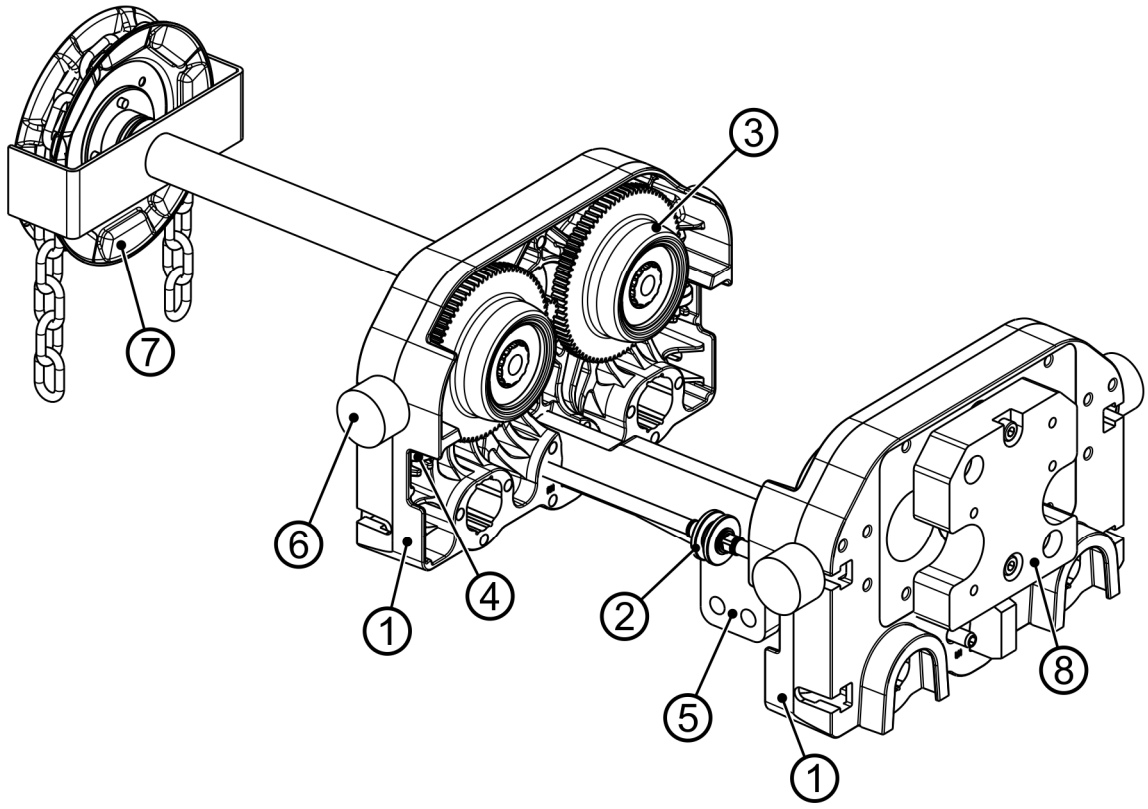


Figure 11. Hand-geared CT trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plate (casted aluminum)	Aluminum	Electrophoretic dip coating RAL 9005 / black
2	Connection set (flange width adjustment) / tie rod	Steel	Zinc plating ISO 2081 – Fe/Zn8/B
3	Traveling wheels	Casted iron	-
4	Guide rollers (standard)	Bearing	-
5	Hoist suspension	Steel	Zinc plating ISO 2081 – Fe/Zn8/B
6	Buffers	Elastomer Vibrachoc	BLACK
7	Hand chain pulley	Steel plate	Paint, epoxy black
8	Counterweight (optional)	Steel / iron	Paint, epoxy black

Standard features in hand-geared CT trolley

When available, the corresponding technical feature code is given in brackets.

- Stepless flange width adjustment, using threaded bar or adjusting rings (DIM39, Flange width range for trolley)
- Iron-casted drive wheels
- Hand-gear driven wheels with toothing on wheel flange
- Guide rollers for track guidance (OTH62, Guide rollers for trolley)
- Fall protection for the trolley and side plates
- Electrophoretic coating
- Rigid hoist suspension: no tilting, less vibration (DES54, Hoist suspension type)
- Corrosion resistant aluminum trolley side plates
- Buffers
- Counterweights to balance the trolley in narrow beam width cases
- Minimum curve radius:
  - CT12 = 2000 mm
  - CT25 = 2000 mm
  - CT32 = 2000 mm

Optional features in hand-geared CT trolley

- X-head for hook suspension
- Extra hand chain length
- Towing arm
- Available with stainless steel hand chain

3.3.2 Hand-geared C-trolley

Identifying key parts of hand-geared C-trolley

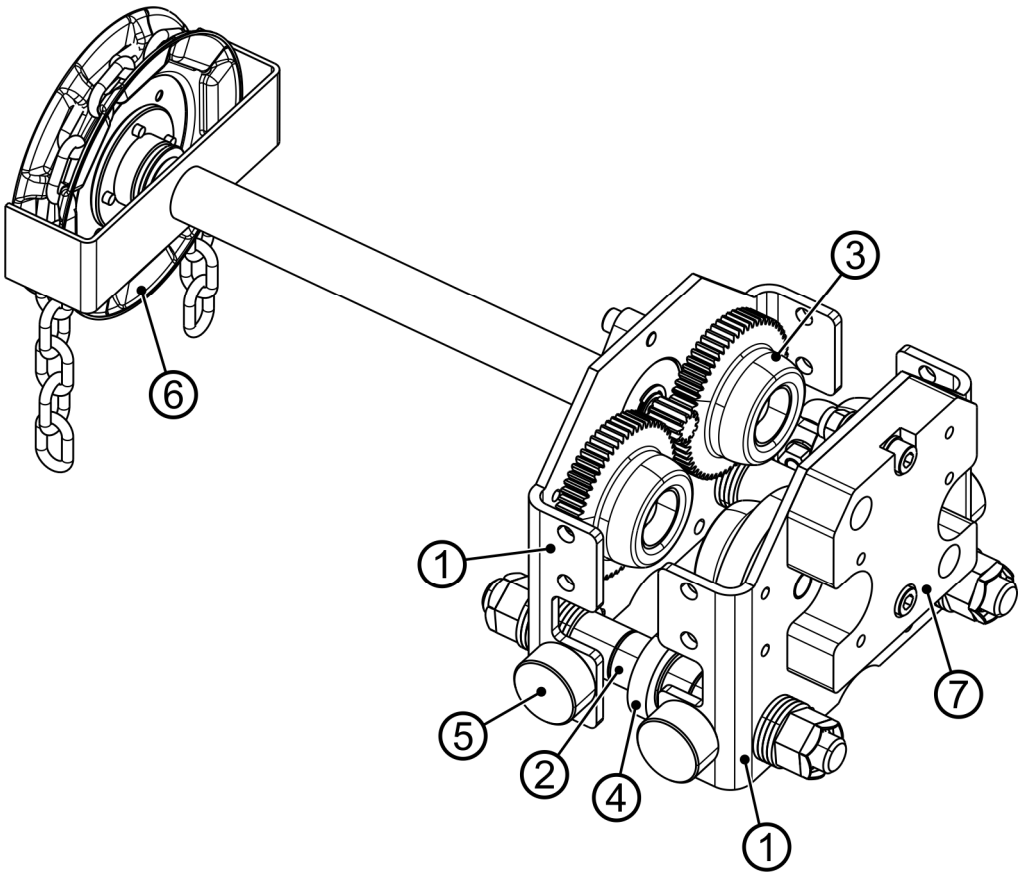


Figure 12. Hand-geared C-trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plate (bent steel plate)	Steel	Paint PU, RAL7021
2	Connection set (flange width adjustment) / tie rod	Steel	Zinc plating / chromation, 15/20µm
3	Traveling wheels	Steel	Paint, powder epoxy black
4	Hoist suspension	Steel	Coating ISO 2081 – Fe/Zn8/B
5	Buffers	Elastomer Vibrachoc	Black
6	Hand chain pulley	Steel plate	Paint, epoxy black
7	Counterweight	Steel	Paint, epoxy black

Standard features in hand-geared C-trolley

- Adjustment based on different connection kits
- Iron-casted drive wheels
- Hand driven wheels with toothing on wheel flange
- Fall protection for the trolley and side plates
- Coating: Epoxy powder paint (trolley side plates, coupling part), zinc-plated tie rods
- Buffers
- Minimum curve radius:
  - C1 = 2000 mm
  - C2 = 2000 mm
  - C3 = 2000 mm
  - C5 = only straight track

Optional features in hand-geared C-trolley

- X-head for hook suspension
- Extra hand chain length
- Towing arm
- Available with stainless steel hand chain

3.4 Push trolley

3.4.1 Manually operated CT trolley

Identifying key parts of manually operated CT trolley

Below is an example of a manually operated CT trolley. The same trolley and hoist combinations are available for the manually operated CT trolleys as are available for the motorized CT trolley.

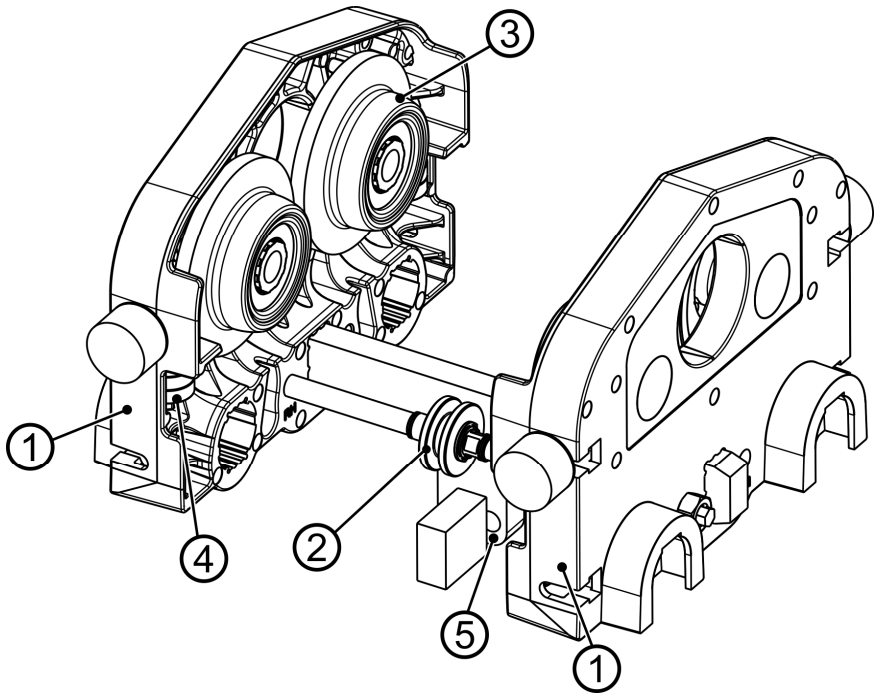


Figure 13. Manually operated CT trolley, CT12

Pos.	Description	Material	Surface treatment
1	Trolley side plate (casted aluminum)	Aluminum	Electrophoretic dip coating RAL 9005 / black
2	Flange width adjustment (stepless)	Steel	Zinc coating ISO 2081 – Fe/Zn8/B
3	Drive wheel	Casted iron	-
4	Guide rollers (standard)	Bearing	-
5	Hoist suspension	Steel	Zinc plating ISO 2081 – Fe/Zn8/B

Standard features in manually operated CT trolley

When available, the corresponding technical feature code is given in brackets.

- Stepless flange width adjustment, using threaded bar or adjusting rings (DIM39, Flange width range for trolley)
- Iron-casted drive wheels
- Manually driven wheels with toothing on wheel flange
- Guide rollers for track guidance (OTH62, Guide rollers for trolley)
- Fall protection for the trolley and side plates
- Electrophoretic coating
- Rigid hoist suspension: no tilting, less vibration (DES54, Hoist suspension type)
- Corrosion resistant aluminum trolley side plates
- Buffers
- Counterweights to balance the trolley in narrow beam width cases
- Minimum curve radius:
  - CT12 = 2000 mm
  - CT25 = 2000 mm
  - CT32 = 2000 mm

Optional features in manually operated CT trolley

- Towing arm

3.4.2 Manually operated C-trolley

A manually operated C-trolley is used with the electrical chain hoist frame sizes VR16, VR25.

Usually, with the smaller hoist frame sizes VR2, VR5, and VR12, a CHD trolley is used in manual operation. C-trolleys can be used with smaller hoist frame sizes too, but this must be handled by the sales support team as a special request.

Identifying key parts of manually operated C-trolley

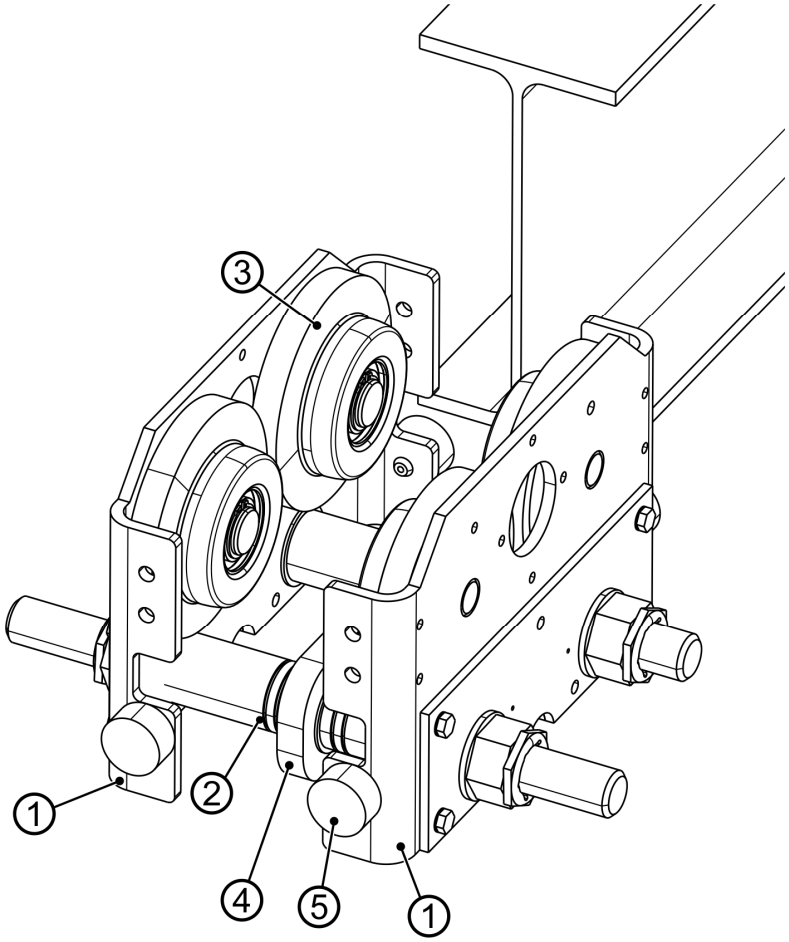


Figure 14. Manually operated C-trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plate (bent steel plate)	Steel	Paint PU, RAL7021
2	Connection set (flange width adjustment) / tie rod	Steel	Zinc plating / chromation, 15/20µm
3	Traveling wheels	Steel	Paint, powder epoxy black
4	Hoist suspension	Steel	Coating ISO 2081 – Fe/Zn8/B
5	Buffers	Elastomer Vibrachoc	Black

Standard features in manually operated C-trolley

- Adjustment based on different connection kits
- Iron-casted drive wheels
- Fall protection for the trolley and side plates
- Coating: Epoxy powder paint (trolley side plates, coupling part), zinc-plated tie rods
- Buffers
- Minimum curve radius:
  - C1 = 2000 mm
  - C2 = 2000 mm
  - C3 = 2000 mm
  - C5 = only straight track

Optional features in manually operated C-trolley

- X-head for hook suspension
- Towing arm

3.4.3 Manually operated CHD trolley

A manually operated CHD trolley is used with all manual hoists and electrical chain hoists with the frame sizes VR02–VR12.

Identifying key parts of manually operated CHD trolley

Below is an illustration of a manually operated CHD1000 trolley. Identical trolley structure is utilized also in the CHD250, CHD500, and CHD2000 trolleys.

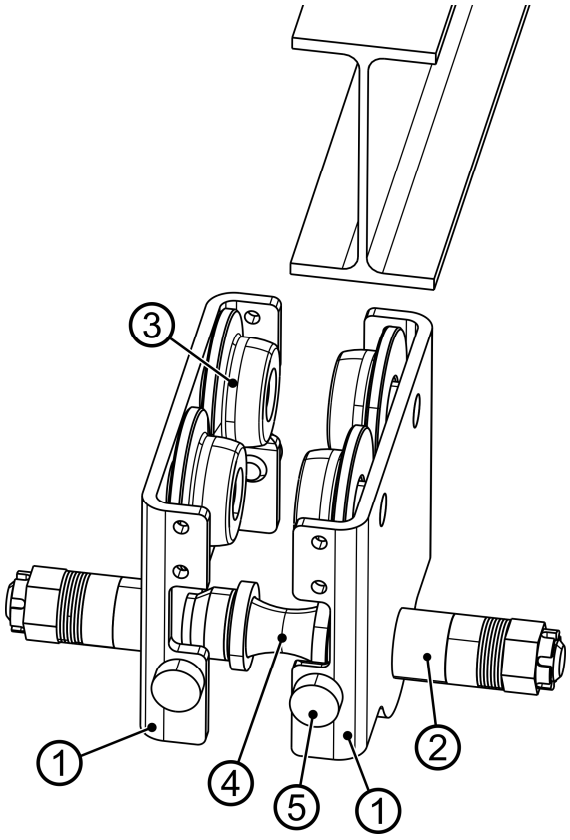


Figure 15. Manually operated CHD1000 push trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plate (bent steel plate)	Steel	Paint PU, RAL7021
2	Connection set (flange width adjustment)	Steel	Zinc plating / chromation, 15/20µm
3	Drive wheel	Steel	Paint, powder epoxy black
4	Tension rod	Steel	Coating ISO 2081 – Fe/Zn8/B
5	Buffers	Elastomer Vibrachoc	Black

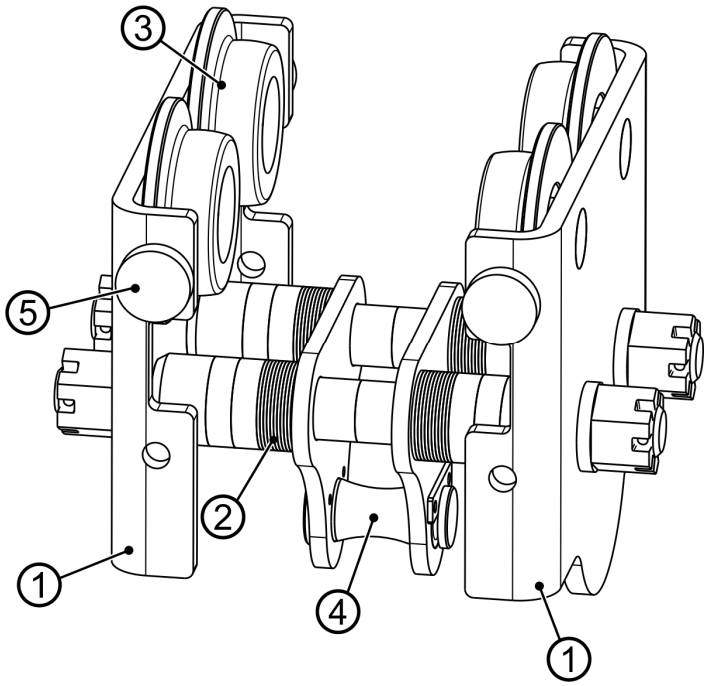


Figure 16. Manually operated CHD3000 push trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plate (bent steel plate)	Steel	Paint PU, RAL7021
2	Connection set (flange width adjustment) / tie rod	Steel	Zinc plating / chromation, 15/20µm
3	Traveling wheels	Steel	Paint, powder epoxy black
4	Hoist suspension	Alloy steel / steel plate	Burnishing black
5	Buffers	Elastomer	Black

Standard features in manually operated CHD push trolleys

- Available for manual and electric top hook hoists
- Adjustable to flange widths up to 310 mm
- Galvanized hand chain
- Delivered preassembled up to 2000 kg (width to be adjusted on site)
- Single flanged machined steel wheels add to the smooth motion
- Crown-tread wheels, compatible with all types of I and H shaped profiles
- Sealed and maintenance free wheel ball bearings
- Safety drop lugs
- Temperature range: -20 ℃ … +50 ℃
- Serial number plated on the frame
- Rubber buffer
- 12-month warranty
- Minimum curve radius:
  - CHD250 = 1000 mm
  - CHD500 = 1000 mm
  - CHD1000 = 1500 mm
  - CHD2000 = 2000 mm
  - CHD3000 = 2000 mm

4 LOW HEADROOM TROLLEY

Information in this chapter applies to the intermediate low headroom trolley solution.

4.1 Motorized low headroom trolley

A motorized low headroom trolley has a frame for a hoist suspension and a chain deflection, and is designed to travel on an I-beam. Low headroom trolley can be used as a one-fall solution or as a two-fall solution with a two-fall hook, where the fixing point is used for the chain reeving.

Identifying key parts of motorized low headroom trolley

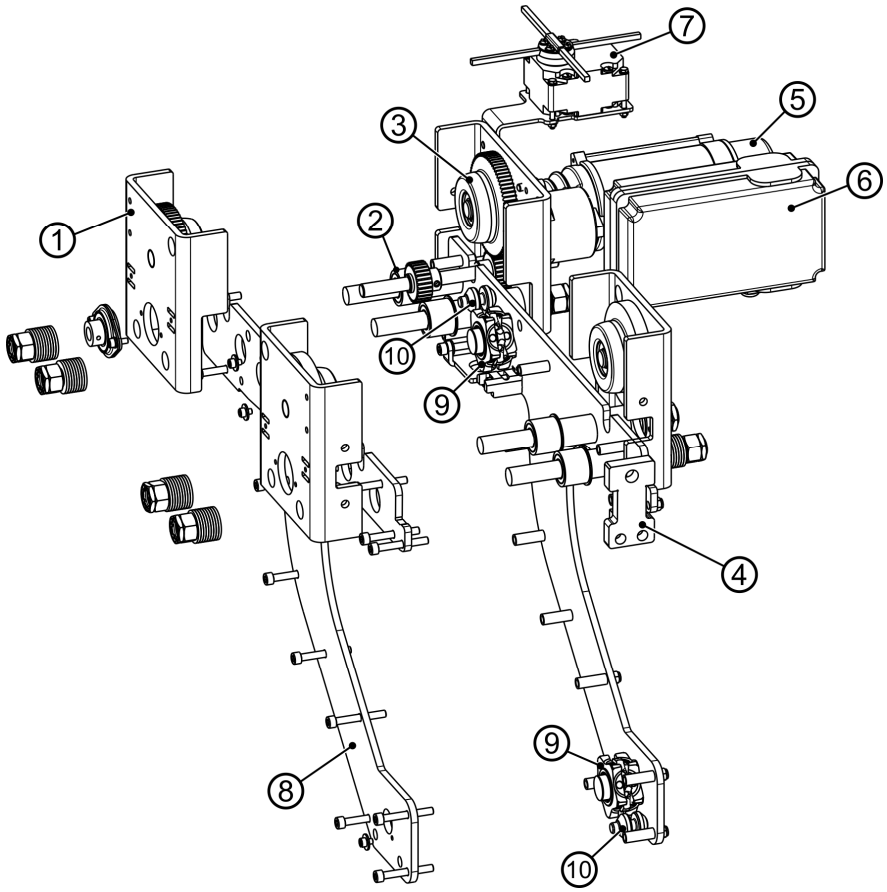


Figure 17. Motorized low headroom trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plate (bent steel plate)	Steel	Paint PU, RAL7021
2	Trolley width adjustment with spacers	Steel	Zinc plating / chromation, 15/20µm
3	Wheel	Steel	Paint, powder epoxy black
4	Hoist suspension	Steel	Coating ISO 2081 – Fe/Zn8/B
5	TMU motor unit	Aluminum profile / aluminum flange	Anodized 10µm, black / powder coating 50µm RAL7021 / black
6	TMU electrical cubicle	Aluminum	Paint powder epoxy 50µm, black
7	Traveling limit switch (optional)	-	-
8	Main trolley frame	Steel	Coating ISO 2081 – Fe/Zn8/F black zinc coating
9	Chain deflection sprocket	Steel	Protection Castrol Rustilo DWX 30
10	Chain guide roller	Steel	-

Drive selection for motorized low headroom trolley

Trolley type	Rated capacity [kg]	Chain hoist [frame size]	Drive		
			Push trolley	Traveling motor	Chain drive
CHV-HPR05	1000	VR05	X	TMU 1	X
CHV-HPR10	2000	VR12	X	TMU 2	X
CHV-HPR25	5000	VR25	–	TMU 2	X

Dimensions for motorized low headroom trolley

Trolley type	Rated capacity [kg]	Chain hoist [frame size]	Beam flange width [mm]	Beam height minimum [mm]
CHV-HPR05	1000	VR05	66 – 110	120
			111 – 154	120
			155 – 197	120
			198 – 259	120
			260 – 300	120
CHV-HPR10	2000	VR12	66 – 110	140
			111 – 154	140
			155 – 197	140
			198 – 259	140
			260 – 300	140
CHV-HPR25	5000	VR25	140 – 150	140
			151 – 189	140
			190 – 197	140
			198 – 200	140
			201 – 249	140
			250 – 299	140
			300 – 310	140

C dimension in low headroom trolley and hoist combinations

Trolley type	Dimensions [mm]					
	Chain hoist [frame size]					
	VR05		VR12		VR25	
	1-fall	2-fall	1-fall	2-fall	1-fall	2-fall
CHV-HPR05	312	373	–	–	–	–
CHV-HPR10	–	–	375	445	–	–
CHV-HPR25	–	–	–	–	470	626

Standard features in low headroom trolley

- Adjustment based on different connection kits
- Iron-casted drive wheels
- Motor driven wheels with toothing on wheel flange
- Fall protection for the trolley and side plates
- Coating: Epoxy powder paint (trolley side plates, coupling part), zinc-plated tie rods
- Buffers
- Dual traveling speed 20 and 5 m/min. in 50 Hz

Optional features in low headroom trolley

- Traveling limit switch (one-step stop, one-step slowdown, two-step stop)
- Slow variable traveling speed 3 … 10 m/min. in 50 Hz
- Worm gearbox used for reducing the horizontal width
- Towing arm
- Rain cover
- Food safety lubricant

4.2 Hand-geared low headroom trolley

Low headroom trolley is also available as a hand-geared version. For more information on the hand-geared drive, components and materials, see Hand-geared trolley.

Identifying key parts of hand-geared low headroom trolley

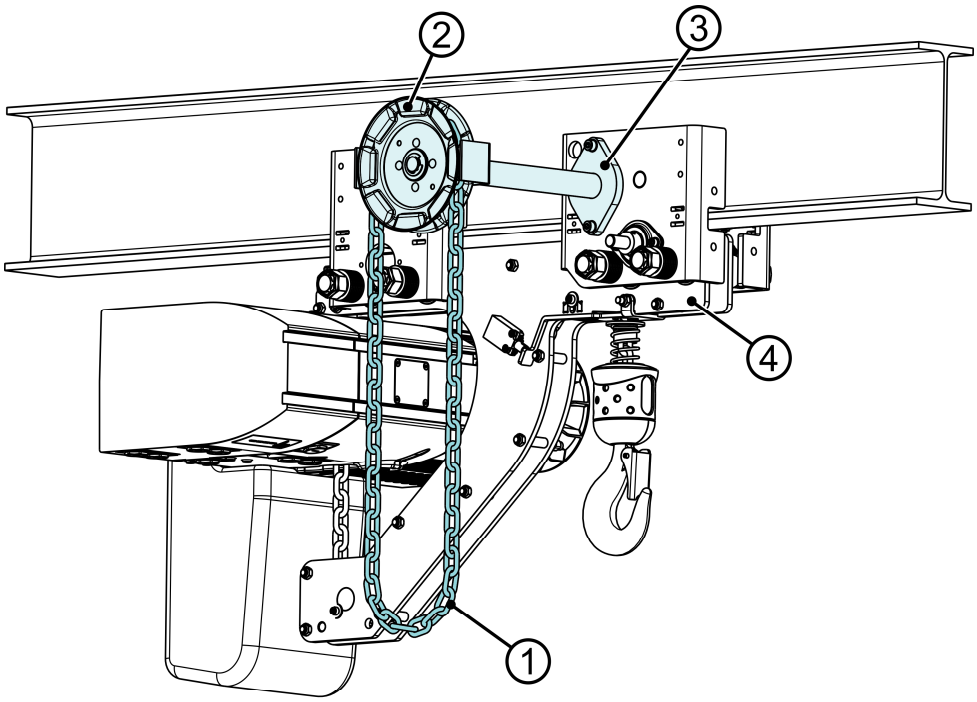


Figure 18. Hand-geared low headroom trolley

Pos.	Description	Material	Surface treatment
1	Hand chain for actuation	Steel	Zinc
2	Chain wheel	Steel	Paint, powder epoxy black
3	Flange with drive gear	Steel	Paint, powder epoxy black
4	Low headroom trolley with hoist	N/A	N/A

5 SWIVELING TROLLEY

Swiveling trolleys are designed for workspaces where a hoist needs to move along a curved track. The current swiveling trolley options are for the rated capacities of 3200 kg and 5000 kg.

Identifying key parts of swiveling trolley

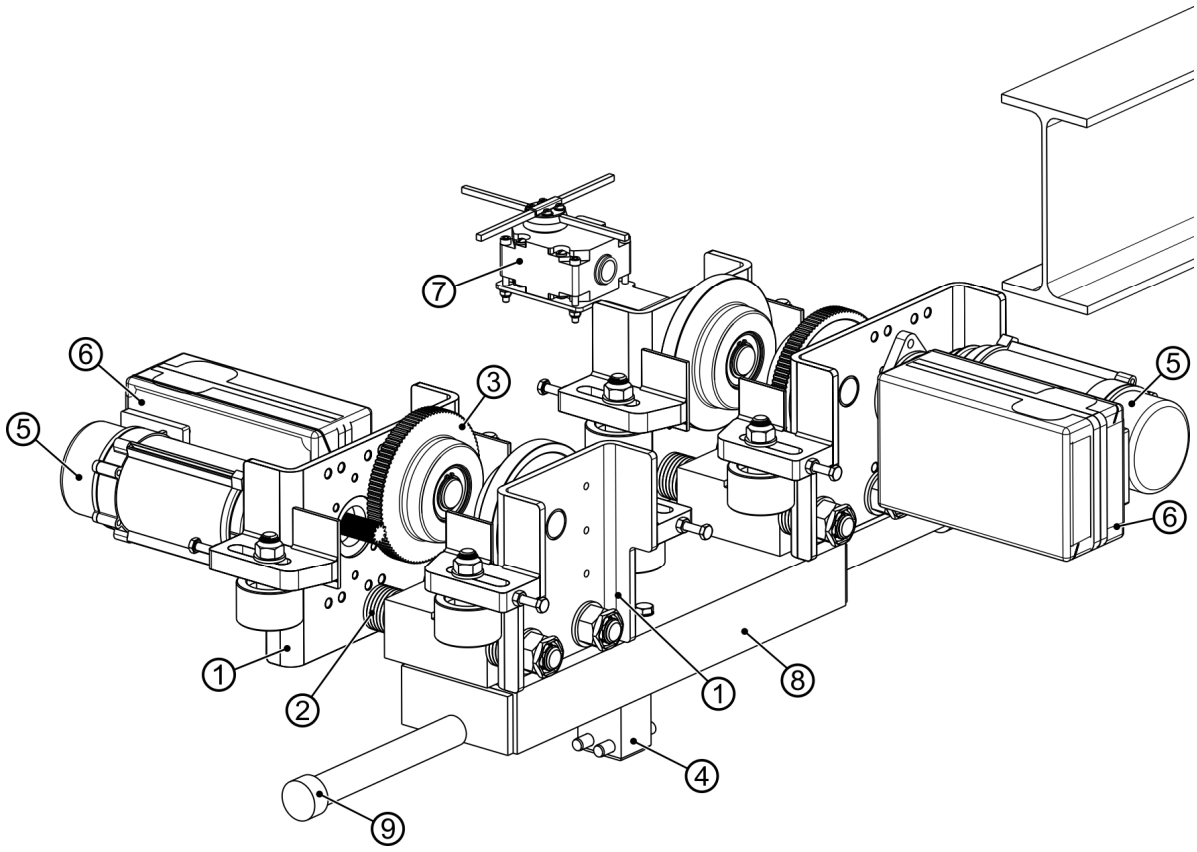


Figure 19. Swiveling trolley

Pos.	Description	Material	Surface treatment
1	Trolley side plate (bent steel plate)	Steel	Paint PU, RAL7021
2	Trolley width adjustment with spacers	Steel	Zinc plating / chromation, 15/20µm
3	Traveling wheels	Steel	Paint, powder epoxy black
4	Hoist suspension	Steel	Coating ISO 2081 – Fe/Zn8/B
5	Traveling motor	Aluminum profile / aluminum flange	Anodized 10µm, black / powder coating 50µm RAL7021 / black
6	TMU electrical cubicle	Aluminum	Paint powder epoxy 50µm, black
7	Traveling limit switch (optional)	-	-
8	Trolley traverse	Steel	Paint
9	Buffers	Elastomer Vibrachoc	Black

Drive selection for motorized swiveling trolley

Trolley type	Rated capacity [kg]	Chain hoist [frame size]	Drive		
			Push trolley	Traveling motor	Chain drive
CHV-B 32	500	VR02	–	TMU 1	–
	1000	VR05	–	TMU 2	–
	2500	VR12	–	TMU 2	–
	3200	VR16	–	TMU 2	–
CHV-B 50	5000	VR25	–	TMU 2	–

Dimensions for motorized swiveling trolley

Trolley type	Chain hoist [frame size]	Reeving	Rated capacity [kg]	Beam width [mm]	Beam height minimum [mm]	Cs / C-dimension [mm]
CHV-B 32	VR02	1/1	320		120	228 / 535
	VR02	2/1	500			228 / 587
	VR05	1/1	630			228 / 548
	VR05	2/1	1000	FL_MIN* – 117		228 / 609
	VR12	1/1	1250	118 – 177		253 / 646
	VR16	1/1	1600	178 – 247		212 / 640
	VR12	2/1	2500	248 – 310		253 / 716
	VR25	1/1	2500			212 / 685
	VR16	2/1	3200			212 / 766
	VR25	2/1	3200			212 / 835
CHV-B 50	VR25	2/1	5000	100 – 150	160	245 / 868
				151 – 222		
				223 – 310		

*)FL_MIN = minimum beam flange width.

Minimum beam flange values depending on beam radius

Trolley type	Minimum beam flange width FL_MIN [mm]	Radius range R [mm]
CHV-B 32	82	2000
	90	1500 ≤ R < 2000
	100	800 ≤ R < 1500

Standard features in swiveling trolley

- Two traveling motor units)
- Adjustment based on different connection kits
- Iron-casted drive wheels
- Motor driven wheels with toothing on wheel flange
- Fall protection for the trolley and side plates
- Coating: Epoxy powder paint (trolley side plates, coupling part), zinc-plated tie rods
- Buffers
- Dual traveling speed 20 and 5 m/min. in 50 Hz

Optional features in swiveling trolley

- Traveling limit switch (one-step stop, one-step slowdown, two-step stop)
- Slow variable traveling speed 3 … 10 m/min. in 50 Hz
- Worm gearbox used for reducing the horizontal width
- X-head for hook suspension
- Rain cover
- Towing arm
- Food safety lubricant

6 SUSPENSION PARTS

6.1 Normal headroom trolley suspension parts

6.1.1 CT trolley

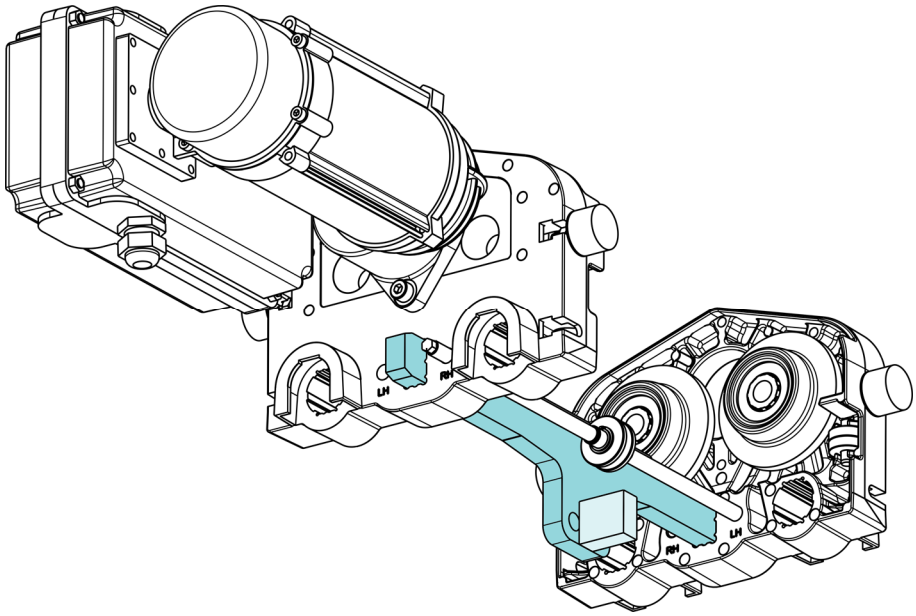


Figure 20. Suspension part in motorized CT trolleys CT12 and CT25

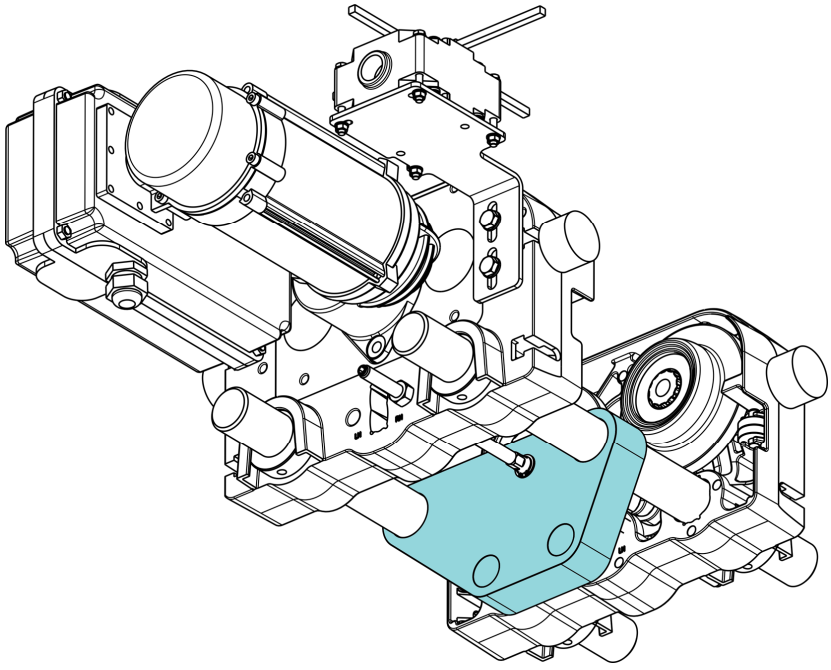


Figure 21. Suspension part in motorized CT trolley CT32

6.1.2 C-trolley

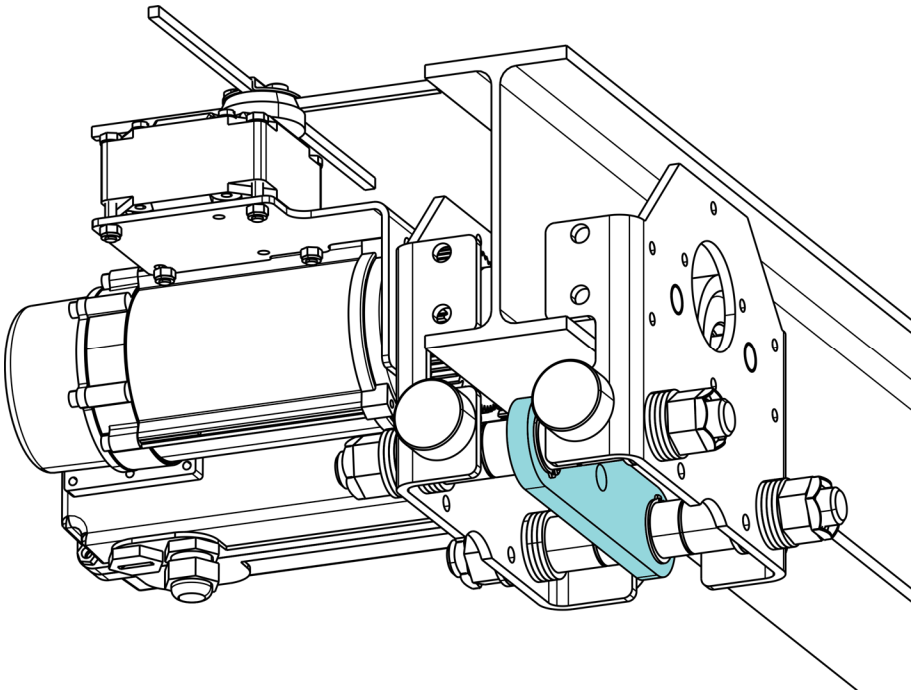


Figure 22. Suspension part in motorized C-trolley, coupled

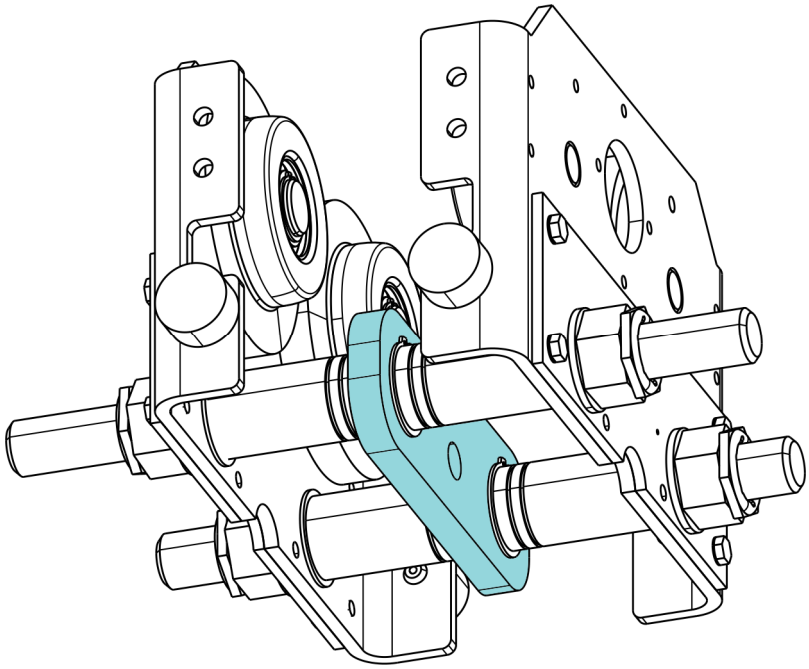


Figure 23. Suspension part in manually operated C-trolley

This trolley is also available with a crosshead suspension for a hook-suspended hoist.

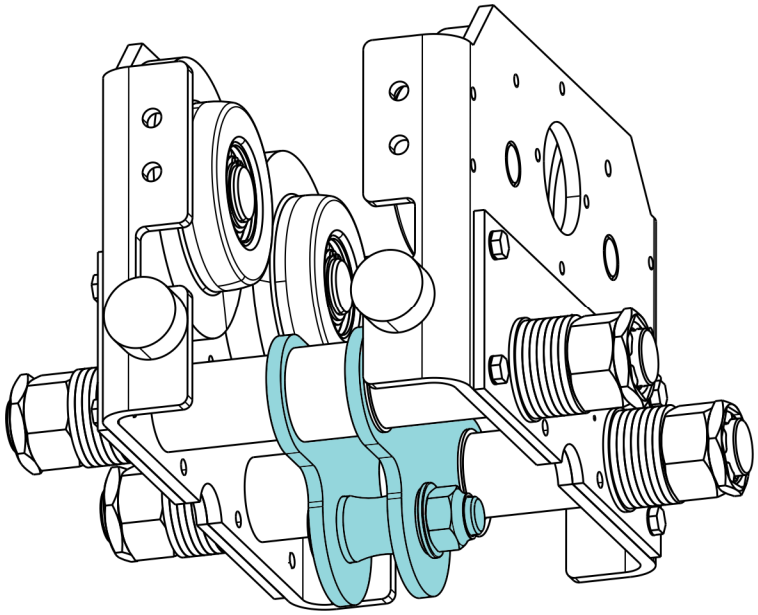


Figure 24. Hook suspension part in C-trolley C3, normal headroom push trolley

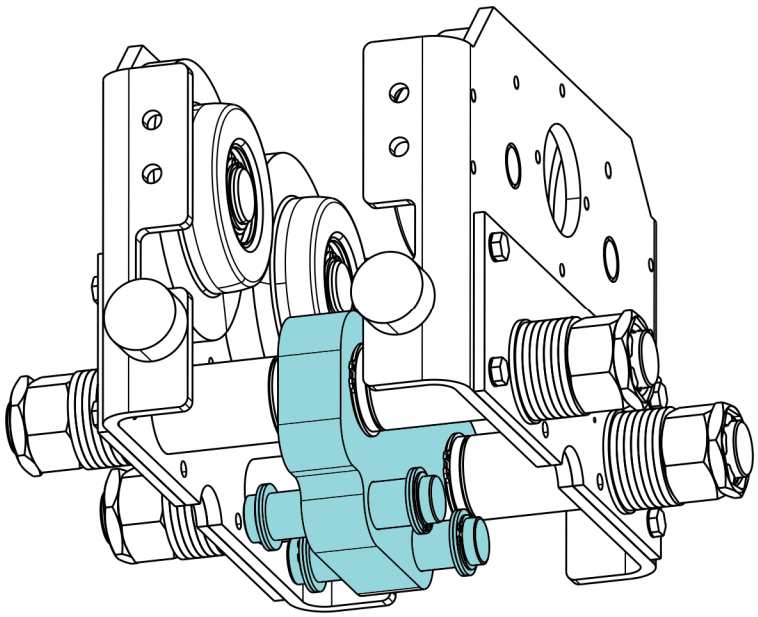


Figure 25. Suspension part in C-trolley C3, normal headroom push trolley for hoist frame sizes VR16, VR25

6.1.3 CHD manual trolley

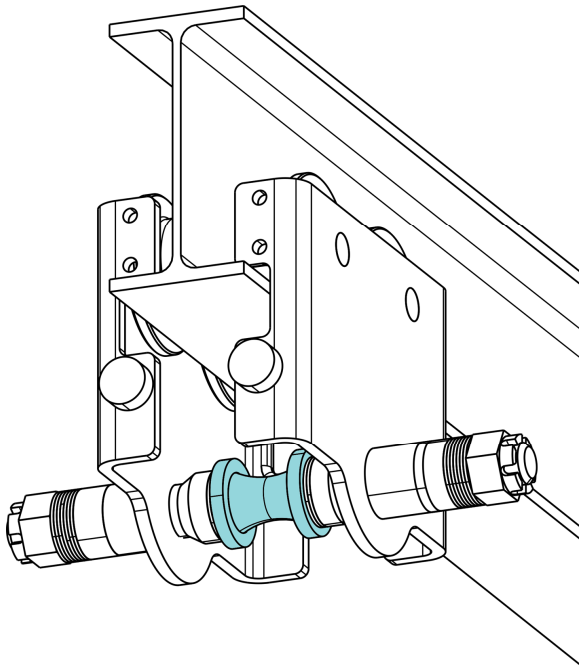


Figure 26. Suspension part in CHD1000 push trolley

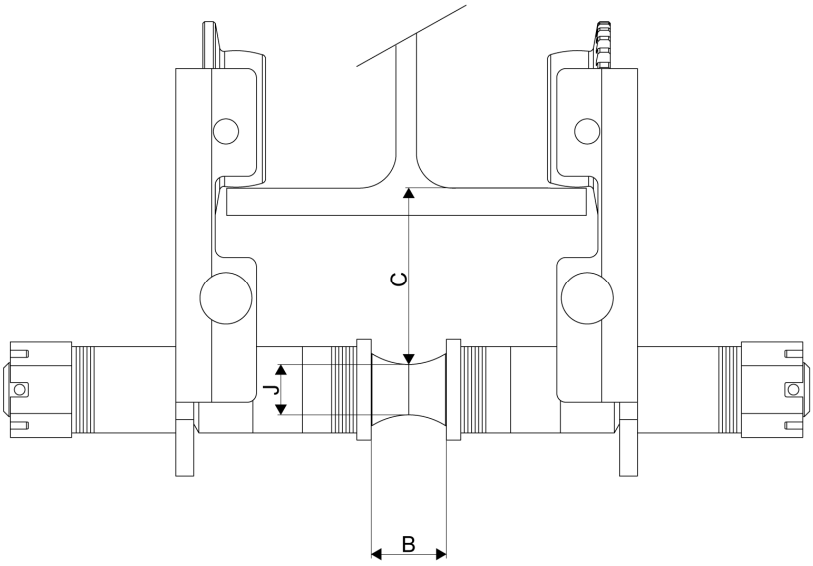


Figure 27. Dimensions in CHD push trolley trolley range 250–2000 kg

Rated capacity [kg]	Dimensions [mm]				
	Beam flange width 1	Beam flange width 2	B	C	J
250	50 - 202	-	32	60	15
500	50 - 202	188 - 310	32	62	20
1000	65 - 202	188 - 310	39	81	24
2000	88 - 202	188 - 310	42	96	30

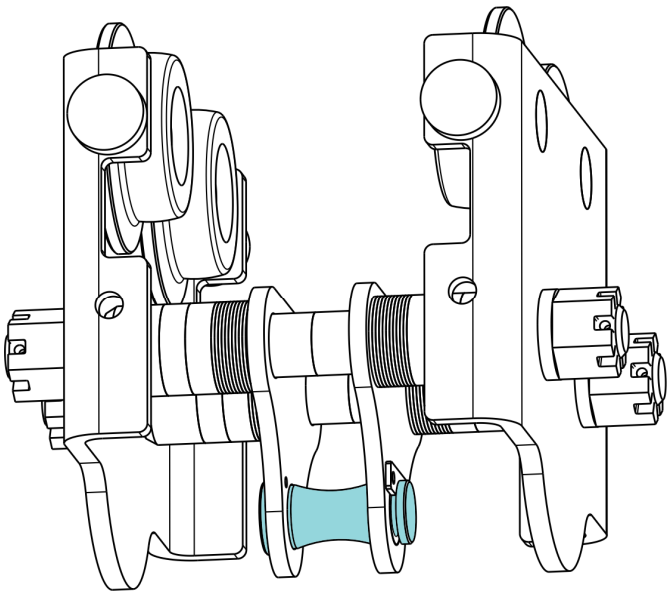


Figure 28. Suspension part in CHD3000 push trolley

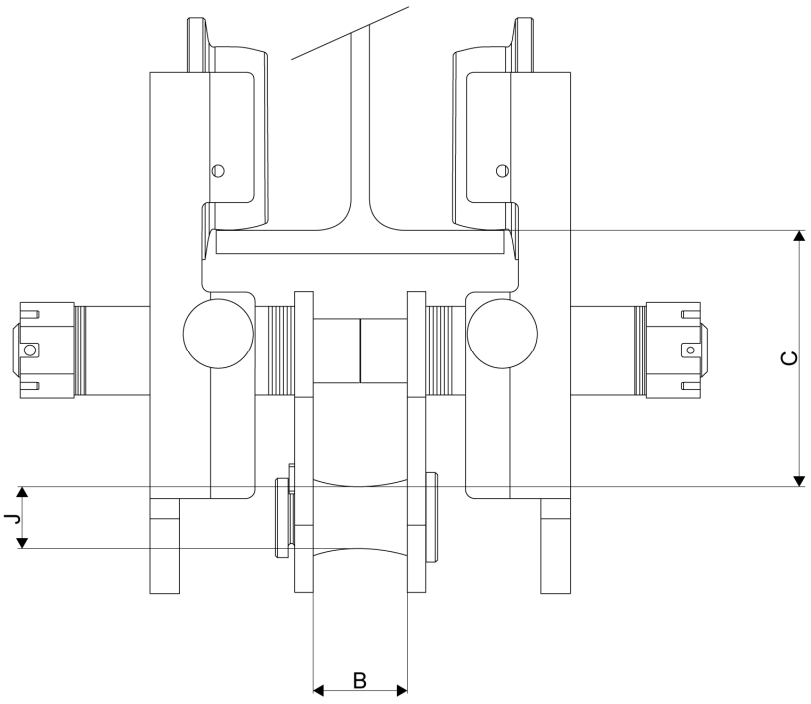


Figure 29. Dimensions in CHD push trolley range 3000–10000 kg

Rated capacity [kg]	Dimensions [mm]				
	Beam flange width 1	Beam flange width 2	B	C	J
3000	100 - 202	188 - 310	49	140	28
5000	114 - 202	188 - 310	60	161	35
7500	124 - 202	188 - 310	68	176	43
10000	124 - 202	188 - 310	70	187	50

6.2 Low headroom trolley suspension part

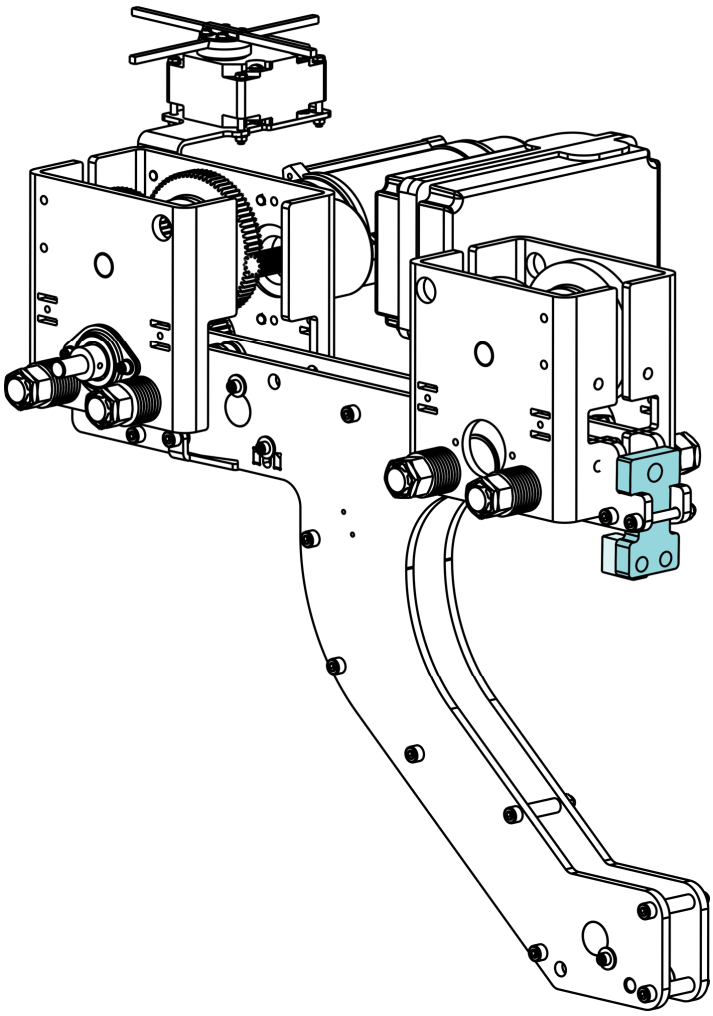


Figure 30. Suspension part in the low headroom trolley, CHV-HPR version

6.3 Swiveling trolley suspension part

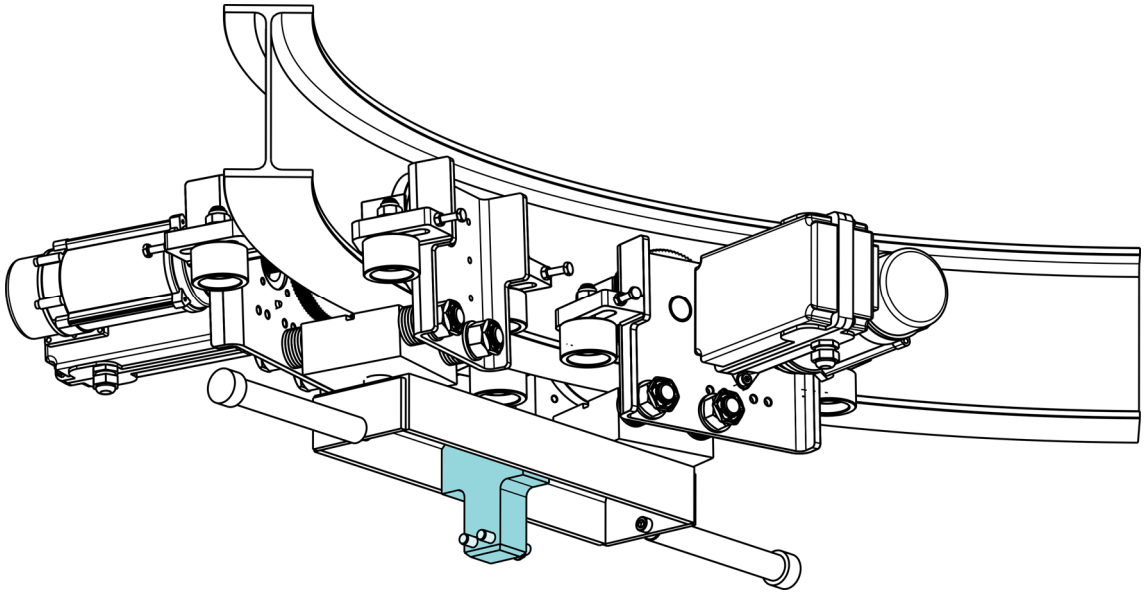


Figure 31. Suspension part in swiveling trolleys

7 TRAVELING MOTORS

7.1 Identifying key parts of traveling motors

Traveling motor unit (TMU) consists of a control box, gear, and motor.

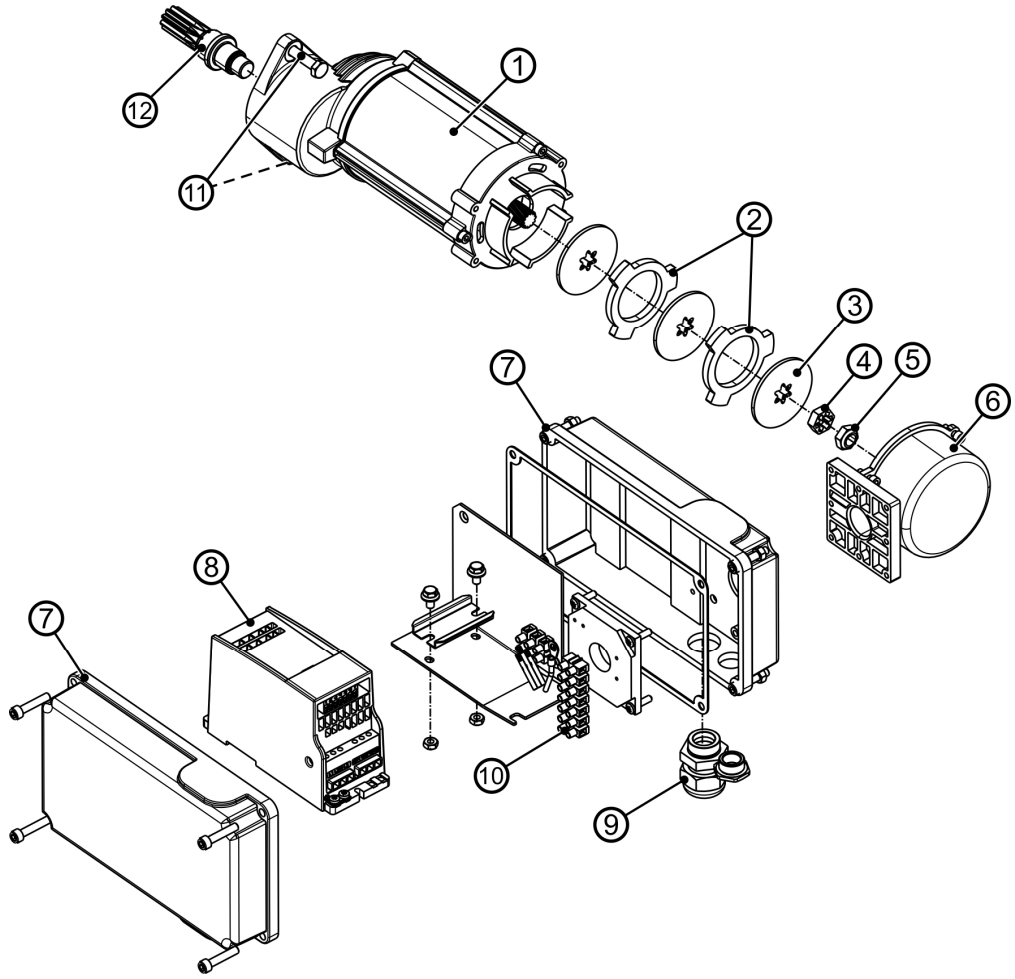


Figure 32. Traveling motor unit

Pos.	Part
1	Gear/motor unit
2	Brake friction discs
3	Brake disc
4	Aluminum ring
5	Adjustment nut
6	Brake cover
7	Electric box
8	Frequency converter
9	Cable gland for connecting cable
10	Electrical connectors
11	Fixing screws
12	Secondary shaft

Two different frequency converter drive units are used as standard for the varying chain hoist applications.

The frequency converter Variator 2VT is mounted on the side of the unit and is connected with a plug to the chain hoist.

The TMU 2 is also available as a contactor-controlled (two-speed) motor version.

Speed control type	**Gearless drive**	**Geared drive**	
Frequency converter control	TMU 1 (150 W)	TMU 2 (300 W)	
Contactor control		TMU 2	50 Hz: 300/50 W 60 Hz: 370/70 W

7.2 Electrical data in TMU

TMU type	**Motor**	**Power [kW]**			**Revolution [1/min.]**			**ED%**	**Work cycles**
		35 Hz	**100 Hz**	**120 Hz**	**35 Hz**	**100 Hz**	**120 Hz**		
TMU 1	MF06MK200-135A8…	0.15	-	-	965	-	-	40	S3-40%
TMU 2	MF06MK200-145F8…	-	0.3	0.37	-	2855	3430	40	S3-40%

7.3 Operating conditions

The following operating conditions apply:

Operating environment	Only for indoor use
Operating temperature	-10 °C…+40 °C (with frequency converter)
	-20 °C…+40 °C (with two-speed contactor control)
	-20 °C…+50 °C (fully manual)
Humidity	90 % relative humidity (no condensation)
Water protection class	IP66 for TMU 1 and TMU 2 as standard
Sound level	70 dB at 1 m

7.4 TMU features

Standard features in TMU

- Maximum relative humidity: 90 % without condensation
- Overheating-protection
- Robust powder-coated aluminum cubicle
- Mechanical limit switches for traveling available
- Frequency-controlled traveling motor
- Programmable acceleration-/deceleration-ramp
- Optimized for usage with electrical chain hoist – power and control cable can be plugged into the chain hoist control
- Protection class: IP66

Optional features in TMU

- Traveling limit switch
- Rain cover for travel drive
- Contactor-controlled (two-speed) traveling motor
- Towing arm
- CAN-BUS connection
- Food safety lubricant
- Worm gearbox used for reducing the horizontal width
- Slow variable traveling speed (3 … 10 m/min. in 50 Hz)

NOTE: When the TMU is used outdoors, a rain cover is always required.

7.5 Frequency converter motor data

Frequency converter driven motor

	Frequency converter motor							
	Standard						Options	
	TMU 1 [35 Hz]		TMU 2 [100 Hz]		TMU 3 [100 Hz]		TMU 2	TMU 2
	LS	HS	LS	HS	LS	HS	LS	HS
Traveling speed [m/min.]	3	20	2	10	2	8	4	16
	…	…	…	…	…	…	…	…
	10	37	6	20 (24)[1)]	4.7	17 (20)[1)]	16	32
							Max. 5000 kg	
Rated capacity [kg]	1000		5000		10 000		–	
ED %	40		40		40		–	
Starts	240		240		240		–	
Current [A]	In = 1.1		In = 1.2		In = 1.8		–	
	Id = 2.3		Id = 4.2		Id = 8.2			
Power [W]	150		300		450		–	
Cos φ	0.5		0.57		0.52		–	
RPM	965		2855		2850		–	
Frequency [Hz]	50…60		50…60		50…60		–	
Power supply [Vac]	380…480		380…480		–		208/220/230/525/575/600/690	
Control voltage [Vac]	48		48		48		115/230	
End limit switches	–		–		–		Yes	
Slow-down switches	–		–		–		Yes (MS mode only)	
Thermal protection	–		–		–		Yes	
IP protection	66		66		66		Reinforced	
Tropicalization [%]	95		95		95		–	
Ambient temperature [℃]	-10 ℃ … +40 ℃		-10 ℃ … +40 ℃		-10 ℃ … + 40 ℃		–	
Standby heaters	–		–		–		Yes	
Motor class	H		H		H		–	
Alone (low volt. cubicle)	–		–		–		Yes	

[1)]NOTE: The values in brackets show the maximum speed with a minimum supply voltage of 460V AC.

Abbreviations	
In	Nominal current
Id	Starting current

For more information on the frequency converter setup, see Owner's manual for Travel frequency control system.

7.6 Contactor-controlled motor data

Two-speed contactor-controlled motor

	Two-speed motor		
	TMU 2		
	Standard [50 Hz]		Options
Traveling speed [m/min.]	**LS**	**HS**	–
	5	20	–
Rated capacity [kg]	5000		–
ED %	40		–
Starts	240		–
Current [A]	In = 1.0	In = 0.8	–
	Id = 3.5	Id = 1.0	
Power [W]	300	50	–
Cos φ	0.70	0.77	–
RPM	2800	690	–
Frequency [Hz]	50		–
Power supply [Vac]	400		208/220/230/525/575/600/690
Control voltage [Vac]	48		115
End limit switches	–		–
Slow-down switches	–		–
Thermal protection	–		Yes
IP protection	66		Reinforced
Tropicalization [%]	95		–
Ambient temperature [°C]	-20 °C … +40 °C		–
Standby heaters	–		Yes
Motor class	H		–

Abbreviations	
In	Nominal current
Id	Starting current

7.7 Worm gearbox

Worm gearbox is an option available for C-trolleys.

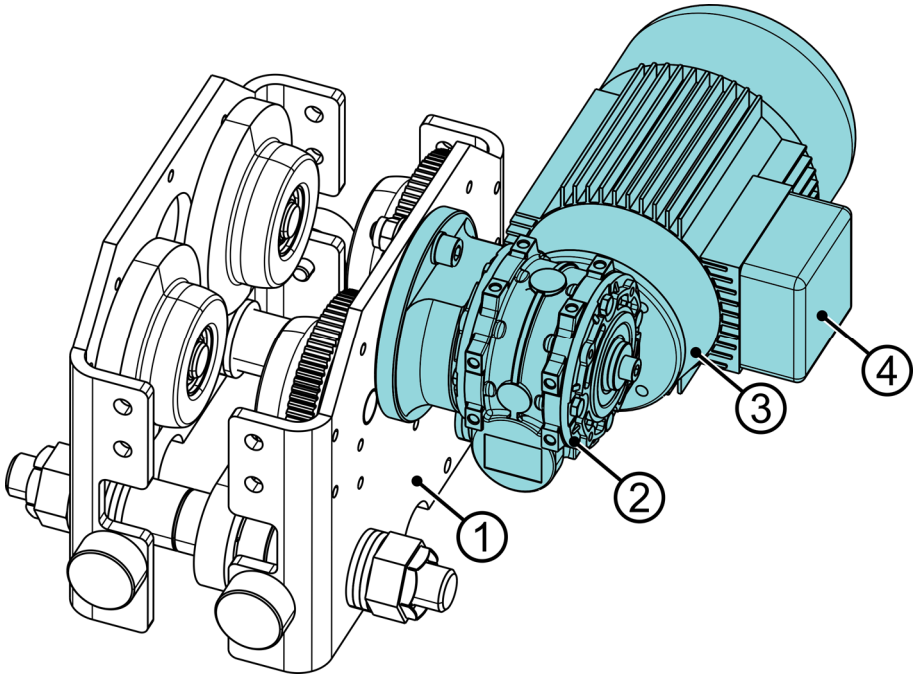


Figure 33. Worm gearbox

Pos.	Part
1	Trolley
2	Worm gearbox
3	Motor
4	Motor terminal box

Worm gearbox is used when the horizontal width of the trolley must be condensed. Whereas a TMU is mounted perpendicular to the trolley and beam, and therefore, requires more space, a worm gearbox is mounted parallel to the trolley and beam.

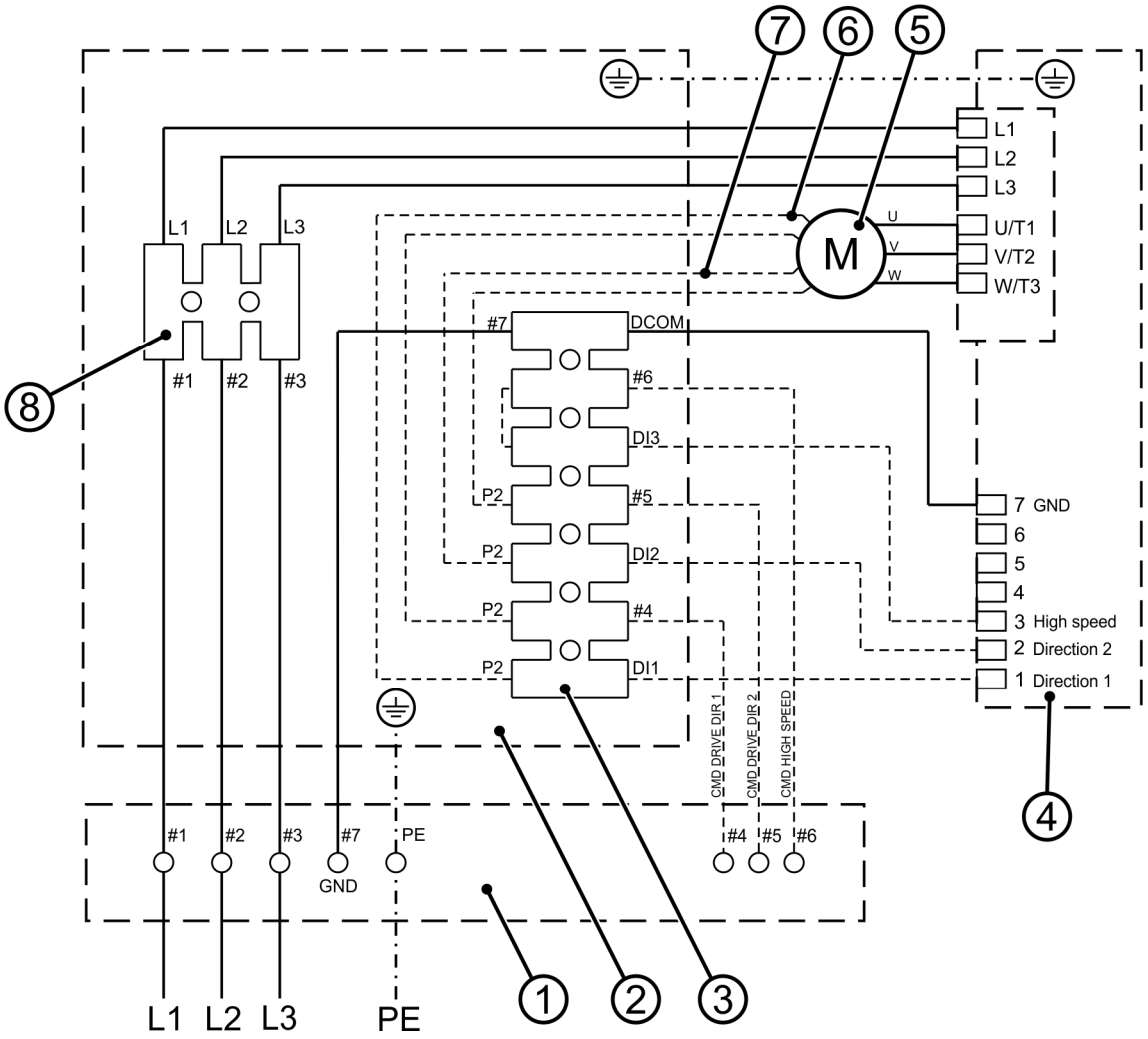
Worm gearbox is only available with contactor-controlled and fixed motor speeds, not with a frequency converter.

Available speeds are:

- 1-speed 5 m/min.
- 1-speed 10 m/min.
- 2-speed 10 and 2.5 m/min.

8 ELECTRICS

8.1 Electrical connections in TMU



Pos.	Description
1	Chain hoist
2	Trolley control box
3	Connection terminal 7-pole
4	Frequency converter
5	Trolley drive motor
6	Bi-metal switch 1 (motor thermal protection)
7	Bi-metal switch 2 (motor thermal protection)
8	Connection terminal 3-pole

	Terminal / name		Function	Cable size	
				mm²	AWG
Power module	L1		3-phase input	1.5–4.0	16–12
	L2				
	L3				
	U 7 T1		Motor output		
	V / T2				
	W 7 T3				
	R+		Braking resistor terminals (not in model 003)		
	R-				
	PE		Protective earth		
Control board	1	DI1	DI1 = S1 Direction command forward	1.0–2.5	20–10
	2	DI2	DI2 = S1 Direction command reverse		
	3	DI3	Function depends on parameter settings		
	4	DI4			
	5	DI5			
	6	DI6	Motor temperature protection / external stop		
	7	COM	Common DI1–DI6		

8.2 Traveling limit switch

Traveling limit switches are used for controlling the area where a motorized trolley is allowed to move. A traveling limit switch (1) is mounted on the trolley and connected directly to the trolley control box. Cross bars in traveling limit switches rotate when they pass mechanical activators (2), which are usually mounted on the beam, at both ends of the allowed traveling range. They actuate the traveling limit switch and trigger the stop or/and slowdown function.

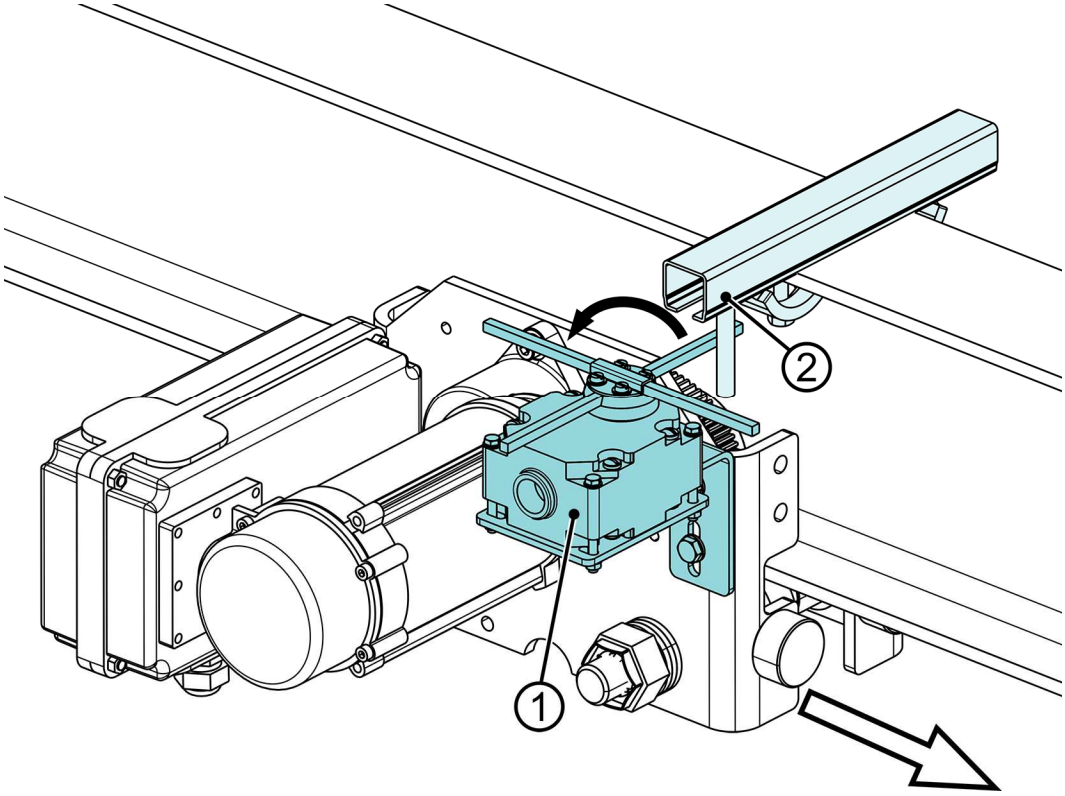


Figure 34. Traveling limit switch and mechanical activator

Pos.	Part
1	Traveling limit switch
2	Mechanical activator on the beam

Traveling limit switch types

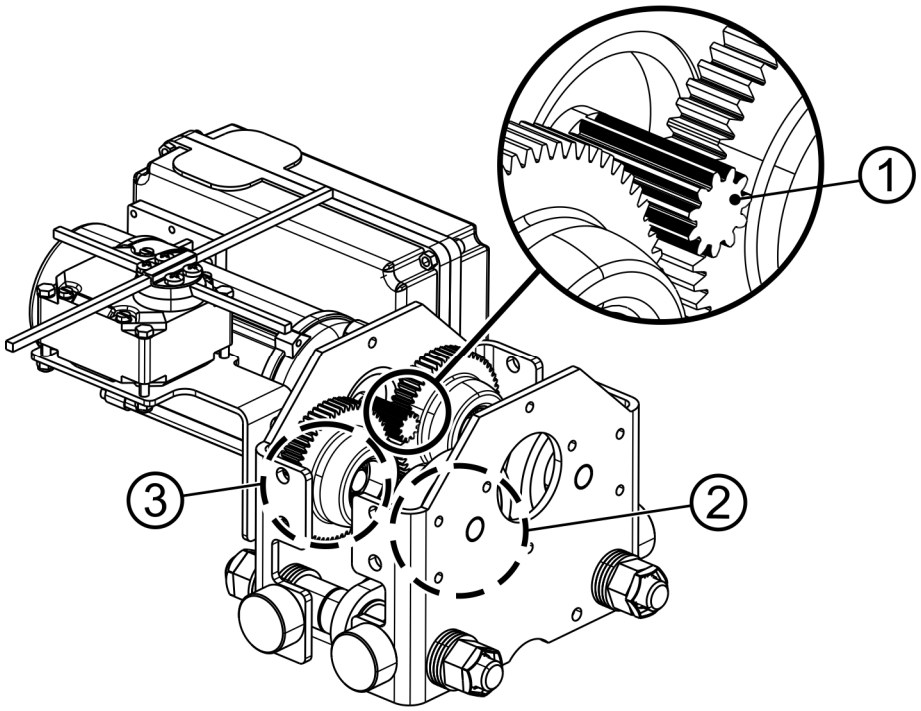
Function	Description
One-step STOP (in MS or EP control mode)	Trolley travels at full speed until it reaches a mechanical activator, then stops within a programmed ramp-down time. This function requires one mechanical activator per side.
One-step SLOWDOWN (in MS control mode)	Trolley travels at full speed until it reaches a mechanical activator, then slows down within a programmed ramp-down time. Travel continues until either a user releases the travel button on pendant or the trolley reaches a mechanical end stop. This function requires one mechanical activator per side.
Two-step SLOWDOWN-STOP (in MS or EP control mode)	Trolley travels at full speed until it reaches the first mechanical activator, then slows down within a programmed ramp-down time. Travel continues until either a user releases the travel button on pendant or the trolley reaches the second mechanical activator, which actuates the switch second time, causing the trolley motor to stop. This function requires two mechanical activators per side, one marking the SLOW area and the other the STOP point.

Frequency control modes

Feature	Description
MS (multi-step) frequency converter control mode	Pendant contains one two-step button for each of the trolley's travel directions: • Button released = stop • Button half-way pressed = slow speed • Button fully pressed = fast speed In this mode, a trolley can only travel with two different speeds, slow and fast.
EP (electronic potentiometer) frequency converter control mode	Pendant contains one two-step button for each of the trolley's travel directions. • Button released = stop • Button half-way pressed = maintain current speed • Button fully pressed = accelerate In this mode, a trolley can travel in any speed between a full stop and the maximum speed. Speed can be changed incrementally. For more information, see Owner's manual for chain hoist trolleys.

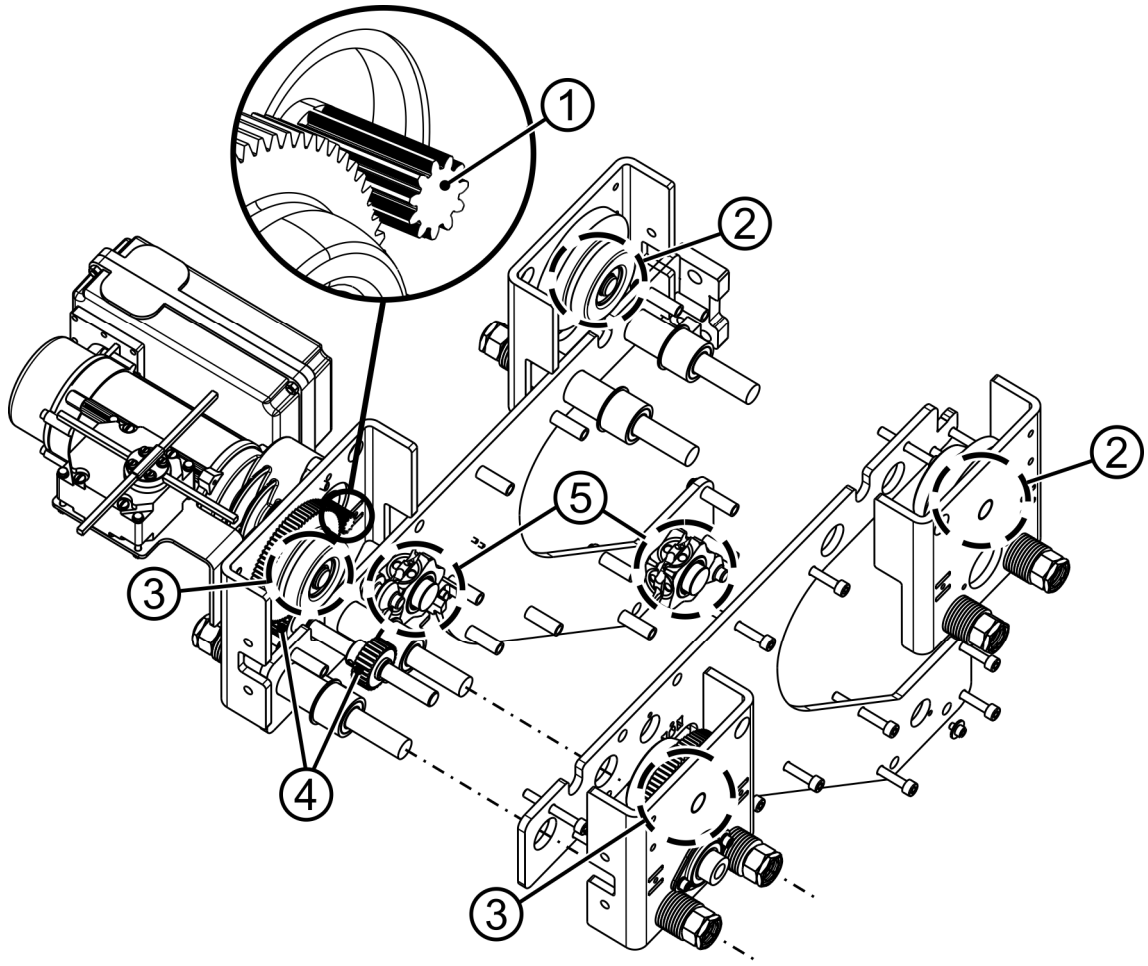
9 LUBRICATION

9.1 Normal and compact headroom trolley lubrication points



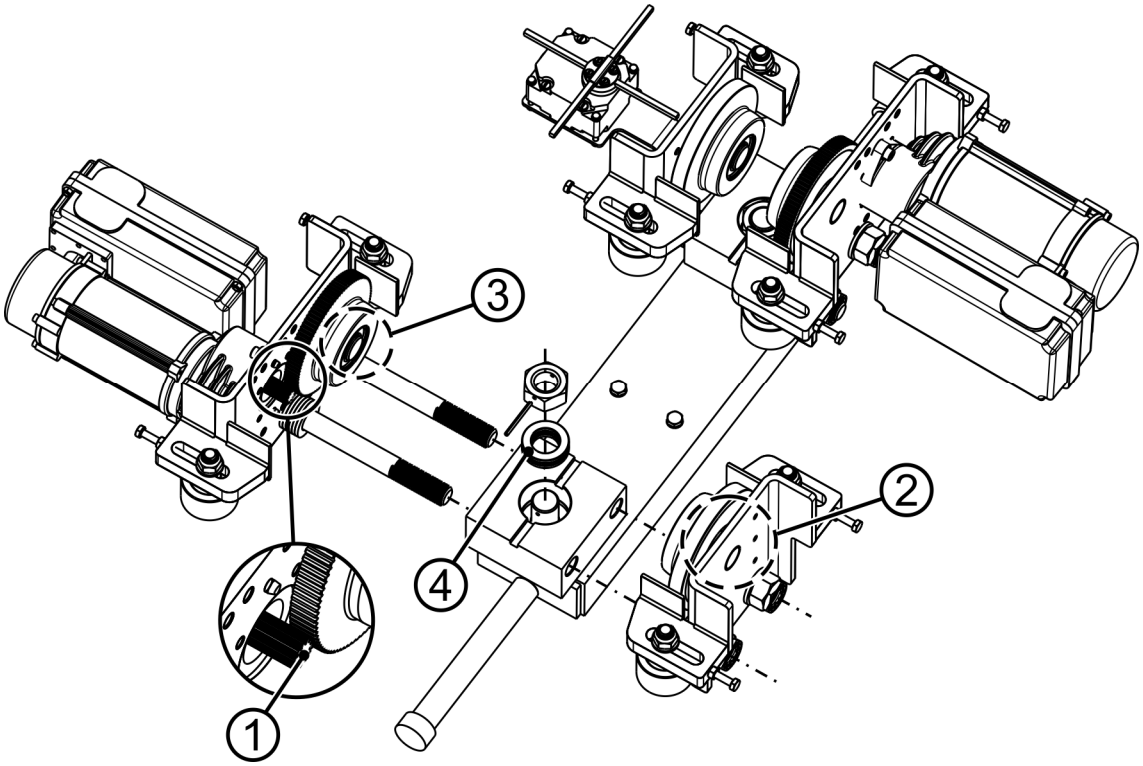
Pos.	Component	Intervals	Trade name	Quantity [l]
1	Secondary/output shaft (traveling transmission)	Annually	Mobilith SCH 460	0.075
2	Idle traveling wheel bearings	No lubrication needed, lubricated at the factory for the design working period of the product	-	-
3	Geared/traveling wheel bearings	No lubrication needed, lubricated at the factory for the design working period of the product	-	-

9.2 Low headroom trolley lubrication points



Pos.	Component	Intervals	Trade name	Quantity [l]
1	Secondary/output shaft (traveling transmission)	Annually	Mobilith SCH 460	0.075
2	Idle traveling wheel bearings	No lubrication needed, lubricated at the factory for the design working period of the product	-	-
3	Geared/traveling wheel bearings	No lubrication needed, lubricated at the factory for the design working period of the product	-	-
4	Drive transmission shaft	Annually	Mobilith SCH 460	0.075
5	Return sprocket slide bearing	Annually or after 400 h (whichever comes first)	Mobilith SCH 460	0.075

9.3 Swiveling trolley lubrication points



Pos.	Component	Intervals	Trade name	Quantity [l]
1	Secondary/output shaft (traveling transmission)	Annually	Mobilith SCH 460	0.075
2	Idle traveling wheel bearings	No lubrication needed, lubricated at the factory for the design working period of the product	-	-
3	Geared/traveling wheel bearings	No lubrication needed, lubricated at the factory for the design working period of the product	-	-
4	Trolley swivel bearing	Annually	Mobilith SCH 460	0.075

9.4 Lubricant information

The following component is initially lubricated at the factory, but needs further lubrication during the planned design working period:

Component	Trade name	Quantity [l]
Traveling transmission	Mobilith SCH 460	0.075

The following component is initially lubricated at the factory, and does not need any lubrication during the planned design working period:

Component	Trade name	Quantity [l]
Gearbox TMU 2	SHC007	0.02