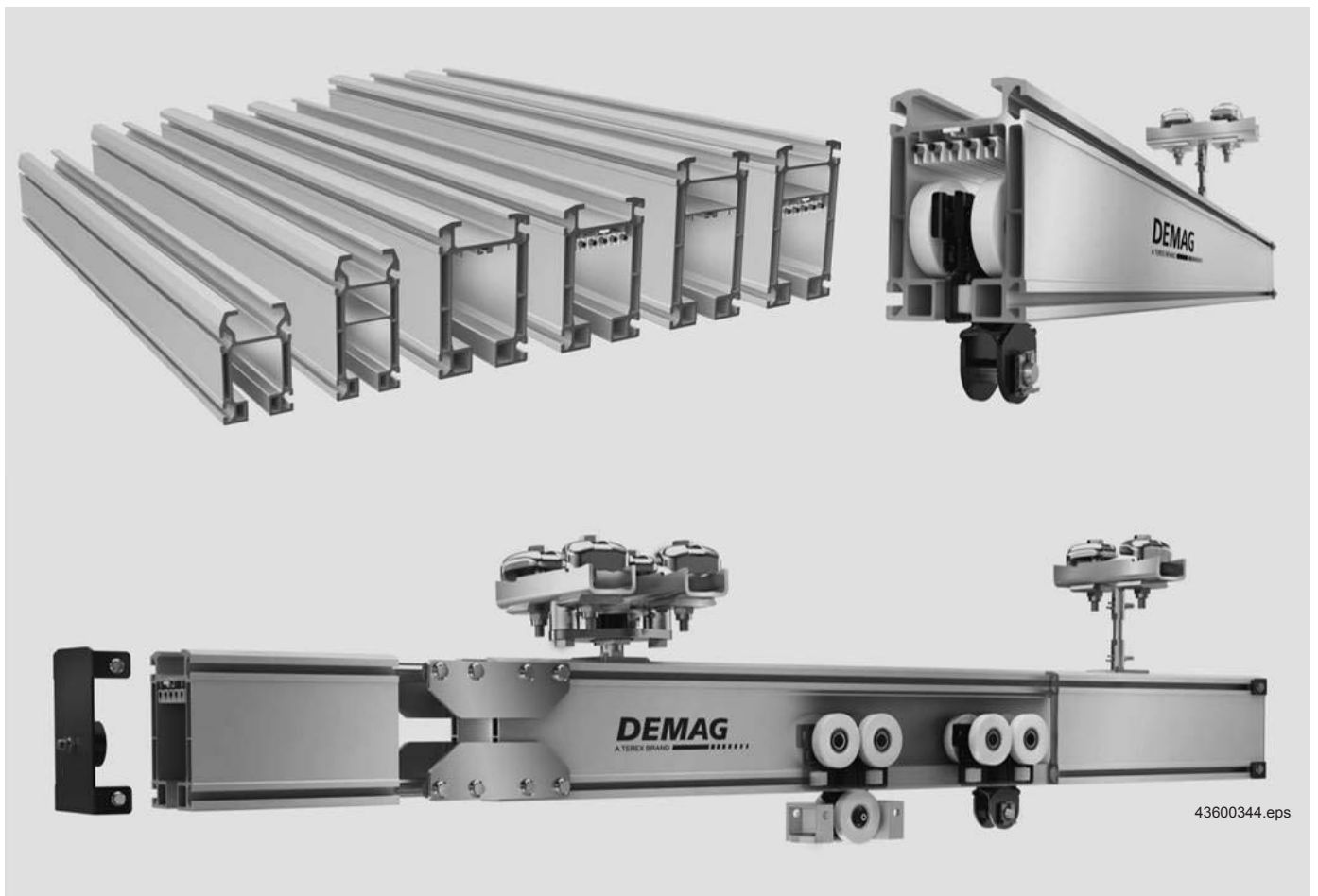


# KBK Aluline crane construction kit

## Classic/ergo system

### Project drafting and components

Design principles, selection criteria, components



**Manufacturer:**

**Terex MHPS GmbH**  
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# 1 Supplementary documents and other publications

Documents	Order no.		
<b>Brochures</b>	KBK crane construction kit	208 385 44	
	KBK pillar and wall-mounted slewing jib cranes	208 756 44	
	Demag KBK and D-IVP portal cranes	208 355 44	
	KBK Aluline light crane system	213 691 44	
	Demag KBK	213 720 44	
<b>KBK installation technical data</b>	DKK conductor line	202 540 44	
	DKK arrangement for KBK cranes and tracks	202 588 44	
	Towing arm fitting for DKK current collector trolleys on KBK trolleys	202 589 44	
	KBK 0, 25, 100 trailing cable power supply line	202 617 44	
	KBK crane construction kit	900 375 49	
	KBK suspensions, upper suspension bracket H, S, clamp S, V	203 072 44	
	Trolley pin B6	203 080 44	
	KBK anchor bolt connection	203 276 44	
	Redundant systems in the KBK crane construction kit	203 334 44	
	KBK cranes and tracks in explosion hazard areas	203 371 44	
	DCL arrangement on KBK	203 510 44	
	DCL-Pro conductor line	203 751 44	
	<b>Slewing crane, portal crane technical data:</b>	EVP/ZVP-KBK full portal crane	202 780 44
		D-IVP single-girder full-portal crane	203 363 44
KBK pillar and wall-mounted slewing jib crane		203 565 44	
<b>Hoist technical data</b>	D-BP 110 D-Balancers	203 359 44	
	Demag DC-Pro 1 – 25 chain hoist Demag DCS-Pro 1 – 10 chain hoist	203 525 44	
	D-SH SpeedHoist	203 533 44	
	Demag DC-Com chain hoist	203 571 44	
	D-BE electric balancer	203 756 44	
<b>Operating instructions/component parts</b>	KBK Aluline classic and ergo	211 259 44	
	RF 100 travel drive	214 559 44	
<b>Assembly instructions (Adjustment/dimensions)</b>	KDC low-headroom hoist	211 017 44	
	Redundant systems in the KBK crane construction kit	211 232 44	
	DRF 200 travel drive	229 260 49	
	E11-E34 DC travel drive (I) E11-E34 DC travel drive (II) (circuit diagrams)	214 810 44 211 229 44	
<b>Test and inspection booklet</b>	KBK installations (only in German)	206 020 44	

## 2 Aluline crane construction kit

### 2.1 General

The KBK Aluline crane construction kit is the efficient and reliable solution for the construction of suspension monorails and suspension cranes made of aluminium profile sections.

It is an extension of the proven KBK crane construction kit.

The use of aluminium profile sections improves installation ergonomics. Lower crane bridge deadweights and extremely low rolling resistance further reduce the required travel forces.

The KBK Aluline crane construction kit consists of standardized mechanical and control components. This facilitates planning, erection and maintenance. Installations can be altered and extended at any time.

The installations can be easily adapted to new material handling requirements.

KBK crane installations utilize the free space above working and production areas. Valuable production floor space is not sacrificed for materials handling tasks.

#### Regulations

KBK Aluline installations are dimensioned on the basis of the DIN 15018 standard. The material properties of aluminium have been taken into consideration.

Relevant industrial safety regulations and codes of practice as stipulated in BGV D6 crane accident prevention regulations must be observed for planning, project engineering and operating KBK installations.

KBK cranes and suspension monorails designed in accordance with the project drafting instructions contained in this document are manufactured in accordance with generally accepted engineering standards and comply with relevant codes of practice concerning the safeguarding of machinery and prevention of accidents, including German technical equipment legislation, accident prevention (UVV) and DIN VDE regulations, and the EC Machinery Directive.

Manufacturer's and conformity declarations and KBK test and inspection booklets for suspension monorails and cranes are supplied.

Instructions in the operating and assembly manuals must be complied with.

#### Spare parts

**We urgently recommend that only spare parts and accessories approved by us be used. Only then can we ensure the safety and normal service life of the installation.**

Spare parts not approved by us may cause damage, malfunctions or complete failure of the installation.

The use of unauthorized spare parts may render null and void any claims for warranty, service, damages or liability against the manufacturer or his appointed personnel, dealers and representatives.

#### Inspection

KBK suspension monorails and KBK suspension cranes require little maintenance. However, 1-2 months after commissioning of an installation, all bolted connections of suspension fittings, track sections and end caps, the pins/bolts connecting hoists to trolleys, and crane girders to runway trolleys should be checked and re-tightened or secured as necessary. This check should be repeated at least once a year.

**For further information, see "KBK Aluline classic and ergo operating instructions"; refer to the table on page 5.**

#### Information

**It is important that all members of staff responsible for erection, operation, operational reliability and servicing of KBK installations receive the KBK operating instructions and all relevant literature.**

## 2.2 Structure of the crane construction kit

### General

KBK Aluline installations are of modular design. The basic construction kit consists of simple, well engineered components. Standardized dimensions ensure rapid erection and allow existing installations to be easily modified or extended. All components are manufactured in series.

Order-specific special functions can be accommodated with special components and modules by our experienced team of engineers.

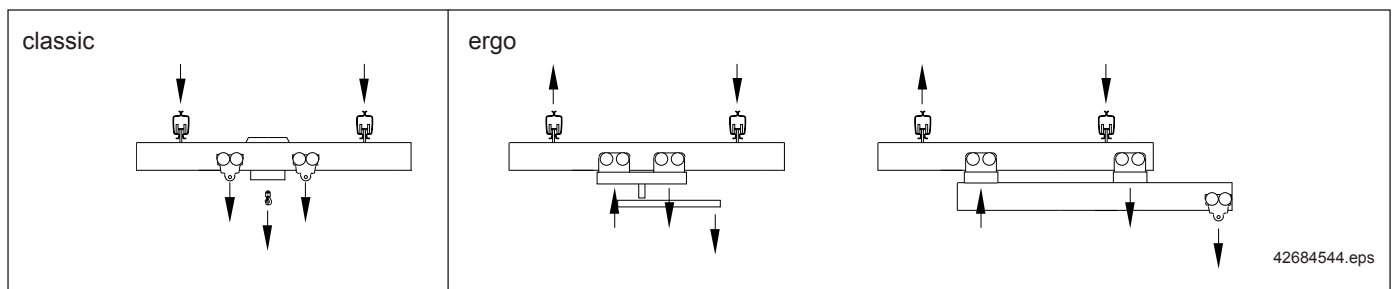
The modular construction kit is designed for normal operating conditions.

### classic

The KBK Aluline modular construction kit is designed on the basis of the KBK classic system for suspended loads with centric load transmission.

### ergo

Additional ergo components have been developed to accommodate load moments and forces in the opposite direction to the load (kick-up forces).



## 2.3 Design principles

- Project drafting/engineering based on reliable static analysis
- Series-produced standard components which have been thoroughly tried and tested
- Tailored installations designed for full compliance with safety regulations and standards
- Low-maintenance systems
- Simple, fast erection
- Detailed technical documentation

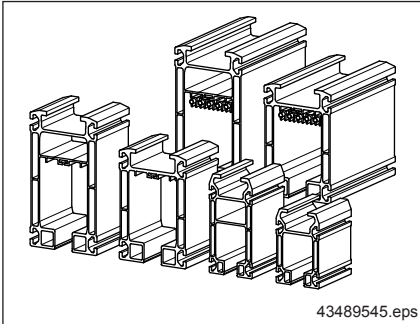
### KBK Aluline classic Installation type

- Single and double-rail track
- Single and double-girder crane

### KBK Aluline ergo Installation type

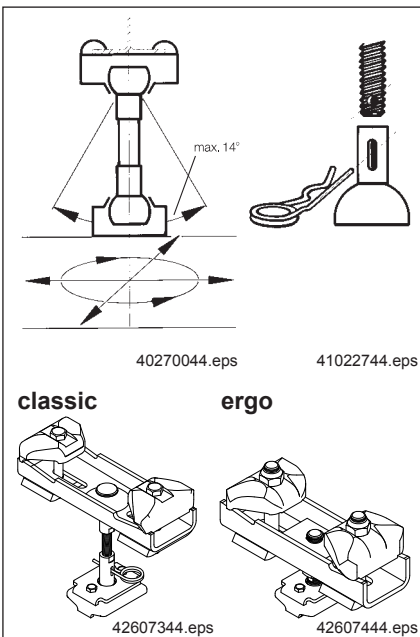
- Double-rail track
- Single and double-girder crane
- Crane with a large overhang
- Manipulator crane

## Profile sections



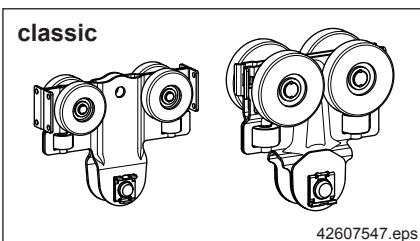
The basic elements of the KBK Aluline construction kit are special extruded profile sections of aluminium featuring high rigidity optimized by hollow sections, low deadweight and anodized surfaces. The rails are of inside-running design to protect the trolleys. Lateral attachment slots offer a wide variety of connection possibilities for fittings of all types. The underside forms a running surface for counter-pressure rollers.

## Suspension system

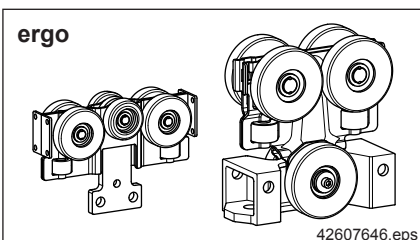


- Flexible, ball-and-socket universal joint suspension, minimum torque transmission to roof and ceiling superstructures, minimum lateral forces transmitted to the track system
  - Low-maintenance ball-and-socket joints with plastic sockets
  - Threaded connections for height adjustment
  - Spring clip through cross hole locks connection
  - Universal suspension fittings for virtually any superstructure – provided as standard
  - High suspension load bearing capacities adapted to the track system
  - Low headroom possible with short suspension fittings
- **ergo** suspension to accommodate loads resulting from counter-forces (from handling devices and cranes with large overhang) with rigid suspensions, featuring rubber buffers.
  - Threaded connections for height adjustment
  - Low headroom dimension

## Trolleys



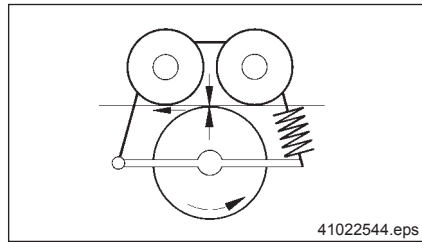
- Quiet, smooth operation with plastic wheels mounted in anti-friction bearings
- Long service life
- Guided in the track profile by guide rollers
- Flexible and torque-free load connection via pin



- Guided in the track profile by guide rollers
- Rigid load connection via **ergo** load plate
- Suitable for accommodating vertical forces resulting from counter-pressure rollers



**Travel drives**



Quiet-running friction wheels with a high friction coefficient ensure reliable transmission of the drive torque. They can be used with special trolleys. Pressure applied by springs.

**Combined crane installations**

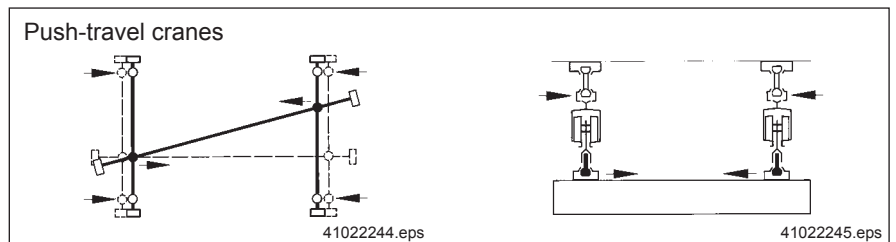
Cranes and tracks of different section types can be combined. Tracks and crane girders made of aluminium and steel profile sections can also be combined.

**Crane installation ergo**

Cranes which transfer kick-up forces to the Aluline components as a result of handling offset loads or moments are designed with special parts.

**Push-travel cranes**

No skewing forces and flexibility of ball-and-socket universal joint suspensions.



**Electric travel cranes**

Single-girder and double-girder designs with rigid crane trolleys or as braced double-girder cranes.

**Power supply**

Flat cable power lines on cable sliders and power supply systems with cable trolleys run in the same track section.

Compact conductor lines, single conductor lines and travel rails for power supply systems can be fitted.

Profile sizes A18 and A22 can be provided with a 5-pole internal conductor line.

**Electric and control equipment**

- Standard controls for push and electric travel trolleys and cranes with hoists
- Special controls
- Automatic controls
- Programmable controllers

**Corrosion protection**

KBK Aluline components are protected against corrosion as standard. Corrosion protection meets at least category C2-M requirements to DIN EN ISO 12944-2.

Suspension components are zinc-galvanized, series track sections are anodized, other components are provided with a painted finish; special coatings are possible.

**Ambient conditions**

KBK Aluline installations are designed for operation indoors and for temperatures ranging from 0 °C to +50 °C. Special measures must be implemented in the case of extreme temperatures, outdoor applications and exposure to aggressive atmospheres.

**Horizontal forces**

Only minimum horizontal forces are transmitted to the support superstructure thanks to the articulated suspension design.

For cranes, this does not exceed 10% of trolley load K that occurs. For single and double-girder runways, the value amounts to 5% of K.

# 3 KBK Aluline classic – Planning and project drafting

The following sections provide an overview of the applications for which KBK profile sections may be used:

- Suspension monorail
- Suspension crane of single and double-girder design.

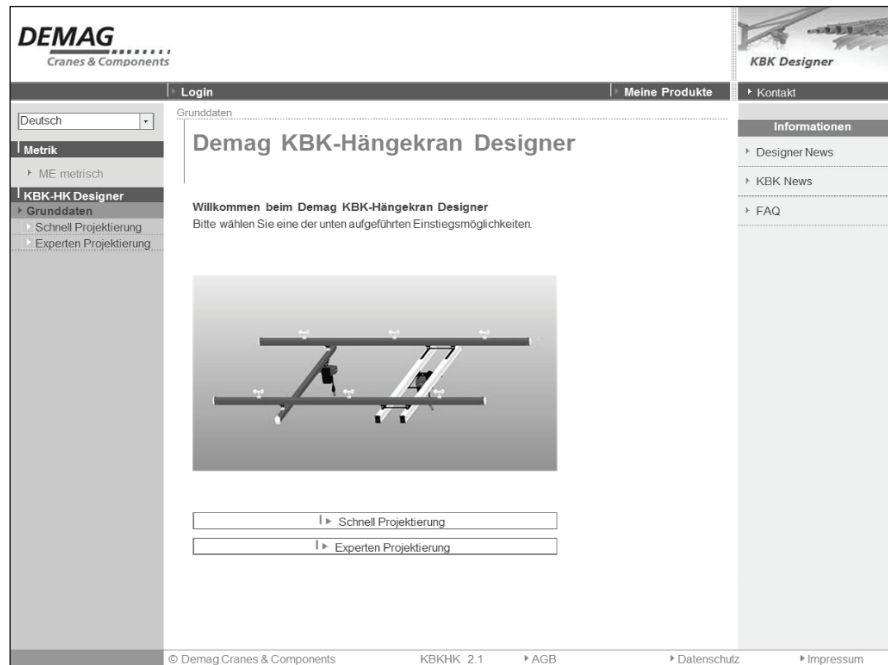
## 3.1 Project engineering for suspension crane and suspension monorail installations

All information and data necessary for project engineering are required for KBK Aluline installation projects. The project drafting sheet in section 3.4 should be used for this purpose.

**As a basis for planning, a sketch or drawing should be provided** showing a scale representation of the track system, position of the suspensions and joints and the number of carriers or cranes, branch sections etc.; see the example in section 3.3.

**All installations must be dimensioned in such a way that the end caps and internal buffer stops are not approached during normal operation.**

## 3.2 KBK Designer



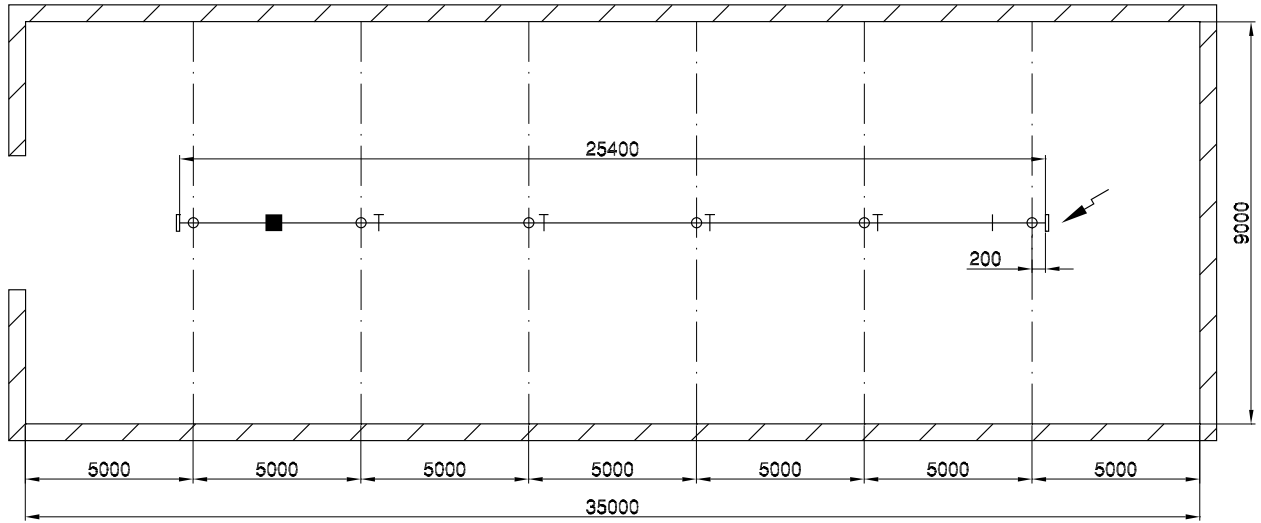
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We recommend you use the KBK Designer tool for project engineering KBK suspension crane installations. Refer to the Demag Cranes & Components GmbH website at

[www.demagcranes.com](http://www.demagcranes.com)

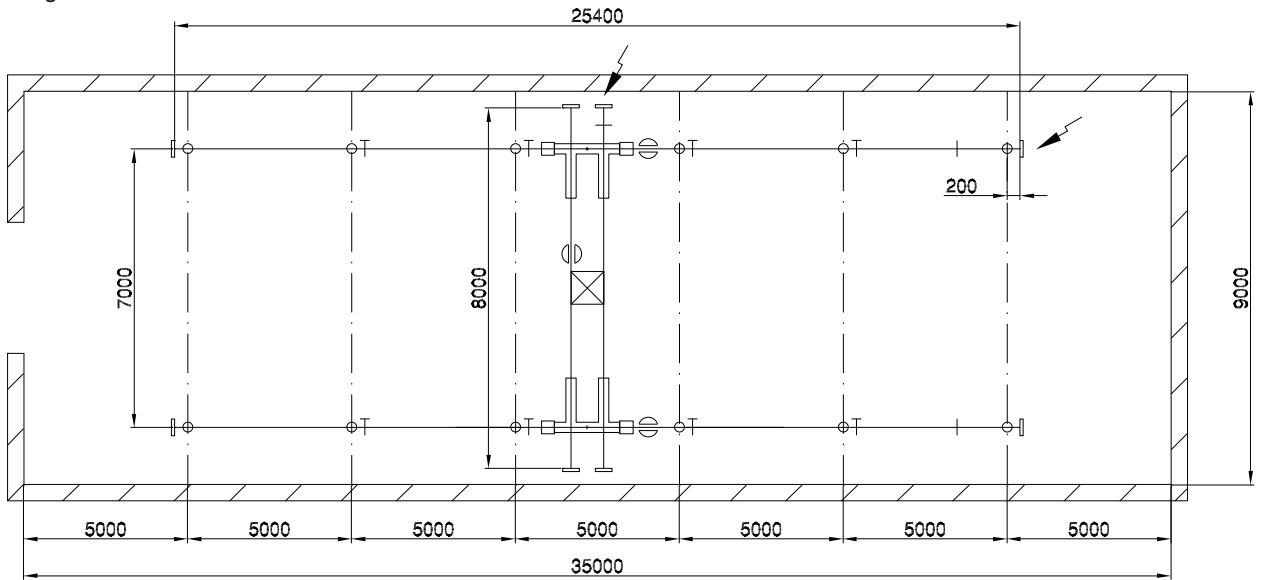
### 3.3 Examples and symbols

Suspension monorail

















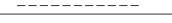


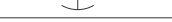

42609444.eps

Double-girder crane



42609544.eps

#### Symbols for use in drawings

Direction of travel 	Suspension 	Travel drive 
Straight section 	V-type suspension fitting 	Travel drive with limit switch 
Joint bolts 	Stiffener 	Limit switch actuator 
Internal buffer stop 	Trolley 	Power feed 
End cap with buffer 	Rigid crane end carriage 	Power supply 
Monorail hoist 	Double-rail crab 	Current collector 
		Maintenance section 

### 3.4 Project engineering sheet for KBK installations

Please enclose a sketch.

Please send to your nearest Demag Cranes & Components sales office or direct to Demag Cranes & Components GmbH.

<p><b>Customer</b></p> <p>Project no. _____          Customer no. _____          Customer _____</p> <p>Person responsible _____ Date _____</p> <p>Dept./Sales office _____</p> <hr/> <p>Stage of customer's planning          Financial planning for investments</p> <p><input type="checkbox"/> Tech.      <input type="checkbox"/> Prelim.      <input type="checkbox"/> Detailed planning</p> <p>Implementation expected _____</p> <p><input type="checkbox"/> Invitation to tender</p> <p><input type="checkbox"/> Order soon to be placed _____</p> <hr/> <p><b>Type of installation</b></p> <p><input type="checkbox"/> Suspension monorail      <input type="checkbox"/> Double-rail track      KBK track section _____</p> <p><input type="checkbox"/> Single-girder crane      KBK crane section _____      KBK track section _____</p> <p><input type="checkbox"/> Double-girder crane      <input type="checkbox"/> More than 2 crane tracks      KBK crane section _____      KBK track section _____</p> <hr/> <p><b>Technical data</b></p> <p>SWL _____ kg      Average operating time _____ hours/day</p> <p>Track length _____ m</p> <p>Crane length _____ m      Crane span dimension _____ m</p> <p>Number of trolleys on one track _____</p> <p>Number of cranes on one runway _____      Load hook distance for several loads _____ m</p> <p>Installation site _____</p> <p>Type of supporting structure/suspension methods/flange _____</p> <p>Clear height from floor to bottom edge of supporting structure _____</p> <hr/> <p><b>Hoist unit</b></p> <p>Electric chain hoist type _____      Lifting speed v _____ / _____ m/min</p> <p>Hook path _____ m</p> <hr/> <p><b>Travel speeds</b></p> <p>Travelling hoist      <input type="checkbox"/> manual      <input type="checkbox"/> electric, v = _____ / _____ m/min</p> <p>Crane      <input type="checkbox"/> manual      <input type="checkbox"/> electric, v = _____ / _____ m/min</p> <hr/> <p><b>Power supply</b></p> <p>On crane      <input type="checkbox"/> Trailing cable      <input type="checkbox"/> Integrated conductor line      <input type="checkbox"/> External conductor line</p> <p>On track      <input type="checkbox"/> Trailing cable      <input type="checkbox"/> Integrated conductor line      <input type="checkbox"/> External conductor line</p> <hr/> <p><b>Current type</b></p> <p>Operating voltage _____ V, _____ Hz</p> <hr/> <p><b>Type of control</b></p> <p><input type="checkbox"/> from trolley      <input type="checkbox"/> from crane      <input type="checkbox"/> Mobile      <input type="checkbox"/> Wireless</p> <hr/> <p>Additional information (e.g. special ambient conditions)</p> <hr/> <p><b>Special commercial conditions</b></p>	<p><b>Scope of required quotation</b></p> <p><input type="checkbox"/> Budget offer      <input type="checkbox"/> no      <input type="checkbox"/> Incl. sketch</p> <p><input type="checkbox"/> Detailed quotation</p> <p><input type="checkbox"/> with steelwork      <input type="checkbox"/> with erection</p> <p>Quotation deadline _____      Delivery deadline _____</p>
--	---

Classic Planning

### 3.5 Profile load capacities according to the diagram

The diagram below provides the basis for determining the sections for cranes and tracks, span dimensions  $l_{Kr}$  and the spacing between supports  $l_w$ .

Deflection limits: cranes, runways: 1/500,  
Frequency  $\geq 2,8$  Hz

The span and spacing between supports which are permissible for the individual crane and track sections can be read off for a given load.

Ensure compliance with the permissible length of overhang, distances of joints from suspension assemblies, and maximum loads on suspension assemblies and trolleys.

#### Selecting the section

Determining the spacing between supports or crane span:

1. Determine load  $K_{Ges}$  according to sections 3.6 to 3.8.
2. Determine the maximum value for  $l_w$  and  $l_{Kr}$  in the diagram (where it intersects the limit curve)
3. Select the most suitable profile section

#### Push travel

all profile section sizes

#### Suitable for electric travel

all profile section sizes

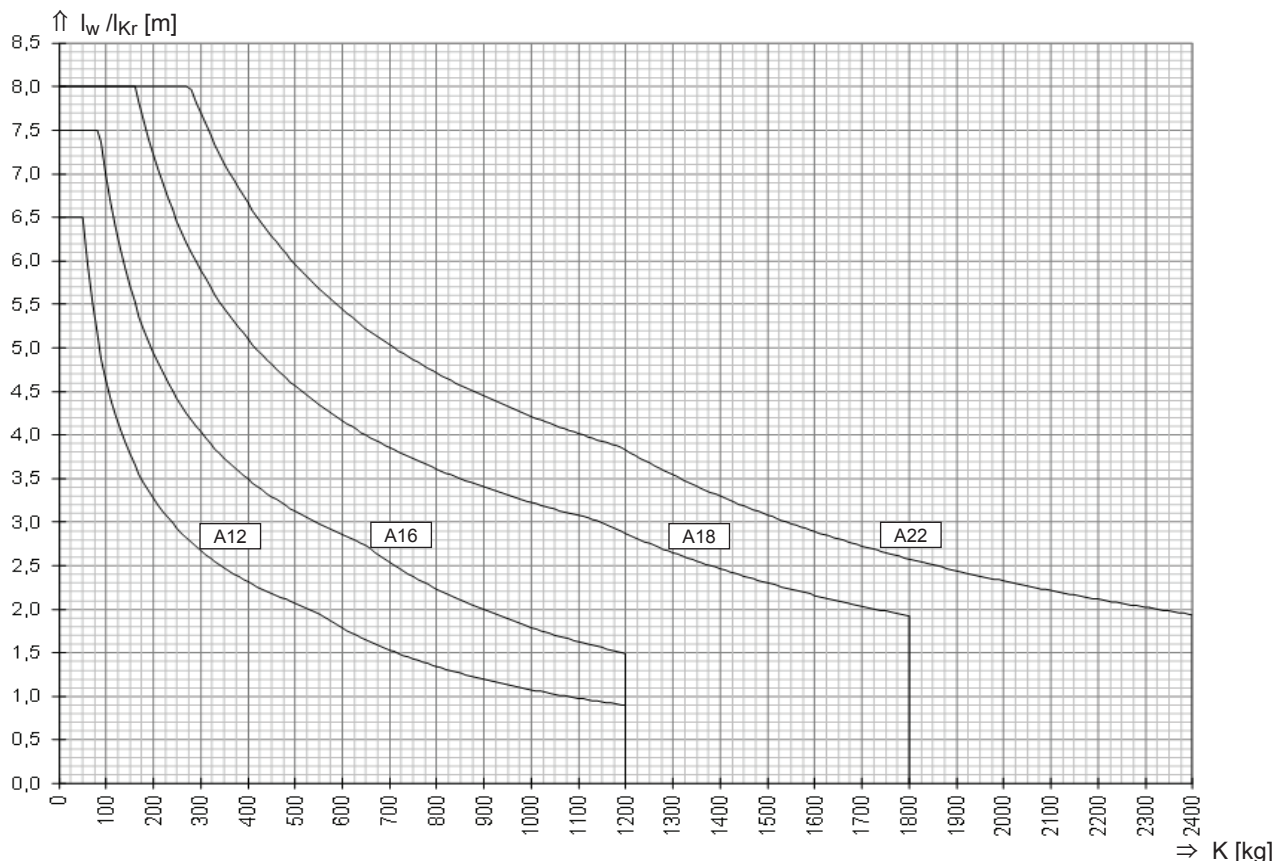
#### Diagram for crane and track selection

Diagram: Spacing between supports, crane spans

(Curves apply if hoists are used with lifting speeds up to 16 m/min.

For higher speeds, see section 3.10 Hoists with KBK.)

KBK profile section	A12	A16	A18	A22
Moment of inertia	313 cm <sup>4</sup>	713 cm <sup>4</sup>	1520 cm <sup>4</sup>	2593 cm <sup>4</sup>
Neutral axis	approx. profile centre			



**Important:** - - - Limit curves for maximum length of straight sections. Pay attention to the distance between supports and distances of joints (see section 3.8).

Lifted load coefficient  $\psi$ , deadweight coefficient  $\phi$  to DIN 15018 and oscillation coefficient  $\phi$  to DIN 4132 for crane group H1, B3 as well as the deadweight of each loaded girder are already considered in the calculation diagrams.

K = Load on the profile section  
 $l_w$  = Distance between supports  
 $l_{Kr}$  = Crane span dimension

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### 3.6 Steps for project drafting and technical specification

#### Calculating load K

##### Monorail track and single-girder crane

$$K = G_H + G_3$$

##### Double-girder crane

The girder with the least favourable load (RF friction wheel drive unit) is considered in the following

$$K = 0,5 (G_H + G_3 + G_{RFK})$$

##### Crane runway

Load does not travel on overhung portion of crane girder

$$K = G_H + G_3 + 0,50 (G_1 + G_2)$$

Load travels on overhung portion of crane girder

$$K = G_H + G_3 + 0,80 (G_1 + G_2)$$

Crane travels on more than two tracks (centre track)

$$K = G_H + G_3 + 0,65 (G_1 + G_2)$$

##### where:

$G_H$  = SWL including load handling attachment

$G_1$  = Crane girder dead weight including attachments

$G_2$  = Dead weight of crane trolleys including attachments (both ends together)

$G_3$  = Dead weight of trolley including hoist, cross-travel drive and attachments

$G_{RFK}$  = Dead weight of cross travel drive and attachments

### 3.7 Reading off from the diagram

Span  $l_{Kr}$

Distance between suspensions  $l_w$   
(Monorail track and crane runway)

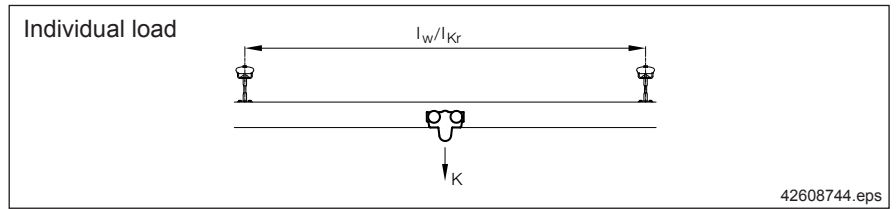
Individual load

A distinction is made between a concentrated load, two identical loads or more than two identical loads in one panel.

$e_{Ka}$  = Distance between cross-travel units or wheel axes

$e_{KT}$  = Distance between crane trolleys or wheel axes

For the (concentrated) load  $K$  in the panel between supports, the permissible limit for  $l_w$  or  $l_{Kr}$  can be read off direct from the diagram.



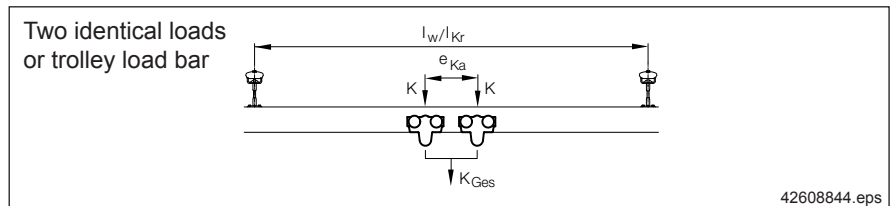
Two identical loads or load bar

For two or more loads at a maintained distance in one panel, the max.  $l_w$  or  $l_{Kr}$  must never exceed the permissible limit for one of the individual loads. The minimum distance ( $e_{Ka}$ ,  $e_{KT}$ ) between loaded trolleys is that defined by the articulated frame or crane traverse.

By adding both loads, a total load  $K_{Ges}$  is obtained for which the limits  $l_w(K_{Ges})$  or  $l_{Kr}(K_{Ges})$  are taken from the diagram. This limit can be increased using the following formula:

$$\text{max. } l_w = l_w(K_{Ges}) + 0,9 \times e_{Ka} \text{ (or } e_{KT})$$

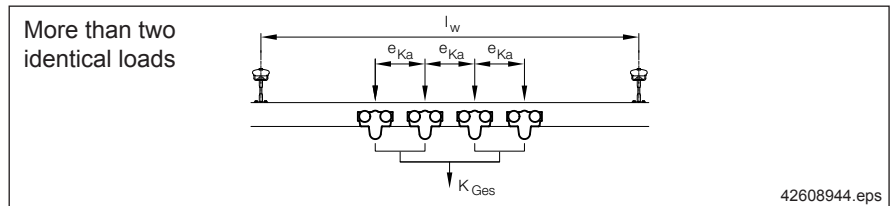
$$\text{max. } l_{Kr} = l_{Kr}(K_{Ges}) + 0,9 \times e_{Ka} \text{ (or } e_{KT})$$



More than two identical loads at equal distances

The loads in one panel between supports are added up and a total load  $K_{Ges}$  is obtained, for which the limit  $l_w(K_{Ges})$  is taken from the diagram. This limit can be increased using the following formula:

$$\text{max. } l_w = l_w(K_{Ges}) + \frac{n}{2} \times e_{Ka} \text{ (or } e_{KT}); \quad n = \text{number of loads } K$$



### 3.8 Determining load $G_{AB}$ on one suspension fitting

#### Individual load

The suspension fitting with the worst-case load is considered in the following.

#### Max. permissible load $G_{AB}$ on one suspension fitting

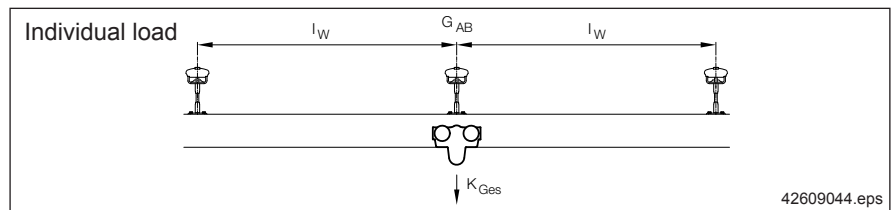
KBK profile section	A12	A16	A18	A22
max. $G_{AB}$ [kg]	750		1400	1700

The load on one suspension fitting is calculated from  $K$  for monorail or suspension crane tracks and from the proportional track girder dead weight.

Proportional track girder dead weight = max. distance between fittings x track girder weight/m x 1,25.

$G_B$  = Track girder weight/m;  $l_w$  = max. distance between suspension fittings

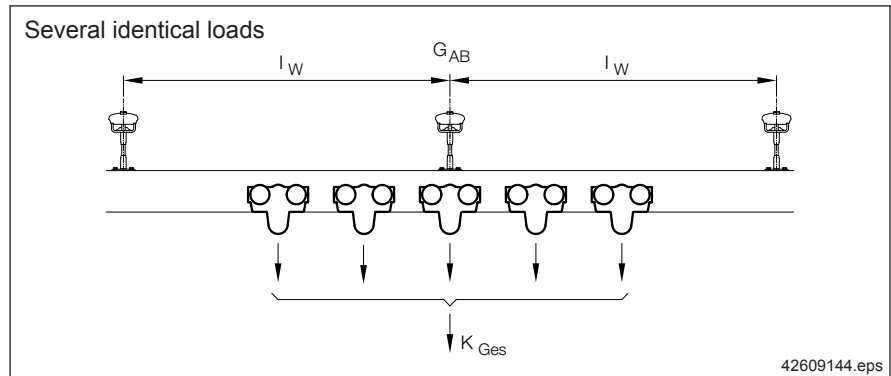
$G_{AB}$  =  $K_{Ges}$  +  $G_B \times l_w \times 1,25$



The load on one fitting is determined from the sum total of all concentrated loads in two panels and from the proportional track dead weight. If the load on one suspension fitting determined according to this formula exceeds the permissible limit, one or both of the following measures is required:

- Reduce the spacing between supports by providing additional suspension fittings
- Distribute the load by spacing loads at a safe distance

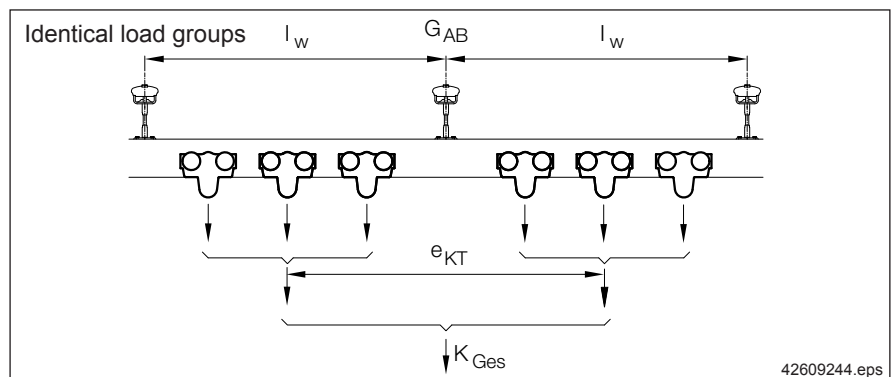
$G_{AB}$  =  $K_{Ges}$  +  $G_B \times l_w \times 1,25$



$e_{KT} = 0,5 \times l_w$  :  $G_{AB} = 0,9K_{Ges} + G_B \times l_w \times 1,25$

$e_{KT} = l_w$  :  $G_{AB} = 0,7K_{Ges} + G_B \times l_w \times 1,25$  (load distance = suspension distance)

$e_{KT} = 1,5 \times l_w$  :  $G_{AB} = 0,5K_{Ges} + G_B \times l_w \times 1,25$



#### Two or more loads in one of two panels between supports

#### Two loads or groups of loads at a distance $e_{KT}$



### 3.9 System dimensions and system limits

#### Overhang

			A12 / A16	A18 / A22
Shortest possible overhang	$u_{min}$	[mm]	40	50
Project engineering values for overhang	$u$	[mm]	200	300

The stability of the track section should be checked for short tracks and crane girders. (Multiply load on overhang by a factor of 1,2, crane girder forms counter torque).

Aluline tracks or cranes must not be lifted (e.g. where the load is on the overhang)

**If the girder is unstable (girder is lifted, suspension fitting is relieved of load), the suspension fitting is subjected to impact loading which causes wear and can lead to premature failure of the connection.**

**Premature failure can be prevented by using Aluline ergo components.**

#### Crane overhang

The maximum and minimum lengths of overhang for cranes can be found in the crane selection table. They are directly related to the crane girder length.

**The length of overhang  $u$  can be increased for**

- flat cable supply lines by the length of the accumulated cable trolleys at the end of the track where accumulation takes place,
- unloaded spacer trolleys – by the corresponding overall dimension.

The overhang at either end applicable to double-girder cranes running on more than two tracks is that shown in the selection table for cranes with the same SWL and comparable span.

#### Track overhang

Refer to the crane selection tables for the maximum lengths of overhang  $u$  for single-girder cranes.

#### Approach dimension

Approach dimension  $l_{an}$  (load hook centre to girder end) is derived from the dimensions of the individual components.

#### Permissible distance $st$ of joint from suspension fitting

A suspension fitting has to be provided in the vicinity of each track joint.

			A12 / A16	A18 / A22	
Minimum distance	$st_{min}$	[mm]	$l_w \leq 5 \text{ m}$	40	50
			$l_w > 5 \text{ m}$	$0,05 \cdot l_w$	
Maximum permissible distance	$st_{max}$	[mm]		$0,1 \cdot l_w$	

#### Drive

KBK Aluline single and double-girder cranes as well as monorail and double-rail trolleys can be easily moved by hand. Crabs and rigid cranes can also be fitted with electric or pneumatic drives.

#### Deflection

If the maximum spacing between supports/crane span is selected in the selection diagram, the deflection ratio ranges up to 1/500. Deflection can be reduced by the use of larger Aluline or steel profile sections.

## 3.10 Hoists with KBK

### Higher lifting speeds

The layout diagrams shown in KBK documents apply for Demag chain hoists with lifting speeds up to max. 16 m/min.

The use of other chain hoists may in result in an overload of the crane installation in borderline cases. Higher lifting speeds and weights may be considered by means of the following factor using the diagrams:

$$G_{H\text{new}} = G_H \times (0,97 + 0,002 \times v_H)$$

$$v_H = \text{lifting speed in m/min}$$

### Use of balancers with KBK

The following must be considered when rope balancers are used on KBK:

- Rope balancers operate at higher speeds and have higher acceleration values than chain hoists. This increases the lifted load coefficient.
- In load handling applications, smaller deflections and vibrations are often required than those in classic crane applications.

**Pneumatic rope balancers** with lifting speeds up to max. 60 m/min may be used if

- a factor of at least 1,1 is used to calculate load K by means of the diagrams  $\Rightarrow$   
 $K = G_H \times 1,1 + G_3$   
(this factor may be increased to avoid high deflections and unwanted vibrations)
- the selection table for 160 kg is used for D-BP 110 units (at rated load) for the simplified use of selection tables.

**Electric rope balancers** with lifting speeds up to max. 35 m/min can be used if

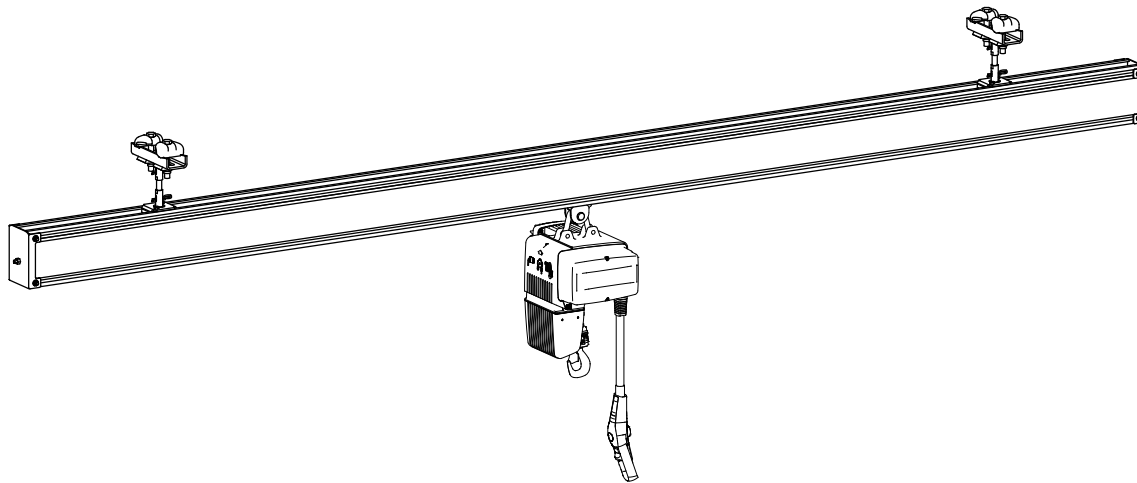
- a factor of at least 1,15 is used to calculate load K by means of the diagrams  $\Rightarrow$   
 $K = G_H \times 1,15 + G_3$
- use the next highest load capacity for the simplified use of the crane selection table (section 3.12).

Example: use the selection table for a load capacity of 125 kg for D-BE units with a rated load capacity of 80 kg.



## 3.11 Suspension monorails

### 3.11.1 Specifying suspension monorails



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Suspension monorail		
Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	5
Suspension	Suspension, short suspension, upper suspension bracket, upper suspension clamp, ball-head suspension rod, suspension rod, ball-head bolt, track suspension clamp, spring clip	6
Trolley combination	Trolley, load bar, traverse	7
Travel drive	RF 100, RF 125 and DRF 200	11
Link bars	Trolley link, link bar, spacer bar	13
Accessories	Buffers on crabs, trolley fittings	14
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	16.1
Pneumatic power supply	Cable trolley, protective hose, compressed air lines, fittings	16.2
Control system		17

**Type:** flexible track suspensions

### 3.11.2 Specifying monorails according to selection table

#### Tracks according to DIN 15018: H1; B3

- $G_H$  = Hoist load
- $K_{(1)}$  = Total load (live load + trolley dead weight)
- $K_{(2)}$  = Total load with electric/pneumatic drive
- $e_{Ka}$  = Distance between trolley axles (axle base)
- $l_w$  = Spacing between supports for one trolley
- $G_{AB}$  = Suspension load for one trolley

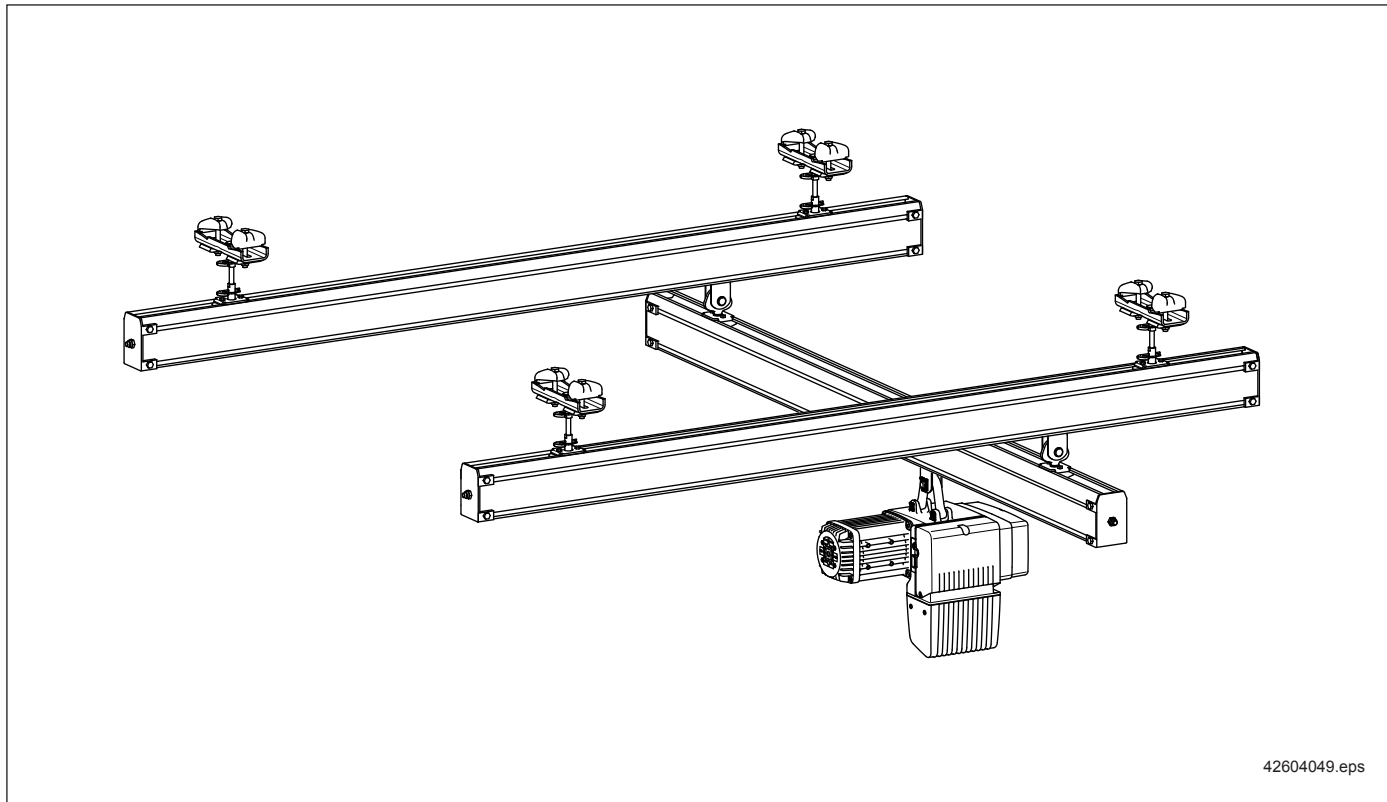
#### Selection basis: 1 load on the monorail track

In individual cases, exact static analysis calculations may lead to different results. Enquire about details for higher or multiple loads on one track.

$G_H$	$v_H$	A12				A16				A18				A22				
		$K_{(1)}$	$e_{Ka}$	$l_w$	$G_{AB}$	$K_{(1)}$	$e_{Ka}$	$l_w$	$G_{AB}$	$K_{(1)}$	$e_{Ka}$	$l_w$	$G_{AB}$	$K_{(1)}$	$e_{Ka}$	$l_w$	$G_{AB}$	
		$K_{(2)}$				$K_{(2)}$				$K_{(2)}$				$K_{(2)}$				
[kg]	[m/min]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]	
50	30	85	0,065	5,00	125	85	0,065	7,40	155	85	0,085	8,00	195	85	0,085	8,00	210	
		100	0,065	4,60	140	100	0,065	7,00	165	115	0,085	8,00	225	115	0,085	8,00	240	
80		115	0,065	4,30	150	115	0,065	6,50	180	115	0,085	8,00	225	115	0,085	8,00	240	
		130	0,065	4,10	165	130	0,065	6,10	195	145	0,085	8,00	255	145	0,085	8,00	270	
125		160	0,065	3,65	190	160	0,065	5,50	215	160	0,085	8,00	270	160	0,085	8,00	285	
	175	0,065	3,50	205	175	0,065	5,25	230	190	0,085	7,40	300	190	0,085	8,00	315		
160	20	200	0,065	3,30	230	200	0,065	4,90	250	200	0,085	7,20	300	200	0,085	8,00	325	
		215	0,065	3,15	245	215	0,065	4,75	265	230	0,085	6,75	330	230	0,085	8,00	355	
200		240	0,065	3,00	265	240	0,065	4,50	285	240	0,085	6,60	335	240	0,085	8,00	365	
		255	0,065	2,90	280	255	0,065	4,35	300	270	0,085	6,20	365	270	0,085	8,00	395	
250		290	0,065	2,70	315	290	0,065	4,10	335	290	0,085	6,00	375	290	0,085	7,80	415	
	305	0,065	2,65	330	305	0,065	4,00	350	320	0,085	5,70	405	320	0,085	7,45	445		
315	15	380	0,210	2,50	400	380	0,210	3,70	420	375	0,085	5,30	455	375	0,085	6,85	485	
		395	0,210	2,45	415	395	0,210	3,60	435	405	0,085	5,10	485	405	0,085	6,60	515	
400		465	0,210	2,30	485	465	0,210	3,35	500	460	0,085	4,75	530	460	0,085	6,20	560	
		480	0,210	2,25	500	480	0,210	3,30	515	490	0,085	4,60	560	490	0,085	6,00	590	
500		565	0,210	2,05	585	565	0,210	3,05	600	560	0,085	4,30	625	560	0,085	5,60	650	
		580	0,210	2,00	600	580	0,210	3,00	615	590	0,085	4,20	655	590	0,085	5,50	680	
630											715	0,085	3,80	770	715	0,085	5,00	800
											745	0,085	3,75	800	745	0,085	4,90	830
800											885	0,250	3,60	935	885	0,250	4,60	960
											915	0,250	3,55	965	915	0,250	4,55	990
1000										1095	0,250	3,30	1140	1095	0,250	4,20	1160	
										1125	0,250	3,20	1170	1125	0,250	4,10	1190	

## 3.12 Single and double-girder cranes

### 3.12.1 Specifying single-girder cranes



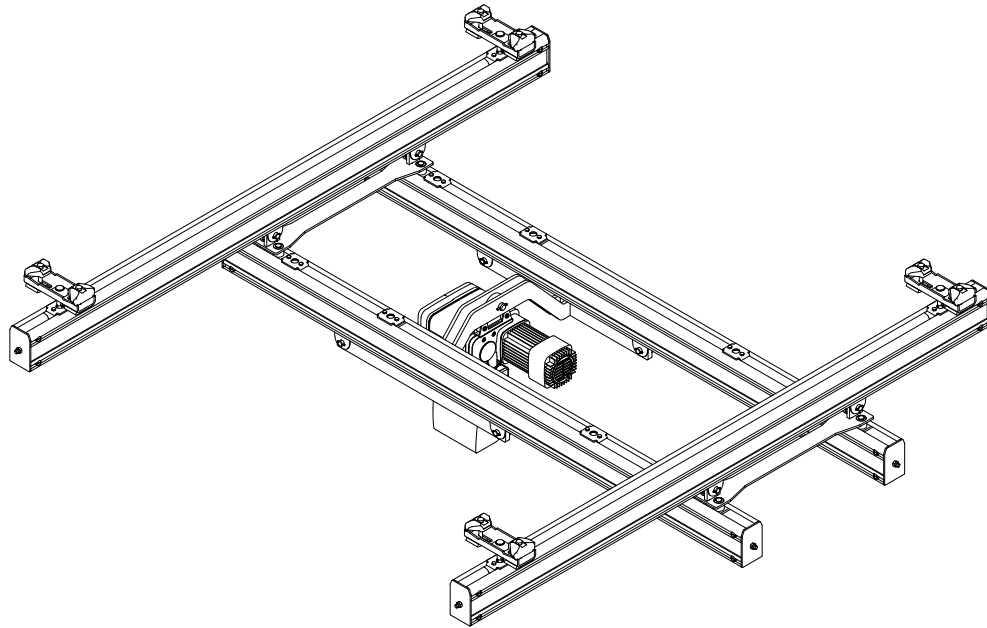
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Single-girder crane		
Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	5
Suspension	Suspension, short suspension, upper suspension bracket, upper suspension clamp, ball-head suspension rod, suspension rod, ball-head bolt, track suspension clamp, spring clip	6
Trolley combination	Trolley, load bar, traverse, trolley assembly, crane suspension eye, rigid crane end carriage	7
Travel drive	RF 100, RF 125 and DRF 200	11
Link bars	Trolley link, link bar, spacer bar	13
Accessories	Buffers on crabs and cranes	14
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	16.1
Pneumatic power supply	Cable trolley, protective hose, compressed air lines, fittings	16.2
Control system		17

- Type:**
- a) Articulated track and crane suspensions (shown)
  - b) Articulated track suspensions with rigid crane end carriages
- Crane girder without a rail joint

### 3.12.2 Specifying double-girder cranes

Frame for double-girder crane



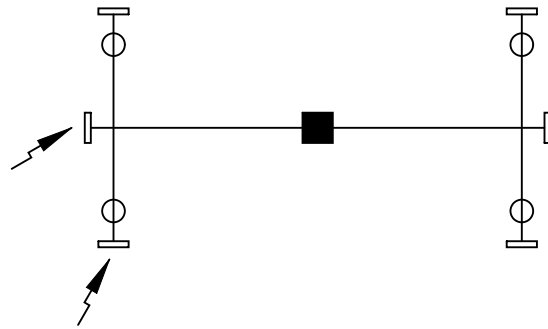
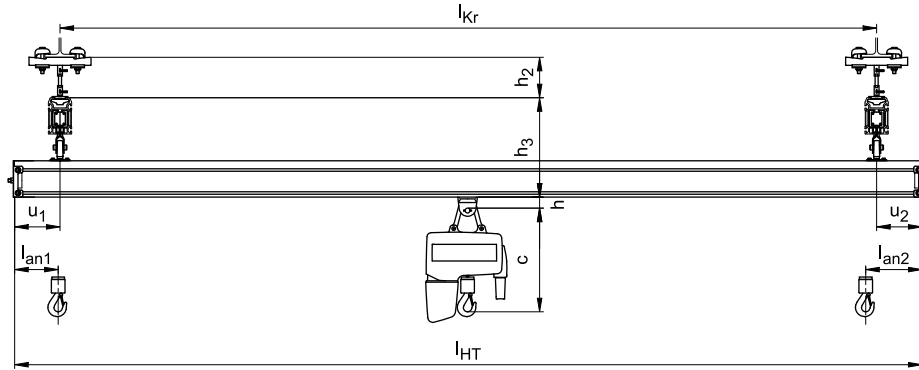
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Assemblies	Double-girder crane	
	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	5
Suspension	Short suspension, upper suspension bracket, upper suspension clamp, ball-head suspension rod, suspension rod, track suspension clamp, spring clip	6
Trolley combination	Trolley, load bar, frame for double-girder crane, crab frame	7
Travel drive	RF 100, RF 125 and DRF 200	11
Link bars	Trolley link, link bar, spacer bar	13
Accessories	Buffers on crabs and cranes	14
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	16.1
Control system		17

**Type:** articulated track suspensions with rigid crane end carriages  
(Articulated crane suspensions are not used).

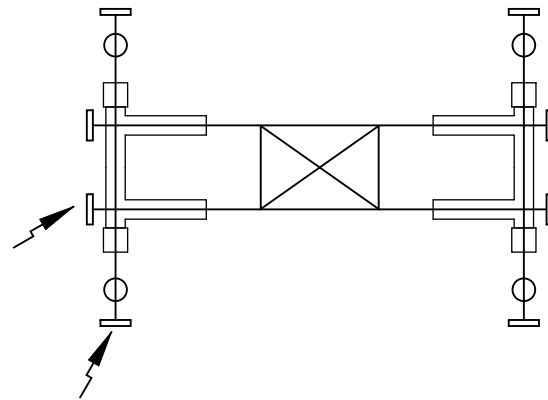
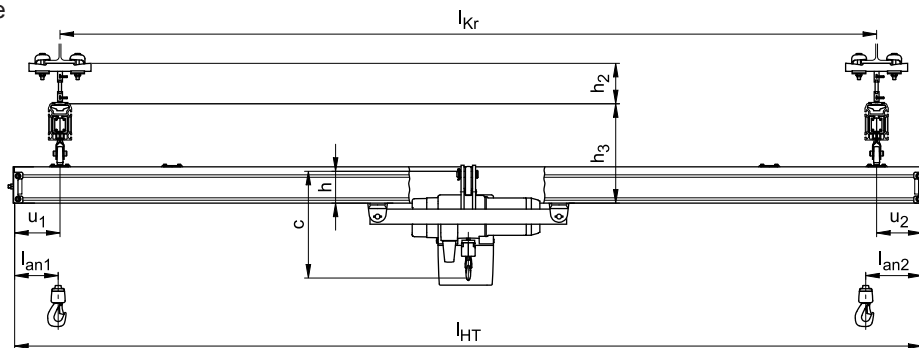
3.12.3 Specifying single and double-girder cranes according to selection tables

Single-girder crane



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Double-girder crane



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$l_{Kr}$  = Crane span dimension  
 $l_{HT}$  = Crane girder length  
 $u$  = Overhang

$h$  = Bottom edge of rail to top edge of pin  
 $h_2$  = Bottom edge of I-beam to top edge of track girder  
 $h_3$  = Top edge of track girder to bottom edge of crane girder

$c$  = Hoist headroom dimension  
 $l_{an}$  = Approach dimension



The following selection tables show a few of the many possible combinations for building crane installations with KBK. Use KBK Designer for precise specification of installations.

$l_w$  data apply to **one crane** on the crane runway.

Crane girder overhangs are always the same on both sides of the crane.

Deflection limits: cranes, runways: 1/500,

Frequency  $\geq 2,8$  Hz

Where there are several cranes on the same runway, the end carriages of single-girder cranes must always be designed as double or quadruple trolleys.

Distances between suspensions  $l_w$  must then be calculated separately. Intermediate lengths for crane girders are possible. Data calculated on the basis of cranes of standard design for standard components and without special attachments.

Check suspension loads.

Classification to DIN 15018 H1 B3

$l_{HT}$  = Crane girder length  
 $l_{Kr}$  = Crane span dimension  
 $l_w$  = Distance between suspensions  
 Suspension loads on request  
 All dimensions in m

		Load capacity: 50 kg, hoist weight: 30 kg, lifting speed: 30 m/min														
Crane girder section, crane girder length	Profile	$l_{HT}$	Single-girder crane						Double-girder crane							
			$l_{Kr}$		$l_w$				$l_{Kr}$		$l_w$					
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22		
Crane girder section, crane girder length	KBK Aluline A12	1	0,75	- 0,90	4,70	7,05	8,00	8,90	-	-	-	-	-	-	-	-
		2	1,65	- 1,90	4,60	6,85	8,00	8,90	1,00	- 1,90	4,00	5,90	8,00	8,90		
		3	2,45	- 2,90	4,45	6,70	8,00	8,90	1,75	- 2,90	3,90	5,80	8,00	8,90		
		4	3,15	- 3,90	4,40	6,55	8,00	8,90	2,40	- 3,90	3,80	5,65	8,00	8,90		
		5	3,85	- 4,80	4,30	6,40	8,00	8,90	2,95	- 4,90	3,65	5,45	7,85	8,90		
		6	4,45	- 4,85	4,20	6,30	8,00	8,90	3,45	- 5,90	3,45	5,15	7,35	8,90		
		7	-	-	-	-	-	-	3,90	- 6,30	3,40	5,00	7,20	8,90		
		8	-	-	-	-	-	-	4,95	- 6,30	3,40	5,05	7,20	8,90		
	KBK Aluline A16	1	0,75	- 0,90	4,70	7,05	8,00	8,90	-	-	-	-	-	-		
		2	1,60	- 1,90	4,50	6,75	8,00	8,90	1,00	- 1,90	3,95	5,80	8,00	8,90		
		3	2,35	- 2,90	4,40	6,55	8,00	8,90	1,65	- 2,90	3,80	5,65	8,00	8,90		
		4	3,00	- 3,90	4,25	6,40	8,00	8,90	2,25	- 3,90	3,65	5,45	7,80	8,90		
		5	3,65	- 4,90	4,15	6,20	8,00	8,90	2,75	- 4,90	3,50	5,25	7,55	8,90		
		6	4,20	- 5,90	4,05	6,05	8,00	8,90	3,15	- 5,90	3,30	4,90	7,05	8,90		
		7	4,80	- 6,90	4,00	5,95	8,00	8,90	3,60	- 6,90	3,25	4,80	6,90	8,90		
		8	5,80	- 7,30	4,00	5,95	8,00	8,90	4,60	- 7,50	3,25	4,80	6,90	8,90		
	KBK Aluline A18	1	0,75	- 0,90	4,60	6,90	8,00	8,90	-	-	-	-	-	-		
		2	1,50	- 1,90	4,35	6,55	8,00	8,90	-	-	-	-	-	-		
		3	2,20	- 2,90	4,20	6,25	8,00	8,90	1,50	- 2,90	3,50	5,25	7,55	8,90		
		4	2,80	- 3,90	4,05	6,05	8,00	8,90	2,00	- 3,90	3,35	5,00	7,15	8,90		
		5	3,30	- 4,90	3,90	5,85	8,00	8,90	2,50	- 4,90	3,20	4,80	6,90	8,90		
		6	3,75	- 5,90	3,80	5,65	8,00	8,90	3,00	- 5,90	3,05	4,55	6,50	8,45		
		7	4,15	- 6,90	3,65	5,50	8,00	8,90	3,50	- 6,90	3,00	4,40	6,35	8,25		
		8	5,00	- 7,90	3,65	5,45	7,95	8,90	4,00	- 7,90	2,90	4,30	6,20	8,05		
KBK Aluline A22	1	0,75	- 0,90	4,60	6,85	8,00	8,90	-	-	-	-	-	-			
	2	1,50	- 1,90	4,30	6,45	8,00	8,90	-	-	-	-	-	-			
	3	2,10	- 2,90	4,10	6,15	8,00	8,90	1,50	- 2,90	3,45	5,15	7,40	8,90			
	4	2,65	- 3,90	3,95	5,90	8,00	8,90	2,00	- 3,90	3,30	4,90	7,05	8,90			
	5	3,15	- 4,90	3,80	5,70	8,00	8,90	2,50	- 4,90	3,15	4,70	6,75	8,80			
	6	3,55	- 5,90	3,65	5,50	8,00	8,90	3,00	- 5,90	3,00	4,45	6,35	8,30			
	7	4,00	- 6,90	3,60	5,35	7,80	8,90	3,50	- 6,90	2,90	4,35	6,20	8,05			
	8	5,00	- 7,90	3,60	5,35	7,80	8,90	4,00	- 7,90	2,85	4,20	6,05	7,85			

1) Two end carriages on each side of the crane  
 2) Double trolley unit

		Load capacity: 80 kg, hoist weight: 30 kg, lifting speed: 30 m/min													
Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane						Double-girder crane						
			I <sub>Kr</sub>		l <sub>w</sub>				I <sub>Kr</sub>		l <sub>w</sub>				
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22	
KBK Aluline A12	1	0,75	-	0,90	4,10	6,15	8,00	8,90	-	-	-	-	-	-	
	2	1,65	-	1,90	4,05	6,05	8,00	8,90	1,05	-	1,90	3,70	5,40	7,70	8,90
	3	2,50	-	2,90	3,95	5,90	8,00	8,90	1,85	-	2,90	3,55	5,30	7,65	8,90
	4	3,30	-	3,90	3,90	5,80	8,00	8,90	2,55	-	3,90	3,45	5,15	7,45	8,90
	5	4,05	-	4,20	3,85	5,70	8,00	8,90	3,15	-	4,90	3,40	5,05	7,25	8,90
	6	-	-	-	-	-	-	-	3,75	-	5,60	3,25	4,80	6,85	8,90
	7	-	-	-	-	-	-	-	4,25	-	5,60	3,15	4,70	6,70	8,75
	8	-	-	-	-	-	-	-	5,40	-	5,60	3,20	4,70	6,75	8,80
KBK Aluline A16	1	0,75	-	0,90	4,10	6,15	8,00	8,90	-	-	-	-	-	-	
	2	1,65	-	1,90	4,00	5,95	8,00	8,90	1,00	-	1,90	3,65	5,30	7,55	8,90
	3	2,45	-	2,90	3,90	5,80	8,00	8,90	1,75	-	2,90	3,45	5,20	7,45	8,90
	4	3,20	-	3,90	3,80	5,70	8,00	8,90	2,40	-	3,90	3,35	5,00	7,20	8,90
	5	3,85	-	4,90	3,75	5,60	8,00	8,90	2,95	-	4,90	3,25	4,85	7,00	8,90
	6	4,50	-	5,90	3,65	5,45	7,95	8,90	3,45	-	5,90	3,10	4,60	6,60	8,60
	7	5,10	-	6,35	3,60	5,35	7,80	8,90	3,90	-	6,90	3,05	4,50	6,45	8,40
	8	6,15	-	6,35	3,60	5,35	7,85	8,90	4,60	-	7,50	3,00	4,45	6,35	8,30
KBK Aluline A18	1	0,75	-	0,90	4,05	6,05	8,00	8,90	-	-	-	-	-	-	
	2	1,60	-	1,90	3,90	5,80	8,00	8,90	-	-	-	-	-	-	
	3	2,30	-	2,90	3,75	5,60	8,00	8,90	1,50	-	2,90	3,25	4,80	6,90	8,90
	4	2,95	-	3,90	3,65	5,45	7,95	8,90	2,05	-	3,90	3,10	4,60	6,60	8,60
	5	3,55	-	4,90	3,55	5,30	7,75	8,90	2,55	-	4,90	3,00	4,45	6,35	8,30
	6	4,10	-	5,90	3,45	5,15	7,55	8,90	3,00	-	5,90	2,85	4,20	6,05	7,85
	7	4,55	-	6,90	3,35	5,05	7,35	8,90	3,50	-	6,90	2,80	4,10	5,90	7,70
	8	5,00	-	7,90	3,30	4,90	7,15	8,90	4,00	-	7,90	2,75	4,05	5,75	7,50
KBK Aluline A22	1	0,75	-	0,90	4,05	6,00	8,00	8,90	-	-	-	-	-	-	
	2	1,55	-	1,90	3,85	5,75	8,00	8,90	-	-	-	-	-	-	
	3	2,25	-	2,90	3,70	5,55	8,00	8,90	1,50	-	2,90	3,20	4,75	6,80	8,90
	4	2,85	-	3,90	3,60	5,35	7,80	8,90	2,00	-	3,90	3,05	4,50	6,50	8,45
	5	3,40	-	4,90	3,45	5,20	7,55	8,90	2,50	-	4,90	2,95	4,35	6,25	8,15
	6	3,90	-	5,90	3,35	5,05	7,35	8,90	3,00	-	5,90	2,80	4,15	5,95	7,70
	7	4,35	-	6,90	3,30	4,90	7,15	8,90	3,50	-	6,90	2,75	4,05	5,80	7,55
	8	5,00	-	7,90	3,25	4,85	7,05	8,90	4,00	-	7,90	2,70	3,95	5,65	7,35

		Load capacity: 125 kg, hoist weight: 30 kg, lifting speed: 30 m/min													
Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane						Double-girder crane						
			I <sub>Kr</sub>		l <sub>w</sub>				I <sub>Kr</sub>		l <sub>w</sub>				
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22	
KBK Aluline A12	1	0,75	-	0,90	3,55	5,30	7,70	8,90	-	-	-	-	-	-	
	2	1,70	-	1,90	3,50	5,20	7,60	8,90	1,10	-	1,90	3,35	4,85	6,90	8,90
	3	2,60	-	2,90	3,45	5,15	7,50	8,90	1,90	-	2,90	3,20	4,75	6,80	8,90
	4	3,40	-	3,55	3,40	5,05	7,40	8,90	2,65	-	3,90	3,15	4,65	6,70	8,70
	5	-	-	-	-	-	-	-	3,35	-	4,85	3,05	4,55	6,55	8,55
	6	-	-	-	-	-	-	-	4,00	-	4,85	2,95	4,40	6,25	8,15
	7	-	-	-	-	-	-	-	4,60	-	4,85	2,90	4,30	6,15	8,00
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KBK Aluline A16	1	0,75	-	0,90	3,55	5,25	7,70	8,90	-	-	-	-	-	-	
	2	1,65	-	1,90	3,45	5,15	7,55	8,90	1,05	-	1,90	3,30	4,80	6,80	8,80
	3	2,55	-	2,90	3,40	5,05	7,40	8,90	1,85	-	2,90	3,15	4,65	6,70	8,70
	4	3,35	-	3,90	3,35	5,00	7,30	8,90	2,55	-	3,90	3,05	4,55	6,50	8,50
	5	4,10	-	4,90	3,30	4,90	7,15	8,90	3,20	-	4,90	3,00	4,45	6,35	8,30
	6	4,80	-	5,40	3,25	4,85	7,05	8,90	3,75	-	5,90	2,85	4,25	6,05	7,90
	7	-	-	-	-	-	-	-	4,30	-	6,90	2,80	4,15	5,95	7,70
	8	-	-	-	-	-	-	-	4,75	-	7,30	2,75	4,05	5,80	7,55
KBK Aluline A18	1	0,75	-	0,90	3,50	5,20	7,60	8,90	-	-	-	-	-	-	
	2	1,65	-	1,90	3,40	5,05	7,40	8,90	-	-	-	-	-	-	
	3	2,45	-	2,90	3,30	4,95	7,20	8,90	1,60	-	2,90	2,95	4,40	6,25	8,20
	4	3,15	-	3,90	3,25	4,80	7,05	8,90	2,25	-	3,90	2,85	4,25	6,05	7,90
	5	3,80	-	4,90	3,15	4,70	6,90	8,90	2,80	-	4,90	2,75	4,10	5,85	7,65
	6	4,45	-	5,90	3,10	4,60	6,75	8,80	3,30	-	5,90	2,65	3,90	5,60	7,30
	7	5,00	-	6,90	3,05	4,50	6,60	8,65	3,70	-	6,90	2,60	3,80	5,45	7,10
	8	5,55	-	7,85	2,95	4,45	6,45	8,45	4,10	-	7,90	2,50	3,70	5,30	6,90
KBK Aluline A22	1	0,75	-	0,90	3,50	5,20	7,55	8,90	-	-	-	-	-	-	
	2	1,60	-	1,90	3,35	5,00	7,30	8,90	-	-	-	-	-	-	
	3	2,40	-	2,90	3,25	4,90	7,10	8,90	1,55	-	2,90	2,90	4,30	6,15	8,05
	4	3,10	-	3,90	3,20	4,75	6,95	8,90	2,15	-	3,90	2,80	4,15	5,95	7,75
	5	3,70	-	4,90	3,10	4,65	6,75	8,85	2,65	-	4,90	2,70	4,00	5,75	7,45
	6	4,30	-	5,90	3,05	4,55	6,60	8,65	3,10	-	5,90	2,60	3,80	5,45	7,10
	7	4,80	-	6,90	2,95	4,40	6,45	8,45	3,50	-	6,90	2,50	3,70	5,30	6,90
	8	5,30	-	7,90	2,90	4,35	6,30	8,25	4,00	-	7,90	2,45	3,65	5,20	6,75

1) Two end carriages on each side of the crane  
 2) Double trolley unit

**Load capacity: 160 kg, hoist weight: 35 kg, lifting speed: 20 m/min**

Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane								Double-girder crane							
			I <sub>Kr</sub>		I <sub>w</sub>				I <sub>Kr</sub>		I <sub>w</sub>							
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22				
KBK Aluline A12	1	0,75	-	0,90	3,20	4,75	6,95	8,90	-	-	-	-	-	-	-	-		
	2	1,70	-	1,90	3,15	4,70	6,85	8,90	1,10	-	1,90	3,10	4,50	6,35	8,25	-		
	3	2,60	-	2,90	3,10	4,65	6,80	8,85	1,95	-	2,90	2,95	4,40	6,30	8,20	-		
	4	-	-	-	-	-	-	-	2,75	-	3,90	2,90	4,30	6,15	8,05	-		
	5	-	-	-	-	-	-	-	3,50	-	4,40	2,85	4,25	6,05	7,90	-		
	6	-	-	-	-	-	-	-	4,20	-	4,40	2,75	4,10	5,85	7,60	-		
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
KBK Aluline A16	1	0,75	-	0,90	3,20	4,75	6,90	8,90	-	-	-	-	-	-	-	-		
	2	1,70	-	1,90	3,15	4,65	6,80	8,90	1,10	-	1,90	3,05	4,45	6,30	8,15	-		
	3	2,55	-	2,90	3,10	4,60	6,70	8,80	1,90	-	2,90	2,90	4,30	6,20	8,05	-		
	4	3,40	-	3,90	3,05	4,55	6,65	8,65	2,65	-	3,90	2,85	4,20	6,05	7,90	-		
	5	4,20	-	4,85	3,00	4,50	6,55	8,55	3,30	-	4,90	2,80	4,15	5,90	7,70	-		
	6	-	-	-	-	-	-	-	3,95	-	5,90	2,70	3,95	5,65	7,40	-		
	7	-	-	-	-	-	-	-	4,55	-	6,65	2,65	3,90	5,55	7,25	-		
	8	-	-	-	-	-	-	-	5,05	-	6,65	2,60	3,85	5,45	7,10	-		
KBK Aluline A18	1	0,75	-	0,90	3,15	4,70	6,85	8,90	-	-	-	-	-	-	-	-		
	2	1,65	-	1,90	3,10	4,60	6,70	8,75	-	-	-	-	-	-	-	-		
	3	2,50	-	2,90	3,00	4,50	6,55	8,60	1,65	-	2,90	2,75	4,10	5,85	7,65	-		
	4	3,25	-	3,90	2,95	4,40	6,45	8,40	2,35	-	3,90	2,70	3,95	5,70	7,40	-		
	5	4,00	-	4,90	2,90	4,35	6,30	8,25	2,95	-	4,90	2,60	3,85	5,50	7,20	-		
	6	4,65	-	5,90	2,85	4,25	6,20	8,10	3,50	-	5,90	2,50	3,70	5,30	6,90	-		
	7	5,30	-	6,90	2,80	4,20	6,10	8,00	4,00	-	6,90	2,45	3,60	5,15	6,70	-		
	8	5,85	-	7,05	2,75	4,10	6,00	7,85	4,40	-	7,90	2,40	3,55	5,05	6,55	-		
KBK Aluline A22	1	0,75	-	0,90	3,15	4,70	6,85	8,90	-	-	-	-	-	-	-	-		
	2	1,65	-	1,90	3,05	4,55	6,65	8,70	-	-	-	-	-	-	-	-		
	3	2,45	-	2,90	3,00	4,45	6,50	8,50	1,60	-	2,90	2,70	4,05	5,75	7,50	-		
	4	3,20	-	3,90	2,95	4,35	6,35	8,30	2,25	-	3,90	2,65	3,90	5,60	7,25	-		
	5	3,90	-	4,90	2,85	4,25	6,25	8,15	2,85	-	4,90	2,55	3,80	5,40	7,05	-		
	6	4,50	-	5,90	2,80	4,20	6,10	8,00	3,35	-	5,90	2,45	3,60	5,15	6,75	-		
	7	5,10	-	6,90	2,75	4,10	6,00	7,85	3,80	-	6,90	2,40	3,55	5,05	6,55	-		
	8	5,65	-	7,90	2,70	4,05	5,90	7,70	4,20	-	7,90	2,35	3,45	4,90	6,40	-		

**Load capacity: 200 kg, hoist weight: 35 kg, lifting speed: 20 m/min**

Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane				Double-girder crane									
			I <sub>Kr</sub>		I <sub>w</sub>		I <sub>Kr</sub>		I <sub>w</sub>							
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22		
KBK Aluline A12	1	0,80	-	0,90	2,95	4,35	6,40	8,35	-	-	-	-	-	-	-	-
	2	1,75	-	1,90	2,90	4,30	6,30	8,25	1,10	-	1,90	2,80	4,15	5,95	7,75	-
	3	2,65	-	2,90	2,85	4,30	6,25	8,15	2,00	-	2,90	2,75	4,10	5,85	7,65	-
	4	-	-	-	-	-	-	-	2,80	-	3,90	2,70	4,05	5,75	7,50	-
	5	-	-	-	-	-	-	-	3,60	-	4,05	2,70	3,95	5,70	7,40	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KBK Aluline A16	1	0,75	-	0,90	2,90	4,35	6,35	8,30	-	-	-	-	-	-	-	-
	2	1,70	-	1,90	2,90	4,30	6,25	8,20	1,10	-	1,90	2,90	4,15	5,90	7,60	-
	3	2,60	-	2,90	2,85	4,25	6,20	8,10	1,95	-	2,90	2,70	4,05	5,75	7,55	-
	4	3,45	-	3,90	2,80	4,20	6,10	8,00	2,70	-	3,90	2,65	3,95	5,65	7,40	-
	5	4,30	-	4,45	2,80	4,15	6,05	7,90	3,45	-	4,90	2,60	3,90	5,55	7,25	-
	6	-	-	-	-	-	-	-	4,10	-	5,90	2,55	3,75	5,35	7,00	-
	7	-	-	-	-	-	-	-	4,75	-	6,10	2,50	3,70	5,25	6,85	-
	8	-	-	-	-	-	-	-	5,30	-	6,10	2,45	3,65	5,20	6,75	-
KBK Aluline A18	1	0,75	-	0,90	2,90	4,30	6,30	8,25	-	-	-	-	-	-	-	-
	2	1,70	-	1,90	2,85	4,25	6,20	8,10	-	-	-	-	-	-	-	-
	3	2,55	-	2,90	2,80	4,15	6,10	7,95	1,70	-	2,90	2,60	3,85	5,50	7,20	-
	4	3,35	-	3,90	2,75	4,10	6,00	7,80	2,40	-	3,90	2,55	3,75	5,35	7,00	-
	5	4,10	-	4,90	2,70	4,05	5,90	7,70	3,05	-	4,90	2,50	3,65	5,25	6,80	-
	6	4,80	-	5,90	2,65	3,95	5,80	7,55	3,65	-	5,90	2,40	3,55	5,05	6,55	-
	7	5,50	-	6,45	2,65	3,90	5,70	7,45	4,20	-	6,90	2,35	3,45	4,90	6,40	-
	8	6,10	-	6,50	2,60	3,85	5,60	7,35	4,70	-	7,90	2,30	3,40	4,80	6,25	-
KBK Aluline A22	1	0,75	-	0,90	2,90	4,30	6,30	8,20	-	-	-	-	-	-	-	-
	2	1,65	-	1,90	2,85	4,20	6,15	8,05	-	-	-	-	-	-	-	-
	3	2,50	-	2,90	2,75	4,15	6,05	7,90	1,65	-	2,90	2,55	3,80	5,45	7,10	-
	4	3,30	-	3,90	2,70	4,05	5,90	7,75	2,35	-	3,90	2,50	3,70	5,25	6,85	-
	5	4,00	-	4,90	2,65	3,95	5,80	7,60	2,95	-	4,90	2,45	3,60	5,15	6,70	-
	6	4,70	-	5,90	2,65	3,90	5,70	7,45	3,50	-	5,90	2,35	3,45	4,90	6,40	-
	7	5,30	-	6,90	2,60	3,85	5,60	7,35	4,00	-	6,90	2,30	3,35	4,80	6,25	-
	8	5,90	-	7,90	2,55	3,75	5,50	7,20	4,45	-	7,90	2,25	3,30	4,70	6,10	-

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1) Two end carriages on each side of the crane  
2) Double trolley unit

		Load capacity: 250 kg, hoist weight: 35 kg, lifting speed: 20 m/min															
Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane							Double-girder crane							
			I <sub>Kr</sub>		A12	A16	I <sub>w</sub>	A18	A22	I <sub>Kr</sub>		A12	A16	I <sub>w</sub>	A18	A22	
			min	max						min	max						
KBK Aluline A12	1	0,80	-	0,90	2,70	<sup>1)</sup>	4,00	<sup>1)</sup>	5,80	7,60	-	-	-	-	-	-	
	2	1,75	-	1,90	2,65	<sup>1)</sup>	3,95	<sup>1)</sup>	5,80	7,55	1,15	-	1,90	2,60	3,85	5,50	7,20
	3	-	-	-	-	-	-	-	-	-	2,00	-	2,90	2,55	3,80	5,45	7,10
	4	-	-	-	-	-	-	-	-	-	2,85	-	3,75	2,55	3,75	5,35	7,00
	5	-	-	-	-	-	-	-	-	-	3,65	-	3,75	2,50	3,70	5,30	6,90
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KBK Aluline A16	1	0,80	-	0,90	2,65	<sup>1)</sup>	3,95	<sup>1)</sup>	5,80	7,60	-	-	-	-	-	-	
	2	1,70	-	1,90	2,65	<sup>1)</sup>	3,95	<sup>1)</sup>	5,75	7,50	1,10	-	1,90	2,70	3,90	5,45	7,10
	3	2,65	-	2,90	2,60	<sup>1)</sup>	3,90	<sup>1)</sup>	5,70	7,45	1,95	-	2,90	2,55	3,75	5,35	7,00
	4	3,50	-	3,90	2,60	<sup>1)</sup>	3,85	<sup>1)</sup>	5,65	7,35	2,80	-	3,90	2,50	3,70	5,25	6,85
	5	-	-	-	-	-	-	-	-	-	3,55	-	4,90	2,45	3,65	5,20	6,75
	6	-	-	-	-	-	-	-	-	-	4,25	-	5,60	2,40	3,55	5,05	6,55
	7	-	-	-	-	-	-	-	-	-	4,90	-	5,60	2,35	3,50	4,95	6,45
	8	-	-	-	-	-	-	-	-	-	5,55	-	5,60	2,35	3,45	4,90	6,35
KBK Aluline A18	1	0,80	-	0,90	2,65	<sup>1)</sup>	3,95	<sup>1)</sup>	5,75	7,55	-	-	-	-	-	-	
	2	1,70	-	1,90	2,60	<sup>1)</sup>	3,90	<sup>1)</sup>	5,70	7,45	-	-	-	-	-	-	
	3	2,60	-	2,90	2,60	<sup>1)</sup>	3,85	<sup>1)</sup>	5,60	7,30	1,75	-	2,90	2,45	3,60	5,15	6,70
	4	3,40	-	3,90	2,55	<sup>1)</sup>	3,75	<sup>1)</sup>	5,50	7,20	2,50	-	3,90	2,40	3,50	5,05	6,55
	5	4,20	-	4,90	2,50	<sup>1)</sup>	3,70	<sup>1)</sup>	5,45	7,10	3,20	-	4,90	2,35	3,45	4,90	6,40
	6	4,95	-	5,90	2,50	<sup>1)</sup>	3,65	<sup>1)</sup>	5,35	7,00	3,80	-	5,90	2,25	3,35	4,75	6,20
	7	5,65	-	5,90	2,45	<sup>1)</sup>	3,60	<sup>1)</sup>	5,30	6,95	4,40	-	6,90	2,25	3,30	4,65	6,05
	8	-	-	-	-	-	-	-	-	-	4,95	-	7,90	2,20	3,20	4,55	5,95
KBK Aluline A22	1	0,80	-	0,90	2,65	<sup>1)</sup>	3,95	<sup>1)</sup>	5,75	7,50	-	-	-	-	-	-	
	2	1,70	-	1,90	2,60	<sup>1)</sup>	3,85	<sup>1)</sup>	5,65	7,40	-	-	-	-	-	-	
	3	2,55	-	2,90	2,55	<sup>1)</sup>	3,80	<sup>1)</sup>	5,55	7,25	1,70	-	2,90	2,40	3,55	5,10	6,65
	4	3,35	-	3,90	2,50	<sup>1)</sup>	3,75	<sup>1)</sup>	5,45	7,15	2,45	-	3,90	2,35	3,45	4,95	6,45
	5	4,10	-	4,90	2,50	<sup>1)</sup>	3,70	<sup>1)</sup>	5,40	7,05	3,10	-	4,90	2,30	3,40	4,85	6,30
	6	4,85	-	5,90	2,45	<sup>1)</sup>	3,65	<sup>1)</sup>	5,30	6,95	3,65	-	5,90	2,25	3,30	4,65	6,05
	7	5,50	-	6,90	2,40	<sup>1)</sup>	3,55	<sup>1)</sup>	5,20	6,85	4,20	-	6,90	2,20	3,20	4,55	5,95
	8	6,15	-	7,70	2,40	<sup>1)</sup>	3,50	<sup>1)</sup>	5,15	6,75	4,70	-	7,90	2,15	3,15	4,45	5,80

		Load capacity: 315 kg, hoist weight: 55 kg, lifting speed: 15 m/min																
Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane							Double-girder crane								
			I <sub>Kr</sub>		A12	A16	I <sub>w</sub>	A18	A22	I <sub>Kr</sub>		A12	A16	I <sub>w</sub>	A18	A22		
			min	max						min	max							
KBK Aluline A12	1	0,75	-	0,90	<sup>2)</sup>	2,55	<sup>1)</sup>	3,75	<sup>1)</sup>	5,50	7,20	-	-	-	-	-	-	
	2	1,55	-	1,90	<sup>2)</sup>	2,35	<sup>1)</sup>	3,50	<sup>1)</sup>	5,10	6,65	1,15	-	1,90	2,35	3,45	4,95	6,45
	3	-	-	-	-	-	-	-	-	-	2,05	-	2,90	2,35	3,40	4,90	6,35	
	4	-	-	-	-	-	-	-	-	-	2,95	-	3,35	2,30	3,40	4,85	6,30	
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
KBK Aluline A16	1	0,75	-	0,90	<sup>2)</sup>	2,55	<sup>1)</sup>	3,75	<sup>1)</sup>	5,50	7,20	-	-	-	-	-	-	
	2	1,55	-	1,90	<sup>2)</sup>	2,35	<sup>1)</sup>	3,45	<sup>1)</sup>	5,10	6,65	1,15	-	1,90	2,35	3,45	4,90	6,40
	3	2,45	-	2,90	<sup>2)</sup>	2,35	<sup>1)</sup>	3,45	<sup>1)</sup>	5,05	6,60	2,00	-	2,90	2,30	3,40	4,85	6,30
	4	3,40	-	3,55	<sup>2)</sup>	2,30	<sup>1)</sup>	3,40	<sup>1)</sup>	5,00	6,55	2,85	-	3,90	2,25	3,35	4,75	6,20
	5	-	-	-	-	-	-	-	-	-	3,65	-	4,90	2,25	3,30	4,70	6,15	
	6	-	-	-	-	-	-	-	-	-	4,40	-	5,00	2,20	3,20	4,60	5,95	
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
KBK Aluline A18	1	0,80	-	0,90	-	2,35	<sup>1)</sup>	3,50	<sup>1)</sup>	5,10	6,70	-	-	-	-	-	-	
	2	1,70	-	1,90	-	2,35	<sup>1)</sup>	3,45	<sup>1)</sup>	5,05	6,60	-	-	-	-	-	-	
	3	2,65	-	2,90	-	2,30	<sup>1)</sup>	3,40	<sup>1)</sup>	5,00	6,50	1,80	-	2,90	2,25	3,30	4,70	6,10
	4	3,50	-	3,90	-	2,30	<sup>1)</sup>	3,35	<sup>1)</sup>	4,95	6,45	2,60	-	3,90	2,20	3,20	4,60	5,95
	5	4,30	-	4,90	-	2,25	<sup>1)</sup>	3,35	<sup>1)</sup>	4,90	6,40	3,30	-	4,90	2,15	3,15	4,50	5,85
	6	5,10	-	5,20	-	2,25	<sup>1)</sup>	3,30	<sup>1)</sup>	4,80	6,30	4,00	-	5,90	2,10	3,10	4,40	5,70
	7	-	-	-	-	-	-	-	-	-	4,65	-	6,90	2,05	3,05	4,30	5,60	
	8	-	-	-	-	-	-	-	-	-	5,25	-	7,20	2,05	3,00	4,25	5,50	
KBK Aluline A22	1	0,80	-	0,90	-	2,35	<sup>1)</sup>	3,50	<sup>1)</sup>	5,10	6,65	-	-	-	-	-	-	
	2	1,70	-	1,90	-	2,30	<sup>1)</sup>	3,45	<sup>1)</sup>	5,00	6,55	-	-	-	-	-	-	
	3	2,60	-	2,90	-	2,30	<sup>1)</sup>	3,40	<sup>1)</sup>	4,95	6,50	1,75	-	2,90	2,20	3,25	4,65	6,05
	4	3,45	-	3,90	-	2,25	<sup>1)</sup>	3,35	<sup>1)</sup>	4,90	6,40	2,55	-	3,90	2,15	3,20	4,55	5,90
	5	4,25	-	4,90	-	2,25	<sup>1)</sup>	3,30	<sup>1)</sup>	4,85	6,30	3,25	-	4,90	2,15	3,10	4,45	5,80
	6	5,00	-	5,90	-	2,20	<sup>1)</sup>	3,25	<sup>1)</sup>	4,75	6,25	3,90	-	5,90	2,10	3,05	4,30	5,60
	7	5,75	-	6,80	-	2,20	<sup>1)</sup>	3,25	<sup>1)</sup>	4,70	6,15	4,50	-	6,90	2,05	3,00	4,25	5,50
	8	6,45	-	6,80	-	2,15	<sup>1)</sup>	3,20	<sup>1)</sup>	4,65	6,10	5,05	-	7,90	2,00	2,95	4,15	5,40

1) Two end carriages on each side of the crane  
 2) Double trolley unit

**Load capacity: 400 kg, hoist weight: 55 kg, lifting speed: 15 m/min**

Profile	l <sub>HT</sub>	Single-girder crane								Double-girder crane							
		l <sub>Kr</sub>		l <sub>w</sub>				l <sub>Kr</sub>		l <sub>w</sub>							
		min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22				
KBK Aluline A12	1	0,75	0,90	2,30	3,40	5,00	6,50	-	-	-	-	-	-				
	2	1,55	1,90	2,15	3,15	4,60	6,05	1,15	1,90	2,15	3,15	4,50	5,90				
	3	-	-	-	-	-	-	2,10	2,90	2,15	3,15	4,50	5,85				
	4	-	-	-	-	-	-	2,95	3,05	2,15	3,10	4,45	5,80				
	5	-	-	-	-	-	-	-	-	-	-	-	-				
	6	-	-	-	-	-	-	-	-	-	-	-	-				
	7	-	-	-	-	-	-	-	-	-	-	-	-				
	8	-	-	-	-	-	-	-	-	-	-	-	-				
KBK Aluline A16	1	0,75	0,90	2,30	3,40	4,95	6,50	-	-	-	-	-	-				
	2	1,55	1,90	2,15	3,15	4,60	6,05	1,15	1,90	2,15	3,15	4,50	5,85				
	3	2,50	2,90	2,10	3,15	4,60	6,00	2,05	2,90	2,15	3,10	4,45	5,80				
	4	-	-	-	-	-	-	2,90	3,90	2,10	3,10	4,40	5,70				
	5	-	-	-	-	-	-	3,75	4,55	2,10	3,05	4,35	5,65				
	6	-	-	-	-	-	-	-	-	-	-	-	-				
	7	-	-	-	-	-	-	-	-	-	-	-	-				
	8	-	-	-	-	-	-	-	-	-	-	-	-				
KBK Aluline A18	1	0,80	0,90	2,15	3,15	4,65	6,05	-	-	-	-	-	-				
	2	1,75	1,90	2,10	3,15	4,60	6,00	-	-	-	-	-	-				
	3	2,65	2,90	2,10	3,10	4,55	5,95	1,85	2,90	2,05	3,05	4,30	5,60				
	4	3,55	3,90	2,10	3,10	4,50	5,90	2,65	3,90	2,05	3,00	4,25	5,55				
	5	4,40	4,70	2,05	3,05	4,45	5,85	3,45	4,90	2,00	2,95	4,20	5,45				
	6	-	-	-	-	-	-	4,15	5,90	-	-	4,10	5,30				
	7	-	-	-	-	-	-	4,85	6,55	-	-	4,00	5,25				
	8	-	-	-	-	-	-	5,50	6,55	-	-	3,95	5,15				
KBK Aluline A22	1	0,80	0,90	2,15	3,15	4,60	6,05	-	-	-	-	-	-				
	2	1,75	1,90	2,10	3,15	4,55	5,95	-	-	-	-	-	-				
	3	2,65	2,90	2,10	3,10	4,50	5,90	1,80	2,90	2,05	3,00	4,30	5,55				
	4	3,50	3,90	2,05	3,05	4,45	5,85	2,60	3,90	2,00	2,95	4,20	5,45				
	5	4,35	4,90	2,05	3,05	4,40	5,80	3,35	4,90	-	-	4,15	5,35				
	6	5,15	5,90	2,05	3,00	4,40	5,70	4,05	5,90	-	-	4,00	5,25				
	7	5,90	6,15	2,00	2,95	4,35	5,65	4,70	6,90	-	-	3,95	5,15				
	8	-	-	-	-	-	-	5,30	7,90	-	-	3,90	5,05				

**Load capacity: 500 kg, hoist weight: 75 kg, lifting speed: 15 m/min**

Profile	l <sub>HT</sub>	Single-girder crane				Double-girder crane							
		l <sub>Kr</sub>		l <sub>w</sub>		l <sub>Kr</sub>		l <sub>w</sub>					
		min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22
KBK Aluline A12	1	0,75	0,90	2,05	3,05	4,45	5,80	-	-	-	-	-	-
	2	1,55	1,90	1,90	2,85	4,15	5,40	1,30	1,90	2,00	2,95	4,20	5,45
	3	-	-	-	-	-	-	2,45	2,75	2,00	2,95	4,20	5,45
	4	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-
KBK Aluline A16	1	0,75	0,90	2,05	3,05	4,45	5,80	-	-	-	-	-	-
	2	1,55	1,90	1,90	2,85	4,15	5,40	1,35	1,90	2,00	2,95	4,20	5,45
	3	2,60	2,85	1,90	2,85	4,15	5,40	2,50	2,90	2,00	2,95	4,20	5,45
	4	-	-	-	-	-	-	3,70	3,90	2,00	2,95	4,20	5,45
	5	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-
KBK Aluline A18	1	0,80	0,90	1,90	2,85	4,15	5,40	-	-	-	-	-	-
	2	1,75	1,90	2,20	2,90	4,10	5,35	-	-	-	-	-	-
	3	2,70	2,90	2,15	2,85	4,05	5,30	1,85	2,90	-	-	3,95	5,10
	4	3,60	3,90	2,15	2,85	4,05	5,30	2,70	3,90	-	-	3,85	5,05
	5	-	-	-	-	-	-	3,55	4,90	-	-	3,80	4,95
	6	-	-	-	-	-	-	4,30	5,85	-	-	3,75	4,85
	7	-	-	-	-	-	-	5,05	5,85	-	-	3,70	4,80
	8	-	-	-	-	-	-	5,75	5,85	-	-	3,65	4,75
KBK Aluline A22	1	0,80	0,90	1,90	2,85	4,15	5,40	-	-	-	-	-	-
	2	1,75	1,90	2,20	2,85	4,10	5,35	-	-	-	-	-	-
	3	2,65	2,90	2,15	2,85	4,05	5,30	1,85	2,90	-	-	3,90	5,05
	4	3,55	3,90	2,15	2,80	4,00	5,25	2,70	3,90	-	-	3,85	5,00
	5	4,45	4,90	2,15	2,80	4,00	5,20	3,45	4,90	-	-	3,80	4,90
	6	5,25	5,45	2,15	2,80	3,95	5,15	4,20	5,90	-	-	3,70	4,80
	7	-	-	-	-	-	-	4,90	6,90	-	-	3,65	4,75
	8	-	-	-	-	-	-	5,60	7,65	-	-	3,60	4,70

1) Two end carriages on each side of the crane  
2) Double trolley unit

Load capacity: 630 kg, hoist weight: 75 kg, lifting speed: 15 m/min																
Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane							Double-girder crane						
			I <sub>Kr</sub>		I <sub>w</sub>				I <sub>Kr</sub>		I <sub>w</sub>					
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22		
Crane girder section, crane girder length	KBK Aluline A18	1	0,80	- 0,90	2,05 <sup>1)</sup>	2,30 <sup>1)</sup>	3,75 <sup>1)</sup>	4,90 <sup>1)</sup>	-	-	-	-	-	-	-	-
		2	1,75	- 1,90	2,05 <sup>1)</sup>	2,00 <sup>1)</sup>	3,75 <sup>1)</sup>	4,85 <sup>1)</sup>	-	-	-	-	-	-	-	-
		3	2,70	- 2,90	2,05 <sup>1)</sup>	1,75 <sup>1)</sup>	3,70 <sup>1)</sup>	4,85 <sup>1)</sup>	1,90	- 2,90	-	-	3,60	4,70	-	-
		4	3,65	- 3,80	2,00 <sup>1)</sup>	1,60 <sup>1)</sup>	3,70 <sup>1)</sup>	4,80 <sup>1)</sup>	2,75	- 3,90	-	-	3,55	4,65	-	-
	KBK Aluline A22	5	-	-	-	-	-	-	3,60	- 4,90	-	-	3,55	4,60	-	-
		6	-	-	-	-	-	-	4,40	- 5,35	-	-	3,45	4,50	-	-
		7	-	-	-	-	-	-	5,20	- 5,35	-	-	3,45	4,45	-	-
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	KBK Aluline A22	1	0,80	- 0,90	2,05 <sup>1)</sup>	2,25 <sup>1)</sup>	3,75 <sup>1)</sup>	4,90 <sup>1)</sup>	-	-	-	-	-	-	-	-
		2	1,75	- 1,90	2,05 <sup>1)</sup>	1,90 <sup>1)</sup>	3,70 <sup>1)</sup>	4,85 <sup>1)</sup>	-	-	-	-	-	-	-	-
		3	2,70	- 2,90	2,05 <sup>1)</sup>	1,65 <sup>1)</sup>	3,70 <sup>1)</sup>	4,80 <sup>1)</sup>	1,85	- 2,90	-	-	3,60	4,65	-	-
		4	3,60	- 3,90	2,00 <sup>1)</sup>	1,50 <sup>1)</sup>	3,65 <sup>1)</sup>	4,80 <sup>1)</sup>	2,75	- 3,90	-	-	3,55	4,60	-	-
		5	4,50	- 4,90	2,00 <sup>1)</sup>	1,35 <sup>1)</sup>	3,65 <sup>1)</sup>	4,75 <sup>1)</sup>	3,55	- 4,90	-	-	3,50	4,55	-	-
		6	-	-	-	-	-	-	4,35	- 5,90	-	-	3,45	4,45	-	-
		7	-	-	-	-	-	-	5,10	- 6,90	-	-	3,40	4,40	-	-
		8	-	-	-	-	-	-	5,80	- 6,95	-	-	3,35	4,35	-	-

Load capacity: 800 kg, hoist weight: 75 kg, lifting speed: 15 m/min																
Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane							Double-girder crane						
			I <sub>Kr</sub>		I <sub>w</sub>				I <sub>Kr</sub>		I <sub>w</sub>					
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22		
Crane girder section, crane girder length	KBK Aluline A18	1	0,75	- 0,90 <sup>2)</sup>	2,00 <sup>1)</sup>	1,40 <sup>1)</sup>	3,65 <sup>1)</sup>	4,75 <sup>1)</sup>	-	-	-	-	-	-	-	-
		2	1,50	- 1,90 <sup>2)</sup>	1,25 <sup>1)</sup>	1,20 <sup>1)</sup>	3,35 <sup>1)</sup>	4,40 <sup>1)</sup>	-	-	-	-	-	-	-	-
		3	2,50	- 2,90 <sup>2)</sup>	1,25 <sup>1)</sup>	1,20 <sup>1)</sup>	3,35 <sup>1)</sup>	4,35 <sup>1)</sup>	1,90	- 2,90	-	-	3,30	4,25	-	-
		4	-	-	-	-	-	-	2,80	- 3,90	-	-	3,25	4,25	-	-
	KBK Aluline A22	5	-	-	-	-	-	-	3,70	- 4,85	-	-	3,25	4,20	-	-
		6	-	-	-	-	-	-	4,50	- 4,85	-	-	3,20	4,15	-	-
		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	KBK Aluline A22	1	0,75	- 0,90 <sup>2)</sup>	2,00 <sup>1)</sup>	1,40 <sup>1)</sup>	3,65 <sup>1)</sup>	4,75 <sup>1)</sup>	-	-	-	-	-	-	-	-
		2	1,50	- 1,90 <sup>2)</sup>	1,25 <sup>1)</sup>	1,20 <sup>1)</sup>	3,35 <sup>1)</sup>	4,35 <sup>1)</sup>	-	-	-	-	-	-	-	-
		3	2,45	- 2,90 <sup>2)</sup>	1,20 <sup>1)</sup>	1,15 <sup>1)</sup>	3,35 <sup>1)</sup>	4,35 <sup>1)</sup>	1,90	- 2,90	-	-	3,25	4,25	-	-
		4	3,40	- 3,90 <sup>2)</sup>	1,20 <sup>1)</sup>	1,15 <sup>1)</sup>	3,30 <sup>1)</sup>	4,30 <sup>1)</sup>	2,80	- 3,90	-	-	3,25	4,20	-	-
		5	4,30	- 4,45 <sup>2)</sup>	1,20 <sup>1)</sup>	1,15 <sup>1)</sup>	3,30 <sup>1)</sup>	4,30 <sup>1)</sup>	3,65	- 4,90	-	-	3,20	4,15	-	-
		6	-	-	-	-	-	-	4,45	- 5,90	-	-	3,15	4,10	-	-
		7	-	-	-	-	-	-	5,25	- 6,30	-	-	3,15	4,05	-	-
		8	-	-	-	-	-	-	6,00	- 6,30	-	-	3,10	4,00	-	-

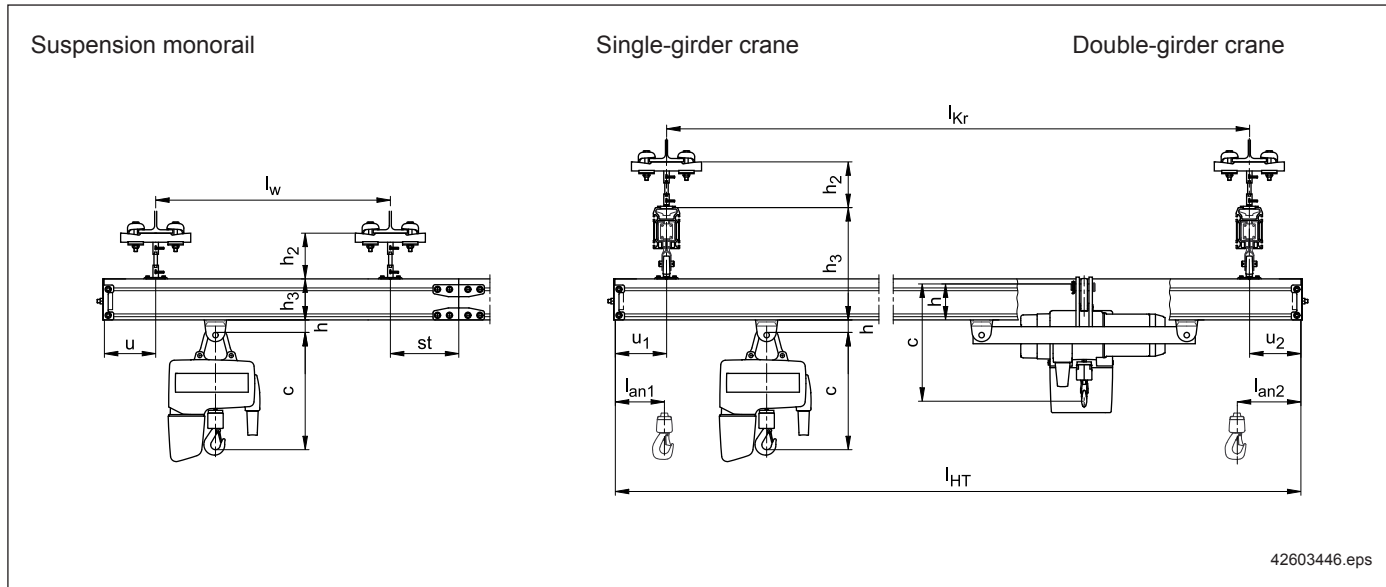
Load capacity: 1.000 kg, hoist weight: 85 kg, lifting speed: 15 m/min																
Crane girder section, crane girder length	Profile	I <sub>HT</sub>	Single-girder crane							Double-girder crane						
			I <sub>Kr</sub>		I <sub>w</sub>				I <sub>Kr</sub>		I <sub>w</sub>					
			min	max	A12	A16	A18	A22	min	max	A12	A16	A18	A22		
Crane girder section, crane girder length	KBK Aluline A18	1	0,75	- 0,90 <sup>2)</sup>	1,15 <sup>1)</sup>	1,10 <sup>1)</sup>	3,30 <sup>1)</sup>	4,30 <sup>1)</sup>	-	-	-	-	-	-	-	-
		2	1,55	- 1,90 <sup>2)</sup>	0,95 <sup>1)</sup>	0,90 <sup>1)</sup>	3,00 <sup>1)</sup>	3,95 <sup>1)</sup>	-	-	-	-	-	-	-	-
		3	2,50	- 2,90 <sup>2)</sup>	0,95 <sup>1)</sup>	0,90 <sup>1)</sup>	3,00 <sup>1)</sup>	3,90 <sup>1)</sup>	2,00	- 2,90	-	-	3,00	3,85	-	-
		4	-	-	-	-	-	-	3,00	- 3,90	-	-	3,00	3,85	-	-
	KBK Aluline A22	5	-	-	-	-	-	-	4,10	- 4,35	-	-	3,00	3,85	-	-
		6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	KBK Aluline A22	1	0,75	- 0,90 <sup>2)</sup>	1,15 <sup>1)</sup>	1,10 <sup>1)</sup>	3,30 <sup>1)</sup>	4,30 <sup>1)</sup>	-	-	-	-	-	-	-	-
		2	1,50	- 1,90 <sup>2)</sup>	0,95 <sup>1)</sup>	0,90 <sup>1)</sup>	3,00 <sup>1)</sup>	3,95 <sup>1)</sup>	-	-	-	-	-	-	-	-
		3	2,50	- 2,90 <sup>2)</sup>	0,95 <sup>1)</sup>	0,90 <sup>1)</sup>	3,00 <sup>1)</sup>	3,90 <sup>1)</sup>	2,00	- 2,90	-	-	3,00	3,85	-	-
		4	3,45	- 3,90 <sup>2)</sup>	0,90 <sup>1)</sup>	0,90 <sup>1)</sup>	3,00 <sup>1)</sup>	3,90 <sup>1)</sup>	3,05	- 3,90	-	-	3,00	3,85	-	-
		5	-	-	-	-	-	-	4,15	- 4,90	-	-	3,00	3,85	-	-
		6	-	-	-	-	-	-	5,30	- 5,60	-	-	3,00	3,85	-	-
		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1) Two end carriages on each side of the crane

30 2) Double trolley unit



### 3.13 Structural dimensions for monorail tracks and cranes



The lifting height achieved by using a double-girder crane is higher than that of single-girder cranes, as the hoist is positioned between the two crane girders.

#### Dimension h<sub>2</sub>

Dimension h <sub>2</sub> [mm] (I-beam bottom edge to track girder top edge)				
	Short suspension with spring clip	Length of suspension rod for spring clip		
		80	100	300
A12 / A16	75	135	-	355
A18 / A22	115	-	195	395

For  $l_w$ ,  $l_{kr}$ ,  $l_{HT}$ , see diagram (section 3.5) and selection tables (see section 3.12.3)  $u$ ,  $st$ ,  $l_{an}$  according to specification and individual dimensions of components.

#### Dimension h<sub>3</sub>

Dimension h <sub>3</sub> [mm] (track girder top edge to crane girder bottom edge)														
Cranes														
KBK crane runway		A12			A16			A18				A22		
KBK crane girder		A12	A16	A18	A12	A16	A18	A12	A16	A18	A22	A16	A18	A22
Track trolley	Single	330	370	390	370	410	430	390	430	450	490	470	490	530
	Double	340	380	400	380	420	440	405	445	465	505	485	505	545

Rigid crane end carriages: + 15

#### Dimension h

Dimension h [mm] (bottom edge of rail to top edge of pin)						
Cranes and suspension monorails						
KBK profile		A12	A16	A18	A22	A22 > 1,2 t
Cross-travel unit	Single	37		35		-
	Double	47		50		-
	Crab frame	-105		-150		-196

Dimension c = Hoist headroom dimension



## 4 KBK Aluline ergo – Planning and project engineering

The following pages provide an overview of the applications for which the various Aluline profile sections may be used for:

- Cranes with a large overhang
- Manipulator cranes and crabs

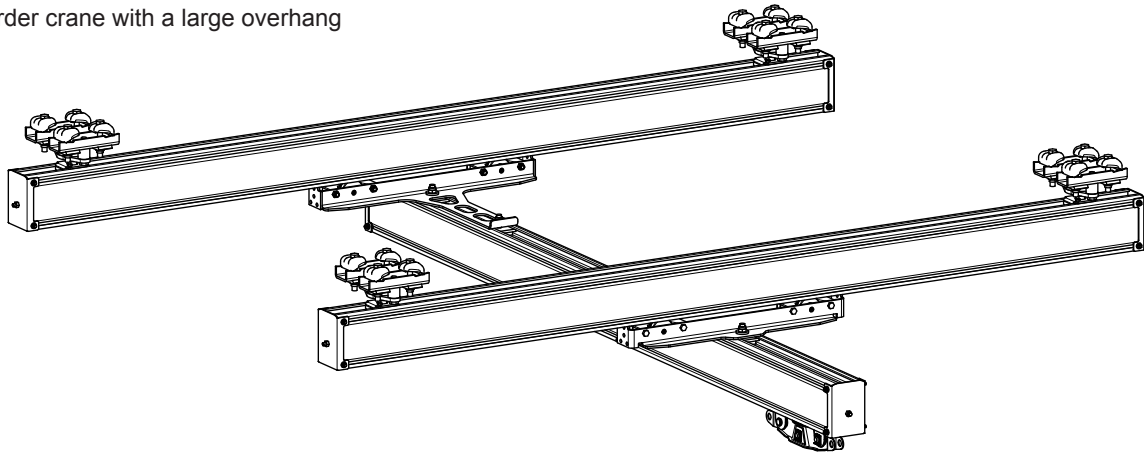
Rigid ergo trolleys integrated into special end carriages and trolley frames, together with rigid suspensions accommodate load torques and forces acting in the opposite direction to the load. KBK ergo trolleys can accommodate horizontal forces resulting from handling devices.

The crane runway length must not exceed 30 meters when rigid suspensions are used. (Different expansion coefficients for support structure and aluminium rail).

### 4.1 Cranes with a large overhang

#### 4.1.1 Single-girder crane with a large overhang

Single-girder crane with a large overhang

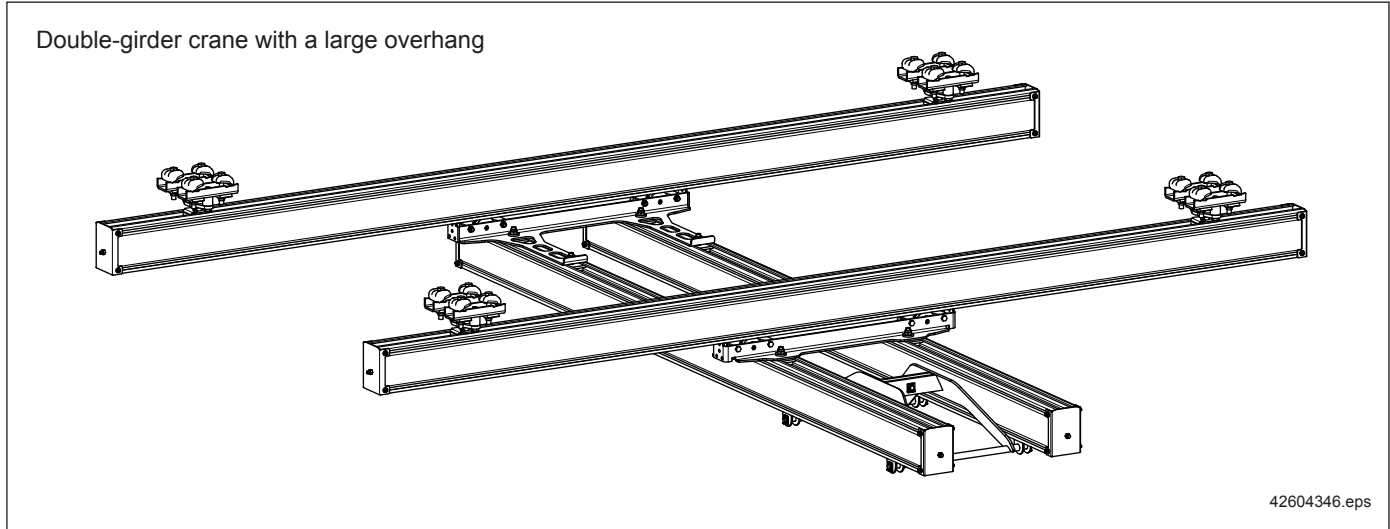


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Assemblies	Single-girder crane	
	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, shock absorber, information plates	5
Suspension	Short suspension, Ergo suspension	6
Trolley combination	Trolley, ergo crane trolley, ergo crab trolley	7
Travel drive	RF 100, RF 125 and DRF 200	11
Link bars	Trolley link, link bar, spacer bar	13
Accessories	Buffers on crabs and cranes	14
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	16.1
Control system		17

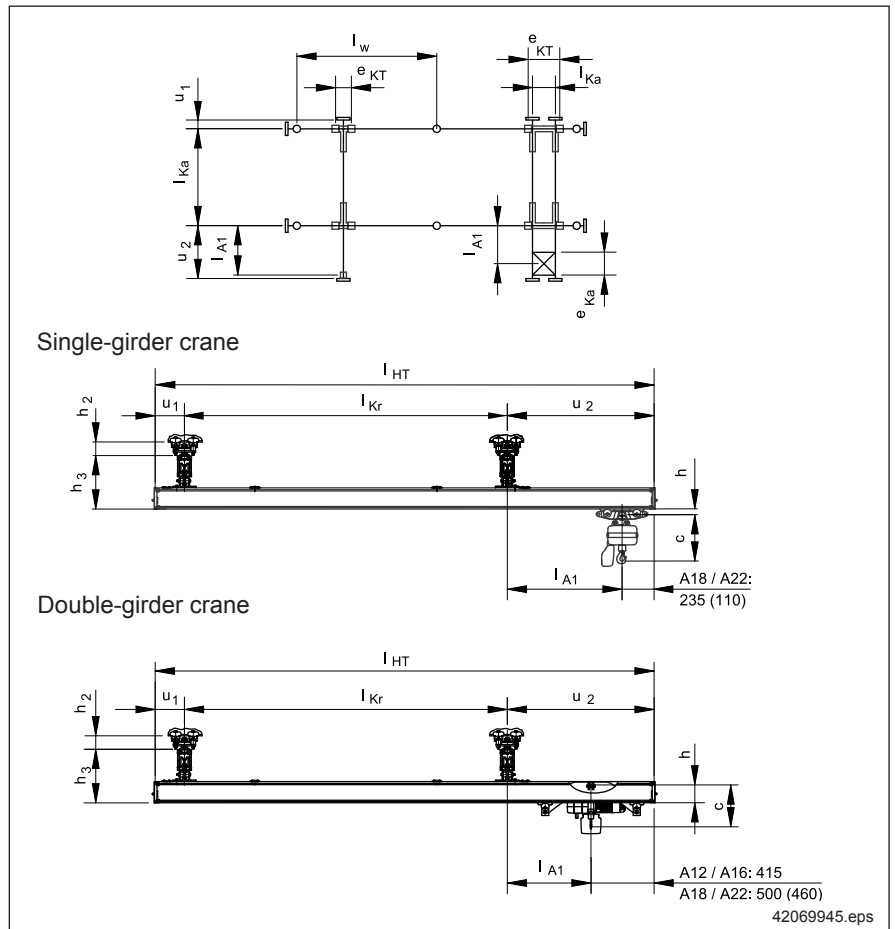
**Type:** rigid track suspensions and crane end carriages

#### 4.1.2 Double-girder crane with a large overhang



Double-girder crane

Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, shock absorber, information plates	5
Suspension	Short suspension, Ergo suspension	6
Trolley combination	Trolley, ergo crane trolley, ergo crab trolley	7
Travel drive	RF 100, RF 125 and DRF 200	11
Link bars	Trolley link, link bar, spacer bar	13
Accessories	Buffers on crabs and cranes	14
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	16.1
Control system		17



Crane girders may have overhang  $u_2$  on both sides if crane length  $I_{HT}$  is increased accordingly and crane span dimension  $I_{KR}$  is maintained.

**Crane types:**

- Single-girder crane: Cranes and tracks made of KBK Aluline A18/A22
- Double-girder crane: Cranes and tracks made of all KBK Aluline profile sections

A KBK Aluline double trolley with an articulated frame is used as the crab for single-girder cranes that have a large overhang. (A single trolley is sufficient for the crab for cranes up to  $I_{HT} = 3$  metres.)

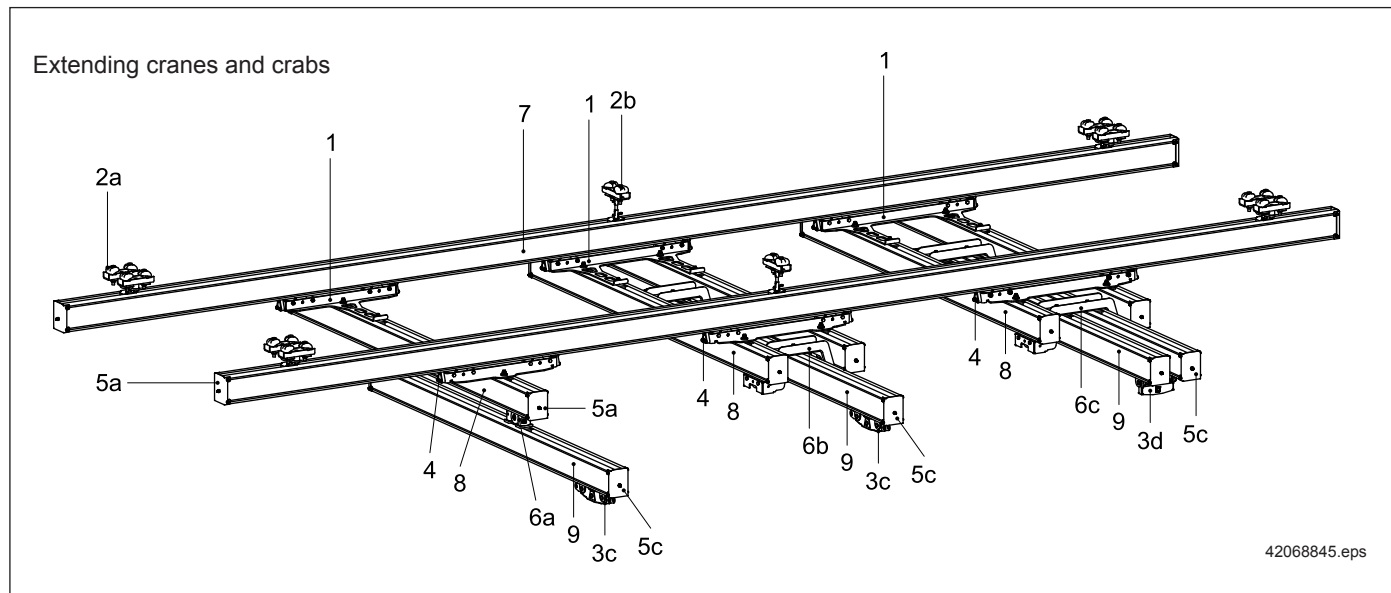
A KBK Aluline crab frame is used as the crab for double-girder cranes. KBK Aluline end caps with rubber buffers are used at the ends of the runway and at the ends of the crane girders.

The hoist/load connection is articulated.

- |  |   |
|--|---|
| $I_{Kr}$ = Crane span dimension            | $u_1$ = Overhang  |
| $I_{HT}$ = Crane girder length             | $u_2$ = Overhang  |
| $I_{Ka}$ = Crab span                       | $h$ = Bottom edge of rail to top edge of pin                    |
| $e_{KT}$ = Distance between crane trolleys | $h_2$ = Bottom edge of I-beam to top edge of track girder       |
| $e_{KT}$ = Distance between crab trolleys  | $h_3$ = Top edge of track girder to bottom edge of crane girder |
| $I_{A1}$ = Permissible overhang dimension  | $c$ = Hoist headroom dimension                                  |

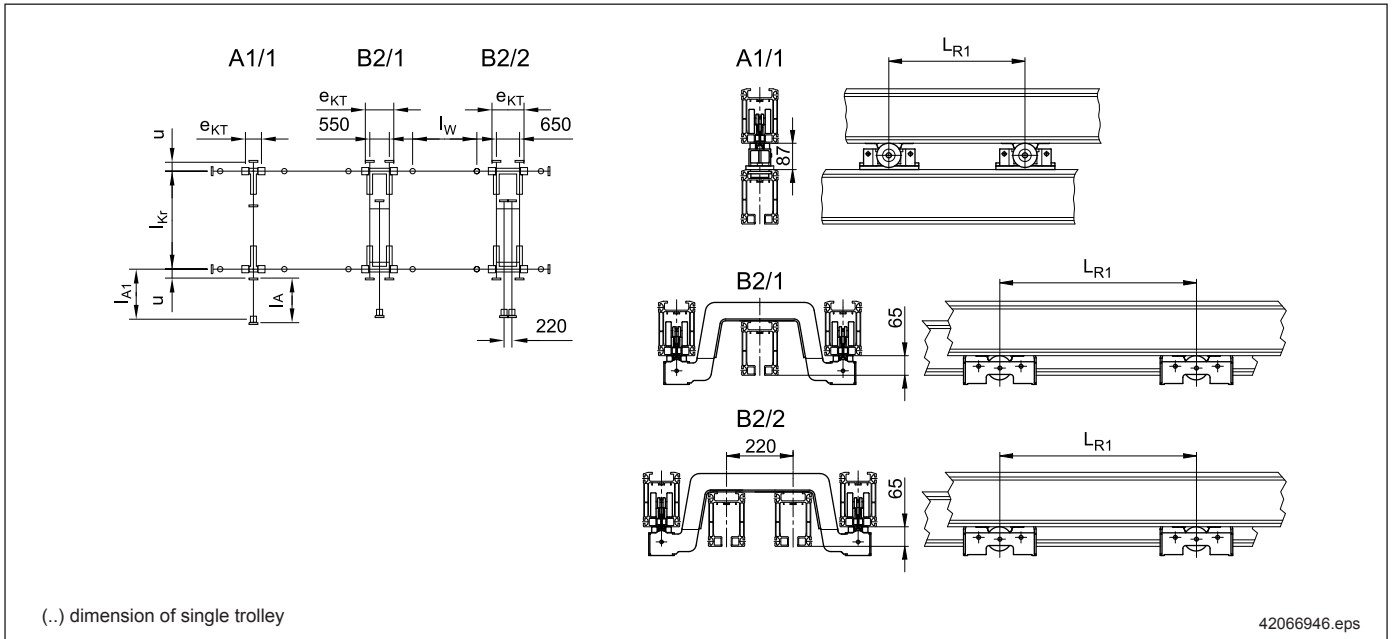
## 4.2 Extending frame

Example:



### KBK ergo cranes

- |  |                             |
|--|-----------------------------|
| 1. KBK ergo crane end carriage                   | 6. KBK ergo extending frame |
| 2. Suspension                                    | a) Type A1/1                |
| a) KBK ergo                                      | b) Type B2/1                |
| b) KBK classic                                   | c) Type B2/2                |
| 3. Travelling hoist                              | 7. KBK crane runway         |
| a) KBK ergo crab frames                          | 8. KBK crane girder         |
| b) KBK classic crab frame                        | 9. KBK extending rail       |
| c) KBK classic single or double trolleys         | 10. Drives                  |
| d) Crab end carriage for extending crane B2/2    | a) electric                 |
| 4. Buffer plate                                  | b) Pneumatic                |
| 5. End cap                                       | 11. Power supply            |
| a) KBK ergo with rubber or cellular foam buffers | a) electric                 |
| b) KBK ergo with shock absorbers                 | b) Pneumatic                |
| c) KBK classic                                   |                             |



Item	Designation	Max. load [kg]	A18		A22	
			Weight [kg]	Order no.	Weight [kg]	Order no.
117	Extending frame A 1/1	-400 to +800	11,51	715 705 46	11,51	715 705 46
118	Extending frame B 2/1	-400 to +1200	39,80	715 442 46	40,88	715 701 46
119	Extending frame B 2/2		45,80	715 446 46	On application	
120	Load bar 220	1200	1,80	851 520 44	1,80	851 520 44

Extending frames are used for transferring loads between adjacent crane areas, for depositing loads between building columns and for extending the crane operating range. These cranes consist of a crane bridge and a sliding crab frame to which a single-girder or double-girder lateral travel bridge is fitted. This lateral travel bridge with the load-carrying trolley has a large lateral projection over the frame and can thus be extended sideways.

The lateral travel bridge can be adjusted in the frame in such a way that the entire projection can extend either on one side or distributed over both sides.

Type A (extending rail below the crane girder) is not designed to be used with double-girder cranes due to the unfavourable headroom dimension. For type B, the extending rails move between the crane girder rails.

**Crane types:**

- Single-girder crane: extending frame type A1/1
- Double-girder crane: extending frame types B2/1 and B2/2

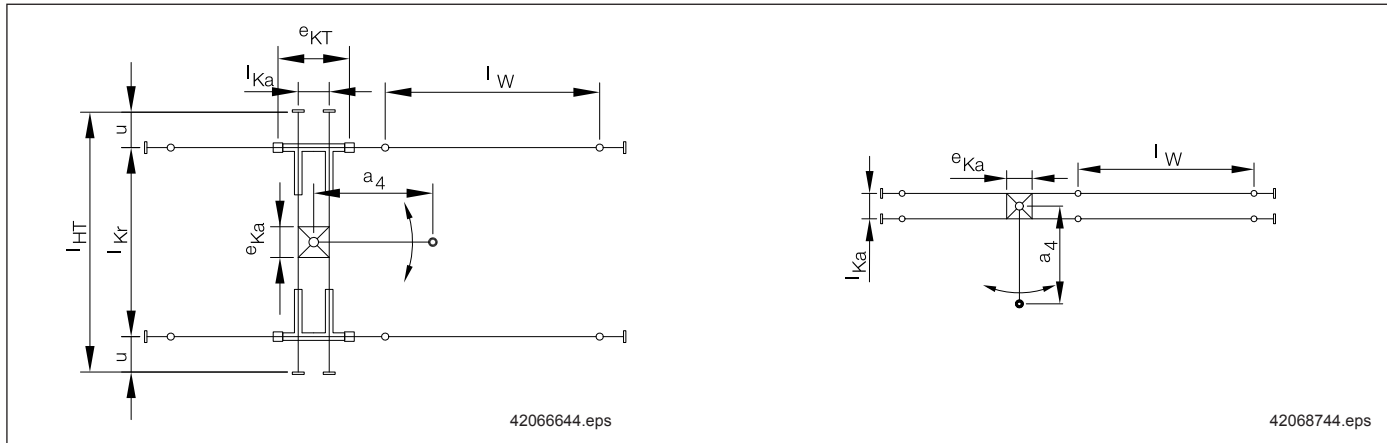
Crane runways, crane girders, extending rails: A18 and A22

KBK classic trolleys are used as crabs in the extending rail. Double trolleys with an articulated frame are used for extending types A1/1 and B2/1. (A single trolley is sufficient for the crab for cranes up to  $l_{HT} = 3$  meters.)

The extending rails are the same length as the crane girders. Shorter extending rails are available on request (separate calculation required).

### 4.3 Manipulator cranes

#### 4.3.1 Specifying manipulator crabs, manipulator cranes



Double-girder crane		
Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, shock absorber, information plates	5
Suspension	Short suspension, Ergo suspension	6
Trolley combination	Trolley, ergo crane trolley, ergo crab trolley	7
Travel drive	RF 100, RF 125 and DRF 200	11
Link bars	Trolley link, link bar, spacer bar	13
Accessories	Buffers on crabs and cranes	14
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	16.1
Control system		17

**Type:** Rigid runway and crane suspensions

### 4.3.2 Project engineering for manipulator crabs

Offset loads and the associated moments on manipulators and handling equipment result in special loads on crane installations.

If forces acting in the opposite direction to gravity are exerted on the trolleys and suspensions, KBK Aluline ergo components must be used at the points concerned. Otherwise, KBK Aluline classic components can be used.

Manipulators and handling equipment are bolted to a KBK ergo crab frame. The manipulator crab runs in a double-rail system or on a double-girder crane.

End caps with shock absorbers are used as end caps. For total weights of less than 300 kg and vertical loads, end caps with cellular foam rubber or rubber buffers can be used.

**The dead weights of the crane and crab are included in the total weight.**

Determining the device geometry, weights and moments is particularly important for specifying the crab frame size and the double-rail track.

#### Example:

##### Loads

Crab frame:	$G_1 =$	75 kg
Mast:	$G_2 =$	28 kg
Arm:	$G_3 =$	122 kg
Device:	$G_4 =$	10 kg
Load:	$G_H =$	30 kg
Total:	$G_{Ges} =$	265 kg

**Manual force:**  $H = 5 \text{ kg}$

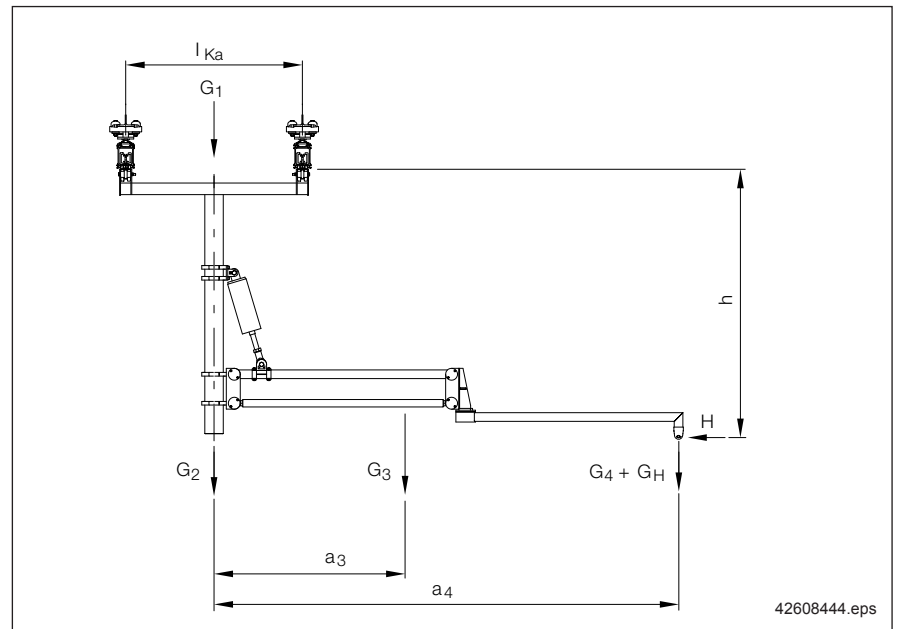
##### Distances:

Arm:	$a_3 =$	0,94 m
Device:	$a_4 =$	2,60 m
Manual force:	$h =$	3,00 m

##### Moments:

Arm:	$G_3 \times a_3 =$	114,7 kgm
Device, load:	$(G_4 + G_H) \times a_4 =$	104,0 kgm
Manual force:	$H \times h =$	15,0 kgm
Total:	$M_{Ges} =$	233,7 kgm

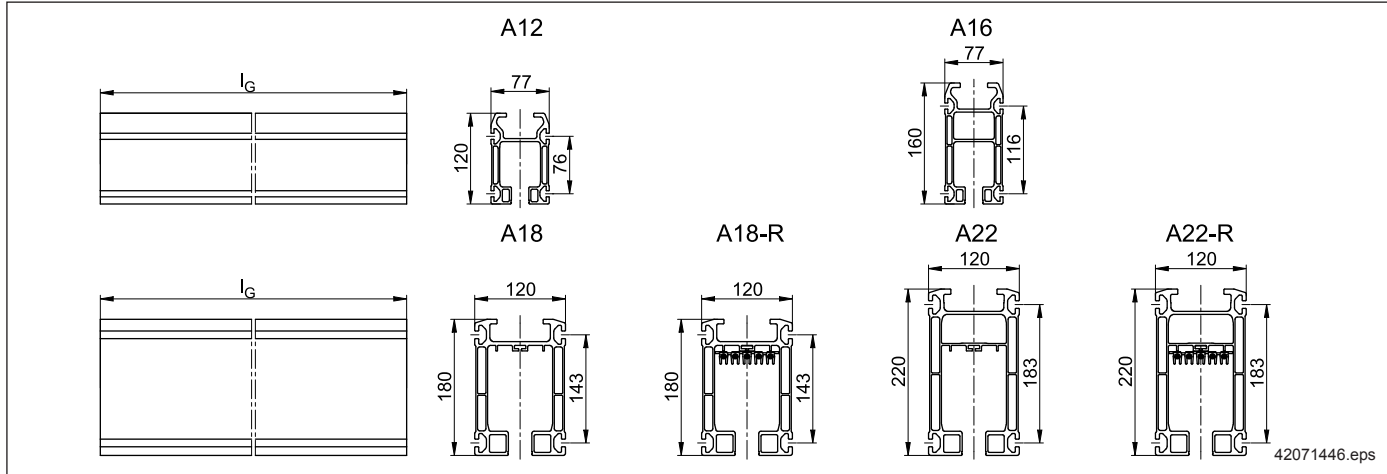
#### Values required for project engineering



# 5 Monorail track, crane runway and crane girder basic components

## 5.1 Crane and track elements

### 5.1.1 Straight section (item 1)



Item	Designation	Length l <sub>G</sub>		A12	A16	A18	A18-R	A22	A22-R
1	Straight section	1000 mm	Weight [kg]	5,45	7,02	10,30	11,50	11,97	13,17
			Order no.	855 301 44	855 401 44	855 501 44	855 801 44	855 601 44	855 901 44
		2.000 mm	Weight [kg]	10,90	14,04	20,60	23,00	23,94	26,34
			Order no.	855 302 44	855 402 44	855 502 44	855 802 44	855 602 44	855 902 44
		3.000 mm	Weight [kg]	16,35	21,06	30,90	34,50	35,91	40,51
			Order no.	855 303 44	855 403 44	855 503 44	855 803 44	855 603 44	855 903 44
		4.000 mm	Weight [kg]	21,80	28,08	41,20	46,00	47,88	52,68
			Order no.	855 304 44	855 404 44	855 504 44	855 804 44	855 604 44	855 904 44
		5.000 mm	Weight [kg]	27,25	35,10	51,50	57,50	59,85	65,85
			Order no.	855 305 44	855 405 44	855 505 44	855 805 44	855 605 44	855 905 44
		6.000 mm	Weight [kg]	32,70	42,12	61,80	69,00	71,82	79,02
			Order no.	855 306 44	855 406 44	855 506 44	855 806 44	855 606 44	855 906 44
		7.000 mm	Weight [kg]	38,15	49,14	72,10	80,50	83,79	92,19
			Order no.	855 307 44	855 407 44	855 507 44	855 807 44	855 607 44	855 907 44
		8.000 mm	Weight [kg]	43,60	56,16	82,40	92,00	95,76	105,36
			Order no.	855 308 44	855 408 44	855 508 44	855 808 44	855 608 44	855 908 44

#### Integrated conductor line

KBK A18-R and KBK A22-R straight track sections are fitted with five internal busbars (10 mm<sup>2</sup> cross-section, up to 60 A, 500 V) which are enclosed over their entire length. If no control functions or zero have to be transmitted, only 4 conductors are connected.

KBK straight sections without protective earth conductor on application.

#### Type of enclosure:

IP 23 to DIN 40050.

#### Designation of busbars:

1-3 = L1- L3

4 = control

PE

A12/A16 profile sections are compatible with Aluline 120, A18/A22 profile sections are compatible with Aluline 180. Special bolt connection elements must be used to connect them.

Special lengths can be supplied ex works  
(Min. length: A12 / A16 = 170 mm, A18 / A22 = 220 mm).

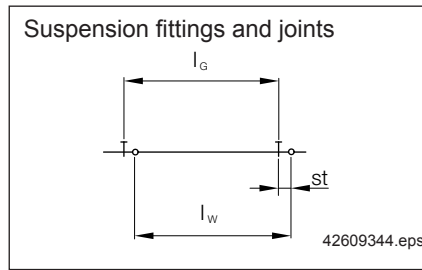
#### Temperature range

0 °C to +50 °C, normal operating conditions

**Finish:** anodized



## Suspension of straight sections



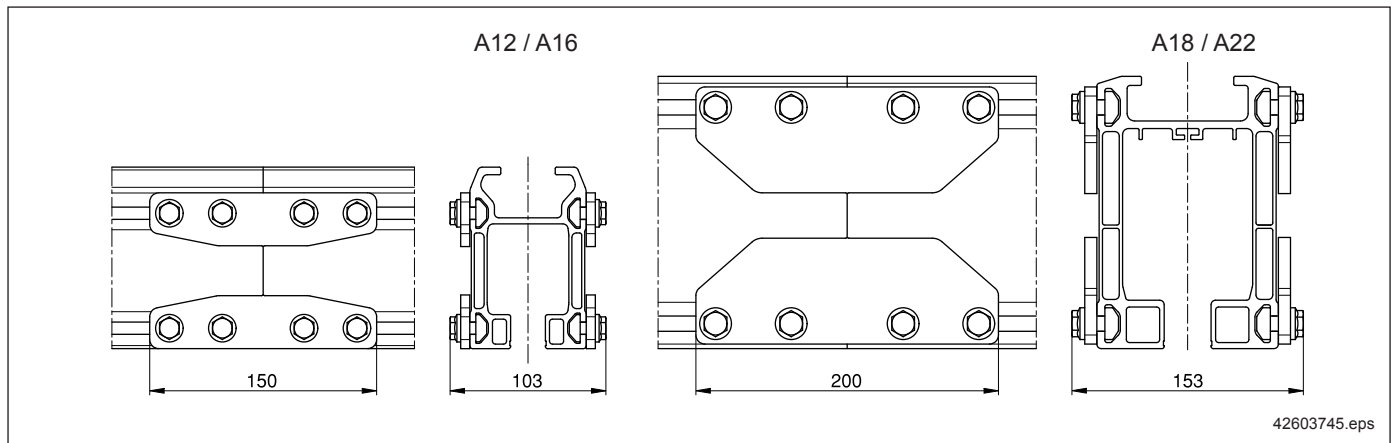
See sections 3.7 to 3.9 for distance between supports  $l_W$  and distance  $st$  of joint from suspension fitting.

## 5.2 Joint bolts

(Item 2)

### Conductor joint set

(Item 3)



Basic components

Item	Designation		A12	A16	A18	A18-R	A22	A22-R
2	Joint bolts	Weight [kg]	1,35	1,35	4,09	4,09	4,09	4,09
		Order no.	855 423 44	855 423 44	855 623 44	855 623 44	855 623 44	855 623 44
3	Conductor joint set	Weight [kg]	-	-	-	0,07	-	0,07
		Order no.	-	-	-	873 649 44	-	873 649 44

The joint bolt set consists of patterned link plates that are bolted to the side and located by the slots.

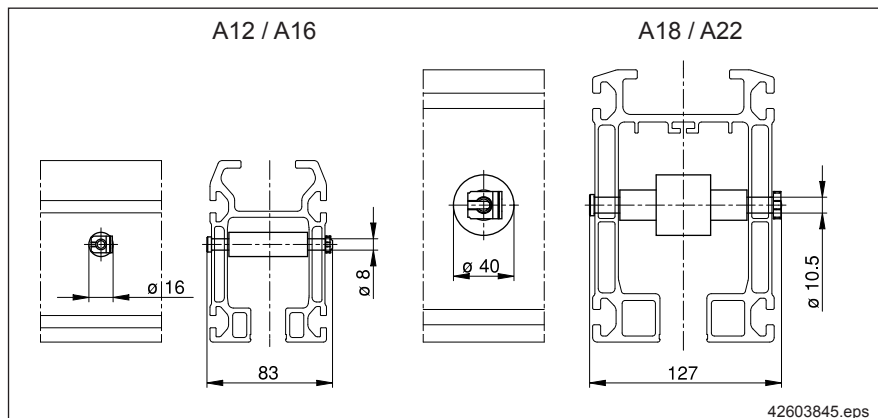
For KBK R sections, an additional busbar joint set is required for each joint. The kit consists of five busbar connectors which are pressure-fitted to establish electric contact, and one plastic connector ensuring the mechanical connection of the busbar enclosures.

Adapter bolt sets to connect the sections to profile section sizes KBK Aluline 120 and KBK Aluline 180 are available on request.

The connection is a positive and friction connection.

**Finish:** galvanized

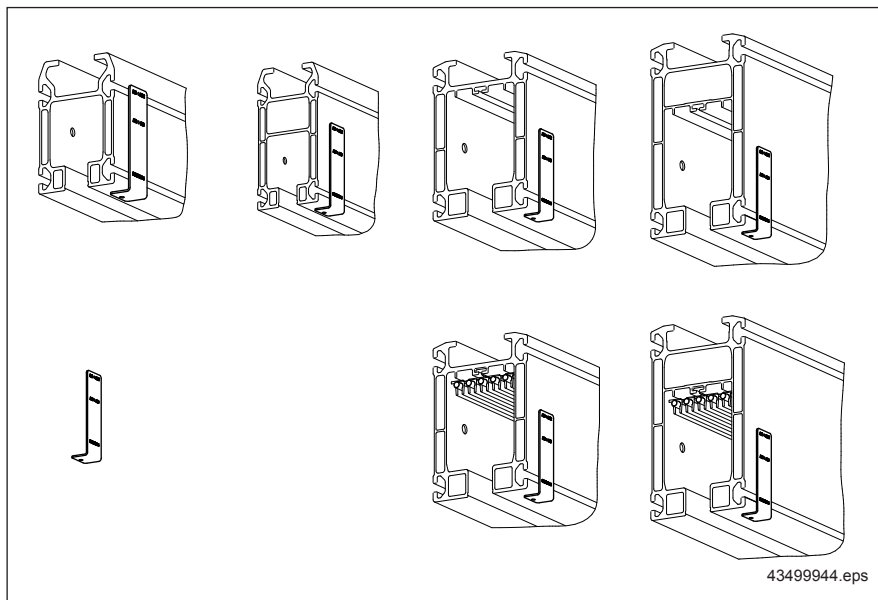
### 5.3 Internal buffer stop (Item 6)



Item	Designation		A12 / A16	A18 / A22
6	Internal buffer stop	Weight [kg]	0,04	0,25
		Order no.	855 420 44	855 620 44

An internal buffer stop is fitted as protection for accumulated cable sliders (item 85) and cable trolleys (item 86) and to limit crane or hoist trolley travel.

**Finish:** Vulkollan/galvanized



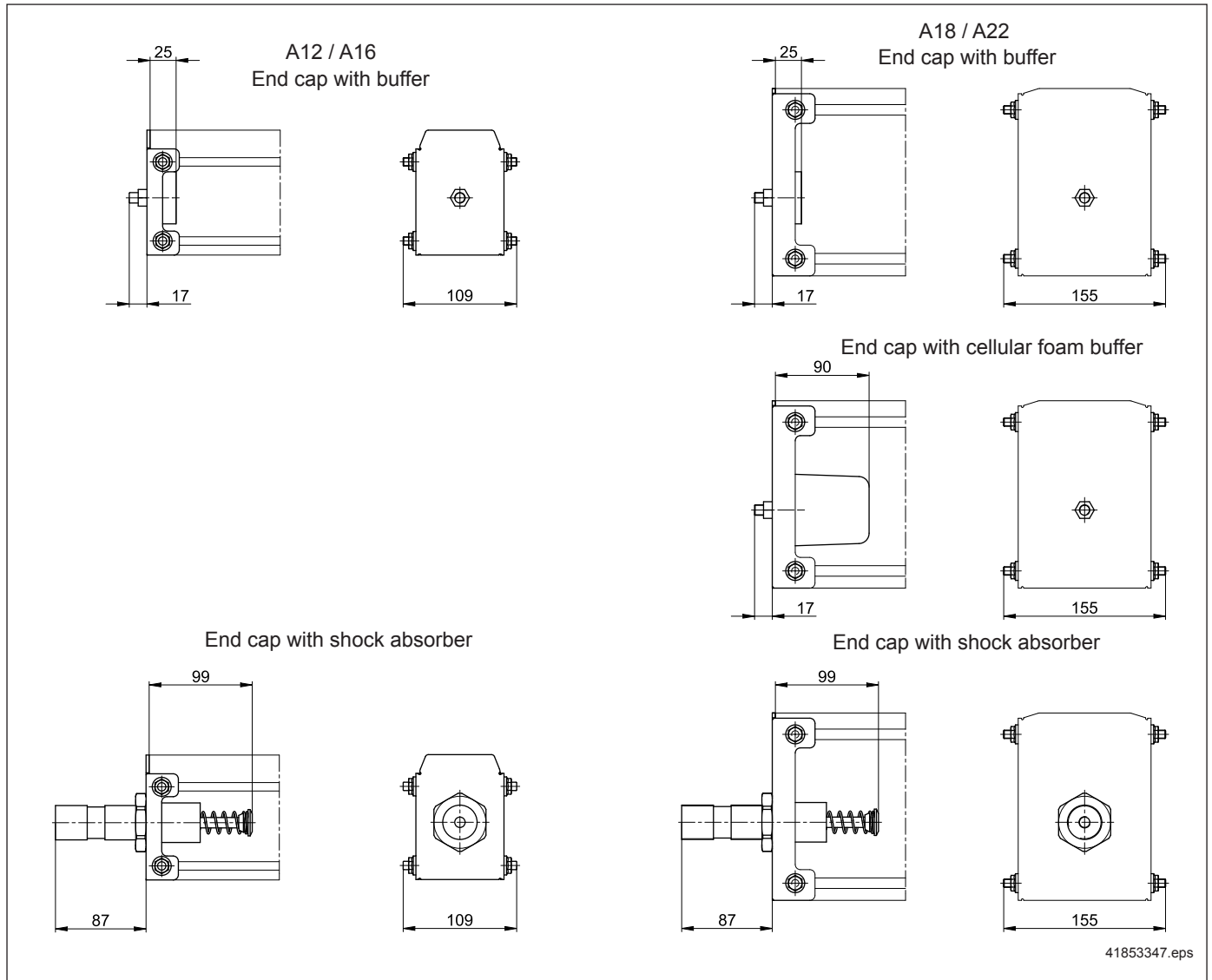
Item	Designation		A12 / A16 / A18 / A22
175	Drilling template	Weight [kg]	0,04
		Order no.	855 691 44

The bore hole template can be used to simply mark the bore hole position for an internal buffer stop.

## 5.4 End cap with buffer

(Item 7)

(Item 7e)



Basic components

Item	Designation		A12	A16	A18	A18-R	A22	A22-R
7	End cap with buffer	Weight [kg]	0,38	0,45	0,71	0,93	0,81	1,04
		Order no.	855 326 44	855 426 44	855 526 44	855 826 44	855 626 44	855 926 44
7e	End cap with cellular foam buffer	Weight [kg]	-	-	0,85	-	0,95	-
		Order no.	-	-	855 530 44	-	855 630 44	-
	End cap with shock absorber	Weight [kg]	1,08	1,15	1,41	-	1,52	-
Order no.		855 333 44	855 433 44	855 533 44	-	855 633 44	-	

An end cap is fitted as a termination for tracks and crane girders.

End caps with rubber buffers are used for lighter loads.

End caps with cellular foam buffers can be used on Aluline A18/A22 for heavy loads, electrical and pneumatic drives and for crane runways.

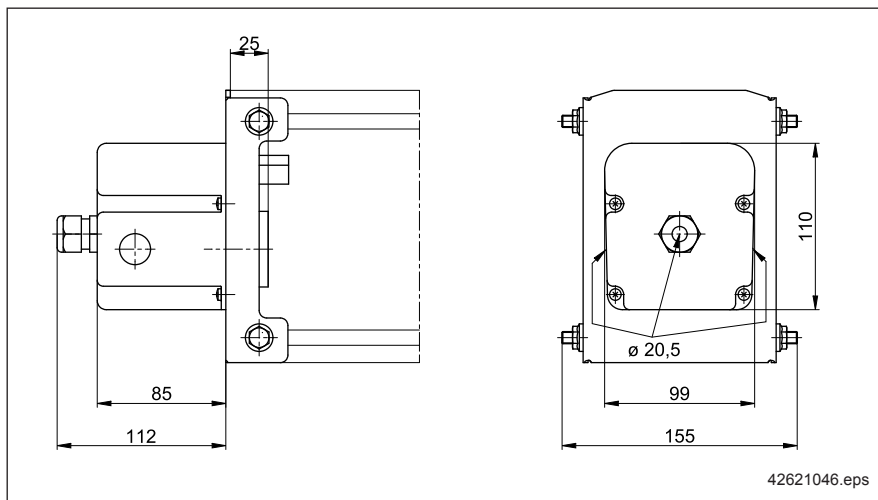
End caps with shock absorbers are used for installations featuring manipulators.

**All installations must be dimensioned in such a way that the end caps and internal buffer stops are not approached during normal operation.**

**Finish:** black (RAL 9005), steel

## 5.5 KBK Aluline-R components

### Powerfeed end cap (Item 8)



Item	Designation		A18-R	A22-R
8	Powerfeed end cap	Weight [kg]	1,08	1,19
		Order no.	855 820 44	855 920 44

The powerfeed end cap is used for power supply to the end of a KBK rail. It consists of an end cap with buffer and a terminal box.

The terminal box includes an M20 union on its end face. Prepared openings of 20,5 mm and 25,5 mm in diameter are provided on the side (max. connection cross-section 10 mm<sup>2</sup>).

The powerfeed end cap is supplied pre-assembled with attached plug connectors and jumper wires. Powerfeed end caps without protective earth conductor available on application.

**Finish:** black

### DFL fixed points (Item 210)

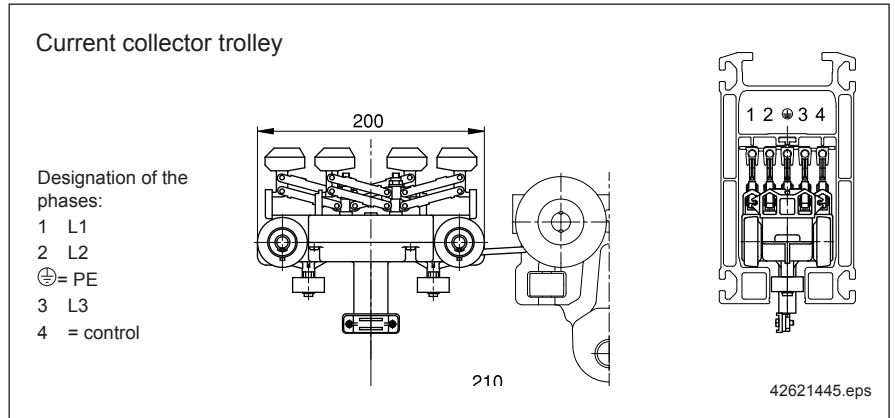
Item	Designation		A18 / A22
200	Fixed points (40 off)	Weight [kg]	0,04
		Order no.	855 912 44

A DFL internal conductor line can be added to A18 and A22 sections. In addition to the conductor line, 4 fixed points are required for each straight section.

The DFL conductor line must be ordered separately.

See operating instructions for assembly.

**Current collector trolley  
(Item 12)**



Item	Designation		A18-R / A22-R 5-pole
12	Current collector trolley (5-pole)	Weight [kg]	1,50
		Order no.	855 985 44

For reliable current collection, the 5-pole KBK-R collector trolley is fitted with two sliding carbon contacts mounted on individually spring-loaded double pantographs for each conductor. The connecting cable is 2 m long.

Maximum load: 15 A at 100 % CDF.

The collector trolley is guided by two rollers in the track section and runs on four plastic wheels mounted on anti-friction bearings which are lubricated for life. The traction resistance is approx. 2 kg. A coupling is used for connection to a KBK load trolley.

**Collector trolleys must always be arranged to run between two trolleys. These are used to protect against collisions.**

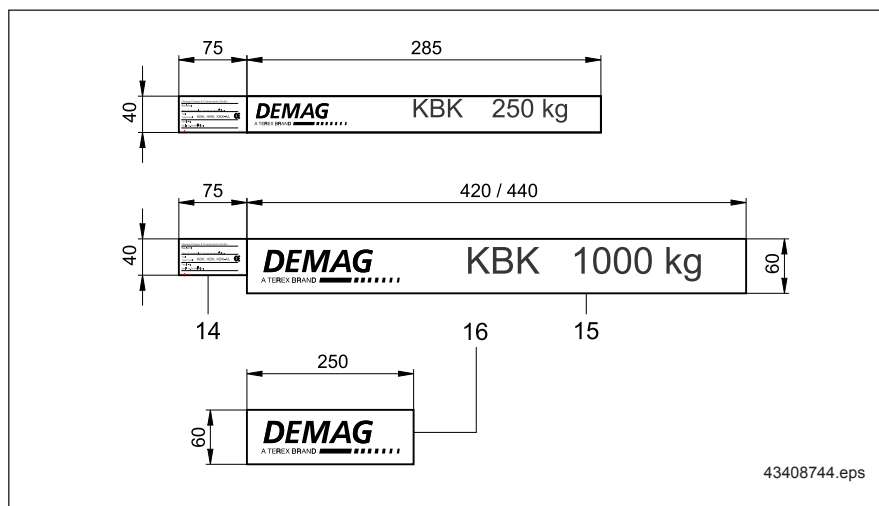
Current collector trolleys without protective earth conductor available on application.

## 5.6 Information plates

Manufacturer's plate (item 14)

Capacity plate (item 15)

Demag name plate (item 16)



Item	Designation	Load capacity [kg]	A12	A16 / A18 / A22
			h = 40 mm Order no.	h = 60 mm Order no.
14	Manufacturer's plate	-	980 149 44	-
15	Capacity plate	50	980 861 44	-
		80	980 862 44	-
		100	980 863 44	-
		125	980 864 44	-
		160	980 865 44	-
		200	980 866 44	-
		250	980 867 44	851 491 44
		315	980 868 44	-
		400	980 869 44	-
		500	980 870 44	851 492 44
		630	-	851 493 44
		800	-	851 494 44
1000	-	851 495 44		
	Special load capacity plate	10 - 500	715 540 46	-
		100 - 3200	-	715 560 46
16	Name plate	-	-	850 150 44

A manufacturer's plate (in English, German and French) showing manufacturer, year of construction, "KBK" type designation, serial number and CE confirmation must be fitted to each crane bridge or electric travelling hoist.

The manufacturer's plate on the hoist is sufficient for monorail push travel trolleys. Capacity plates must be fitted to both sides of all crane bridges. Such plates must be fitted to monorail tracks at suitable distances and in such a manner that operators can see the permissible load capacity from any operating position. The load capacity stated on the hoist and on the crane or suspension monorail must be identical.

60 mm high plates are recommended for use on KBK Aluline A16/A18/A22 sections.

### Finish:

Manufacturer's plate made of self-adhesive aluminium foil

Capacity plate and name plate made of self-adhesive PVC foil

# 6 Track suspension

## 6.1 Remarks and overview

### Supporting structure

The examples shown on the following page are only some of the many combinations possible by using standard series-manufactured suspension fittings.

The owner is responsible for verification of superstructure/support structure.

### Short suspension fitting

Particularly low suspension heights are achieved by using short suspension arrangements.

### Sloping steel superstructure

Suspension from inclined steelwork is also possible.

### Stiffeners

On long suspension arrangements, with suspension rod lengths from approx. 600 mm upwards, undesirable pendulation of the track may occur. (This may already occur in small installations and when electric drives are used with short suspensions). This can be limited by fitting longitudinal and lateral stiffeners.

Transverse stiffeners are recommended to be fitted approx. every 15 m for KBK Aluline A12/A16 and approx. every 20 m for KBK A18/A22 for monorails and crane tracks. One stiffener is usually sufficient in the longitudinal direction. All crane runways must be provided with stiffeners.

Transverse and longitudinal stiffeners are of V-type design.

### V-type suspension fittings

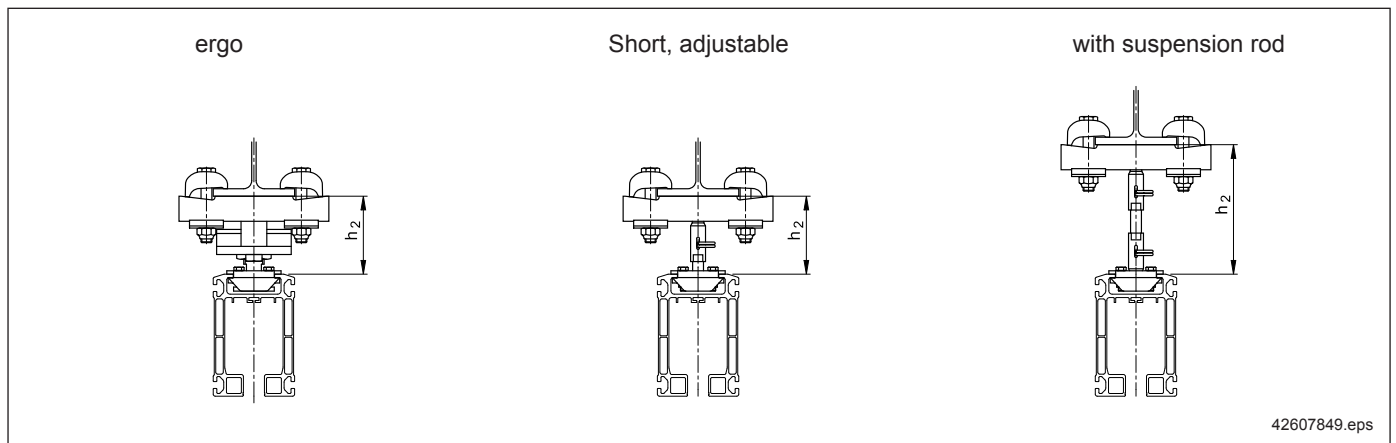
V-type suspension fittings may also replace missing suspension points in vertical suspension arrangements. Max. vertical dimension as for vertical suspension arrangements.

### Load capacity, dimensions for suspension from I-beam superstructures, height compensation

	Thread	Load capacity <sup>1)</sup> [kg]	Suspension dimension h <sub>2</sub>			h <sub>1</sub> Max. Suspension rod length [m]
			ergo [mm]	Short suspension fitting adjustable [mm]	Suspension with suspension rod 80/100 mm	
A12 / A16	M10	750	73 ± 4	73 ± 4	134 ± 9	1
A18	M16 x 1,5	1400	115 ± 7	115 ± 7	195 ± 14	3
A22	M16 x 1,5	1700	115 ± 7	115 ± 7	195 ± 14	3

1) Static or alternating load

### Examples

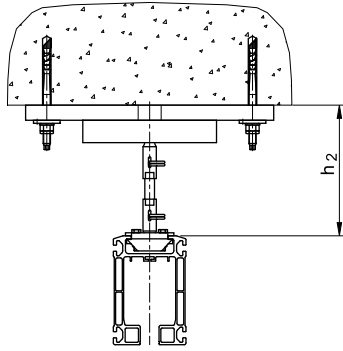


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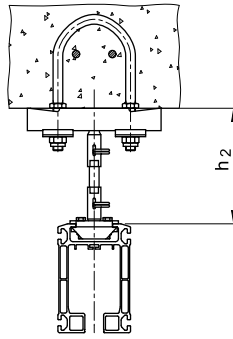
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Examples

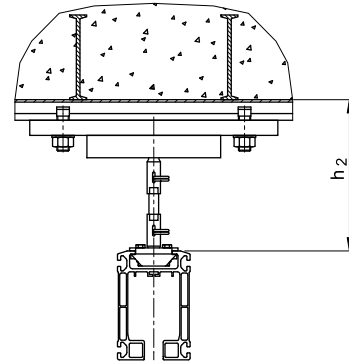
on anchor bolts <sup>2)</sup>



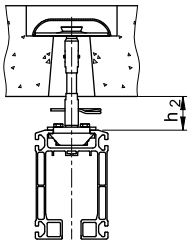
from U-bolt <sup>1)</sup>



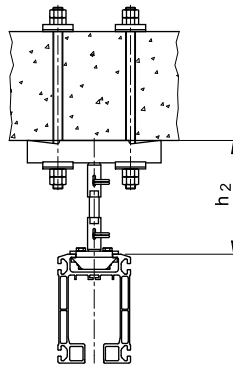
from brackets <sup>1)</sup>



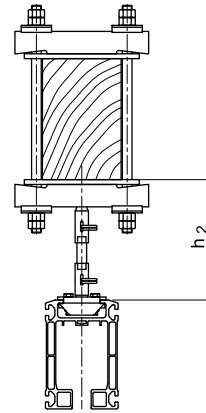
with floor plate <sup>1)</sup>



drilled <sup>1)</sup>

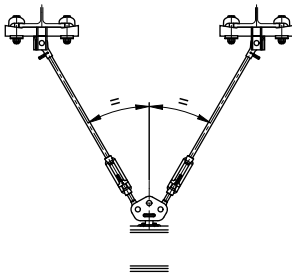


on wood <sup>1)</sup>

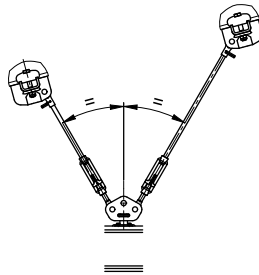


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V-type suspension fitting



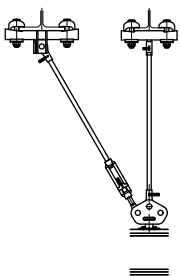
Sloping V-type suspension



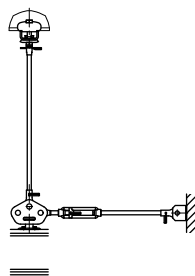
Sloping suspension



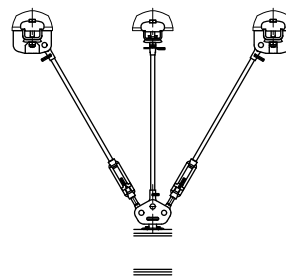
Lateral stiffener



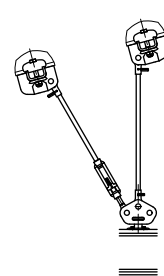
Lateral stiffener <sup>1)</sup>



V-type stiffener



Sloping stiffener



1) For description see document 202 976 44.  
2) For description see document 203 276 44.

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## 6.2 Vertical suspension on I-beams

### 6.2.1 I-beam assignment

**Classic** suspensions are flexible, ball-and-socket universal joint suspension arrangements featuring minimum torque transmission to roof and ceiling superstructures and minimum lateral forces transmitted to the track system

**Ergo** suspension to accommodate loads resulting from counter-forces (from handling devices and cranes with large overhang) with rigid suspensions, featuring rubber buffers.

Profile		Suitable for profile sections		
		I	IPE	HE-B (IPB)
A12 / A16	Upper suspension bracket A	140 - 260	120 - 270	100 - 140
	Suspension bracket B	-	220 - 450	120 - 200
A18 / A22	Upper suspension bracket A	140 - 320	140 - 270	100 - 120
	Suspension bracket B	220 - 450	180 - 500	100 - 200

Upper suspension bracket A can be used on roof structures and steel profile sections; upper suspension bracket B (ends project beyond bearing surface) is only suitable for steel profile sections.

The special clamp design ensures that the bolt of the clamp is always vertical regardless of the beam flange thickness.

For further information on **upper suspension bracket S** and **upper suspension clamp S** for steel sections with larger flange widths for various flange thicknesses, see tech. data 203 072 44.

Higher flange bending stresses may occur, for example, when used on HE-A beams.

### 6.2.2 Suspension with suspension rod

1) Max. girder gradient $\pm 1,5^\circ$						
Profile	$h_2$ [mm]	$m$ [mm]	$n$ [mm]	$w$ [mm]	$x$ [mm]	$z$ [mm]
A12 / A16	$54 + h_1 \pm 9$	M10	70	60	40	4
A18 / A22	$95 + h_1 \pm 14$	M16x1,5	90	95	60	5

Profile		$a$ [mm]	$f$ [mm]	$c$ [mm]	$d$ [mm]
A12 / A16	Upper suspension bracket A	205	66 - 142	70	27
	Suspension bracket B	270	110 - 210		23
A18 / A22	Upper suspension bracket A	221	71 - 139	72	37
	Suspension bracket B	290	100 - 208		76

**Complete suspension fittings, pre-assembled (Item 30)**

Item	Designation	Suspension rod $h_1$ [mm]	Upper suspension bracket Type	A12 / A16 (750 kg)		A18 (1400 kg) A22 (1700 kg)	
				Weight [kg]	Order no.	Weight [kg]	Order no.
30	Complete suspension with suspension rod	80	A	2,10	855 169 44	-	-
			B	2,33	517 729 46	-	-
		100	A	-	-	4,18	855 175 44
			B	-	-	5,02	855 176 44
		300	A	2,23	517 730 46	4,50	517 740 46
			B	2,47	517 731 46	5,34	517 741 46
		600	A	2,42	517 732 46	4,97	517 742 46
			B	2,65	517 733 46	5,81	517 743 46
1000	A	2,66	517 734 46	5,60	517 744 46		
	B	2,90	517 735 46	6,44	517 745 46		

## Suspension fitting in component parts

Item	Designation	h <sub>1</sub> [mm]	A12 / A16 (750 kg)			A18 (1400 kg) A22 (1700 kg)		
			Weight [kg]	Order no.	[Qty/susp.]	Weight [kg]	Order no.	[Qty/susp.]
25	Upper suspension bracket A		0,65	980 302 44	1	1,20	982 302 44	1
	Suspension bracket B		0,85	980 304 44		2,40	982 304 44	
26	Upper suspension clamp		0,45	980 326 44	2	1,00	982 326 44	2
40	Ball-head suspension rod		0,08	980 333 44	2	0,15	982 333 44	2
41	Suspension rod	80	0,07	980 346 44	1			1
		100				0,22	982 446 44	
		300	0,18	980 347 44		0,53	982 447 44	
		600	0,33	980 348 44		1,01	982 448 44	
		1000	0,53	980 349 44		1,64	982 449 44	
		3000				-	4,80	
42	Track suspension clamp		0,30	855 020 44	1	0,80	855 025 44	1
43	Spring clip		0,01	342 200 99	2	0,02	342 201 99	2

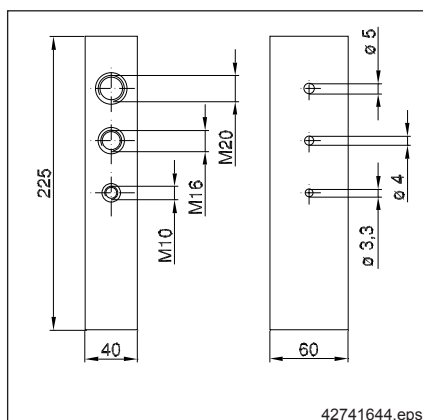
The ball-head suspension rod (item 40) and suspension rod coupling (item 50) are provided with slotted holes. The threaded rod (item 41) has a cross hole at both ends. If standard threaded suspension rods have to be shortened, a new transverse hole must be drilled at the end of the threaded rod.

**Finish:** galvanized

## Wearing parts

Item	Designation	A12 / A16		A18 / A22	
		Weight/unit [kg]	Order no.	Weight/unit [kg]	Order no.
42d	Sliding shell for ball-head suspension rod/ball-head bolt (25 off)	0,02	980 815 44	0,05	851 394 44

## Drilling jig (Item 38)

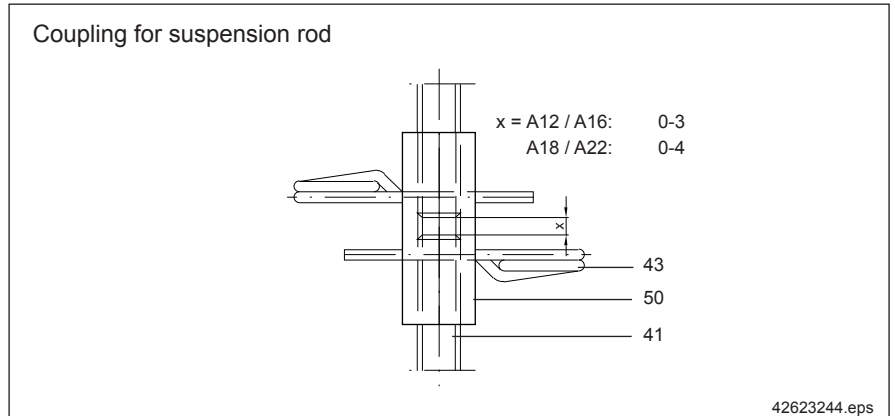


The drilling jig facilitates drilling transverse holes in suspension rods. This ensures that the distance to the end of the rod is reliably maintained.

Item	Designation	Weight [kg]	Order no.
38	Drilling jig for suspension rods	3,92	982 017 44

**Finish:** galvanized

### 6.2.3 Coupling for suspension rod (Item 50)

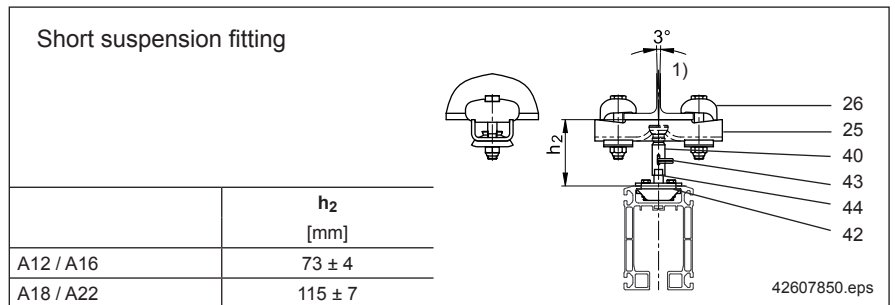


Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
50	Coupling for suspension rod	0,10	980 277 44	0,17	982 277 44

Use couplings to connect several suspension rods.

**Finish:** galvanized

### 6.2.4 Short suspension arrangement with height adjustment



	h <sub>2</sub> [mm]
A12 / A16	73 ± 4
A18 / A22	115 ± 7

### Complete suspension fittings, pre-assembled (Item 31)

Item	Designation	Upper suspension bracket Type	A12 / A16 (750 kg)		A18 (1400 kg) A22 (1700 kg)	
			Weight [kg]	Order no.	Weight [kg]	Order no.
31	Complete suspension, short, adjustable	A	2,02	855 167 44	3,98	855 173 44
		B	2,25	517 727 46	4,82	855 174 44

### Suspension fitting in component parts

Item	Designation	A12 / A16 (750 kg)			A18 (1400 kg) A22 (1700 kg)		
		Weight [kg]	Order no.	[Qty/susp.]	Weight [kg]	Order no.	[Qty/susp.]
25	Upper suspension bracket A	0,65	980 302 44	1	1,20	982 302 44	1
	Suspension bracket B	0,85	980 304 44		2,40	982 304 44	
26	Upper suspension clamp	0,45	980 326 44	2	1,00	982 326 44	2
40	Ball-head suspension rod	0,08	980 333 44	1	0,15	982 333 44	1
44	Ball-head bolt	0,06	980 283 44	1	0,14	982 283 44	1
42	Track suspension clamp	0,30	855 020 44	1	0,80	855 025 44	1
43	Spring clip	0,01	342 200 99	1	0,02	342 201 99	1

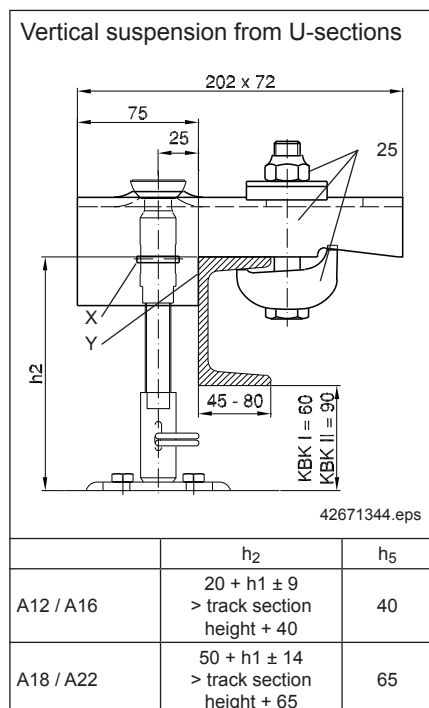
A particularly low suspension headroom can be achieved using the ball-head bolt/ ball-head suspension rod connection arrangement with spring clip. Slotted holes facilitate height adjustment.

**Finish:** galvanized

## Wearing parts

Item	Designation	A12 / A16		A18 / A22	
		Weight/unit [kg]	Order no.	Weight/unit [kg]	Order no.
42d	Sliding shell for ball-head suspension rod/ball-head bolt (25 off)	0,02	980 815 44	0,05	851 394 44

## 6.3 Vertical suspension from U-sections



Upper U-type suspensions can be used on U-shaped steel profile sections (DIN 1024).

The max. suspension load must be observed as specified in the table:

Item	Profile	Weight [kg]	Order no.	Max. suspension load G <sub>AB</sub> [kg]	Girder section
25	A12 / A16	2	980 377 44	750	U 80 - U 220
				750	U 80 - U 100
	A18 / A22	2	984 377 44	1000	U 120 - U 140
				1250	U 160
				1400	U 180 - U 220

The free swing angle of the suspension fitting may be limited by the girder profile. Use stiffeners, as required, to avoid any collision during operation.

Secure the connection between the upper ball-head suspension rod and the threaded rod with the enclosed split sleeve (see "X")

Edge "Y" of the suspension bracket must be in close contact with the profile section.

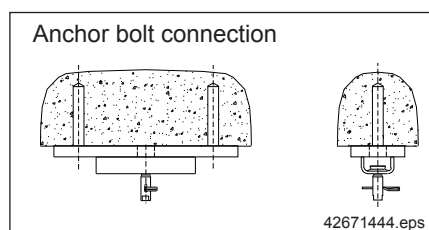
The ball-head suspension rod, spring clip and suspension clamp must be ordered separately.

**Finish:** galvanized

The loads specified for individual profile sections must not be exceeded. The owner is responsible for verification of U-sections.

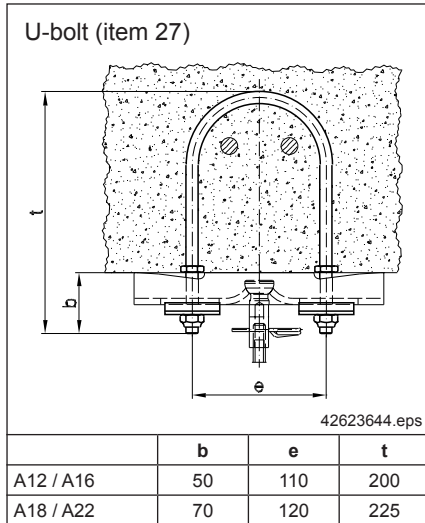
## 6.4 Ceiling attachment

### 6.4.1 Suspension with anchor bolt connection



KBK installations may be attached to concrete superstructures by anchor bolts. Anchor bolts must be used that are approved for use with dynamic loads. They must be installed by trained personnel and an installation report must be compiled. Please refer to data sheet 203 276 44.

### 6.4.2 U-bolt with upper suspension bracket A



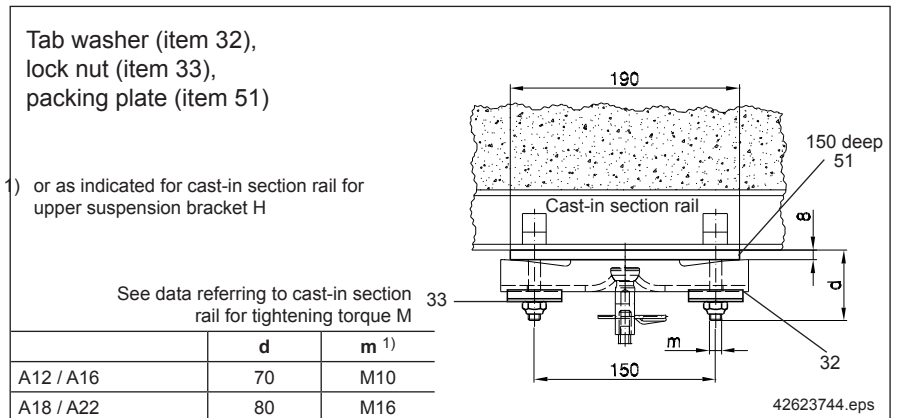
### 6.4.3 Suspension from ceiling section rails with upper suspension bracket A

Item	Designation	Qty/ susp.	A12 / A16		A18 / A22	
			Weight [kg]	Order no.	Weight [kg]	Order no.
27	U-bolt (complete)	1	0,15	980 330 44	0,8	982 330 44

For new buildings, U-bolts can be cast in reinforced ceilings at the KBK track suspension points while the building is still undergoing construction. This must be discussed with the structural engineer. U-bolts are used to secure upper suspension bracket A.

**Important:** To make it possible to align the track, the U-bolts should be cast in at right angles to the direction of the track.

**Finish:** galvanized



Item	Designation	Qty/ susp.	A12 / A16		A18 / A22	
			Weight [kg]	Order no.	Weight [kg]	Order no.
32	Packing plate	2	0,1	980 429 44	0,21	984 329 44
33	Lock nut	2	-	334 610 44	-	334 614 44
51	Packing plate for upper suspension bracket	1	1,6	984 088 44	1,6	984 088 44

Suspension may only be from cast-in section rails that are approved for **dynamic loads**.

A-type upper suspension brackets are secured to section rails cast in concrete using a packing plate and 2 special bolts with nuts and tab washers. The M10 special bolts for KBK Aluline A12/A16 and M16 for KBK Aluline A18/A22 should be provided by the customer or can be supplied on application (specify profile section type).

**Ensure compliance with load-bearing capacity and correct length of special bolts.**

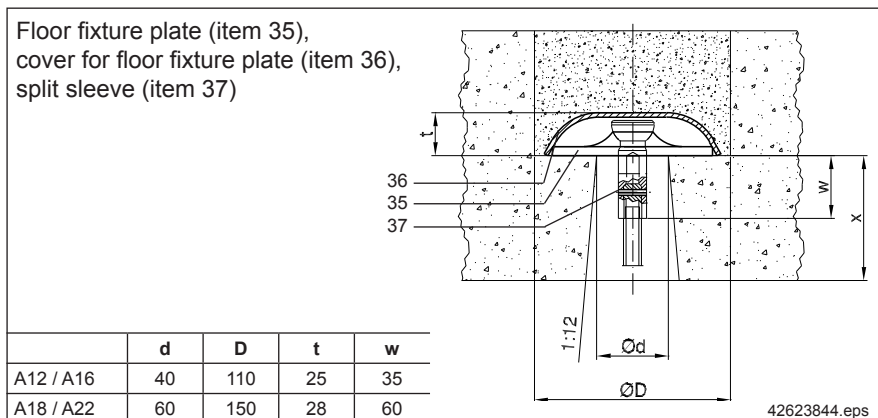
**Important:** This KBK suspension fitting must be regarded as a concentrated load on the securing section rail (**low load-bearing capacity**).

**Finish:** galvanized

**Upper suspension brackets H** with bore hole spacing  $\geq 250$  mm count as dual load suspensions.

See technical data 203 072 44.

#### 6.4.4 Suspension with floor fixture plate and cover

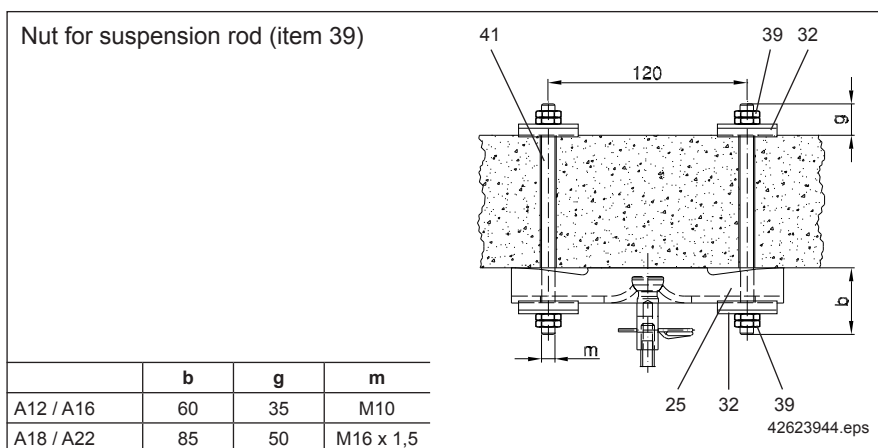


Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
35	Floor slab	0,2	980 336 44	0,4	982 336 44
36	coverage	0,2	980 338 44	0,2	982 338 44
37	Split sleeve 3 x 18	-	345 095 99	-	-
	Split sleeve 4 x 26	-	-	-	345 008 99

In existing concrete buildings it is impossible to fit supporting steel without losing headroom. In such cases it is possible to make a hole in the ceiling at the suspension point and to use a floor fixture plate for the ball-head suspension rod with the cover for the floor fixture plate. The connection between the suspension rod and the ball-head suspension rod is often no longer accessible for maintenance and the two rods must be secured relative to each other by a split sleeve instead of a spring clip. Arrangement of these fittings, the loads to which they are subjected and dimension X should be agreed with the structural engineer or architect responsible.

**Finish:** galvanized

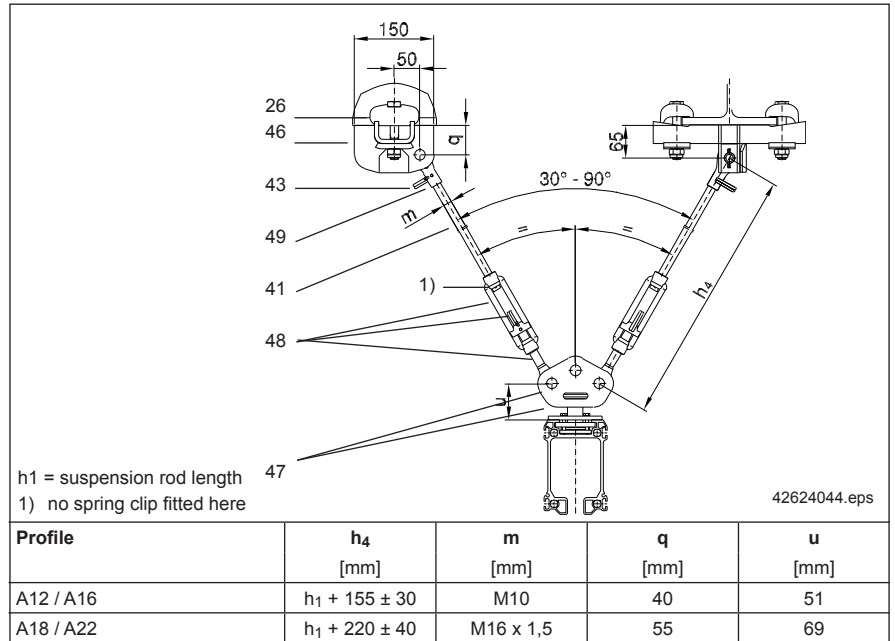
#### 6.4.5 Suspension with upper suspension bracket A and suspension rods or positive anchors



Item	Designation	A12 / A16	A18 / A22
		Order no.	Order no.
39	Nut for suspension rod	150 509 99	150 678 99

A-type upper suspension brackets can also be secured to solid ceilings by using two suspension rods with tab washers. The transmission of forces to the concrete ceiling must be agreed with the structural engineer.

## 6.5 V-type suspension fitting



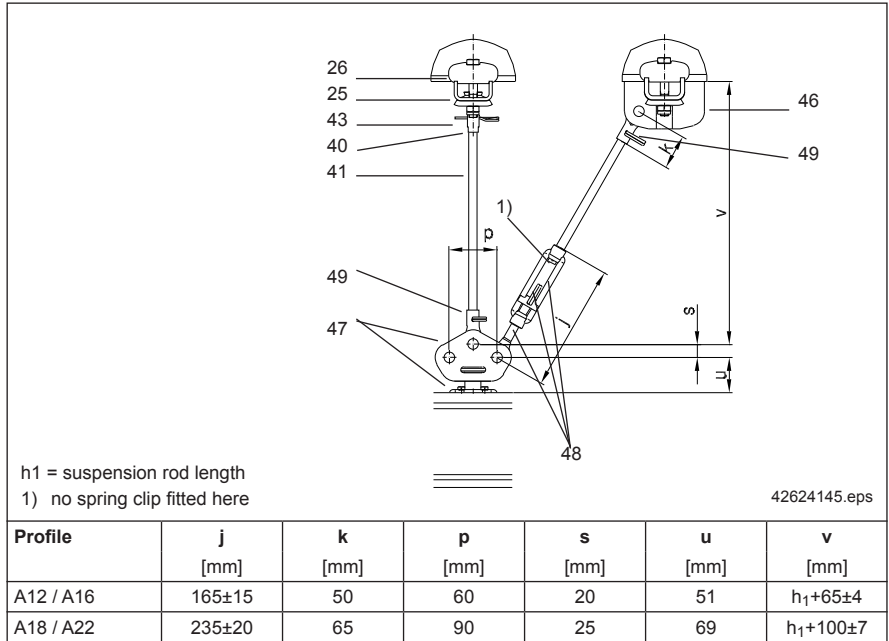
Item	V-type suspension fitting, parallel or perpendicular	h1 [mm]	A12 / A16 (750 kg)			A18 (1400 kg) A22 (1700 kg)		
			Weight [kg/unit]	Order no.	[Qty/susp.]	Weight [kg/unit]	Order no.	[Qty/susp.]
26	Upper suspension clamp		0,45	980 326 44	4	1,00	982 326 44	4
40	Ball-head suspension rod		0,08	980 333 44		0,15	982 333 44	
41	Suspension rod	80	0,07	980 346 44	2			2
		100				0,22	982 446 44	
		300	0,18	980 347 44		0,53	982 447 44	
		600	0,33	980 348 44		1,01	982 448 44	
		1000	0,53	980 349 44		1,64	982 449 44	
		3000			-	4,80	982 445 44	
43	Spring clip		0,01	342 200 99	2	0,02	342 201 99	2
46	V-type upper suspension bracket B		1,39	980 360 44	2	3,20	984 075 44	2
47	V-type suspension bracket		1,24	855 160 44		2,56	855 166 44	1
54	Pin with BoClip for third hinged end piece		0,08	851 305 44		0,16	851 317 44	
48	Suspension rod strainer		0,29	980 310 44	2	0,85	984 085 44	2
49	Hinged block		0,10	980 315 44	2	0,30	984 083 44	2

V-type suspensions are fitted as shown in the diagrams. V-type hinged suspension bracket (item 47) and V-type upper suspension bracket (item 46) are connected to each other by suspension rod strainer (item 48), suspension rod (item 41) and hinged end piece (item 49). Each bolted connection with a hinged end piece must be secured with a spring clip (item 43).

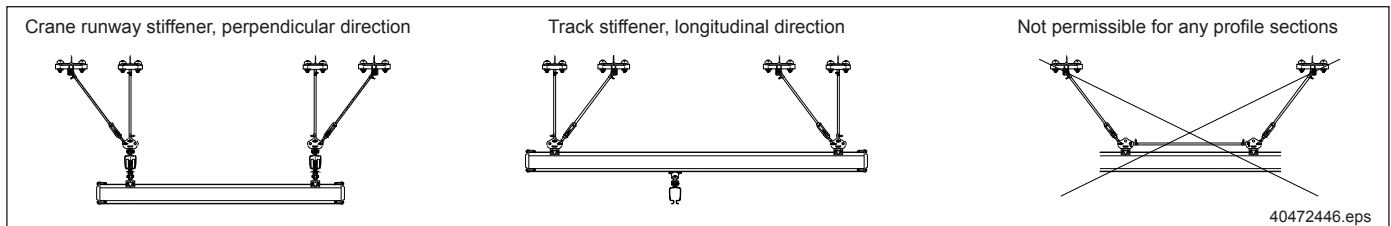
**The maximum permissible loads correspond to those for vertical suspension arrangements.**

**Finish:** galvanized

## 6.6 Stiffener



Item	Stiffener, parallel or perpendicular	h1 [mm]	A12 / A16 (750 kg)			A18 (1400 kg) A22 (1700 kg)		
			Weight [kg/unit]	Order no.	[Qty/susp.]	Weight [kg/unit]	Order no.	[Qty/susp.]
25	Upper suspension bracket A		0,65	980 302 44	1	1,20	982 302 44	1
	Suspension bracket B		0,85	980 304 44		2,40	982 304 44	
26	Upper suspension clamp		0,45	980 326 44	4	1,00	982 326 44	4
40	Ball-head suspension rod		0,08	980 333 44	1	0,15	982 333 44	1
41	Suspension rod	80	0,07	980 346 44	1+1			1+1
		100				0,22	982 446 44	
		300	0,18	980 347 44		0,53	982 447 44	
		600	0,33	980 348 44		1,01	982 448 44	
		1000	0,53	980 349 44		1,64	982 449 44	
		3000				-	4,80	
43	Spring clip		0,01	342 200 99	3	0,02	342 201 99	3
46	V-type upper suspension bracket B		1,39	980 360 44	1	3,20	984 075 44	1
47	V-type suspension bracket		1,24	855 160 44		2,56	855 166 44	1
54	Pin with BoClip for third hinged end piece		0,08	851 305 44		0,16	851 317 44	
47a	Filler plates for sloping surface		-	-	-	0,60	516 833 46	
48	Suspension rod strainer		0,29	980 310 44	1	0,85	984 085 44	1
49	Hinged block		0,10	980 315 44	2	0,30	984 083 44	2



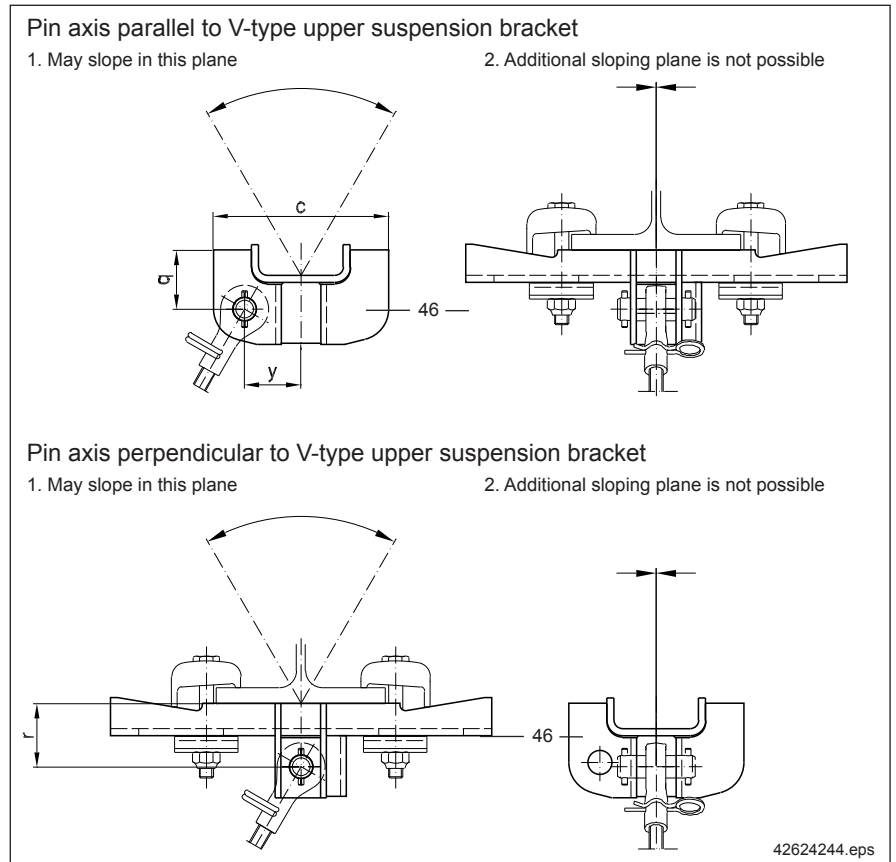
Stiffeners are fitted as shown in the diagrams. V-type hinged suspension bracket (item 47) and V-type upper suspension bracket (item 46) are connected to each other by suspension rod strainer (item 48), suspension rod (item 41) and hinged end piece (item 49). Each bolted connection with a hinged end piece must be secured with a spring clip (item 43).



## 6.7 Components for V-type suspension/stiffener arrangement

### 6.7.1 V-type upper suspension bracket (item 46)

Profile	c [mm]	q [mm]	r [mm]	y [mm]
A12 / A16	125	40	45	40
A18 / A22	150	55	65	50



Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
46	V-type upper suspension bracket B	1,39	980 360 44	3,20	984 075 44

V-type upper suspension brackets are fitted with a pin with split sleeves (no hinged end piece).

### Possible arrangements

V-type upper suspension brackets are fitted to the superstructure in the same way as vertical suspension arrangements (e.g. with upper suspension clamps).

**V-type upper suspension brackets are the same size as upper suspension bracket B (the ends are higher).**

Upper suspension bracket A is not used for stiffeners/V-type suspensions because the girders which fit upper suspension bracket A do not always absorb the lateral and tension forces. For smaller girders: Adapters available on request.

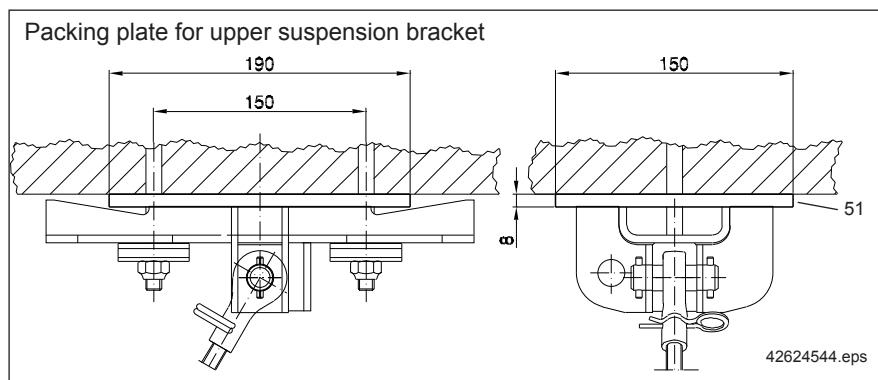
The V-type upper suspension bracket is designed for connecting **one** suspension rod by means of a hinged end piece (item 49) (pin axis either parallel or perpendicular to V-type upper suspension bracket). If two or more connections are fitted, a corresponding number of V-type upper suspension brackets must be fitted next to each other.

The pin axis of the V-type upper suspension bracket must always be horizontal and parallel to the pin axis of the V-type hinged suspension bracket (item 47) and perpendicular to the suspension rod axis. V-type upper suspension brackets on sloping superstructures must be anchored against movement. If a V-type upper suspension bracket is not fitted to steel sections, the packing plate (item 51) must be used.

**Finish:** galvanized

For further information on **clamp section with V-type suspension bracket V** for steel sections with larger flange widths for various flange thicknesses, see tech. data 203 072 44.

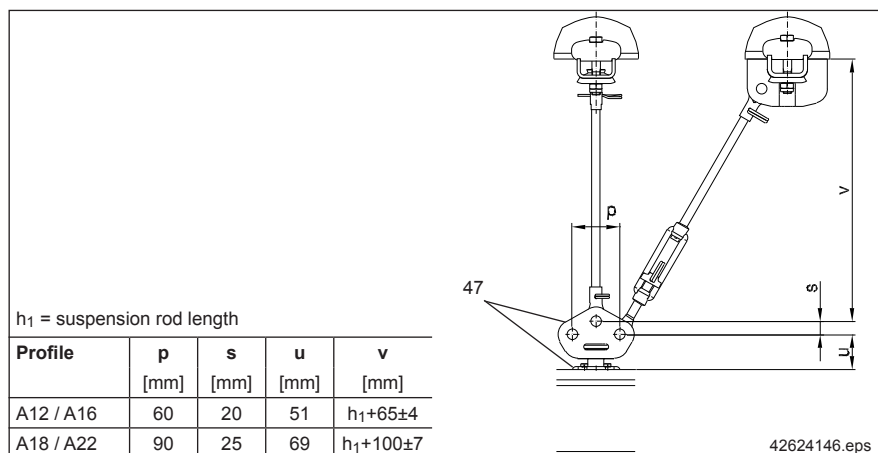
### 6.7.2 Packing plate for upper suspension bracket (Item 51)



Item	Designation	Weight [kg]	Order no.
51	Packing plate for upper suspension bracket	1,79	984 088 44

If the V-type upper suspension bracket is not fitted to steel sections, packing plate (item 51) must be used. This is to ensure that the V-type upper suspension bracket is properly fitted to solid ceilings, ceiling section rails, etc. Connections with U-bolt on request.

### 6.7.3 V-type hinged suspension bracket (Item 47)



Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
47	V-type hinged suspension bracket	1,24	855 160 44	2,56	855 166 44
54	Pin with BoClip for third hinged end piece	0,08	851 305 44	0,16	851 317 44

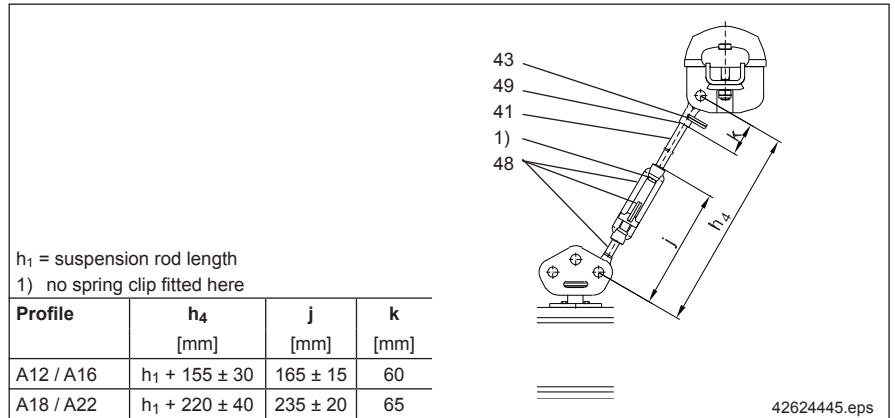
The V-type hinged suspension bracket (item 47) consists of a suspension bracket, V-hinge and two pins with split sleeves.

#### Possible arrangements

The V-type hinged suspension bracket is designed for a maximum of three suspension rod connections (suspension rod strainer or hinged end piece). On a V-type suspension arrangement, the rods are fitted to the outer holes, on a lateral stiffener to the centre and one outer hole.

The V-type hinge can be adjusted in the suspension bracket to any angle in relation to the track, however, the pin axis must always be perpendicular to the suspension rod axis. Where three hinged end pieces are used, one additional pin with a BoClip must be ordered.

- 6.7.4 Spring clip (Item 43)
- Suspension rod strainer (Item 48)
- Hinged block (Item 49)



Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
43	Spring clip	0,01	342 200 99	0,02	342 201 99
48	Suspension rod strainer	0,29	980 310 44	0,85	984 085 44
49	Hinged block	0,10	980 315 44	0,30	984 083 44

**Possible arrangements**

Suspension rod strainer (item 48) and hinged end piece (item 49) together with one suspension rod connect the upper and lower parts of the V-type suspension fitting/suspension fitting with stiffener/sloping suspension fitting. The suspension rod strainer consists of a strainer nut, hinged end piece with left-hand thread, retaining cap and a spring clip.

If the length of the suspension rods can be determined exactly, it is also possible to suspend the track without a suspension rod strainer. In this case, a hinged end piece (item 49) is used at the top and bottom, and the V-type upper suspension brackets can be pulled apart to level the track.

**Length of the suspension rod thread in the hinged end piece:**

KBK Aluline A12/A16: 20 mm

KBK Aluline A18/A22: 25 mm

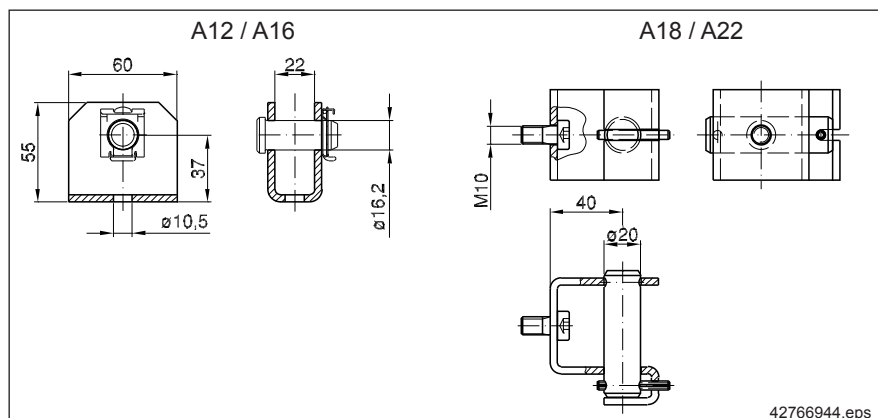
**Length of the left-hand thread of the hinged end piece and of the suspension rod thread in the strainer nut:**

KBK Aluline A12/A16: 45 mm

KBK Aluline A18/A22: 60 mm at full ± adjustment.

One spring clip (item 43) is required for every connection between a hinged end piece (item 49) and suspension rod (item 41). Only the connection between the suspension rod strainer and suspension rod is not provided with a spring clip.

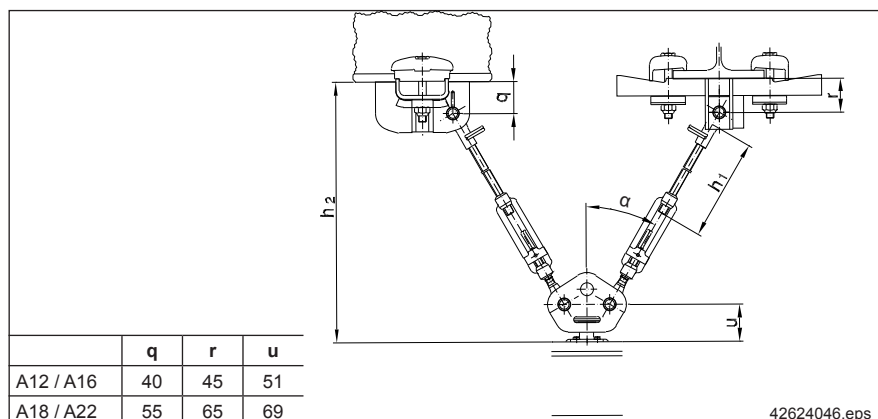
## 6.7.5 Wall fixture



Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
34	Hinged block/connection block	0,2	980 272 44	0,46	850 399 44
54	Pin with BoClip	0,08	851 305 44	-	-

The hinged block/connection block can be used as a wall anchorage for a stiffener arrangement, see also section 6.6.

## 6.8 Determining suspension rod length $h_1$ for V-type suspensions and stiffeners



Suspension rod length  $h_1$  can be determined depending on:

- KBK section,
- Steel structure alignment,
- Distance between lower edge of steel structure and upper edge of KBK section (dimension  $h_2$ ),
- Opening angle  $\alpha$ .

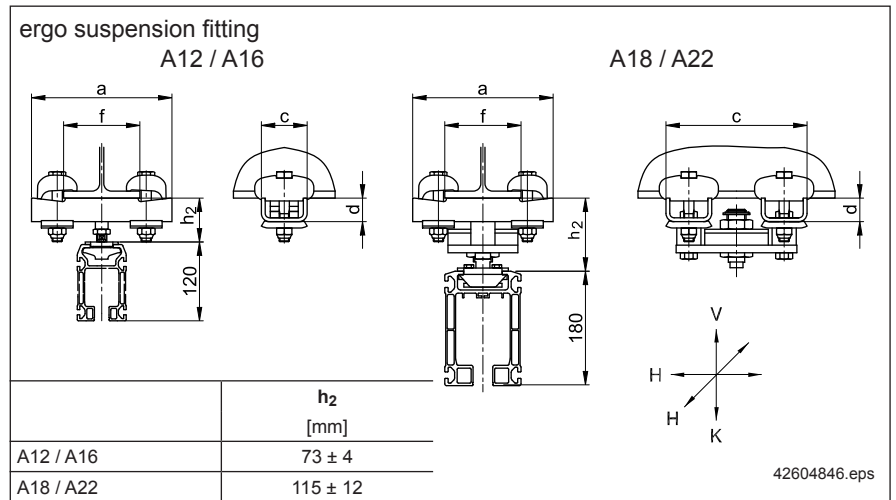
The following simplified formulas may be used, since the suspension rod strainer offers a wide range of adjustment.

$$\text{KBK Aluline A12/A16} \quad \rightarrow \quad h_1 = \frac{h_2 - 95}{\cos \alpha} - 155$$

$$\text{KBK Aluline A18/A22} \quad \rightarrow \quad h_1 = \frac{h_2 - 135}{\cos \alpha} - 220$$

## 6.9 ergo suspension fitting

(Item 31e) with upper suspension bracket A or B on steel profile sections



Profile	Upper suspension bracket	a [mm]	f [mm]	c [mm]	d [mm]
A12 / A16	Upper suspension bracket A	221	71 - 139	72	37
A18 / A22	Upper suspension bracket A	221	71 - 139	247	37
	Suspension bracket B	290	100 - 208	251	36

Item	Designation	A12 / A16		A18		A22		
		Weight [kg]	Order no.	Weight [kg]	Order no.	Weight [kg]	Order no.	
31e	ergo A suspension fitting	4,25	855 031 44	10,21	855 590 44	10,21	855 590 44	
	ergo B suspension fitting			11,90	855 591 44	11,90	855 591 44	
	Load capacity	Load K	750 kg		1.400 kg		1.700 kg	
		Load V	100 Kg		200 kg		200 kg	
Load H		100 kg		200 kg		200 kg		

**KBK Aluline ergo suspensions are complete suspension fittings**, i.e. they already include upper suspension brackets, upper suspension clamps and track suspension clamps (upper suspension brackets and track suspension clamps are pre-assembled).

Ergo suspension fittings can accommodate loads resulting from the use of handling equipment and cranes that have a large overhang.

The use of a rubber element allows the suspension fitting to accommodate forces acting in all directions and to adapt to deflection in the runway. Furthermore, the rubber element provides additional protection from impacts for the superstructure and the KBK Aluline installation.

Upper suspension bracket A can be used on roof structures and steel profile sections, upper suspension bracket B (ends project beyond bearing surface) is only suitable for steel profile sections.

Higher flange bending stresses may occur, for example, when used on HE-A beams.

**The KBK Aluline ergo suspension fitting headroom corresponds to the short classic suspension fitting.** Larger suspension heights must be adapted to suit the steel structure.

Short **classic** suspension fittings and **ergo** suspension fittings can be used alternately.

KBK **ergo** suspension fittings must be used at runway ends.

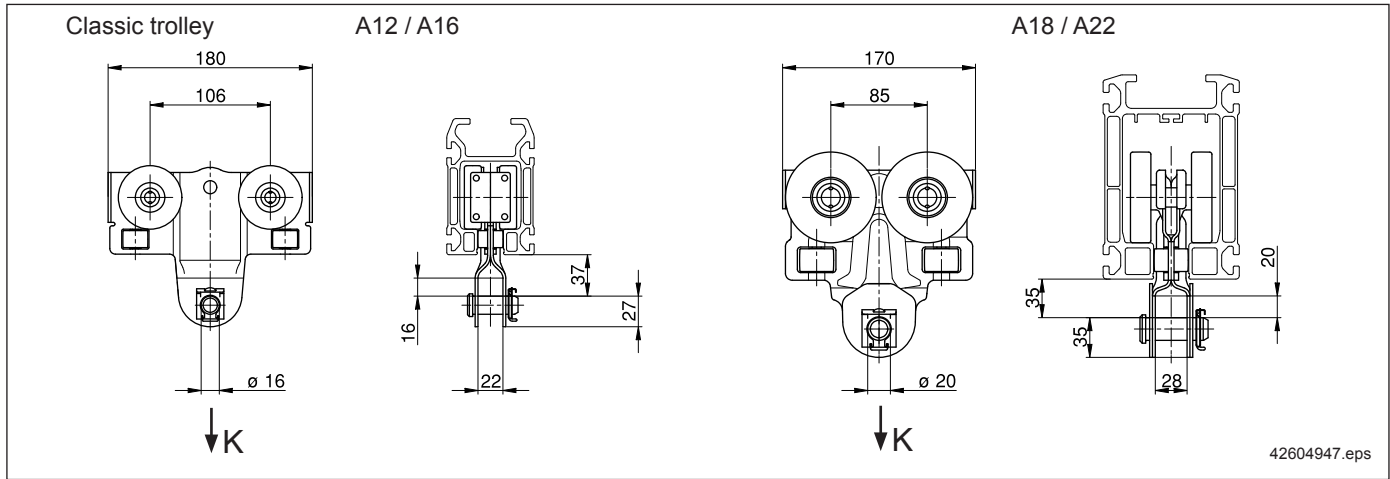
**Finish:** galvanized

# 7 Trolley combinations

## 7.1 Single trolleys

### 7.1.1 Classic trolleys

(Item 55)



42604947.eps

Item	Designation	A12 / A16			A18 / A22		
		Max. load [kg]	Weight [kg]	Order no.	Max. load [kg]	Weight [kg]	Order no.
55	Trolley	300	1,2	855 250 44	800	2,47	855 280 44

Quiet-running Aluline trolleys are fitted with four plastic wheels mounted in permanently lubricated antifriction bearings and two special horizontal support rollers. The trolley side cheek protrudes beyond the travel wheels in the direction of travel as protection against collision damage.

The **traction resistance** of a loaded trolley is < 0,4% of the attached load with constant displacement.

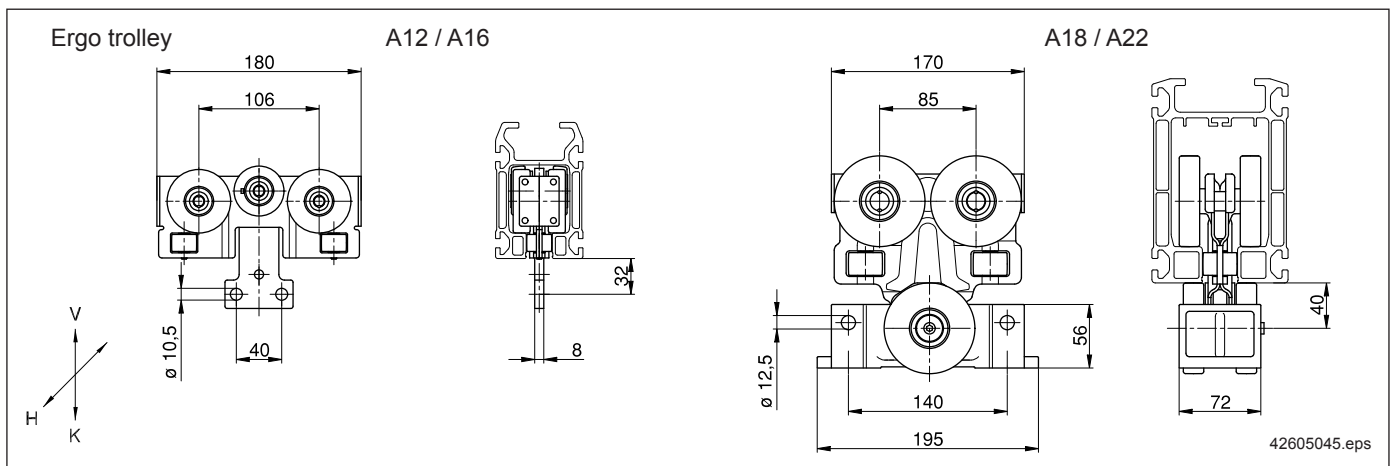
**Connection option for link bars, spacer bars, etc. with link (item 61)**

**Temperature range:** 0 °C to +50 °C

**Finish:** black (RAL 9005), steel

### 7.1.2 Ergo trolleys

(Item 55)



42605045.eps

Item	Designation	A12 / A16					A18 / A22				
		Load K [kg]	Vert. load V [kg]	Hor. load H [kg]	Weight [kg]	Order no.	Load K [kg]	Vert. load V [kg]	Hor. load H [kg]	Weight [kg]	Order no.
55e	Ergo trolley	300	100	50	1,3	855 255 44	800	400	100	2,77	855 275 44

Ergo trolleys can accommodate forces in all axes.

Forces acting against gravity are accommodated by counter-pressure rollers, horizontal forces are accommodated via the lateral guide rollers.

**Ergo trolleys are rigidly bolted to end carriages or crab frames.**

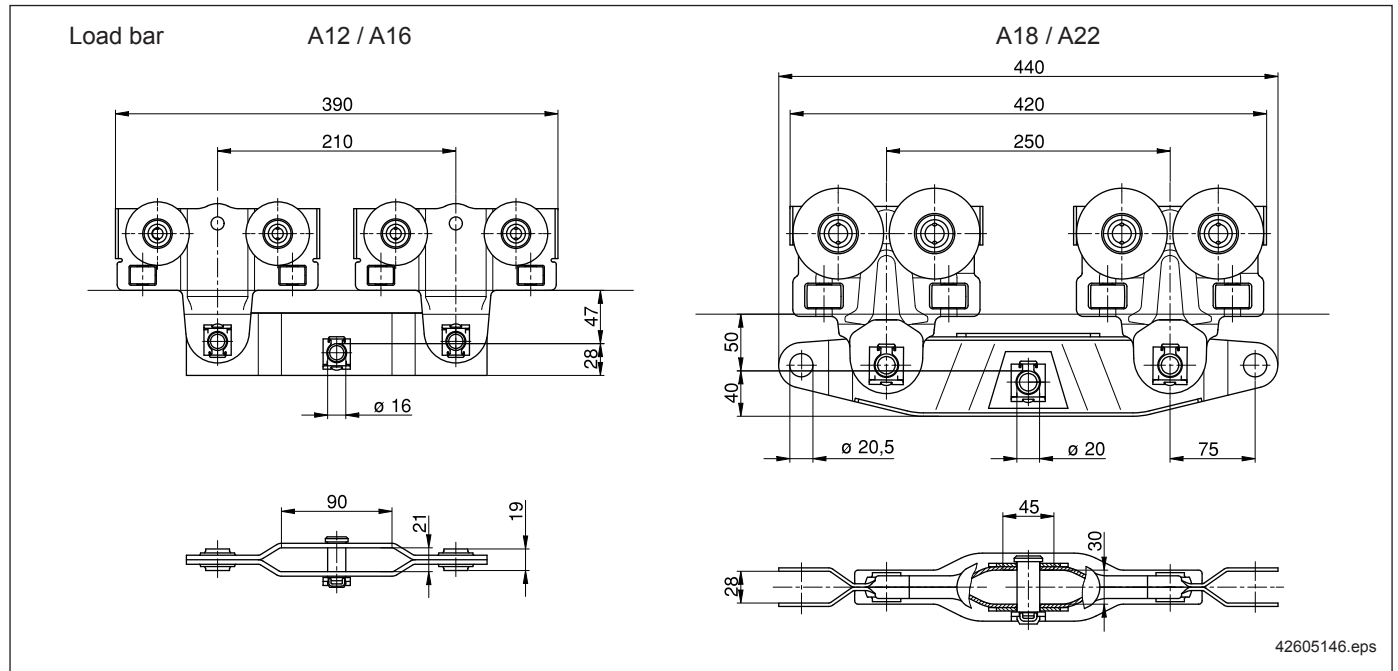
The **traction resistance** of a loaded trolley is < 0,4% of the attached load with constant displacement, start-up resistance < 1%.

**Temperature range:** 0 °C to +50 °C

**Finish:** black (RAL 9005), steel,  
ergo connecting element for KBK Aluline A18/A22: Aluminium

## 7.2 Double trolleys

### Classic load bar



Item	Designation	A12 / A16			A18 / A22		
		Max. load [kg]	Weight [kg]	Order no.	Max. load [kg]	Weight [kg]	Order no.
56	Double trolley end carriage, completed (load bar + 2 trolleys)	600	3,40	855 422 44	1200	6,95	855 622 44
57	Load bar		1,00	980 305 44		2,00	982 305 44

A double trolley is created by joining two trolleys with a load bar. Holes drilled in the ends of KBK Aluline A18/A22 load bars are provided for fitting spacer bars and link bars, they are not designed for connecting loads.

Use the long suspension eye for DC and DK hoists.

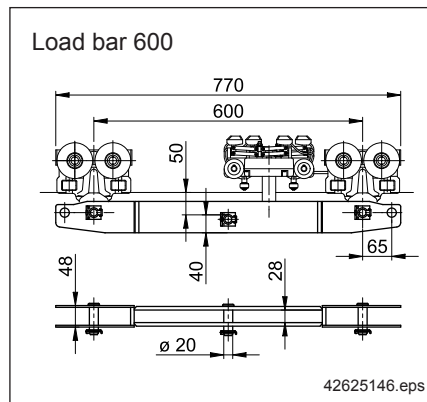
**Finish:** black (RAL 9005), steel

### Wearing parts for single and double trolleys

Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
54	Pin with BoClip	0,08	851 305 44	0,16	851 317 44

## 7.3 Load bars for travel on straight tracks for trolleys and cranes with a pin

### 7.3.1 Load bar 600 (Items 59, 60)



Load bar 600, KBK II for use in KBK Aluline-R crane installations and straight monorails as cross-travel and single-girder crane end carriage load bar.

The current collector trolley is protected against collision between the trolleys.

Item	Designation	A18 / A22		
		Max. load [kg]	Weight [kg]	Order no.
60	Load bar 600, completed	1200	10,00	855 665 44
59	Load bar 600		5,82	858 600 44

**Finish:** black (RAL 9005)

## 7.4 Classic crane end carriages

Rigid crane trolleys make it possible to build parallel-running single and double-girder cranes with a direct connection to the crane girder.

Double-girder cranes can be fitted with normal crab frames, or in order to obtain more favourable hook dimensions, with raised crab frames. Raised crabs run between the rails.

Two frames and two crane end carriages are required for each crane.

Link bars, spacer bars or buffer fittings can be connected using the single-trolley link or load bar (see chapters 13 and 14).

### **Length of stiffener on the crane:**

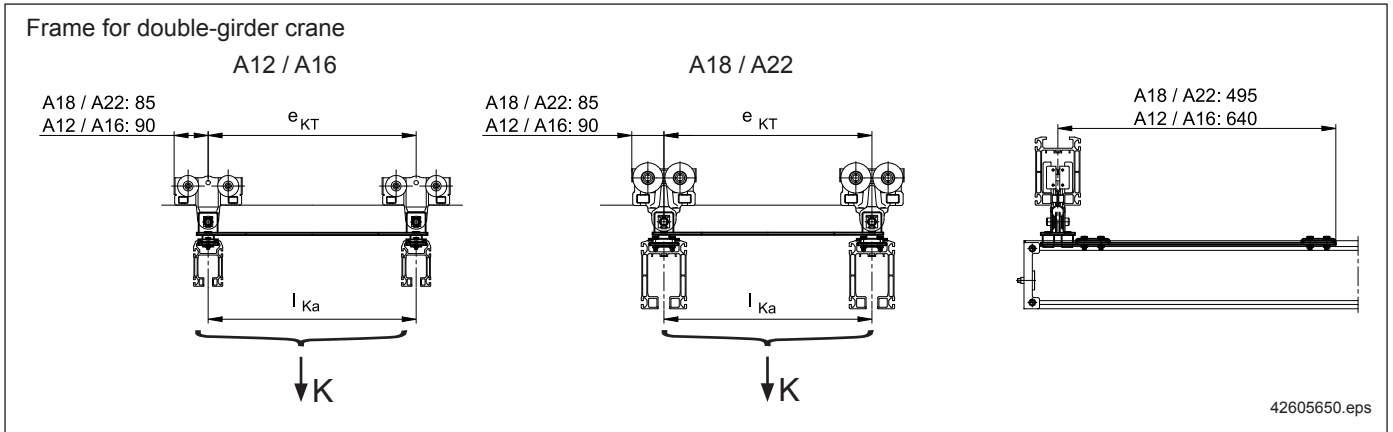
KBK Aluline A12/A16: **495 mm**;

KBK Aluline A18/A22: **640 mm**.

**Frame and crane end carriage not including trolleys and load bars.**

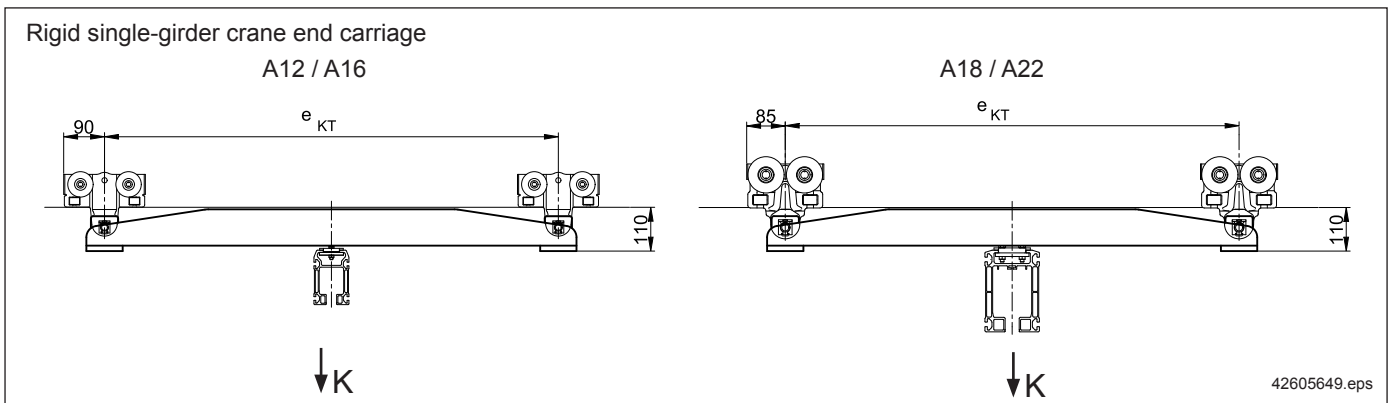


**7.4.1 Frame for double-girder crane  
(Item 63)**



Item	Designation	$e_{KT} = l_{Ka}$ [mm]	A12 / A16			A18 / A22		
			Max. load K [kg]	Weight [kg]	Order no.	Max. load K [kg]	Weight [kg]	Order no.
63	Frame for double-girder crane	550	590	5,50	855 115 44	1185	8,50	855 120 44
	Frame with crane suspensions	650	-	-	-	2370	XXX	XXXXX

**7.4.2 Rigid single-girder crane end carriage  
(Item 62)**



Item	Designation	$e_{KT}$ [mm]	A12 / A16			A18 / A22		
			Max. load K [kg]	Weight [kg]	Order no.	Max. load K [kg]	Weight [kg]	Order no.
62	Rigid single-girder crane end carriage	1000	580	14,00	517 672 46	1170	25,00	517 678 46

**Finish:** black (RAL 9005), steel

Check trolley loads.

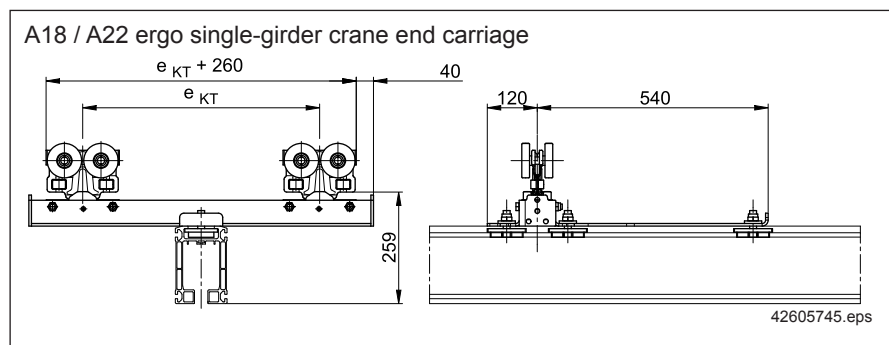
## 7.5 Ergo crane end carriages

The end carriage length required depends on the crane span and the load. Wheel base  $e_{KT}$  of the end carriage should not be less than 1/8 of crane span  $l_K$ .

Longer end carriages should be used to achieve greater suspension distances and reduce suspension loads.

### 7.5.1 Single-girder crane end carriage (Item 62e)

#### KBK Aluline A18/A22 ergo



Item	Standard dimension	A18/A22 track profile section	
	$e_{KT}$ [mm]	Max. load [kg]	Weight [kg]
62e	450	- 400 to +1200	17,1
	550		18,2
	650		20,2
	800		22,1
	1050		28,2
	1250		30,7

**Crane runways and crane girders are made of KBK Aluline A18/A22.**

**The trolleys are an integral part of the end carriage.**

KBK Aluline A12/A16 ergo should not be used for rigid single-girder cranes and single-girder crane end carriages.

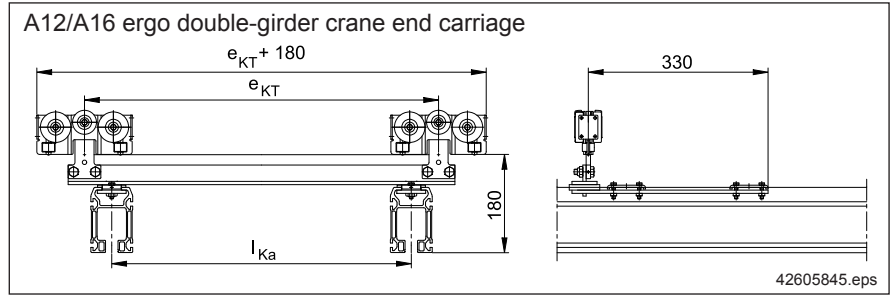
**Finish:** black (RAL 9005), steel

**Example for ordering:**

- 2 off KBK Aluline A18 ergo single-girder crane end carriage,  $e_{KT} = 550$  mm,  
Order no. 715 473 46

**7.5.2 Double-girder crane end carriage  
(Item 62e)**

**KBK Aluline A12/A16 ergo**



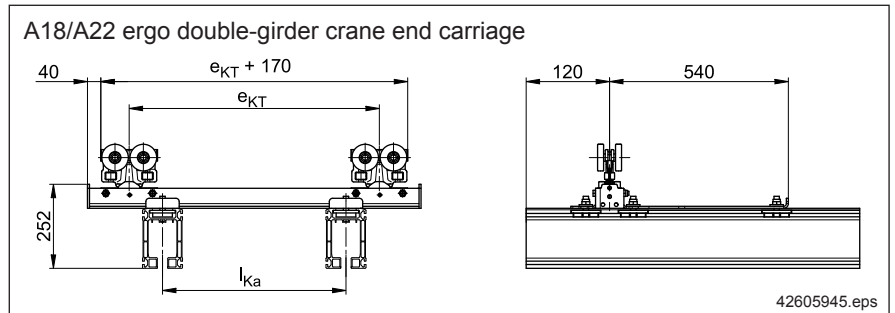
Item	Standard dimension		A12/A16 runway and crane section	
	$l_{Ka}$ [mm]	$e_{KT}$ [mm]	Max. load [kg]	Weight [kg]
62e	550	650	- 200 to +600	8,9
	610	750		9,3
	650	750		9,3
	762	900		9,9
	800	900		9,9
	915	1100		10,7

**Crane runways and crane girders are made of KBK Aluline A12/A16.**

**The trolleys are an integral part of the end carriage.**

**Finish:** black (RAL 9005), steel

**KBK Aluline A18/A22 ergo**



Item	Standard dimension		A18/A22 track profile section		
	$l_{Ka}$ [mm]	$e_{KT}$ [mm]	Max. load [kg]	A12/A16 crane section Weight [kg]	A18/A22 crane section Weight [kg]
62e	550	750	- 400 to +1200	22,1	25,0
	610	810		22,7	25,6
	650	850		23,0	25,9
	762	962		24,1	27,0
	800	1000		24,5	27,4
	915	1115		25,5	28,4
	1000	1200		26,3	29,2

**Crane runways are made of KBK Aluline A18/A22, crane girders of KBK Aluline A12/A16 or KBK Aluline A18/A22.**

**The trolleys are an integral part of the end carriage.**

**Finish:** black (RAL 9005), steel

**Example for ordering:**

- 2 off KBK Aluline A18 ergo double-girder crane end carriage,  $l_{Ka} = 610$  mm, KBK Aluline A18 crane profile section, order no. 715 474 46

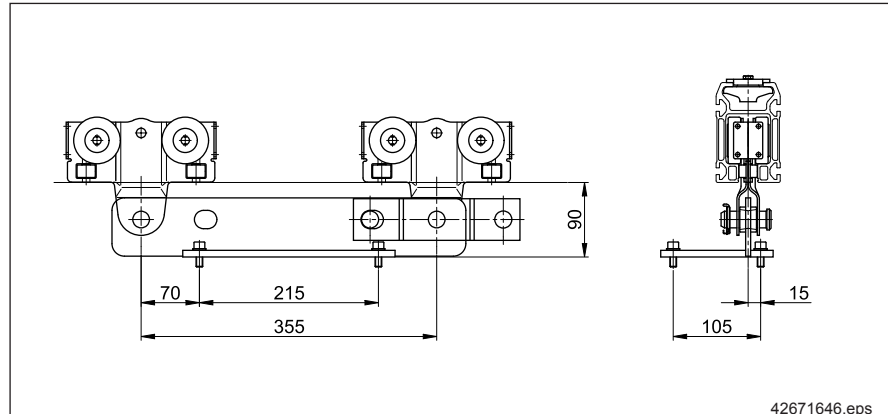
# 8 Monorail trolley for special hoists

## 8.1 Low-headroom frame for monorail travelling hoists

Longer hook paths can be obtained for a given rail height by using the low-headroom frame for monorail hoists.

Further information on request.

## 8.2 Load bar for DS -1 rope winch, D-SH SpeedHoist and D-BE rope balancer (Item 68)



Item	Designation	Weight [kg]	Order no.
68	Load bar for DS-1 rope winch and D-SH SpeedHoist	2,2	851 195 44

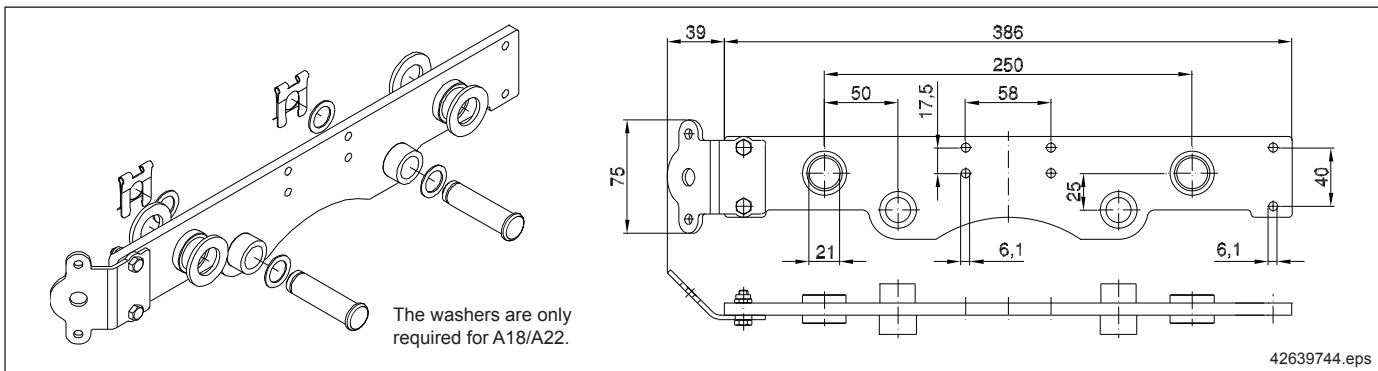
The load bar is used to attach DS-1 rope winch and D-SH SpeedHoist lifting appliances.

The single-trolley link can be fitted.

The load bar is suitable for trolleys: KBK Aluline A12/A16 and KBK Aluline A18/A22

**Finish:** Load bar RAL 9005 (black)

### 8.3 Load bar for D-BP 110 rope balancer (Item 68)



Item	Designation	Weight [kg]	Load capacity [kg]	Order no.
68	Load bar for D-BP 110 rope balancer	1,85	230	984 685 44

In KBK applications, rope balancers are flexibly connected to trolleys using a load bar.

The load bar is symmetrical and is supplied with an anchorage point for the power supply on the left as standard. The anchorage point can be arranged on opposite side possible, if required. The anchorage point is used to accommodate hose bracket set 2.

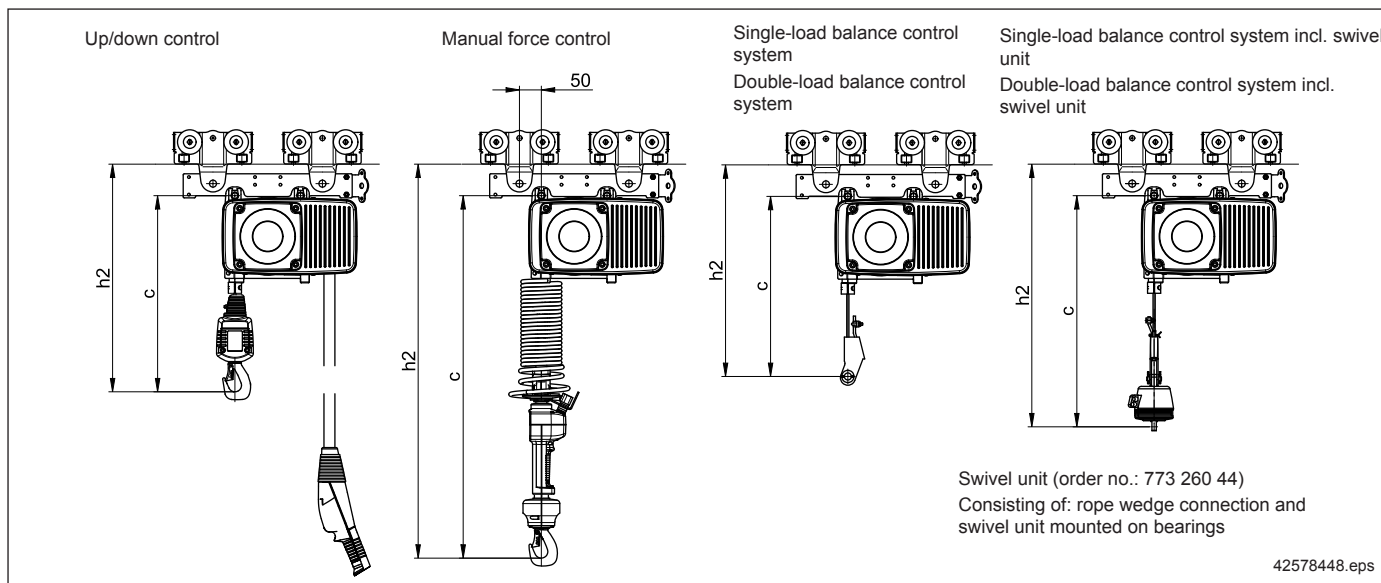
The load bar is suitable for trolleys: KBK Aluline A12/A16 and KBK Aluline A18/A22

The following values are applied for specifying the track and crane:

D-BP 110 : K = 160 kg

**Finish:** Load bar RAL 9005 (black), pin and washers galvanized

#### Balancer dimensions



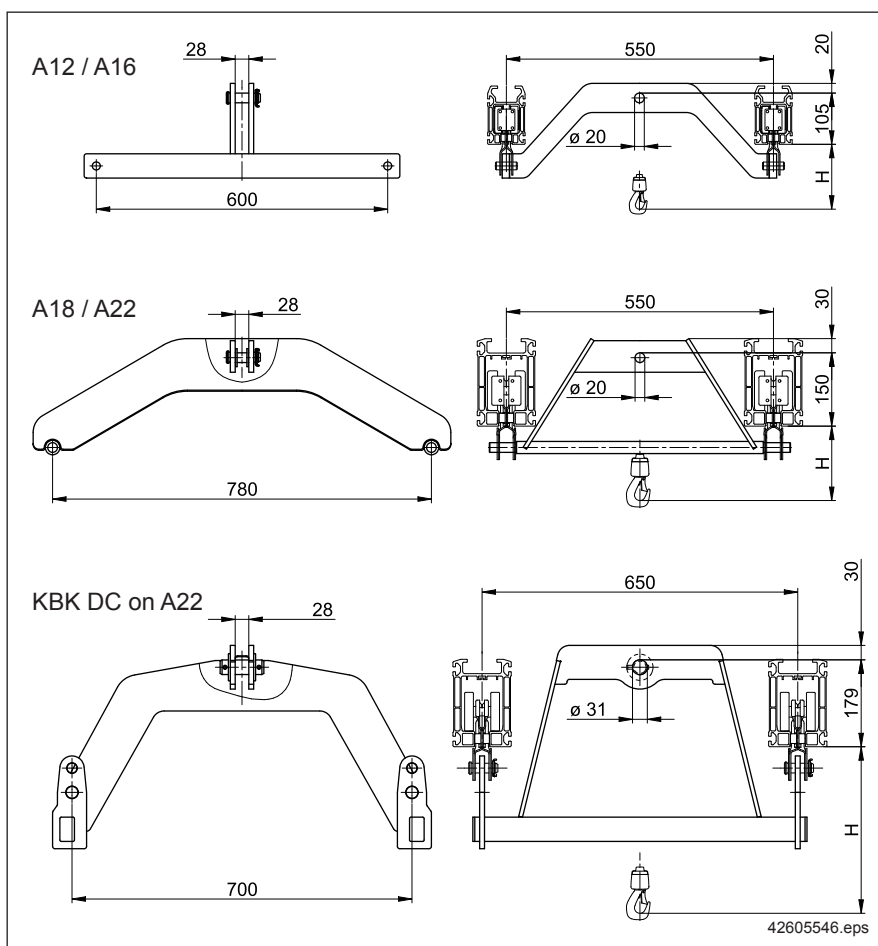
#### Installation dimensions

	Up/down control	Manual force control	Single-load (double-load) Balancer control	Single-load (double-load) Balancer control incl. swivel unit
	c / h2	c / h2	c / h2	c / h2
D-BP 110	465 / 540	845 / 920	430 / 505	545 / 620

# 9 Double-rail crab

## 9.1 Crab frame (Item 78)

Double-rail crab



Item	Designation	A12 / A16			A18 / A22			A22		
		Max. load K [kg]	Weight [kg]	Order no.	Max. load K [kg]	Weight [kg]	Order no.	Max. load K [kg]	Weight [kg]	Order no.
78	Crab frame	600	13,00	980 600 44	1200	16,40	855 110 44	2200	25,24	855 675 44

Dimension H	DCM 1	DCM 2	DCM 5	DC 1	DC 2	DC 5	DC 10
Reeving	1/1						
A12 / A16	568	568	613	238	238	283	-
A18 / A22	523	523	568	193	193	238	343

KBK Aluline crab frames fitted with four trolleys and the hoist form a double-rail crab for double-rail tracks or double-girder cranes.

The crab frame can pass under crane end carriages.

Travel drives are fitted outside the crab frame for KBK Aluline A12/A16, and can be fitted both inside and outside for KBK Aluline A18/A22. The drive motor must face outwards and the hoist motor must face the drive.

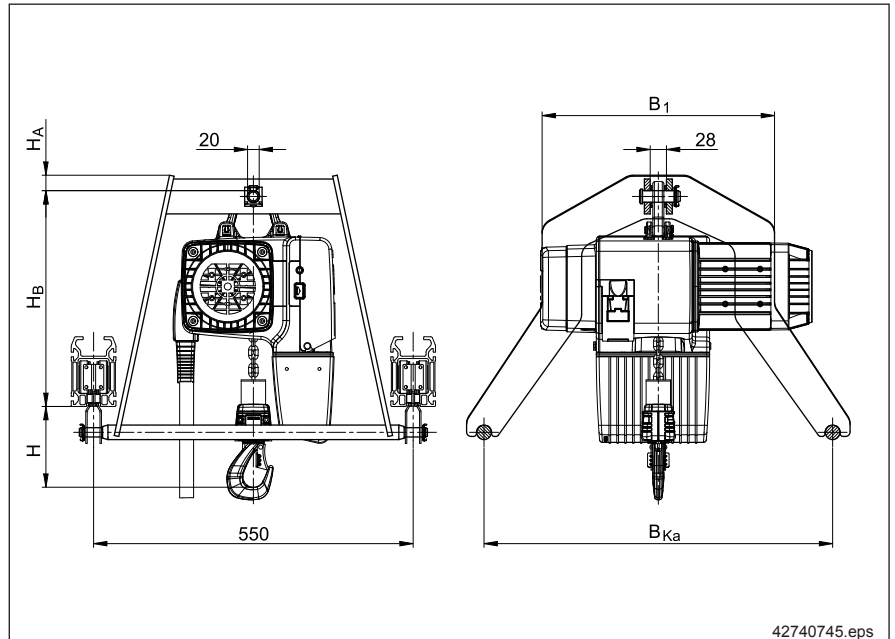
All hoists must be used with the long suspension eye.

**Finish:** black (RAL 9005), steel

### Wearing parts on the hoist support pin

Item	Designation	A12 / A16 / A18 / A22
54	Pin with BoClip	Weight [kg] 0,18 Order no. 851 318 44

## 9.2 Raised crab frame (Item 77)



Double-rail crab

Item	Profile	Max. load [kg]	for		H <sub>B</sub> [mm]	H			H <sub>A</sub> [mm]	B <sub>Ka</sub> [mm]	B <sub>1</sub> [mm]	Weight [kg]	Order no.
			Hoist unit	alternative 1)		DC 1 / 2 [mm]	DC 5 [mm]	DC 10 1/1 [mm]					
77	A12 / A16	600	DC 1 / 2	DC 5	319	45	97	-	27	600	400	15,7	517 890 46
			DC 5	-	371	-	45	-				16,7	
	A18 / A22	1200	DC 1 / 2	DC 5 / 10	320	44	96	185	32	700	510	26,7	517 910 46
			DC 5	DC 10	372	-	44	133				28,7	
			DC 10	-	461	-	-	44				30,9	517 930 46

1) if the unit cannot be raised to the maximum position

Raised crab frames utilize the space between the crane girders of double-girder cranes and make it possible to achieve a minimum dimension H. However, the crab frame cannot pass under crane runways, spacer bars or crane end carriages.

A solution is available with the maximum possible height for every chain hoist type and application (profile section, load). If this is not possible due to obstacles on site, there are alternatives for DC 5/10.

Electric travel drives are arranged inside the crab frame.

All hoists must be used with the long suspension eye.

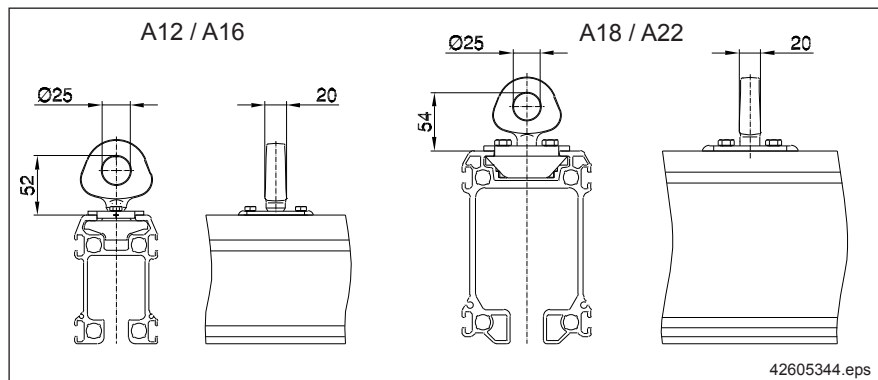
**Finish:** black (RAL 9005)

### Wearing parts on the hoist support pin

Item	Designation		A12 / A16 / A18 / A22
54	Pin with BoClip	Weight [kg]	0,18
		Order no.	851 318 44

# 10 Crane suspension eye

Crane suspension (item 75)  
Type until mid 2014



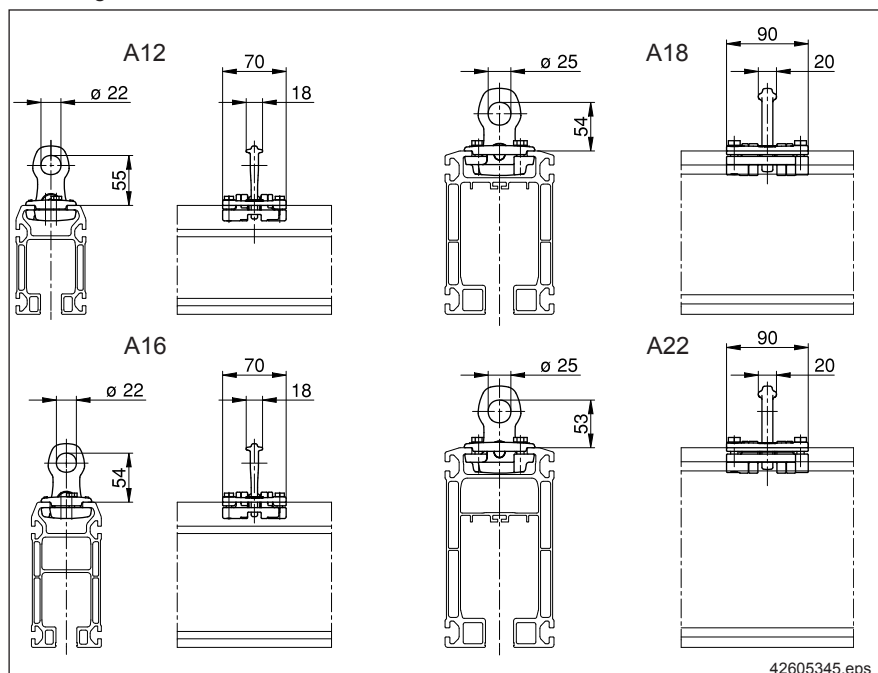
Item	Designation	A12 / A16			A18 / A22		
		Max. load [kg]	Weight [kg]	Order no.	Max. load [kg]	Weight [kg]	Order no.
75	Crane suspension eye	600	0,7	855 036 44	1400	1	855 038 44

The crane suspension connects crane girders with the trolley or the load bar of the runway girder. Due to the ball-and-socket type mounting of the suspension eye, KBK Aluline single-girder cranes can adopt a diagonal position. They can, therefore, also travel on converging crane runways. The suspension eye and track suspension clamp are permanently connected to each other before leaving the factory and must not be separated.

Crane suspension fittings must not be used as swivel joints.

**Finish:** galvanized steel

Crane suspension (item 75)  
Type as of mid 2014



Item	Designation	A12 / A16			A18 / A22		
		Max. load K [kg]	Weight [kg]	Order no.	Max. load K [kg]	Weight [kg]	Order no.
75	Crane suspension eye	600	0,42	855 455 44	1400	0,84	855 655 44

The crane suspension connects crane girders with the trolley or the load bar of the runway girder.

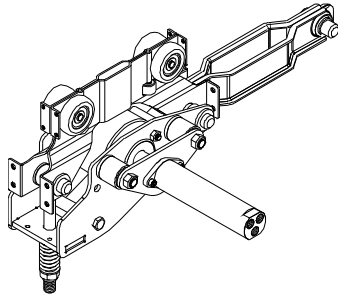
Maintenance-free pivot bearings are fitted in the lower pivot point.

**Finish:** galvanized steel

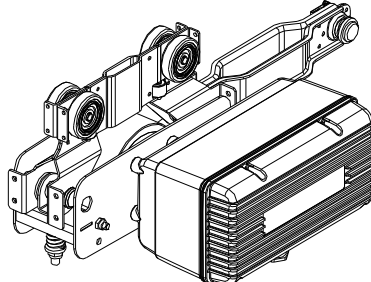


# 11 Travel drives for crabs and cranes

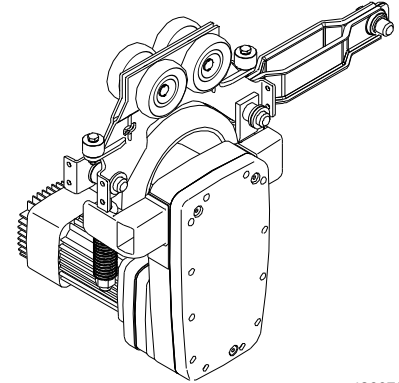
RF 100 travel drive  
Pneumatically driven  
KBK Aluline A12/A16  
KBK Aluline A18/A22



RF 125 travel drive  
Electrically driven  
KBK Aluline A12/A16  
KBK Aluline A18/A22



DRF 200 travel drive  
Electrically driven  
KBK Aluline A18/A22



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## 11.1 RF 100 PN friction wheel travel drive (Item 70)

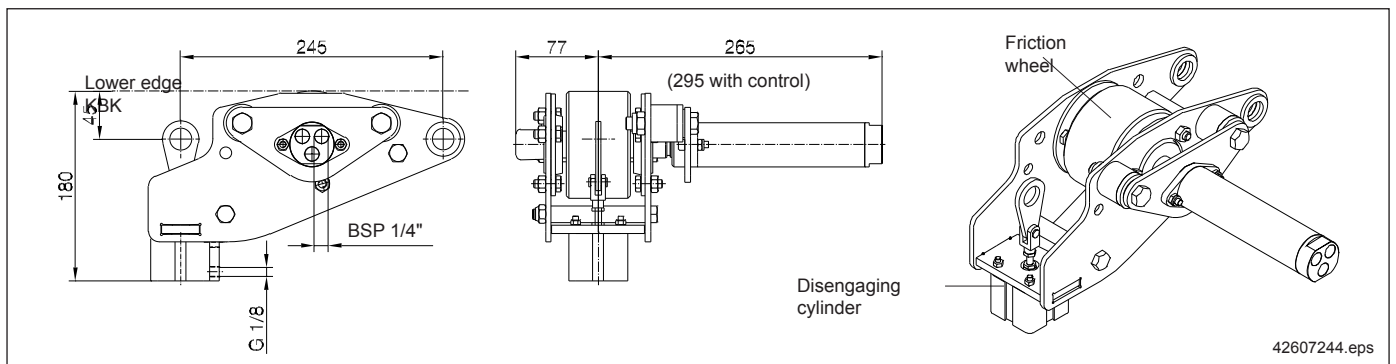
The RF 100 PN friction wheel travel drive is a pneumatic drive unit specially developed for handling equipment duty and loads up to 500 kg. The output of the pneumatic travel motor is transmitted to the bottom flange of the rails by means of a friction wheel.

The drive is controlled pneumatically or electrically and is mainly intended to be used as a starting help.

### Technical data

Reversible oil-free air motor							
Travel speed	Rated speed	Output	Operating pressure	Recommended operating pressure	Air demand at 4 bar	CDF	Max. displaceable load
[m/min]	[m/min]	[W]	[bar]	[bar]	[l/s]	[%]	[kg]
approx. 10 - 50	20	80	3 - 6	approx. 4	4,5	50	500

### 11.1.1 Travel drive with disengaging cylinder (Item 70)

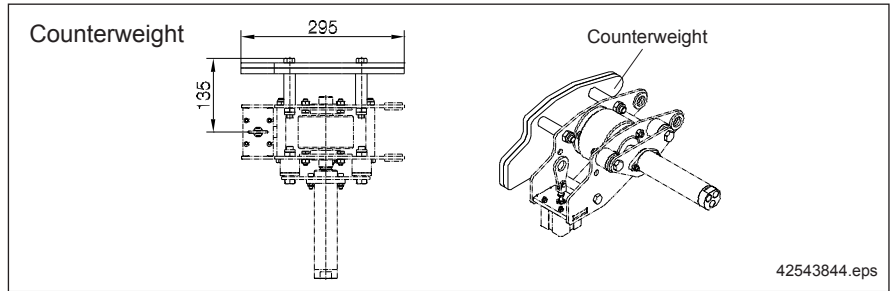


42607244.eps

Item	Designation	Weight [kg]	Order no.
70	RF 100 PN with disengaging cylinder	7,3	851 078 44

The friction wheel is pressed against the bottom flange of the rail by means of a pneumatic cylinder only when the motor is also supplied with compressed air. This enables the connected trolley to be moved by hand when no pressure is applied.

**11.1.2 Counterweight  
(Item 70a)**

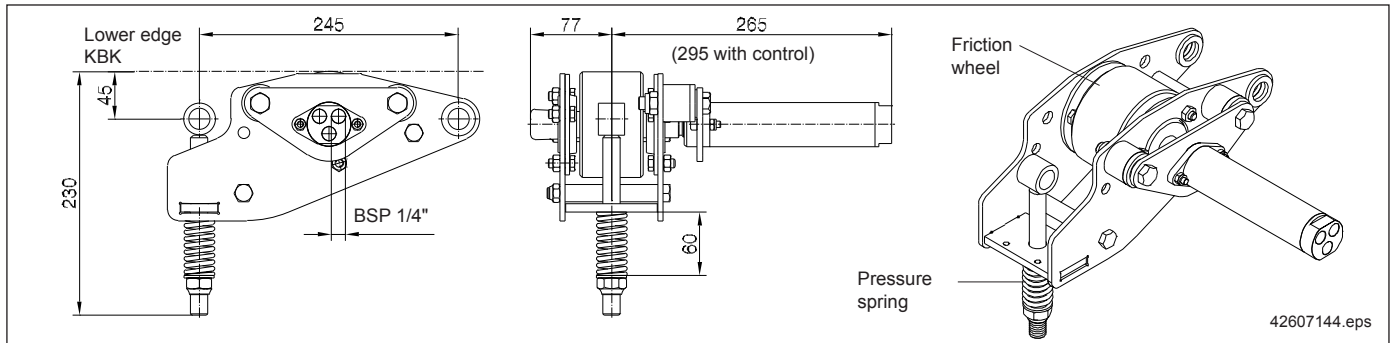


Item	Designation	Weight [kg]	Order no.
70a	Counterweight	4,5	851 205 44

RF travel drives with a disengaging cylinder must be fitted with a counterweight if an articulated link bar is used.

**Finish:** black (RAL 9005)

**11.1.3 Travel drive with pressure spring  
(Item 70)**

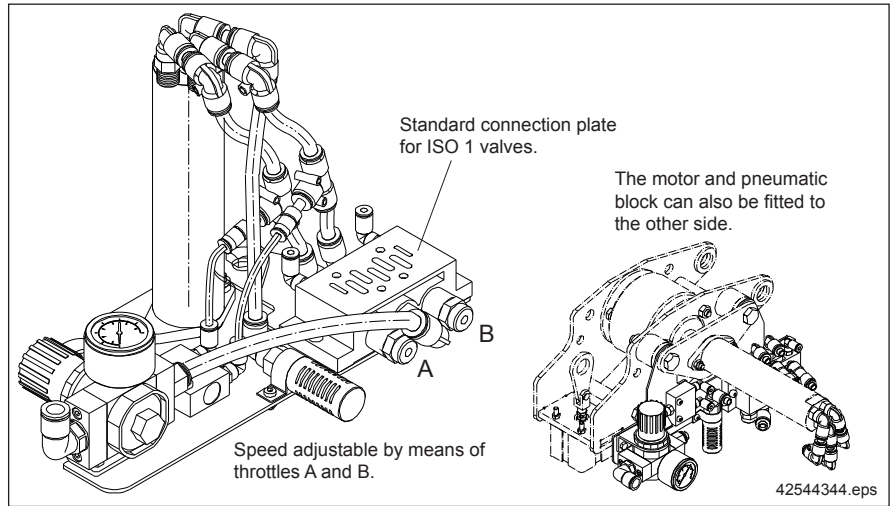
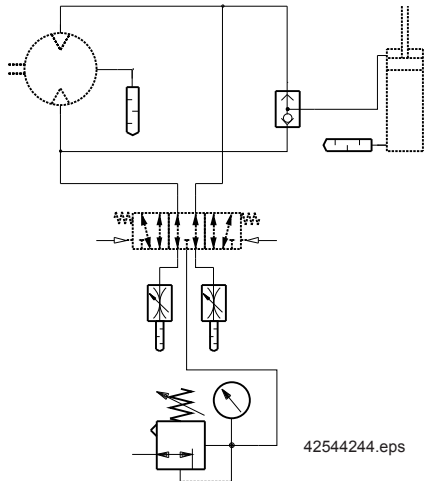


Item	Designation	Weight [kg]	Order no.
70	RF 100 PN with pressure spring	7,2	851 079 44

The friction wheel is permanently pressed against the bottom flange of the rail by means of a pressure spring. The crane or trolley can be moved within certain limits by pushing the load.

### 11.1.4 RF 100 PN controls

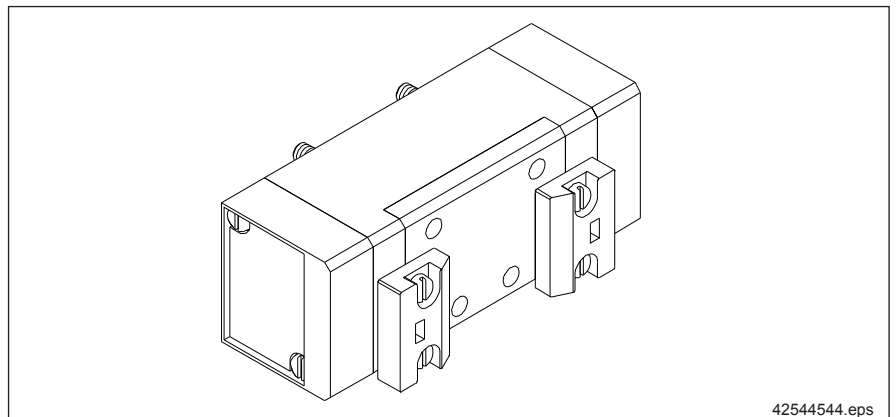
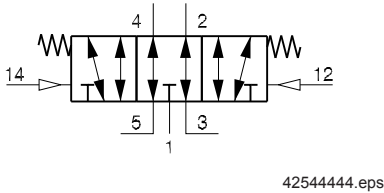
#### RF pneumatic equipment base block (Item 113)



Item	Designation	Weight [kg]	Order no.
113	RF pneumatic equipment base block	1,55	851 201 44

The pneumatic elements are fitted and connected to the hoses on the same mounting panel.

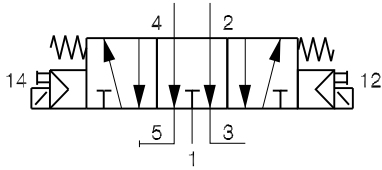
#### Pneumatic control, pneumatic valve (Item 114)



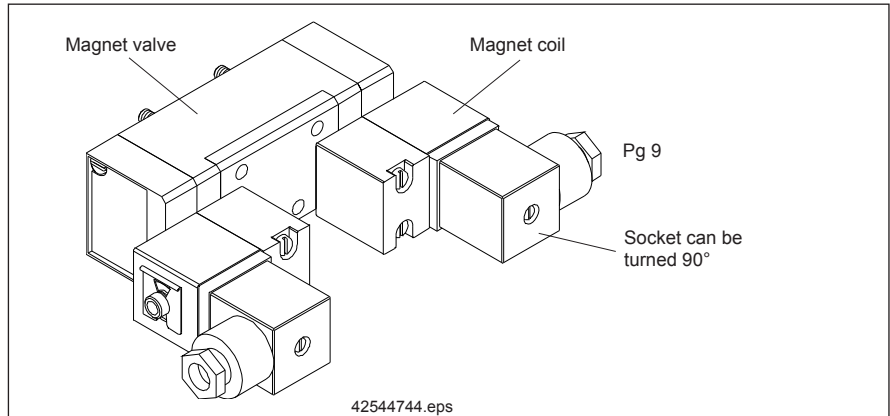
Item	Designation	Weight [kg]	Order no.
114	Pneumatic valve	0,39	343 791 44

The 5/3-way valve is used to close, open or divert compressed air routes. The 5/3 way-function comprises five connections and three switch positions. Connection 1 is the input for compressed air. Connections 2 and 4 are the compressed air outputs and connections 3 and 5 are used for venting.

**Electric control  
(Item 115)**



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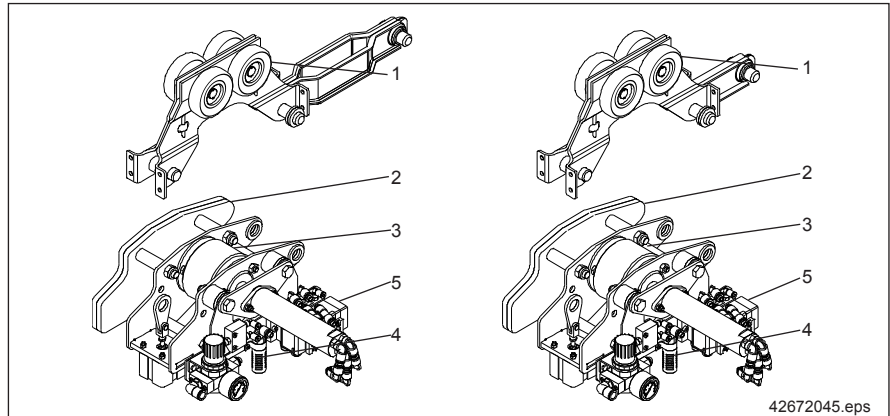


Item	Designation	Rated voltage	Weight [kg]	Order no.
115	Electric control	24 V <sub>DC</sub>	0,62	851 203 44
		230 V <sub>AC</sub>	0,62	851 204 44

The unit consists of:

- Solenoid valve
- Magnet coil 24 V<sub>DC</sub> or 230 V<sub>AC</sub> (2 off)
- Standard socket (2 off)

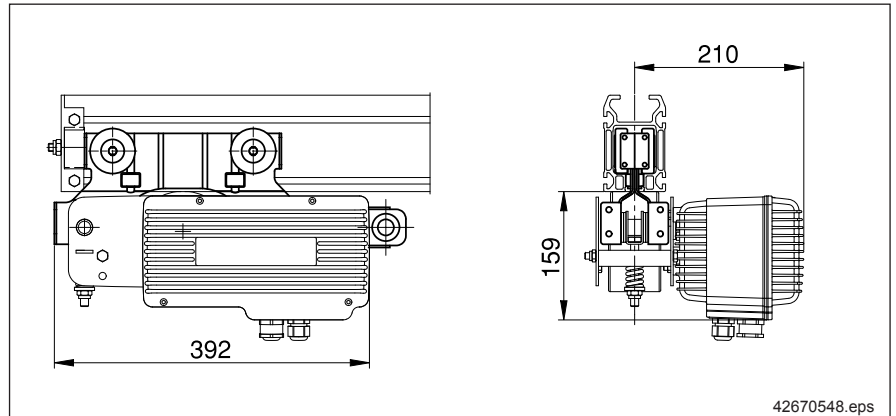
**Example for ordering**



Item	Designation	Order no.
1	Trolley with 270 link bar, A18/A22	855 096 44
2	Counterweight	851 205 44
3	RF 100 PN	851 078 44
4	base block	851 201 44
5	Pneumatic valve	343 791 44

RF 100 PN travel drive with disengaging cylinder, suitable for Aluline KBK A18/A22 with RF pneumatic base block as well as pneumatic valve with 5/3-way function.

## 11.2 RF 125 friction wheel travel drive (Item 70)



### Technical data

DC motor with E22-C worm gearbox							
Travel speed	Output	CDF	Voltage	Frequency	Max. displaceable hoist load incl. dead load	Weight	Order no.
[m/min]	[W]	[%]	[V]	[Hz]	[kg]	[kg]	
7/27 <sup>1)</sup>	50/200	20/40	3 ~ 220-480	50/60	2200	5	716 950 45

1) By programming the parameters can be changed to:

- max. 8/33 m/min with partial load
- min. 3/16 m/min

The RF 125 friction wheel travel drive is a drive unit specially developed for crane requirements with regulated acceleration and braking for loads up to 2000 kg and inclines up to 1%.

**Finish:** blue (RAL 5009)

### 11.2.1 Drive data

The output of the pneumatic travel motor is transmitted to the bottom flange of the rail by means of a friction wheel. The friction wheel is pressed against the bottom flange of the rail by means of a pressure spring.

A permanent-field DC worm geared motor serves as the drive motor.

The speed of DC motors can be controlled very well, enabling smooth acceleration and braking of the drive to be achieved. This facilitates travel with little sway.

The worm geared motor is of self-braking design, which renders a holding brake superfluous.

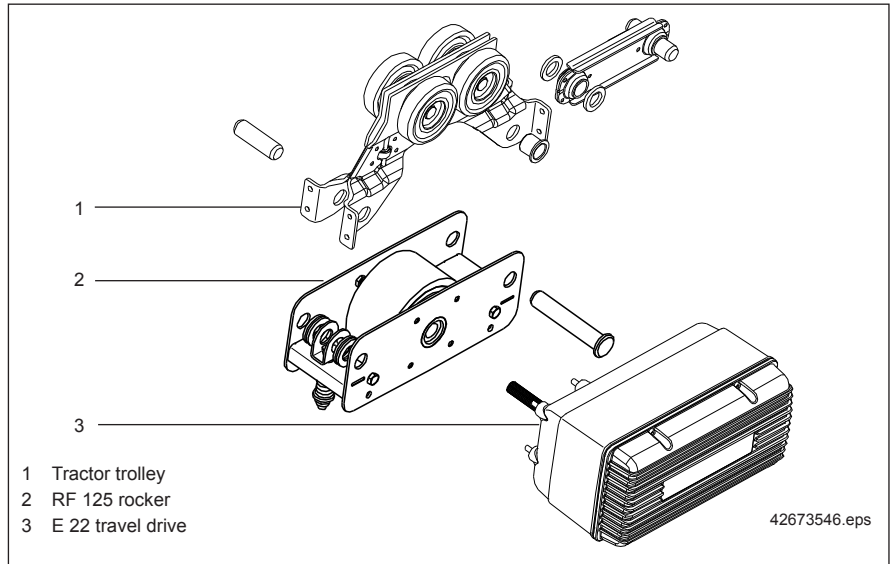
### 11.2.2 Control system

The control card features a wide voltage range input (220-480 V). The line voltage supplies a regulated link. The motor is supplied from the link by a PWM power module. Ramps are output for start-up and braking. The moving motor is braked with electric control and stopped by a short circuit of the armature winding.

The control system includes the following features as standard:

- Plug connections for all inputs and outputs;
- Line voltage relayed to the chain hoist;
- Limit switch inputs;
- Fast-to-slow limit switch inputs;
- 7-segment display for operating status, error messages, parameter programming;
- Programmable parameters for speed, acceleration, etc.;
- Temperature monitoring and cut-off on overheating;
- Signal transmission with tri-state signals (half-wave evaluation).

### 11.2.3 RF 125 rocker (Item 135)

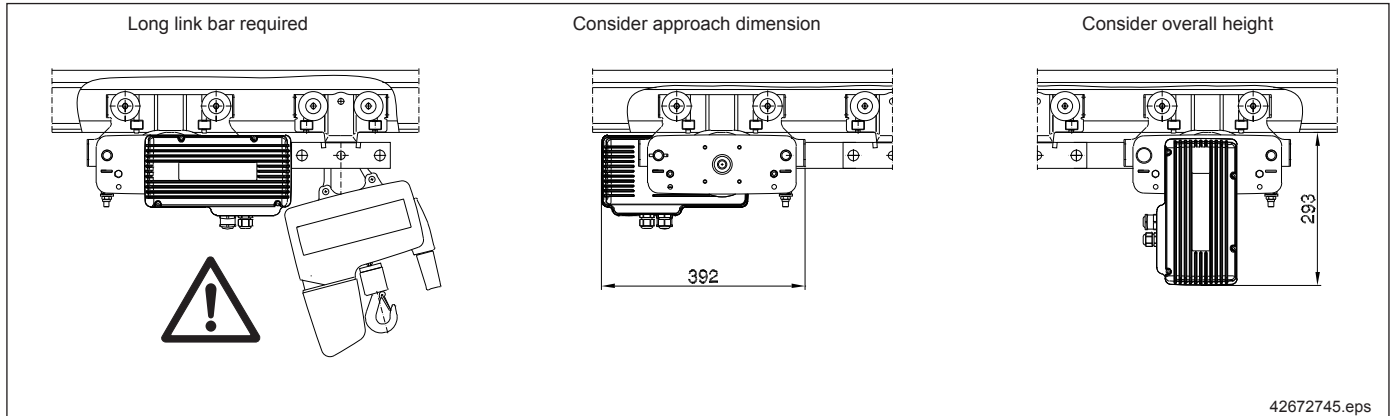


Item	Designation	Weight [kg]	Order no.
135	RF 125 rocker	4,6	851 245 44

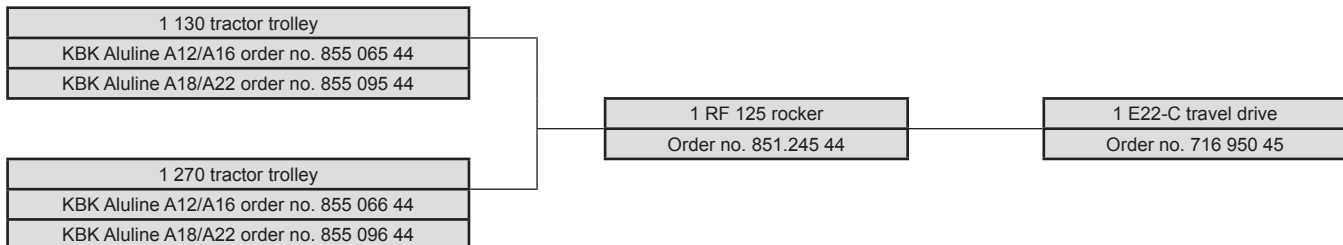
**Finish:** black (RAL 9005); galvanized

### 11.2.4 Possible arrangements

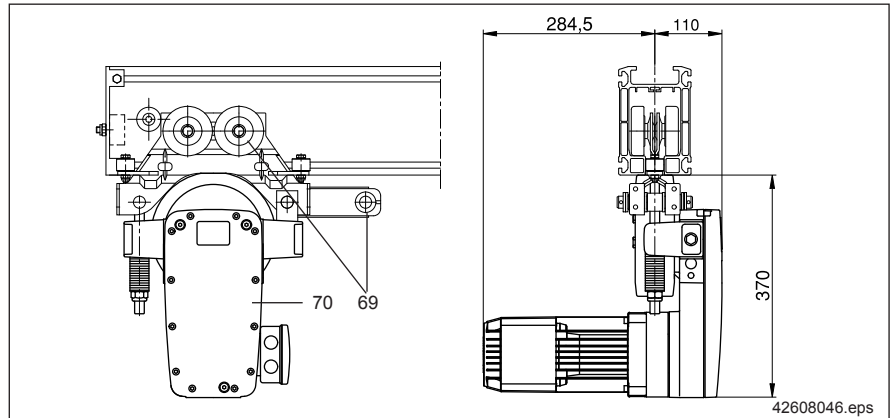
RF 125 friction wheel travel drives can be fitted in various ways, whereby the following must be considered (see also example for ordering):



### Example for ordering RF 125:



### 11.3 DRF 200 friction wheel travel drive (Item 70)



Technical data: ZBF 63 and 71 travel motors for DRF 200 (motor size assignment) <sup>1)</sup>

Travel speed [m/min]	Output [kW]		CDF [%]	Max. displaceable weight in kg <sup>2)</sup>								
				1000	1500	2000	2500	3000	3500			
10	0,13		100	ZBF 63 A4 B003								
12,5							3000			-		
16				ZBF 63 A4 B003			2300					
20	0,26			ZBF 63 A2 B003								
25							3000			-		
31,5				ZBF 63 A2 B003			2300					
40			ZBF 63 A2 B003			1800						
5/20	0,06/0,25 0,09/0,34		40	ZBF 63 A8/2 B003								
6,3/25							2500		ZBF 71 A8/2 B003		3400	-
8/31,5				ZBF 63 A8/2 B003			2000		ZBF 71 A8/2 B003		2800	-
10/40				ZBF 63 A8/2 B003			1500		ZBF 71 A8/2 B003		2200	-

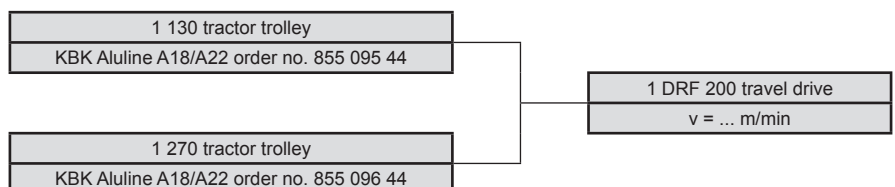
- 1) ZBF 71 B and KM 80 motors cannot be used with Aluline.
- 2) Dry, horizontal track. Application with inclined track on request.

Item	Designation	Weight [kg]	Order no.
70	DRF 200 friction wheel travel drive with wide travel wheel (73 mm), A18/A22	25	Tech. data

DRF 200 friction wheel travel drives transmit the output of the travel motor, which is specially developed for crane duty, via a spring-mounted friction wheel to the bottom flange of KBK rails. The drive is not suitable for use on KBK Aluline A12/A16. DRF 200 mounting components can be relocated to vary the position of the spring assembly and motor as required. Control can be effected direct or via contactors. Contactor control and timed mechanical braking, or timed mechanical braking elements in the control pendant are required if pole-changing travel drives are used.

**Finish:** blue (RAL5009)

#### Example for ordering DRF 200:



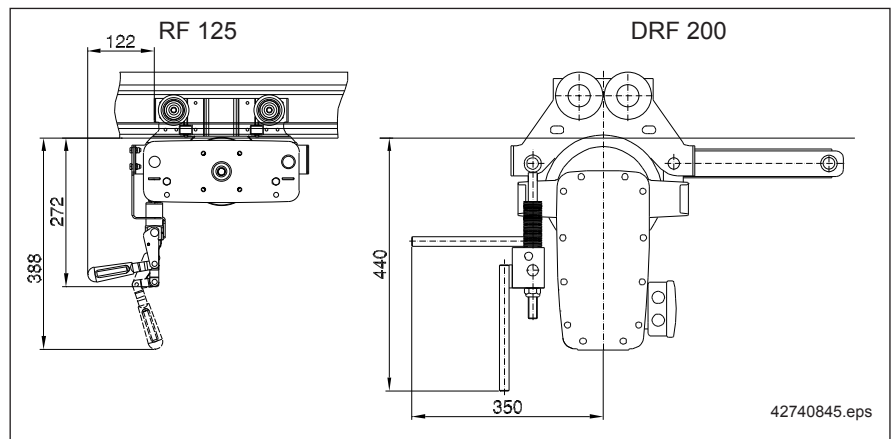
## 11.4 Disengaging devices

When the friction wheel pressure springs are released, the travel drive is lowered and disconnected from the rail.

A disengaging device should preferably be used in the following cases, for example:

- manual travel of an electrically driven unit along a certain section;
- towing an electrically driven unit by a conveyor belt along certain sections of a monorail system;
- depositing loads from an electrically driven unit onto a conveyor belt running at a different speed
- routing electrically driven units out of a system for maintenance purposes.

### 11.4.1 RF 125/DRF 200 manually actuated disengaging devices (Item 137)



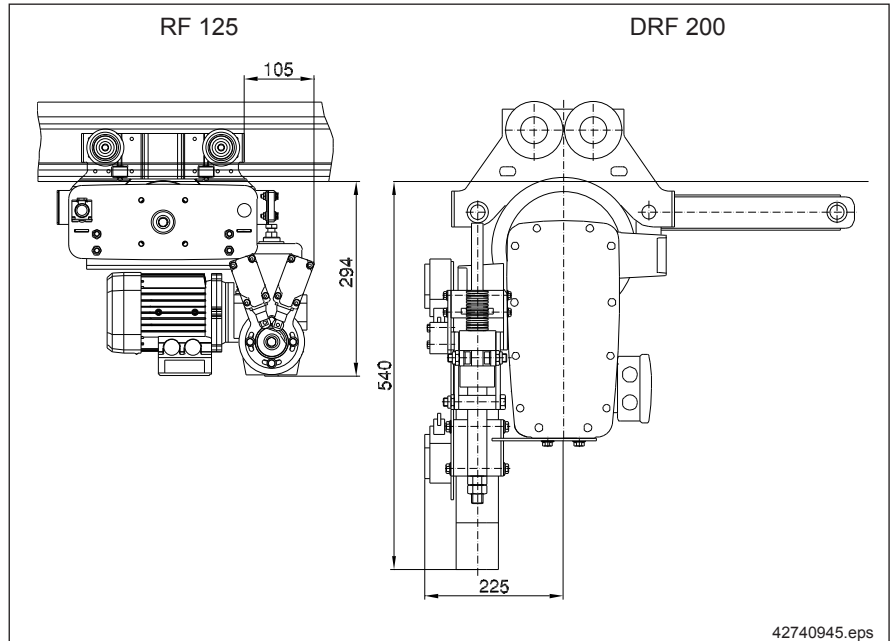
Item	Designation	Travel drive	Weight [kg]	Order no.
137	Manual disengaging device	RF 125	1,1	851 340 44
		DRF 200	2,0	841 150 44

Manually actuated disengaging devices are actuated by turning a lever approximately 90°.

The diagrams show the engaged (with wheel contact) state.



**11.4.2 RF 125/DRF 200 electrically actuated disengaging devices (Item 138)**



Item	Designation	Drive	Weight [kg]	Order no.
138	Electric disengaging device	RF 125	9,3	851 350 44
		DRF 200	5,0	On application

**Drive technical data**

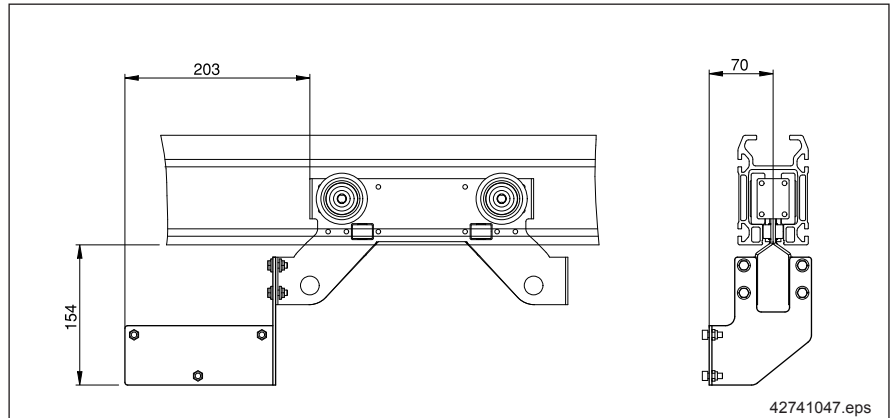
Drive	Disengaging time [s]	CDF [%]	Voltage [V]	Frequency [Hz]	Output [W]
RF 125	1	50	380 - 415	50	120
			440 - 480	60	140
DRF 200	3	10	230	50	30

Electrically actuated disengaging devices consist of a mechanical fitting, a drive and 2 limit switches for the limit positions.

**Control system**

A control system must be separately provided for the given application.

**11.4.3 Angle bracket for housing  
(Item 92)**



Item	Designation	Weight [kg]	Order no.
92	Angle bracket	0,55	851 357 44

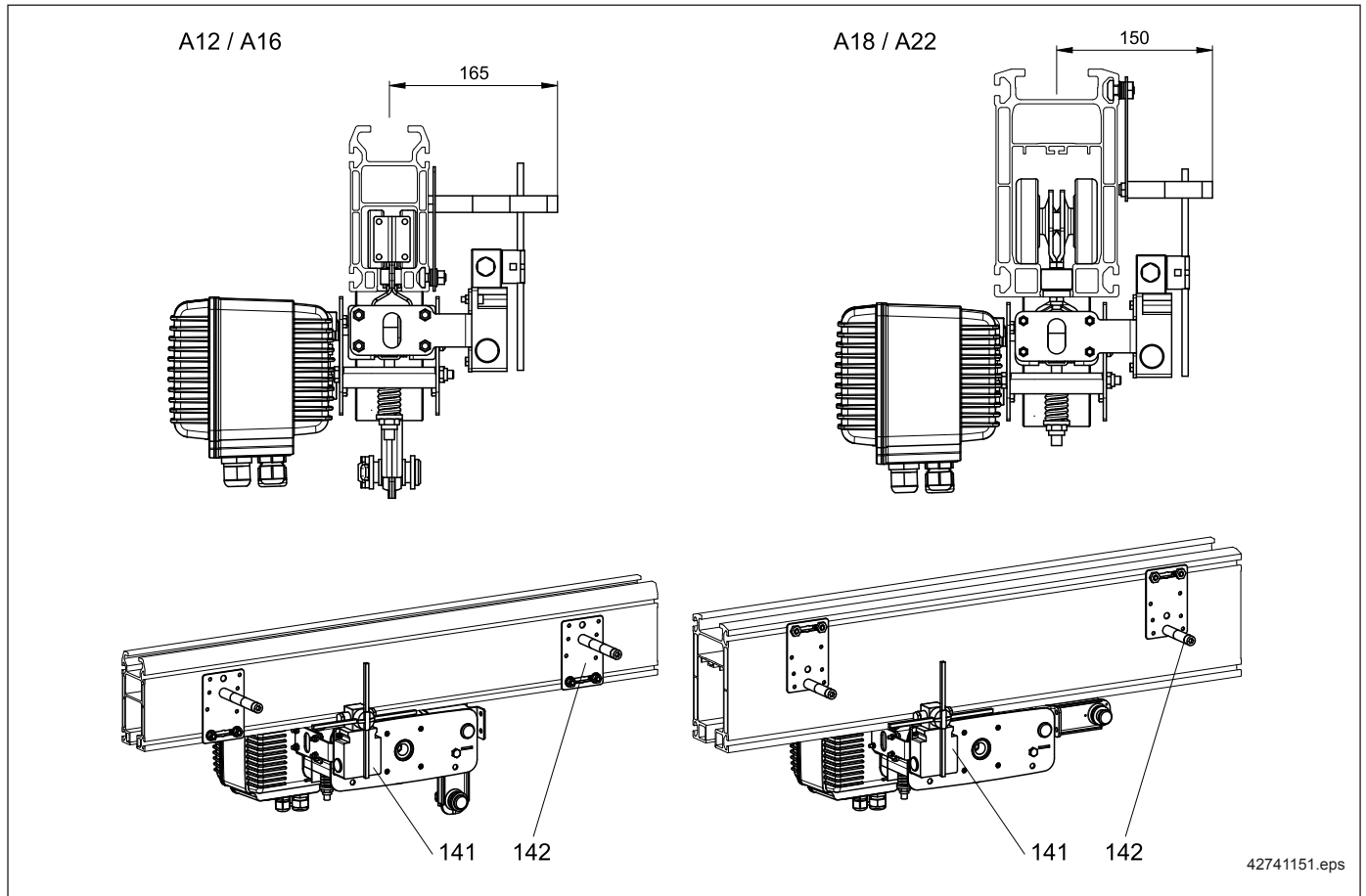
Angle brackets are used to attach a housing (575 381 44) to a tractor trolley when a RF 125 travel drive is also fitted together with an electrically actuated disengaging device.

The control system for the disengaging device can be located in the housing.

## 11.5 Travel limit switches

RF 125 limit switch fitting

(Items 141, 142)



Travel drives

Item	Designation		A12 / A16	A18 / A22
141	Limit switch, cpl.	Weight [kg]	0,85	0,85
		Order no.	851 351 44	851 351 44
142	Switching vane, cpl. (only for single-stage switching for A22)	Weight [kg]	0,39	0,29
		Order no.	517 964 46	517 965 46

Limit switch fittings are designed to be used with RF 125 travel drives on Aluline systems. They can be used for reliable switch-over from fast to slow travel, or from slow travel to the stop function.

This application is utilized when travel against the end stops is to be avoided.

### Crane application

When a limit switch is used with a crane long-travel drive, the signal from the switch is also sent to the second travel drive.

### Contents

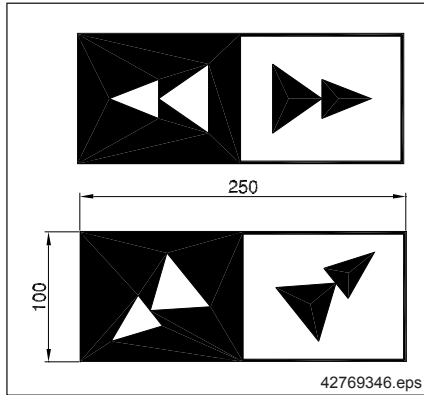
The limit switch cpl. includes the switch, the rail fitting and the electric cable to the drive.

The switching vane cpl. includes **two** switching vanes to actuate the switch incl. the fittings for attachment to the rail.

**Finish:** galvanized

## 11.6 Additional components for wireless control systems

### 11.6.1 Travel direction plates (Item 146)



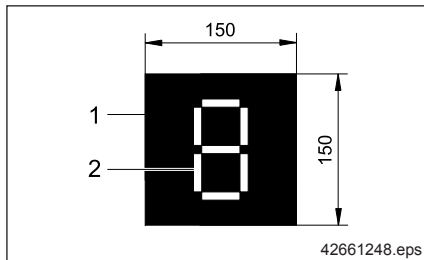
Item	Designation	Use for	Weight [kg]	Order no.
146	Travel direction plates	Cross travel, 2 speeds, stepless	0,03	851 525 44
		Long travel, 2 speeds, stepless	0,03	851 526 44

When wireless control systems are used, travel direction plates must be fitted to the crane for clear assignment of the control buttons to the travel direction.

The adhesive plates shown can be fitted direct to the profile section or to the small mounting bracket (item 93).

**Finish:** Foil, printed yellow/black

### 11.6.2 Identification signs for the installation



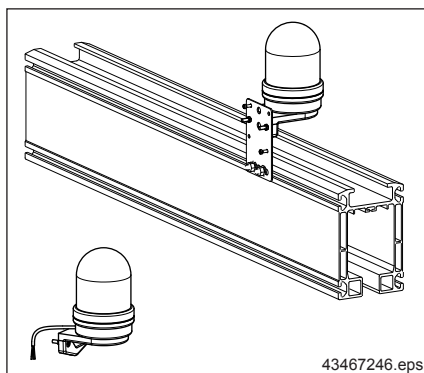
Item	Designation	Weight [kg]	Order no.
	Black carrier foil	-	895 639 44
	Yellow segment	-	895 640 44

Every crane that is operated with wireless control must be identified by means of an easily visible crane identification.

The coding labels are used for illustration of the crane identification on the crab or on the crane. The crane identification illustrated by means of the coding labels must be identical with the crane identification shown in the display of the DRC-DC 6 or DRC-DC 10 hand-held transmitter.

Travel direction symbols on the crane and the crab must identify the movement directions of the travel motions in line with the identification of the keys on the hand-held control system.

### 11.6.3 Warning lamp, set (Item 148)



Item	Designation	Weight [kg]	Order no.
148	Warning lamp, set	0,11	730 496 45

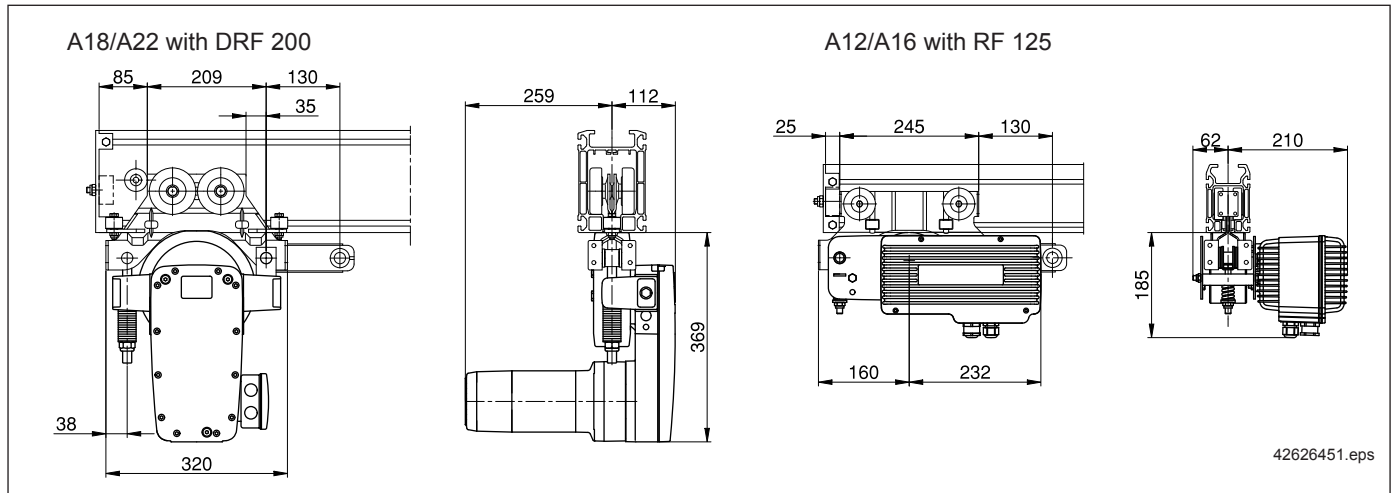
For cranes that have wireless controls, a red warning lamp indicates the crane's state of readiness for operation. The warning lamp set consists of the lamp with base and cable (3 m) prepared for connection to the crane switch contactor in the crane bridge enclosure. The mounting bracket for switches and terminal boxes (item 92) to match the relevant KBK profile section must also be provided.

# 12 Trolleys for travel drives

RF and DRF trolley (item 69)

DRF 200 friction wheel travel drive  
(item 70)

165 trolley coupling (item 71)



Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
69	130 trolley	3,0	855 251 44	4,0	855 095 44
	270 trolley	3,5	855 252 44	4,3	855 096 44
71	165 trolley coupling			0,3	855 142 44

The trolleys shown are suitable for the following drives:

Trolley for KBK Aluline A12/A16: RF 100, RF 125

Trolley for KBK Aluline A18/A22: RF 100, RF 125, DRF 200

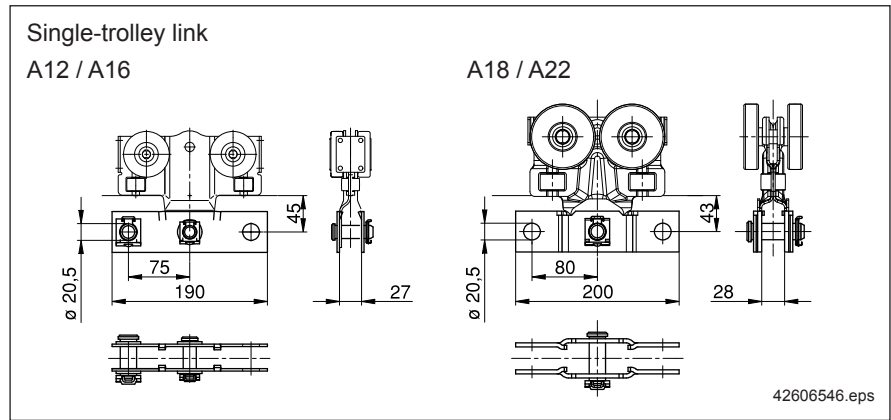
**Finish:** black (RAL 9005)

# 13 Link and spacer bars

Single-trolley links, hinged blocks, link bars or spacer bars can be used to connect trolleys and travel drives for any trolley combinations.

The travel drive must always be connected to the load trolley.

## 13.1 Single-trolley link (Item 61)

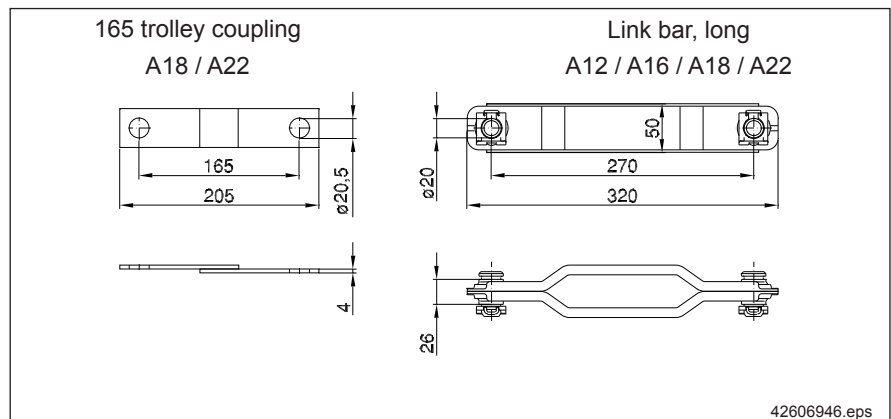


Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
61	Single-trolley link	0,7	855 070 44	0,8	855 205 44

The link provides an additional means for connecting spacer bars, buffers and travel drives to trolleys with a suspended load.

**Finish:** black (RAL 9005), steel

## 13.2 165 trolley coupling/ long link bar (Item 71)



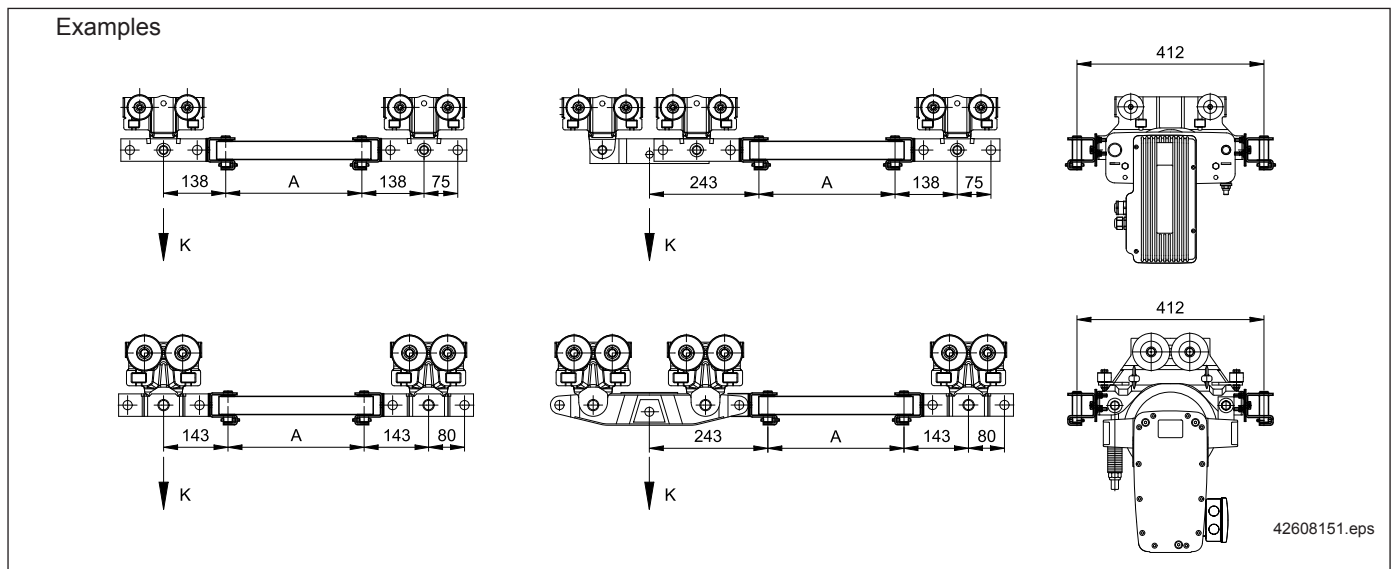
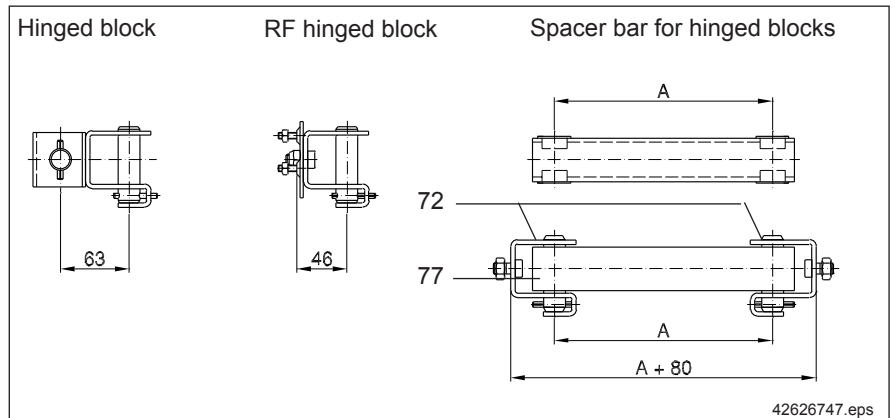
Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
71	165 trolley coupling			0,3	855 142 44
	Link bar, long	0,9	982 345 44	0,9	982 345 44

165 trolley couplings are used to connect friction wheel units in KBK Aluline A18/A22 crab frames.

Long link bars can be used for any trolley combinations and special applications.

**Finish:** black (RAL 9005), steel

### 13.3 Articulated spacer bar (Items 72, 73)



Item	Designation	Fitted to	Dimensions		Weight [kg]	Order no.
			A min.	A max.		
72	Hinged block	Single-trolley link	-	-	0,75	982 402 44
	RF hinged block	Trolley for RF/DRF	-	-	0,64	982 399 44
73	Spacer bar for hinged blocks	Hinged block	70	2500	5,0/m	850 337 44

Spacer bars are used to distribute loads safely by separating several monorail hoist trolleys running on the same track. The spacer bar length is determined according to the information given in sections 3.3-3.5. The dead weight of the spacer bar must be included in load K when selecting the monorail. RF travel drives must always be connected to the load trolley.

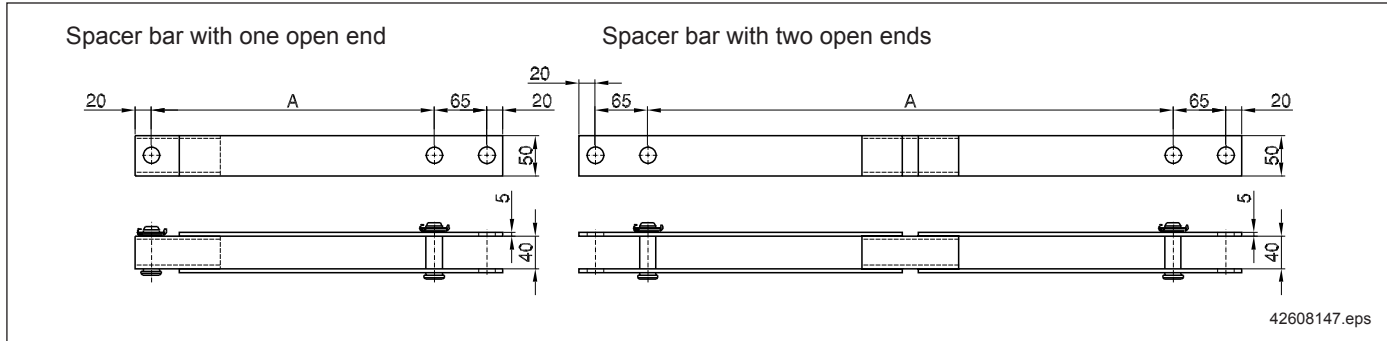
**Finish:** Metal parts black (RAL 9005); pins, nuts and bolts galvanized

**Example for ordering:**

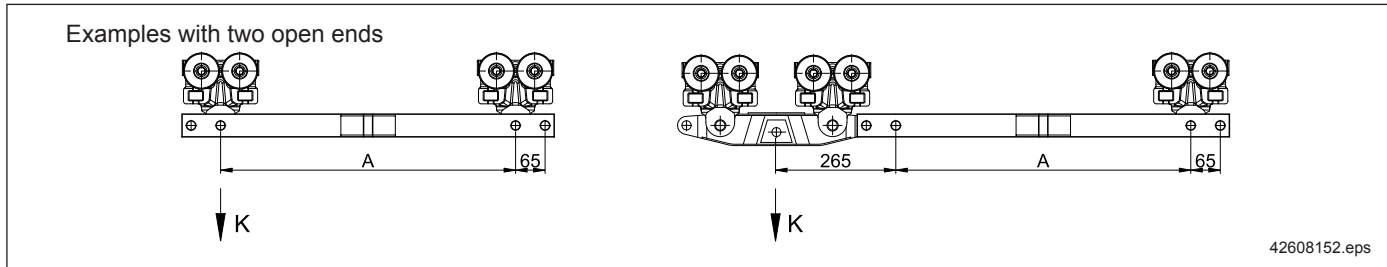
2 off hinged block, order no. 982 402 44

1 off spacer bar for hinged blocks, A = 700 mm, order no. 850 337 44

### 13.4 Spacer bars for straight track, KBK Aluline A18/A22 (Item 76)



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Item	Designation	Fitted to	Dimensions		Weight [kg]	Order no.
			A min.	A max.		
76	Spacer bar with one open end	Spacer bar, trolley	350	3500	4,8 / m + 0,5	Standard drawing
	Spacer bar with two open ends	Single trolley, load bar	650	3500	4,8 / m + 1,0	Standard drawing

Spacer bars are used to distribute loads safely by separating several monorail hoist trolleys, single or double-girder cranes running on the same track. The dead weight of the spacer bar must be included in load K when selecting the monorail.

**Finish:** Metal parts black (RAL 9005); pins, nuts and bolts galvanized

**Examples for ordering:**

- 2 off spacer bar with one open end, A = 3000 mm
- 2 off spacer bar with two open ends, A = 2800 mm





# 14 Buffers and end stops

Limit stops with rubber buffers, end caps with rubber buffers, cellular foam buffers or shock absorbers can be used to limit long and cross-travel motions in KBK Aluline installations.

In order to lessen the impact forces of several monorail hoists or cranes on the same track and/or to reduce the noise of impact, buffers should be provided between the trolleys or cranes.

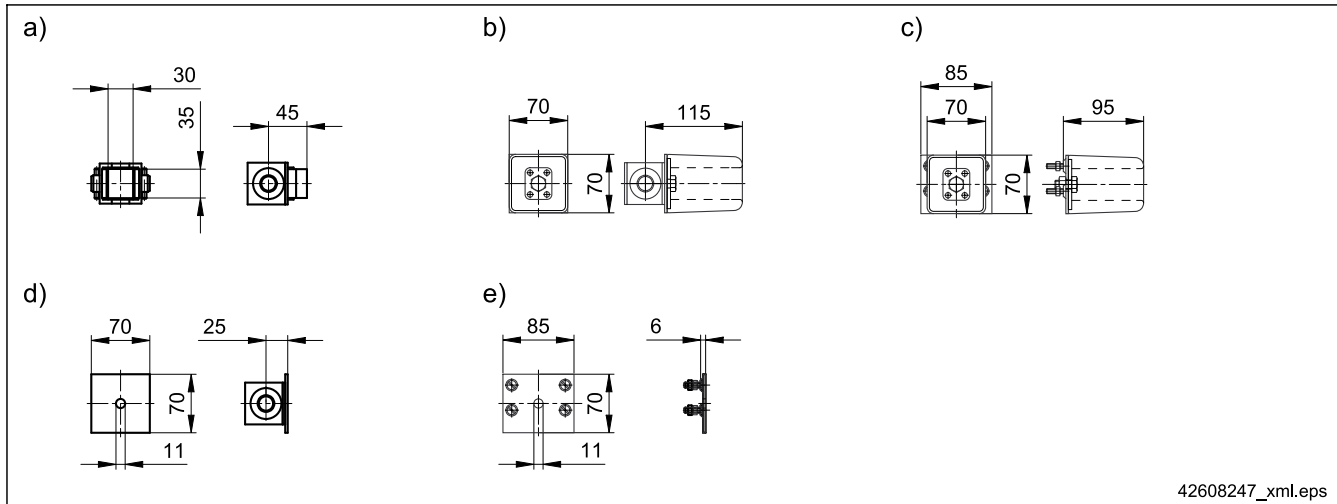
For push travel hoist trolleys and cranes, rubber buffers are used for normal operating conditions, and foamed plastic buffers for a high degree of impact absorbency (buffer against buffer plate).

Electrically or pneumatically driven hoists and cranes are fitted with foamed plastic buffers (plastic buffer against buffer plate). Where travel speeds exceed 21 m/min, the ends facing each other must be fitted with identical buffers (foamed plastic buffer against foamed plastic buffer).

## 14.1 Buffers on crabs and cranes outside the profile section

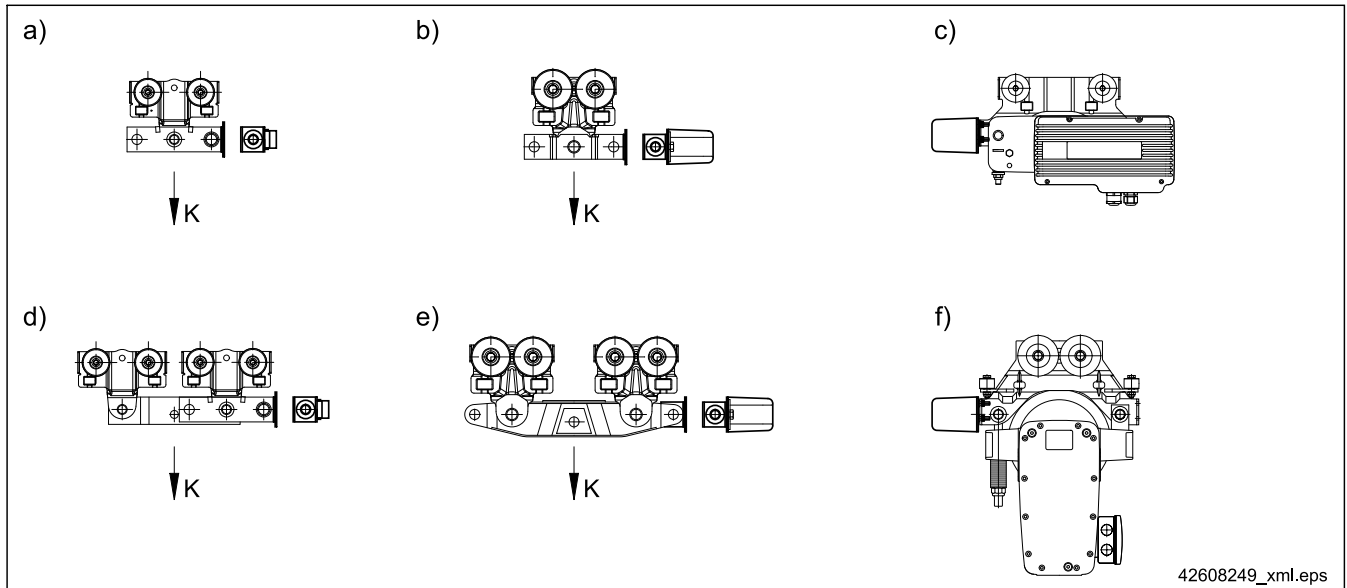
- Rubber stop (item 98)
- Buffer fitting (foamed plastic) (item 98)
- Buffer plate (item 98)
- RF buffer fitting (foamed plastic) (item 98)
- RF buffer plate (item 98)

### KBK buffer components



Item	Designation	Fitted to	Weight [kg]	Order no.
98	Rubber end stop a	Single-trolley link, load bar, spacer bar with two open ends, spacer bar with one open end	0,44	982 395 44
	Buffer fitting (foamed plastic) b		0,80	982 378 44
	Buffer plate d		0,49	982 377 44
	RF buffer fitting (foamed plastic) c	RF 100, RF 125 and DRF 200 trolley	0,45	982 375 44
	RF buffer plate e		0,17	982 374 44

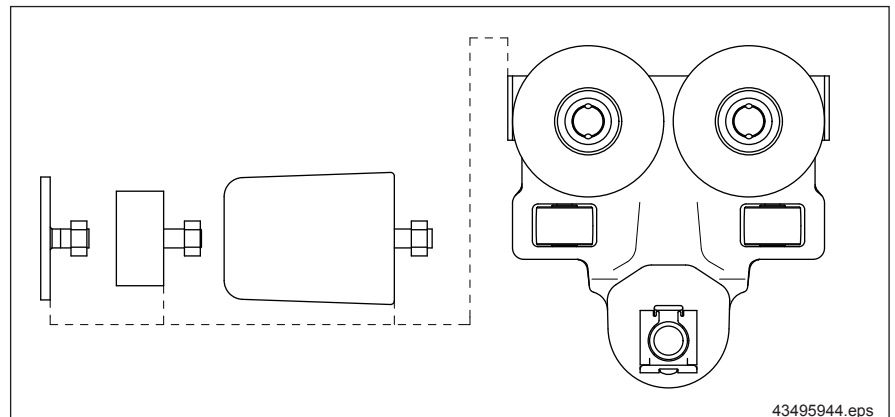
### KBK buffer examples



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a)	Buffer plate or buffer fitted to Aluline A12/A16 single-trolley link
b)	Buffer plate or buffer fitted to Aluline A18/A22 single-trolley link
c)	RF buffer fitted to RF trolley
d)	Buffer plate or buffer fitted to Aluline A12/A16 double-trolley link
e)	Buffer plate or buffer fitted to Aluline A18/A22 load bar
f)	RF buffer fitted to DRF trolley

### 14.2 Buffer on A18/A22 single trolley inside the profile section



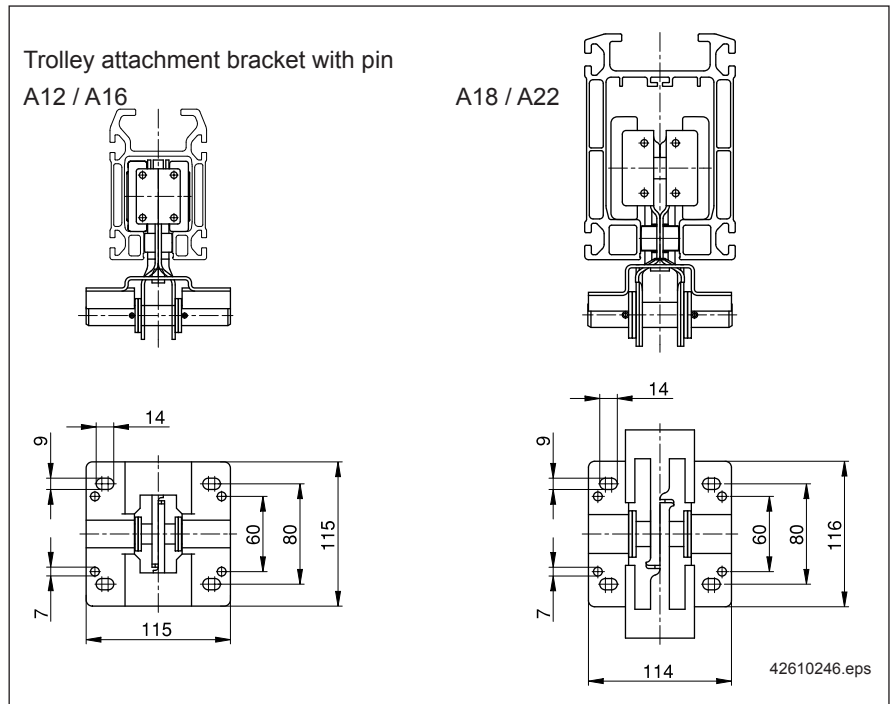
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The following parts can be attached direct to a A18/A22 single trolley:

Item	Designation	A18 / A22	
	Stop plate	Weight [kg]	
		Order no.	855 670 44
	Rubber buffer	Weight [kg]	
		Order no.	855 062 44
	Cellular plastic buffer	Weight [kg]	
		Order no.	855 695 44

# 15 Fittings

## 15.1 Trolley attachment bracket with pin (Item 53)

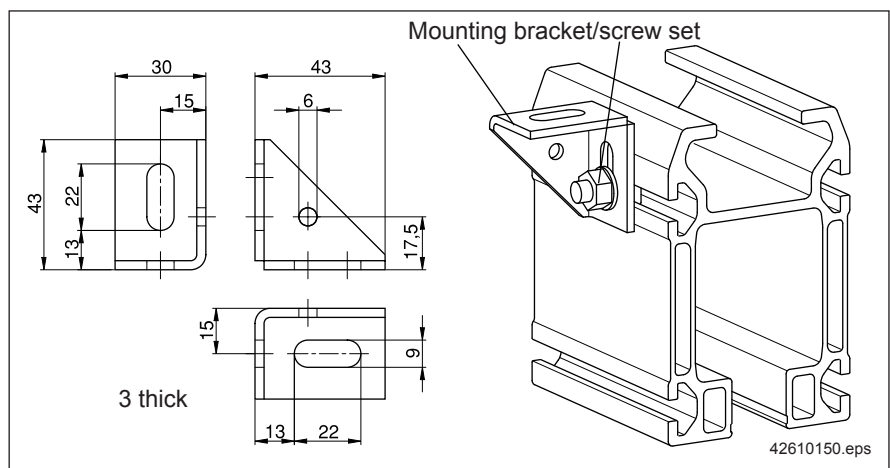


Item	Designation	A12 / A16		A18 / A22	
		Weight [kg]	Order no.	Weight [kg]	Order no.
53	Trolley attachment bracket with pin	0,48	980 041 44	0,66	982 041 44

Trolley attachment brackets with pins make it possible to attach towing arms, current collectors, switches, small terminal boxes, counterweights and similar parts. Offset fittings must be balanced by counterweights or by loading the trolley to prevent it from tilting.

**Finish:** black (RAL 9005)

## 15.2 Mounting bracket/ screw set (Item 89)



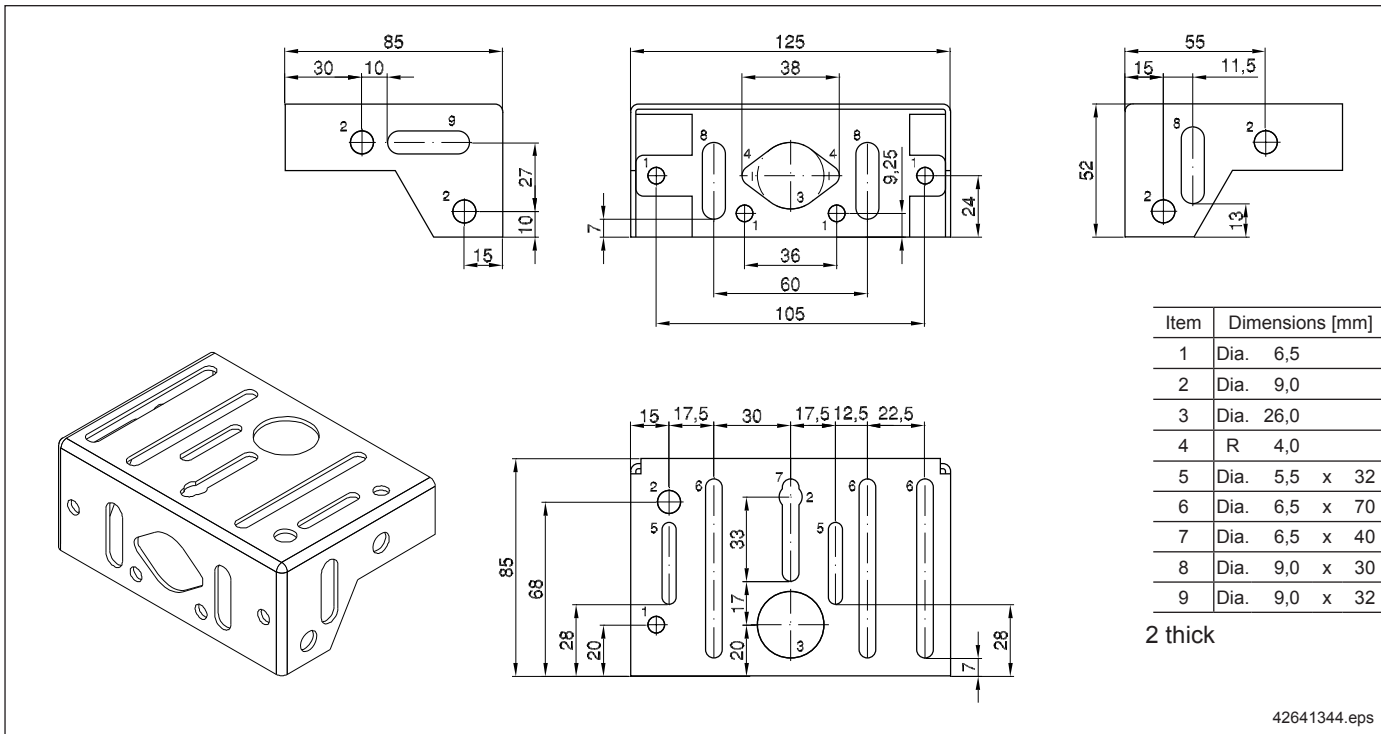
Item	Designation	Weight [kg]	Order no.
89	Attachment bracket	0,07	712 275 47
	M8 x 20 screw set	0,02	712 325 47

The mounting bracket is used together with the screw set as a means of universal fastening for various fittings. However, it must not be used as a load bearing suspension element.

**Finish:** galvanized

### 15.3 Mounting plates

#### 15.3.1 Mounting plate 1 for switch and magnet fittings (Item 95)

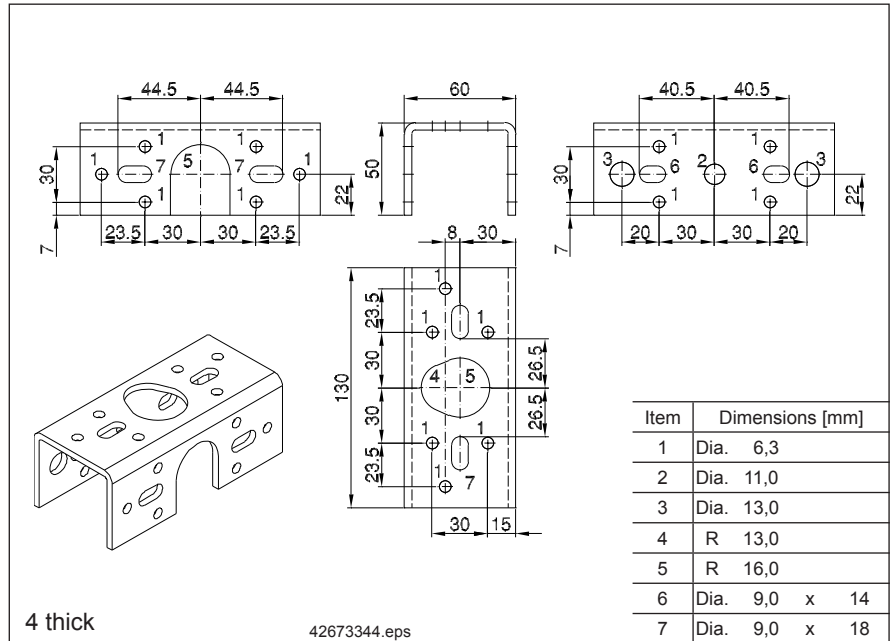


Item	Designation	Weight [kg]	Order no.
95	Mounting plate 1	0,26	505 753 44

Finish:: galvanized



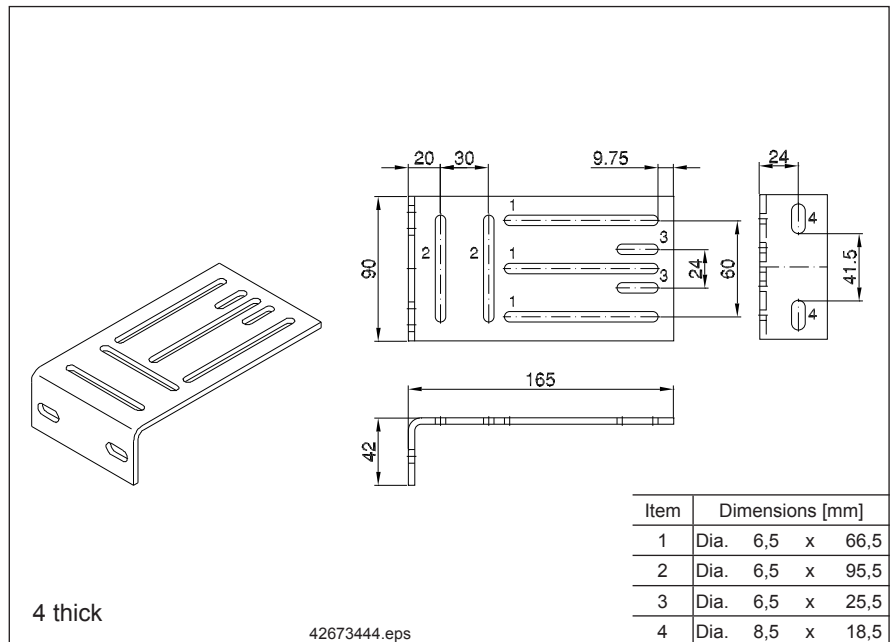
**15.3.3 Mounting plate 3**  
**U-plate**  
**(Item 95)**



Item	Designation	Weight [kg]	Order no.
95	Mounting plate 3	1,1	385 554 46

**Finish:** galvanized

**15.3.4 Mounting plate 4**  
**L-plate**  
**(Item 95)**



Item	Designation	Weight [kg]	Order no.
95	Mounting plate 4	0,38	622 533 46

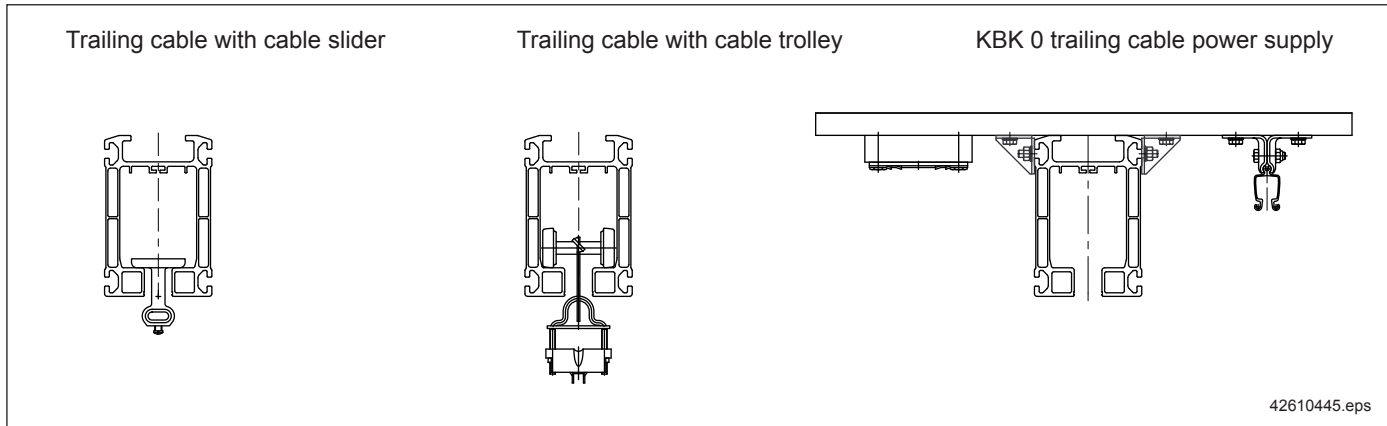
**Finish:** galvanized

# 16 Power supply to crabs and cranes

## 16.1 Electric power supply

### 16.1.1 Trailing cable, General information

A cable (4 x 1,5) running on cable sliders and larger or several cables running on cable trolleys in the Aluline section is the most economical power supply system. Alternative: Cable trolleys running in KBK 0 rail, fitted to the side of the Aluline section.



#### Runways

Cable sliders are used for one cable on tracks with simple electric power supplies to the trolley or to the crane.

Cable trolleys should be used for longer tracks, electric long and cross-travel drives and when flat cables with outside dimensions greater than 8 mm x 19 mm or when several flat cables are used.

#### Cable length

The required cable length is calculated as follows:

Track and crane girder length (m) x 1,2 + supply cable length (m)

#### Number of sliders or cable trolleys

The quantity of sliders or cable trolleys required for a crane or track is calculated taking into consideration cable sag and track or crane girder length.

Max. trailing cable length with cable sliders: 30 m

Max. trailing cable length with cable trolleys: 50 m

Required quantity of sliders or trolleys n:

$$n = \frac{\text{Track or crane girder length [m]}}{\text{Cable sag [m]} \times 2} - 1$$

#### Approach dimension

The approach dimension of the crane or travelling hoist is increased by the distance required for close accumulation of cable sliders and cable trolleys. An internal buffer stop should be fitted to protect the accumulated sliders or trolleys.

For KBK Aluline installations with KBK 0 fitted on the side, the approach dimension can be reduced by arranging the cable trolley accumulating section next to the crane or travelling hoist, or by extending the KBK 0 rail beyond the end of the track.

#### Two trolleys or cranes on one track

If two hoists operate on one monorail track or two cranes on one runway, power supply via one flat cable for each of them from opposite monorail or runway ends may be provided.

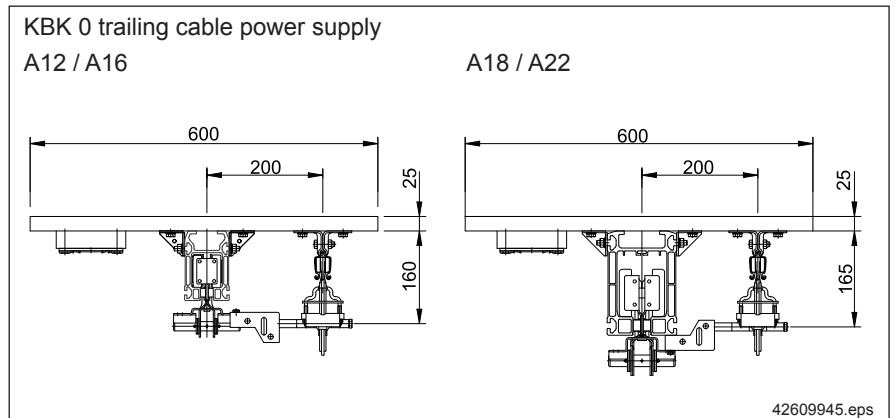
See technical data sheet 202 617 44 for details (KBK 0, KBK 25; KBK 100 trailing cable power supply).

#### More than two trolleys or cranes on one track

Power supply by flat cable is not possible if more than two travelling hoists or two cranes operate on one runway. In these cases, power must be supplied via a conductor line.



## External KBK 0 trailing cable power supply

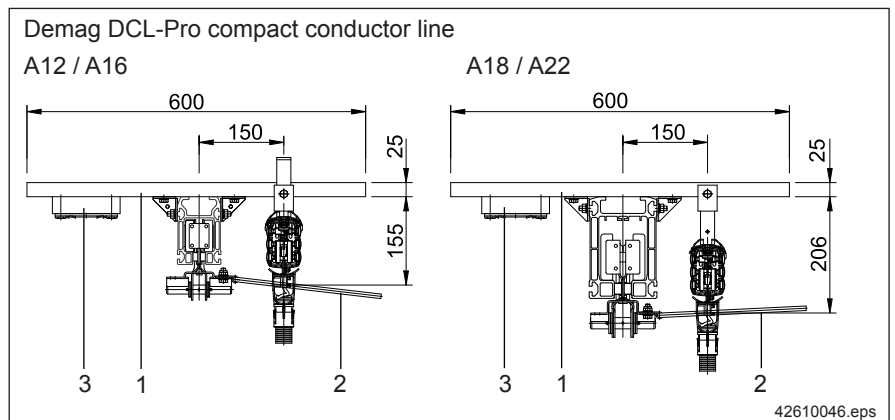


Power supply

A trailing cable power supply system arranged at the side of the Aluline rail can reduce the approach dimension and the section required to accumulate the cable trolleys can extend beyond the end of the track.

See technical data sheet 202 617 44 for details.

## 16.1.2 External Demag DCL-Pro compact conductor line



A conductor line is arranged at the side of the Aluline rail if more than two travelling hoists or two crane girders run on one track. Conductor lines offer good protection against moisture and mechanical damage.

Type of enclosure: IP 23; permissible voltage: 500 V; temperature range: 0 °C to +70 °C.

For details, see:

Technical data 203 387 44 (Demag DCL-Pro compact line),

Technical data 203 510 44 (DCL-Pro on KBK).

## Items required for fitting to Aluline rails

Item	Anbau KBK 0 and DCL-Pro on Aluline	Weight [kg]	Order no.
(1)	600 C-rail fitting	1,6	855 099 44
	Towing arm fitting for DCL-Pro current collector		Standard drawing <sup>1)</sup>
(2)	Towing arm fitting for KBK 0/A12/A16 towing trolley	0,9	855 104 44
	Towing arm fitting for KBK 0/A18/A22 towing trolley	1,1	855 105 44
(3)	C-rail counterweight fitting		Standard drawing <sup>1)</sup>

1) See technical data 203 510 44

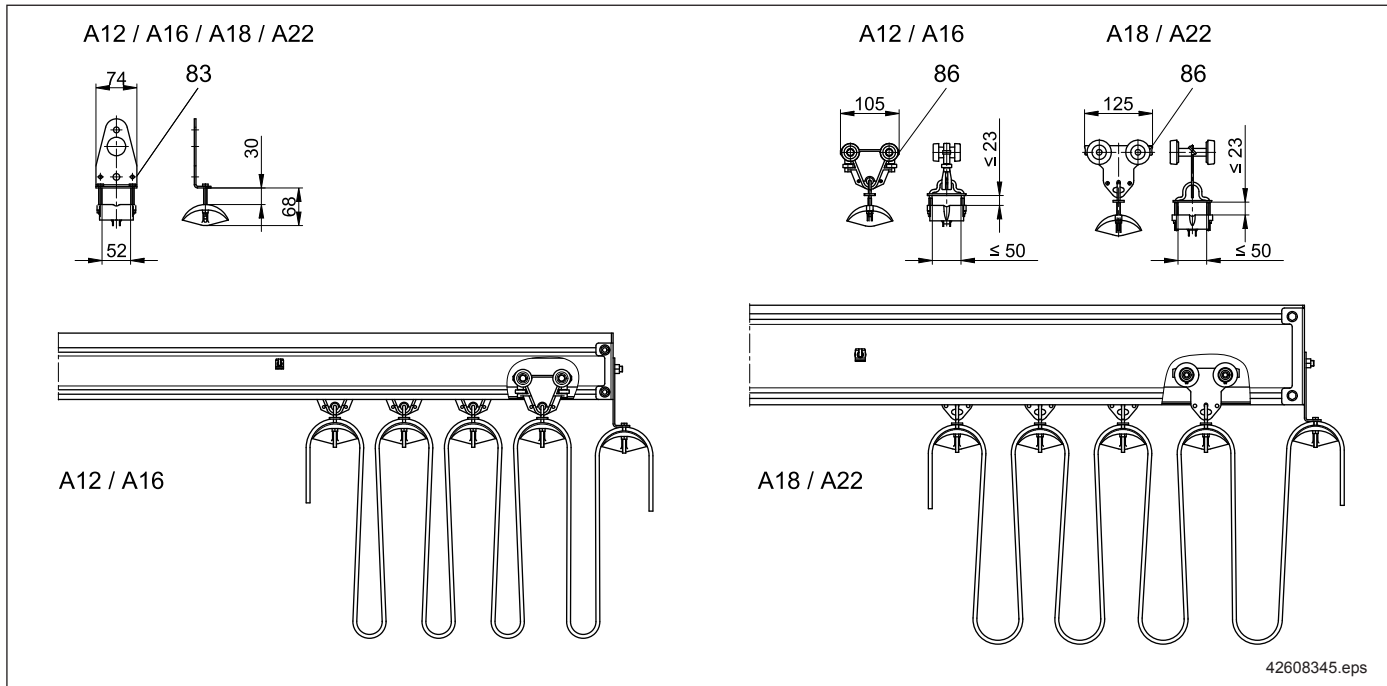
**16.1.3 Trailing cable, components and fittings**

**Rail end cable clamp (item 83)**

**Flat cable with PE (item 84)**

**Cable slider (item 85)**

**Cable trolley (item 86)**



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Item	Designation	No. of conductors x rated cross-section [mm <sup>2</sup> ]	External dimension [mm]	A12 / A16		A18 / A22	
				Weight [kg]	Order no.	Weight [kg]	Order no.
83	Rail end cable clamp			0,23	855 220 44	0,23	855 220 44
84	Flat cable with PE	4 x 1,5	19 x 8	0,21/m	471 352 44	0,21/m	471 352 44
		4 x 2,5	21 x 8	0,26/m	504 208 44	0,26/m	504 208 44
		8 x 1,5	33 x 8	0,35/m	504 226 44	0,35/m	504 226 44
		13 x 1,5	31 x 12	0,55/m	895 171 44	0,55/m	895 171 44
85	Slider	only for flat cable		-	-	0,04	851 850 44
86	Cable trolleys	4 x 1,5		0,22	982 470 44	0,50	855 085 44

Rail end cable clamps are bolted to the end cap with buffer. This provides strain relief of the flat cable to the terminal box and a favourable fixing point for the cable between the crane girder and track.

The plastic-sheathed flat cable (cold-resistant) may be used in buildings with a dry or humid atmosphere, or in the open. Flat cable is flexible in one plane.

Cable sliders with a cable locking screw are suitable for one flat cable with maximum overall dimensions of 19 mm x 8 mm. They are made of temperature-resistant plastic.

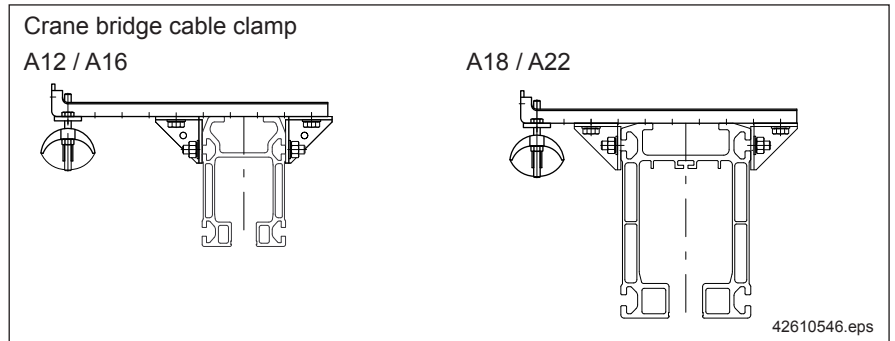
Cable trolleys can be used to support cables, compressed air or water hoses. Additional holes can be drilled for fixing stress-relief strainers.

Temperature range for flat cable, slider and cable trolley: 0 °C to +50 °C.

**Finish:**

Rail end cable clamp:	galvanized
Cable slider:	plain plastic
Clamping plate:	black plastic
A12/A16 cable trolley:	black plastic
A18/A22 cable trolley:	galvanized

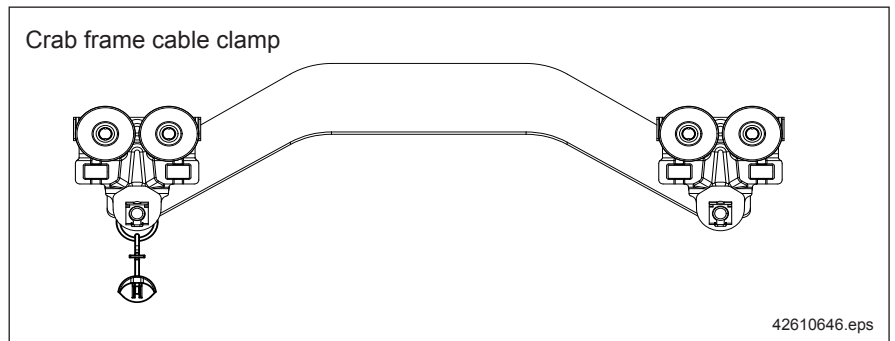
**Crane bridge cable clamp (item 80)**



Item	Designation	A12 / A16 / A18 / A22	
		Weight [kg]	Order no.
80	Crane bridge cable clamp	0,6	855 106 44

Crane bridge cable clamps are used for push-travel single/double-girder cranes to prevent the flat cable running from the crane runway to the crane girder from being subjected to side pull.

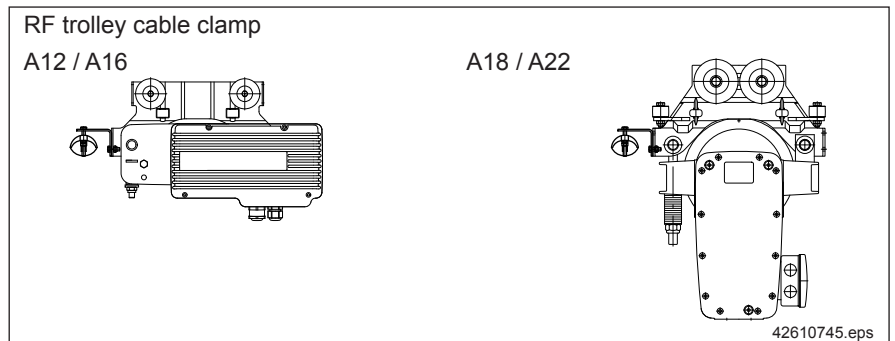
**Crab frame cable clamp (item 81)**



Item	Designation	A12 / A16 / A18 / A22	
		Weight [kg]	Order no.
81	Crab frame cable clamp	0,1	982 577 44

Crab frame cable clamps are suspended from the trolleys of push-travel crab frames to relieve the pull on the hoist terminals.

**RF trolley cable clamp (item 82)**

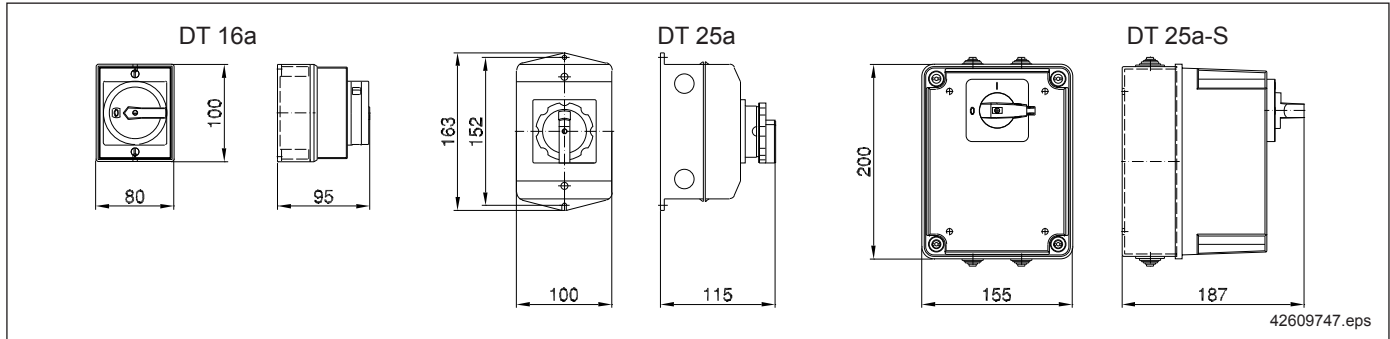


Item	Designation	A12 / A16 / A18 / A22	
		Weight [kg]	Order no.
82	RF trolley cable clamp	0,6	982 578 44

RF trolley cable clamps are fitted to electric-travel hoists/cranes to relieve the pull on the terminals.

**16.1.4 Mains connection switch/  
isolating switch  
(Item 88)**

Power supply



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Item	Designation	Size	Voltage [V]	Current [A]		
88	Isolator switch	DT 16a	≤ 500	max. 20	Weight [kg]	0,32
					Order no.	575 479 44
		DT 25a	≤ 690	max. 25	Weight [kg]	0,40
					Order no.	575 480 44
		DT 25a-S			Weight [kg]	1,41
					Order no.	473 037 44

**Fuse links and inserts for DT 25a-S**

Rated current [A]	D fuse link, delayed action Order no.	D screw-in adapter for fuse insert Order no.
6	451 663 99	504 905 99
10	451 643 99	504 906 99
16	451 644 99	504 907 99
20	451 645 99	504 908 99
25	451 646 99	504 909 99

Switch-isolators are suitable for use as mains connection or isolating switches.

Mains connection switch: Stationary switch-isolator for a crane installation with one or more cranes/travelling hoists.

Isolator: On-board switch-isolator on cranes or travelling hoists on a common power supply line (conductor line).

Switch-isolators can be locked in the OFF (0) position against unauthorized restoration of the power supply by up to three padlocks.

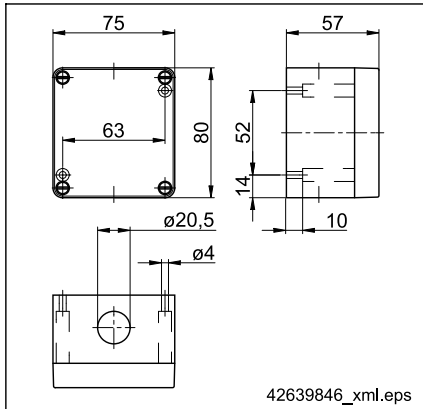
Two M20 x 1,5 cable entries are available. type of enclosure IP 55.

DT 16a switch-isolator without fuses;

DT 25a switch-isolator without fuses;

DT 25a-S switch-isolator with fuse base for 3 fuses.

**16.1.5 Terminal box  
(Item 94)**



Item	Designation		
94	Terminal box	Weight [kg]	0,40
		Order no.	504 650 44

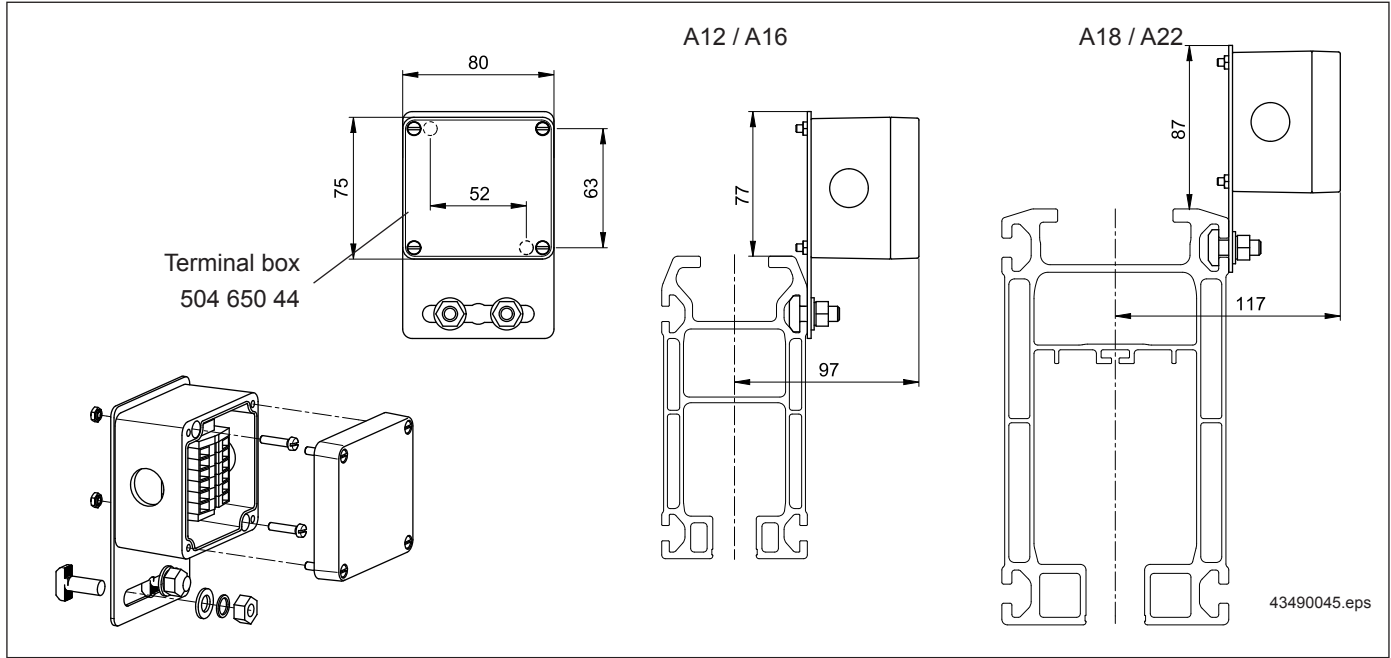
A terminal box must be provided as the junction with the fixed round-section cable when flat cables are used to supply power to KBK installations.

For cable sets, see section 17.3.

**Finish:** Aluminium enclosure with 6 modular spring-loaded terminals (grey) (up to 2,5 mm<sup>2</sup>) fitted on mounting rail, light grey (RAL 7035).

**16.1.6 Mounting brackets for switches and terminal boxes**

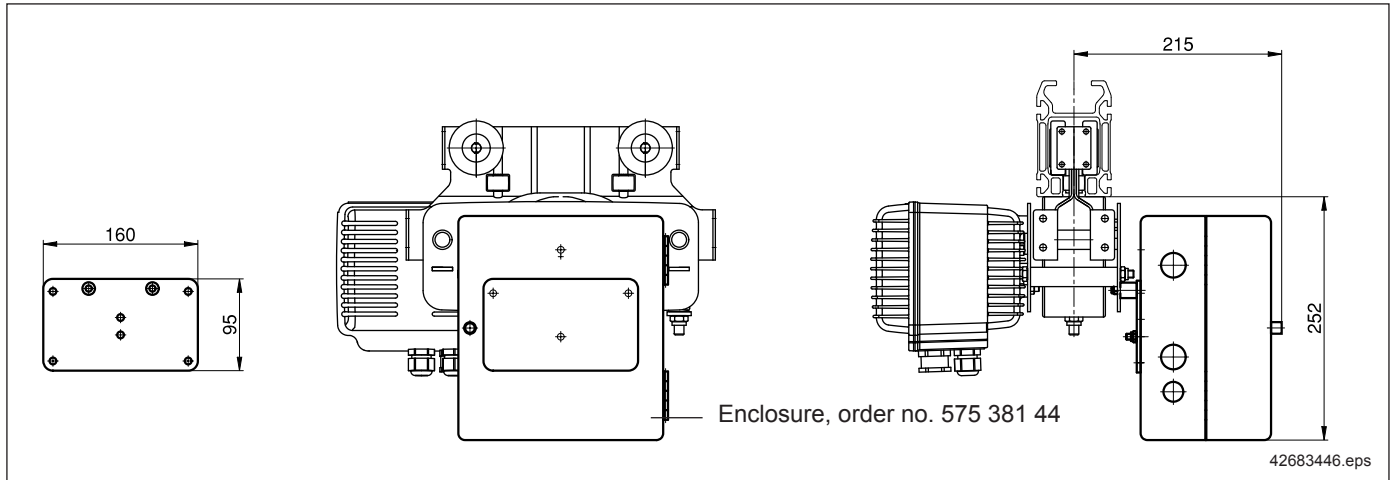
**Mounting bracket for terminal box  
(Item 92)**



Item	Designation	Weight [kg]	Order no.
92	Mounting bracket for terminal box	0,17	855 215 44

**Finish:** galvanized

**Mounting bracket for enclosure on RF 125  
(Item 92)**

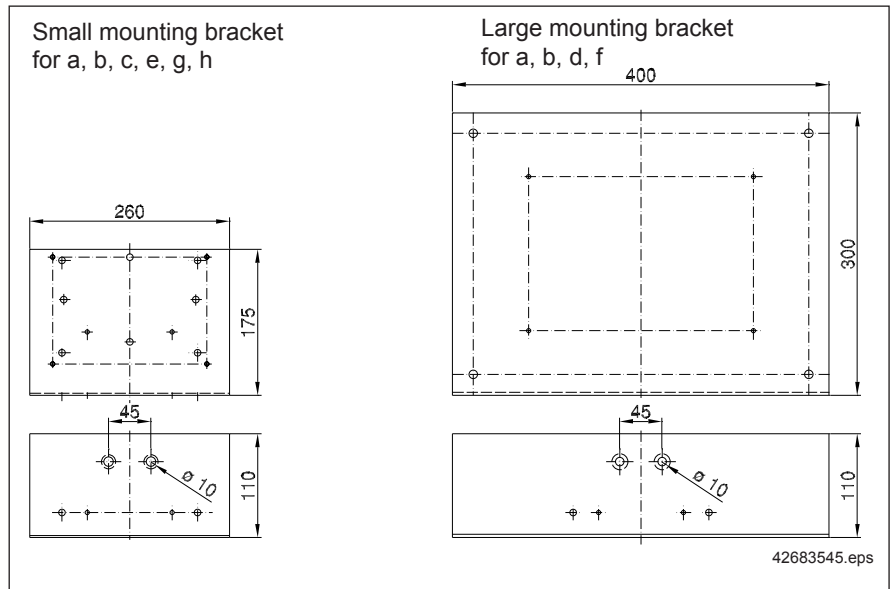


Item	Designation	Weight [kg]	Order no.
92	RF 125 enclosure mounting bracket	0,6	851 270 44

The mounting bracket is used to attach the enclosure, order no. 575 381 44.

**Finish:** black

**Attachment bracket  
(Item 93)**

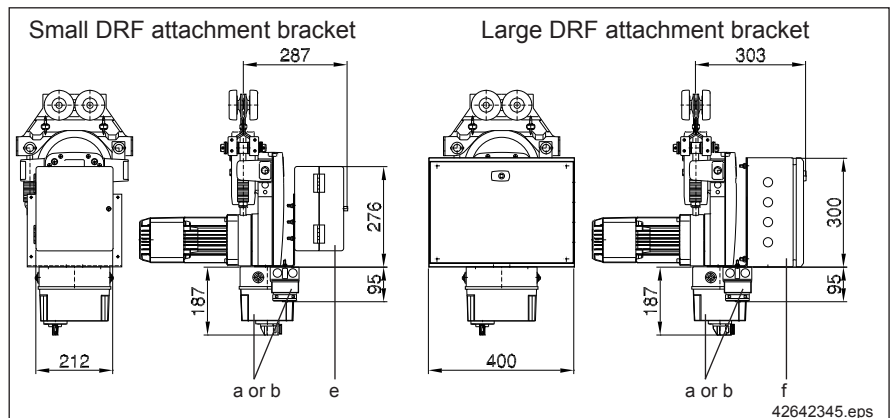


Item	Designation	Weight [kg]	Order no.
93	Small mounting bracket	0,9	851 222 44
	Large mounting bracket	3,9	851 220 44

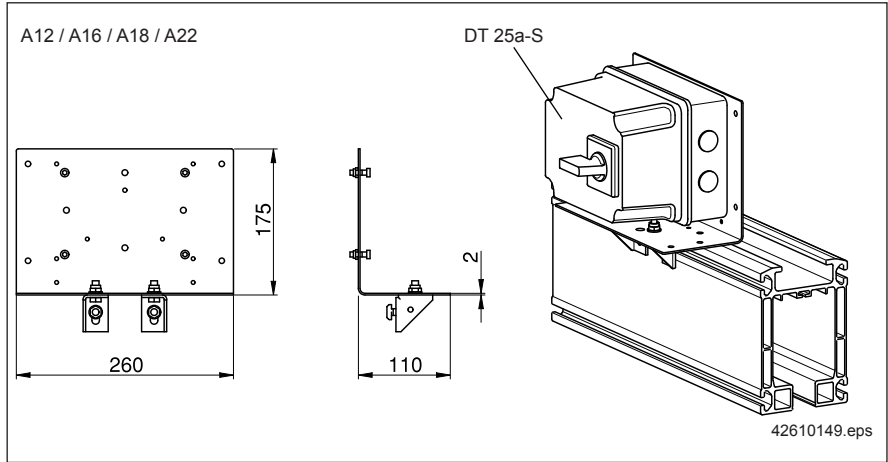
Item	Designation		Order no.	
a		DT 16 a	575 479 44	
b	Mains connection/isolating switch	DT 25 a	575 480 44	
		DT 25 a-S	473 037 44	
		180 x 130 x 75	575 351 44	
c	Terminal box	255 x 180 x 75	575 352 44	
e	Housing		575 381 44	
	Crane bridge enclosure	232 x 212 x 137	772 078 45	
f	Housing		575 382 44	
	Crane bridge enclosure 2	400 x 300 x 155	772 178 45	
g	Receiver	DRC-MP	773 432 44	
h	Terminal E box 185 x 163 x 102	Universal E box	772 167 45	
		3T3	772 174 45	
		Terminal box	Manual crab	772 175 45
		DC/diode	772 165 45	
		Polu-Box	772 280 45	
		3TK	772 176 45	
		Signal converter	KT3	772 177 45
		DT3	772 166 45	

**Finish:** galvanized

**Example: fitted to DRF**



**Bracket for isolator switch  
(Item 90)**

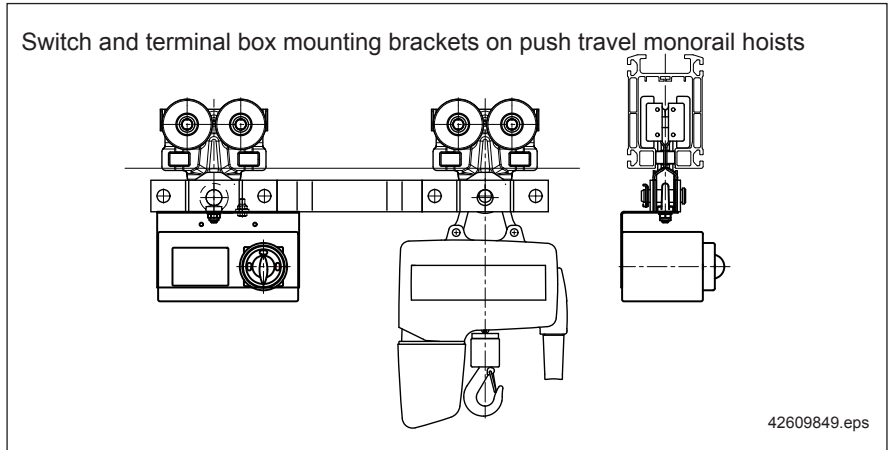


Item	Designation	Weight [kg]	Order no.
90	Bracket for isolator switch	0,7	855 152 44

The bracket for isolator switches is used to accommodate isolator switches and terminal boxes. See small mounting bracket for possible connections.

**Finish:** galvanized

**Switch and terminal box fittings  
(Item 90)**



Item	Designation	Weight [kg]	Order no.
90	Switch bracket	0,75	851 223 44

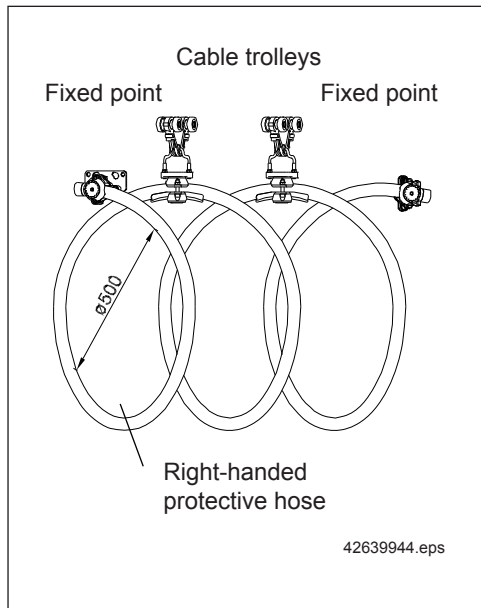
Switch brackets are required when several push-travel monorail trolleys are used with a common power supply on one track.

A mounting bracket consists of a bracket, eye with nut for suspension, and fastening material for the enclosure/switch. It may be necessary to drill additional holes for the enclosure when it is fitted to the mounting bracket. See small mounting bracket for possible connections.



## 16.2 Pneumatic power supply

### 16.2.1 General information



Special power supply lines are required for pneumatic load lifting modules such as Demag D-BP rope balancers.

In some applications, electric power is required in addition to pneumatic energy (e.g. for manual force control of the Demag rope balancer).

The supply lines are laid in a protective hose and attached to special points of the crane runway and to the crane girder as well as to cable trolleys. The helical protective hose is always right-handed and has a sag of approx. 500 mm.

Length of the protective hose = Travel path [m] x 1,3 + connecting length on both sides [m]

Number of cable trolleys = Length of travel path (rounded off to full metres) - 1

Length of cable accumulating section = Number of cable trolleys + reserve x length of cable trolley

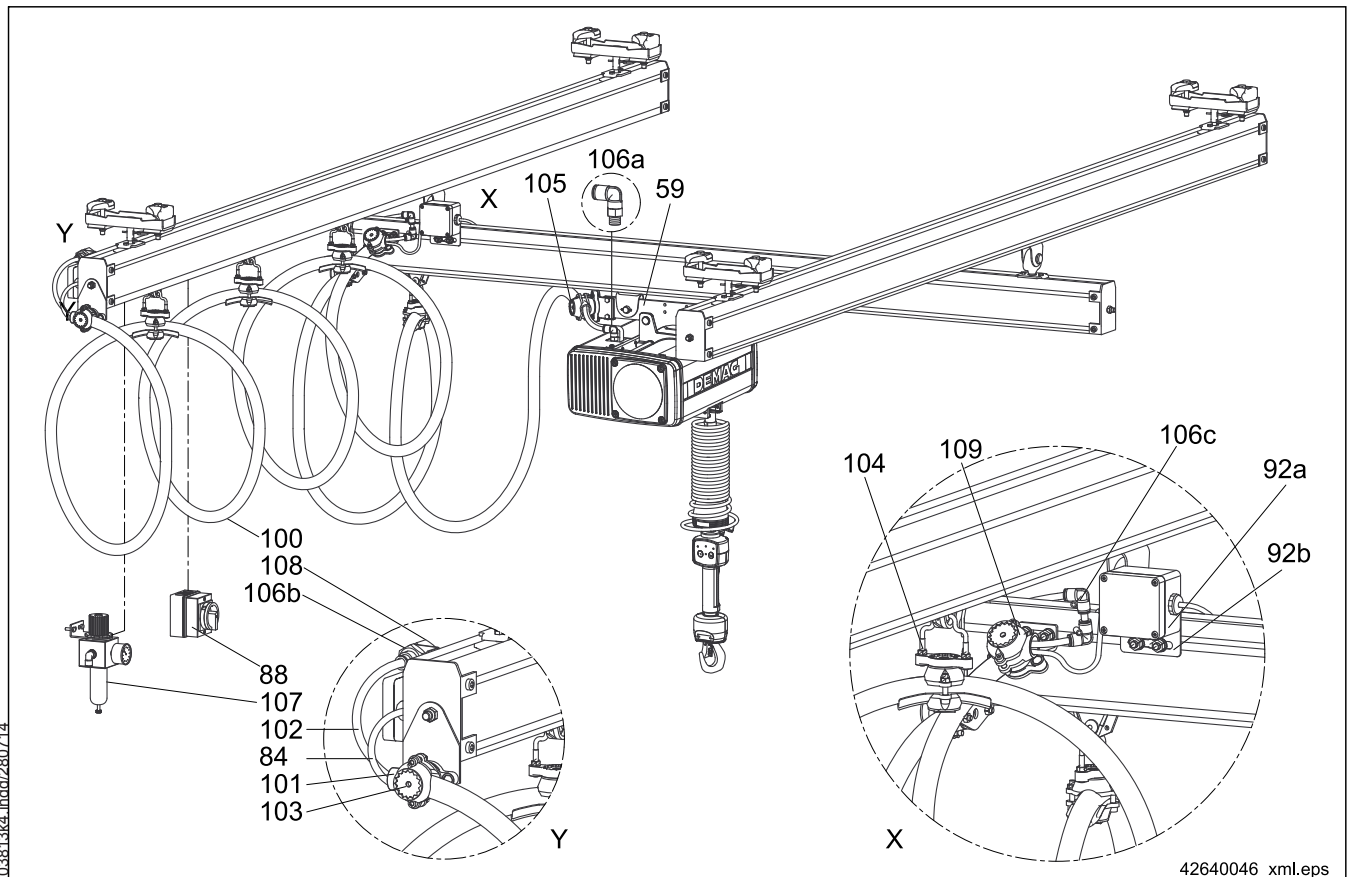
**Example:**  
KBK Aluline A12/A16 single-girder suspension crane (classic)

Separation of power supply:

Transfer point → crane bridge/crane track  
(Detail X)

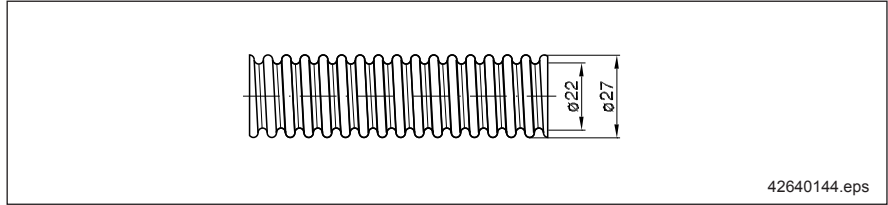
Power supply interface:

End of crane track  
(Detail Y)



### 16.2.2 Components

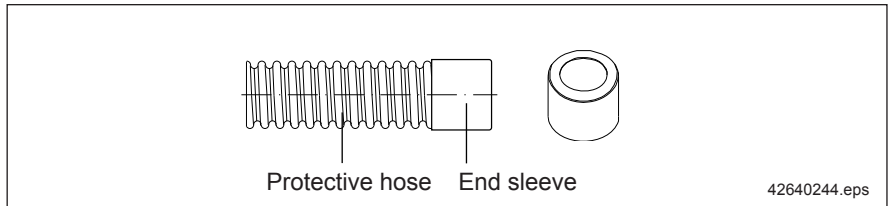
#### Protective hose (Item 100)



Item	Designation	Weight [kg/m]	Order no.
100	Protective hose	0,29	343 836 44

**Finish:** Outer sheath: PVC (grey)  
Internal spiral: PVC-coated spring steel wire

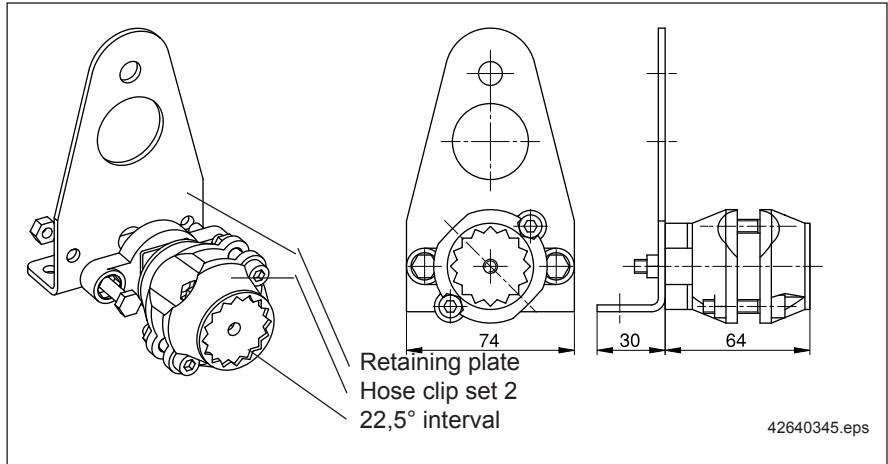
#### End sleeve for protective hose (Item 101)



Item	Designation	Weight [kg]	Order no.
101	End sleeve for protective hose	0,003	343 837 44

**Finish:** plastic (grey)

#### Mounting bracket with hose clip (Item 103)

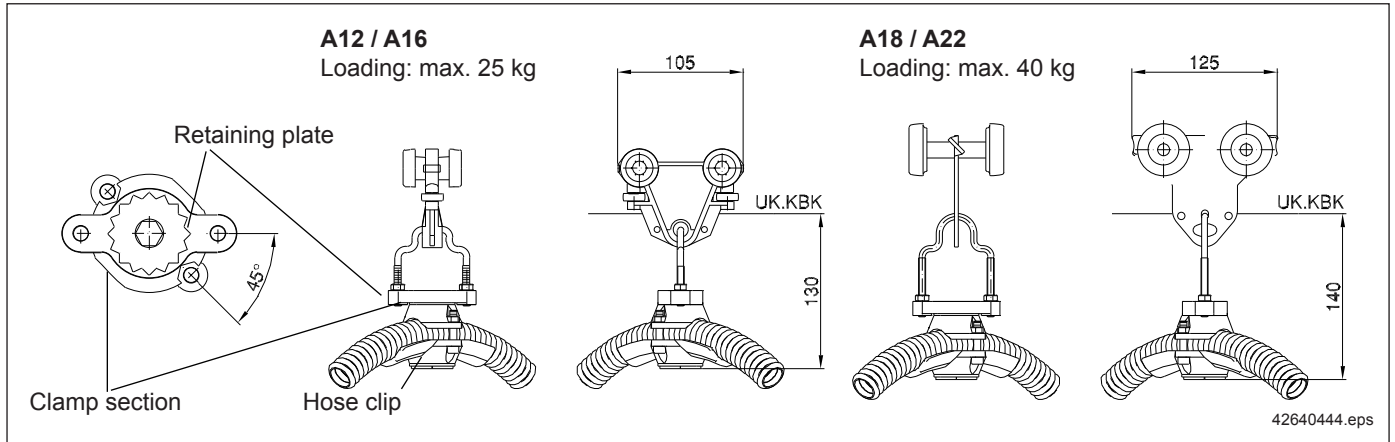


Item	Designation	Weight [kg]	Order no.
103	Mounting bracket with hose clip	0,31	855 218 44

The mounting bracket with hose clip is used as an anchorage to fit the protective hose at the end of the track. The mounting bracket is fitted to the track end or bridge end together with the end cap. Protective hoses with a diameter of 18 mm to 36 mm may be used. The position of the hose can be adjusted by adjusting the angle (at intervals of 22,5 degrees).

**Finish:** Retaining plate: galvanized  
Hose clip set 2: black plastic

**Cable trolley with hose clip  
(Item 104)**



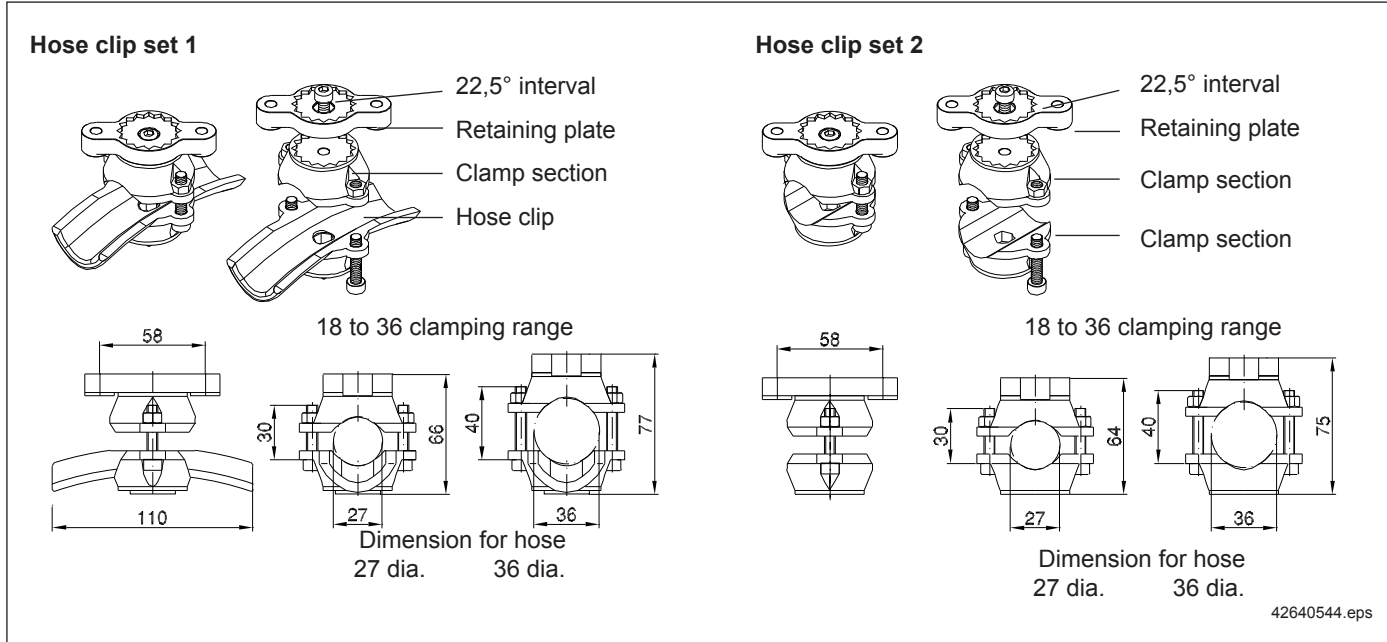
Item	Designation	Size	Weight [kg]	Order no.
104	Cable trolley with hose clip	A12 / A16	0,37	855 148 44
		A18 / A22	0,65	855 149 44

Cable trolleys are suitable for protective hoses with an external diameter of 18 mm to 36 mm. The retaining plate and clamping section on cable trolleys are pre-assembled at an angle of 45° to the direction of travel. Adjustment of the angle is possible at intervals of 22,5°. The hose is fitted by bolting the clamp section with the hose clip from below.

Temperature range: -20°C to + 70°C

Power supply

**Hose clip set  
(Item 105)**

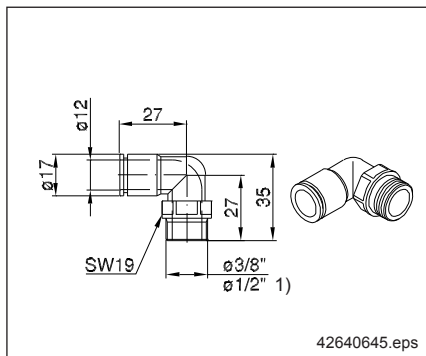


Item	Designation	Weight [kg]	Order no.
105	Hose clip set 1	0,16	855 135 44
	Hose clip set 2	0,14	855 145 44

If power is supplied via hoses, the components listed can be used to fit the hose to retaining plates and walls as well as to KBK cable trolleys. Adjustment is possible at intervals of 22,5° if retaining plates are used.

**Finish:** back plastic

**Angular connection for balancer  
(Item 106a)**

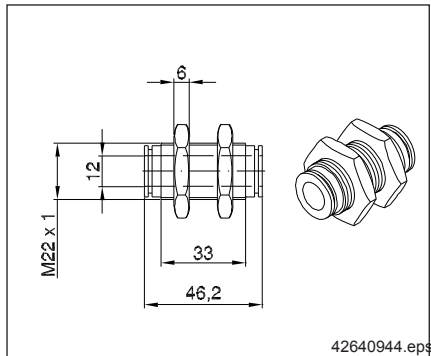


Item	Designation	Weight [kg]	Order no.
106a	Angular connection for balancer 3/8"	0,06	343 777 44
106a	Angular connection for balancer 1/2"	0,06	343 778 44

**Finish:** nickel-plated brass

1) Only for manual force control of the balancer, included in the scope of delivery.

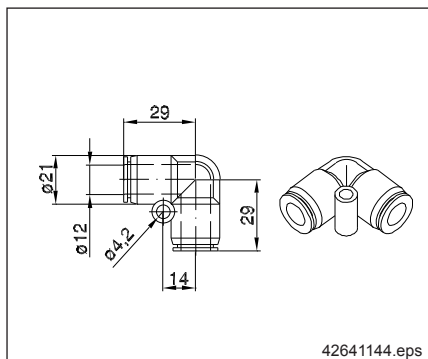
**Bulkhead gland  
(Item 106b)**



Item	Designation		
106b	Bulkhead gland	Weight [kg]	0,09
		Order no.	343 786 44

**Finish:** Nickel-plated brass

**Angle connector  
(Item 106c)**

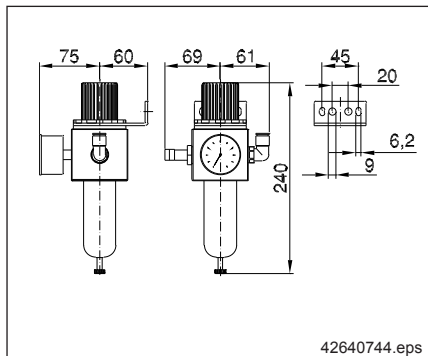


Item	Designation		
106c	Angle connector	Weight [kg]	0,05
		Order no.	343 835 44

Two hose ends (nominal size 12) can be interconnected.

**Finish:** Black plastic

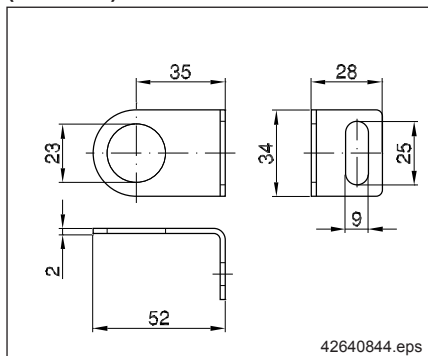
**Maintenance unit  
(Item 107)**



Item	Designation		
107	Maintenance unit	Weight [kg]	1,35
		Order no.	851 199 44

Input pressure: 0 to max. 16 bar  
 Pressure regulating range: 0,5-10 bar  
 Filter element: 5 µm  
 Condensed water drainage: Manual  
 Input: Sleeve suitable for hose with 13 mm internal diameter  
 Output: Angular connection for plastic hose with 12 mm external diameter

**Angle for bulkhead gland  
(Item 108)**

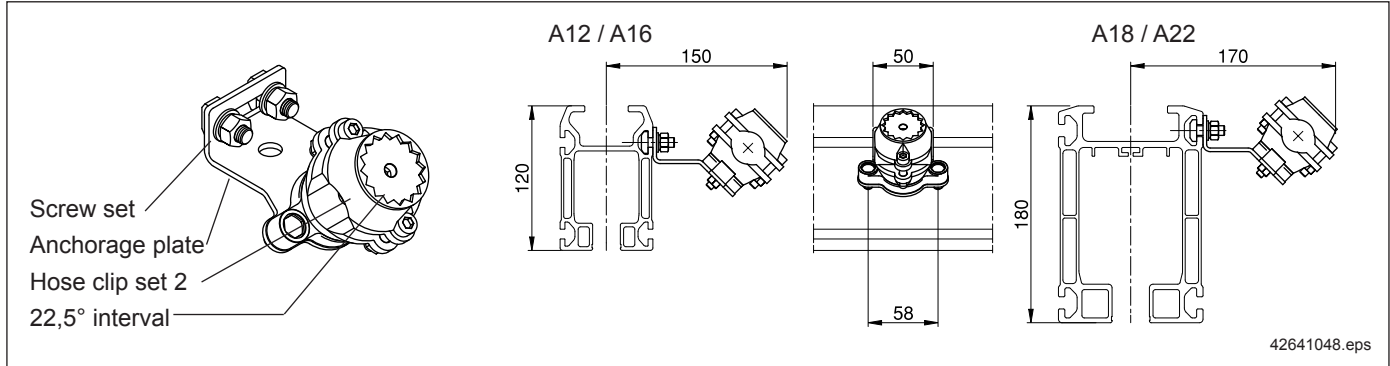


Item	Designation		
108	Angle for bulkhead gland	Weight [kg]	0,03
		Order no.	984 696 44

Attached with screw set (item 89)

**Finish:** galvanized

**AL anchorage bracket  
(Item 109)**



Item	Designation	Weight [kg]	Order no.
109	AL anchorage bracket	0,28	855 147 44

The bracket is used for transfer between a crane bridge and crane track and is fitted in the lateral grooves of the crane bridge by means of a screw set. The position of the hose can be changed by adjusting the angle (at 22,5° intervals) of hose clip set 2.

Protective hoses with a diameter of 18 mm to 36 mm may be used.

**Finish:** Anchorage plate: Galvanized steel  
Hose clip set 2: Black plastic

**Other components for pneumatic power supply**

Item	Designation	Weight	Order no.
59	Load bar for D-BP 110 rope balancer black (RAL9005)	1,85 [kg]	984 685 44
84	highly flexible round cable 3Gx1,5 mm <sup>2</sup>	0,09 [kg/m]	343 838 44
	highly flexible round cable 5Gx1,5 mm <sup>2</sup>	0,14 [kg/m]	343 839 44
	4 x 1,5 flat cable with PE	0,21 [kg/m]	471 352 44
	4 x 2,5 flat cable with PE	0,26 [kg/m]	504 208 44
	8 x 1,5 flat cable with PE	0,35 [kg/m]	504 226 44
	13 x 1,5 flat cable with PE	0,55 [kg/m]	895 171 44
88	Mains connection switch	DT16a	0,32 [kg] 895 167 44
		DT 25a	0,40 [kg] 575 480 44
		DT 25a-S	1,60 [kg] 473 037 44
89	M8x20 screw set	0,02 [kg]	712 325 47
102	Plastic hose, silver in colour, 12 mm external diameter, 8 mm internal diameter	0,08 [kg/m]	343 840 44

# 17 KBK standard electric equipment

## 17.1 General

KBK installations that are equipped with DC chain hoists are controlled through contactors.

### Direct control

Direct on-line control is recommended as standard in cases where no special operating conditions require contactor control, and where drive motors can be controlled with the operating voltage directly through specially developed DSK/DST control pendants.

### Contactor control

Special DSC/DSK/DSE/DST control pendants are used for controlling all drive motors through contactors. The control circuits connected to earth on one side with control transformers. DC chain hoists have 24 V control voltage.

### Conversion

Subsequent conversion from direct to contactor control is possible. Conversion to wireless control systems, IR or radio remote, is possible in connection with contactor control.

### Electro-magnetic compatibility (EMC)

KBK installations comply in full with the provisions of the EC-EMC regulations, as laid down in the EN 61000-6-4 and EN 61000-6-2 harmonized standards.

### Special protection

Special safety measures are available for KBK installations used at locations and in rooms requiring measures exceeding normal standards.

## Regulations

All Demag components and assemblies fully comply with DIN VDE regulations, relevant accident prevention regulations and relevant standards. All relevant national or local regulations must be taken into account when planning electric installations. We refer particularly to DIN VDE 0100 and the harmonized European standards.

## Important requirements from the standards

1. It must be possible to cut off all phases of the main power supply line by means of one mains switch. This switch must be protected against unauthorized restoration of the power supply.
2. An isolator which can be locked should be provided for each hoist if several of these, operating on one track, are fed through one and the same power supply line.
3. Each hoist must be fitted with an emergency-stop device which brings the motive drives to a standstill and interrupts the power supply to these drives.
4. A crane switch is required for
  - electrically powered cranes,
  - cross-travel drives with an output greater than 500 W.
5. Installation of a protective earth conductor, marked green/yellow over its entire length, is obligatory. It must not be possible for earth conductor current collectors to be swapped for phase collectors. Electric chain hoists are connected to the protective earth circuit of the installation. Protection of the KBK rails and the trailing cable power supply lines is achieved by the use of safety class II equipment or equivalent insulation. Therefore, a connection to the protective earth circuit is not necessary.

## Power supply

The required power supply system should be selected and separately ordered in accordance with the KBK standard electric equipment table.

When specifying the power supply line, the total length of the supply lines along the crane runway and crane bridge must be added and checked to ensure that it is within the maximum permissible voltage drop according to section 17.5.

The "Cable union sets" section lists the small parts sets required for assembly and installation.

## 17.2 KBK standard electric equipment with DC

Selection table for installations with 2-stage DC-Pro/DC-Com chain hoist and RF 125

Type of control	Control pendant	Travel motion	Power supply on the crane bridge	Lifting / lowering 2 speeds	Cross travel 2 speeds	Long travel 2 speeds	KBK item with	Required cable(s) on							
								the crane bridge			the crab			Required qty of conductors on crane bridge (PE = protective earth conductor)	
Contactor control	DSC	manual	Trailing cable	O			DC-Pro 1-10	Showing EB, EHK, ZHK see section 17.3	4 x 1,5 flat cable Order no. 471 352 44	13 x 1,5 flat cable Order no. 895 171 44	12 x 1,5 round cable Order no. 504 945 44	DC power cable → E22-C Order no. 720 072 45	DC control cable → E22-C Order no. 720 070 45		3+PE
	DSE-C	electric		O	O		x	1	1				1	1	3+PE
		electric with crane switch contactor		O	O		E20	2	1				1	1	3+PE
				O		O	E28	3	1		1	1			8+PE
				O		O	E28L	7							8+PE
				O	O	O	E32	6			1	1	1	1	8+PE
				O	O	O	E32L					1	1	1	8+PE

x = no KBK item required (see DC-Pro/DC-Com documents)

Selection table for installations with DCS-Pro variable-speed chain hoist and RF 125

Type of control	Control pendant	Travel motion	Power supply on the crane bridge	Lifting / lowering Stepless	Cross travel Stepless	Long travel Stepless	KBK item with	Required cable(s) on								
								the crane bridge			the crab			Required qty of conductors on crane bridge (PE = protective earth conductor)		
Contactor control	DSC-S	manual	Trailing cable	O			DCS-Pro 1-10	Showing EB, EHK, ZHK see section 17.3	4 x 1,5 flat cable Order no. 471 352 44	13 x 1,5 flat cable Order no. 895 171 44	12 x 1,5 round cable Order no. 504 945 44	DC power cable → E22-C Order no. 720 072 45	DC control cable → E22-C Order no. 720 070 45		3+PE	
	DSE-10CS	electric		O	O		x	1	1				1	1	3+PE	
		electric with crane switch contactor		O	O		E20	2	1				1	1	3+PE	
				O		O		7			1	1			8+PE	
				O		O	On application					1				8+PE
				O	O	O	6				1	1	1	1	8+PE	
				O	O	O						1	1	1	8+PE	

x = no KBK item required (see DCS-Pro documents)

### Contents

Contents	Designation	Order no.
E20	Crane bridge enclosure	772 078 45
E32	RF 125 enclosure mounting bracket	851 270 44
E32L	Circuit diagram	
E28 E28L	Manual travelling hoist terminal box	772 075 45
	DC Fibox enclosure bracket	716 540 45
	Crane bridge enclosure	772 078 45
	RF 125 enclosure mounting bracket	851 270 44
	Circuit diagram	

The cables listed in the tables are not included in the electric items and must therefore be ordered separately.

Flat and round cables are supplied by the metre, whereas the cables for the travelling hoist are prepared in suitable lengths.

**Technical data, installation diagrams and components for electric travel motions for KBK installations with DC chain hoists and conventional drives such as DRF 200, for example, on request.**



## 17.3 Cable union sets (Items 190, 191)

Item	Designation			
190	Flat cable set	4 x 1,5 mm <sup>2</sup>	Weight [kg]	0,11
			Order no.	873 989 44
		4 x 2,5 mm <sup>2</sup>	Weight [kg]	0,15
			Order no.	873 990 44
		13 x 1,5 mm <sup>2</sup>	Weight [kg]	0,10
			Order no.	873 991 44
191	Round cable set	5 x 1,5 mm <sup>2</sup>	Weight [kg]	0,11
			Order no.	873 992 44

The cable sets include all small parts needed for the cabling and wiring of KBK installations when series components are used.

Assignment of the sets for the given application is described below.

Contents of the cable sets:

**873 989 44:** 2 x M20 flat cable twist-type entry glands, M20 counter-nut, M25-M20 reducer, M25 counter-nut, M20 union

**873 990 44:** 2 x M25 flat cable twist-type entry glands, 2 x M20 counter-nuts, 2 x M20-M25 adapters, M20 union

**873 991 44:** 2 x M25 flat cable twist-type entry glands

**873 992 44:** 2 x M25 counter-nuts, 2 x M20 counter-nuts, 1 x M25-M20 reducer, 2 x M25 unions, 2 x M20 unions

### Assignment of cable sets:

- Power supply to monorail track or crane runway:
  - 4 x 1,5 mm<sup>2</sup> trailing cable: 1 x 873.989 44 per powerfeed point
  - 4 x 2,5 mm<sup>2</sup> trailing cable: 1 x 873 990 44 per powerfeed point
  - Conductor line: no cable set required
- Crane power supply (see table below)

Electric motion			Isolator switch on crane	Conductor line	Crane power supply (per crane):			
Lifting	Cross travel	Long travel			Trailing cable			
					1,5 mm <sup>2</sup> cross-section		2,5 mm <sup>2</sup> cross-section	
				4 x 1,5 mm <sup>2</sup>	13 x 1,5 mm <sup>2</sup>	4 x 2,5mm <sup>2</sup>	4 x 2,5 mm <sup>2</sup> + 8 x 1,5 mm <sup>2</sup>	
<input type="radio"/>								
<input type="radio"/>			<input type="radio"/>	1 x 873 992 44	1 x 873.989 44		1 x 873.990 44	
<input type="radio"/>	<input type="radio"/>							
<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	1 x 873 992 44	1 x 873.989 44		1 x 873.990 44	
<input type="radio"/>		<input type="radio"/>		2 x 873 992 44		1 x 873.991 44	1 x 873.989 44	
<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	3 x 873 992 44		1 x 873.991 44 1 x 873 992 44	1 x 873.990 44 1 x 873 992 44	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		2 x 873 992 44		1 x 873.991 44	1 x 873.989 44	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3 x 873 992 44		1 x 873.991 44 1 x 873 992 44	1 x 873.990 44 1 x 873 992 44	

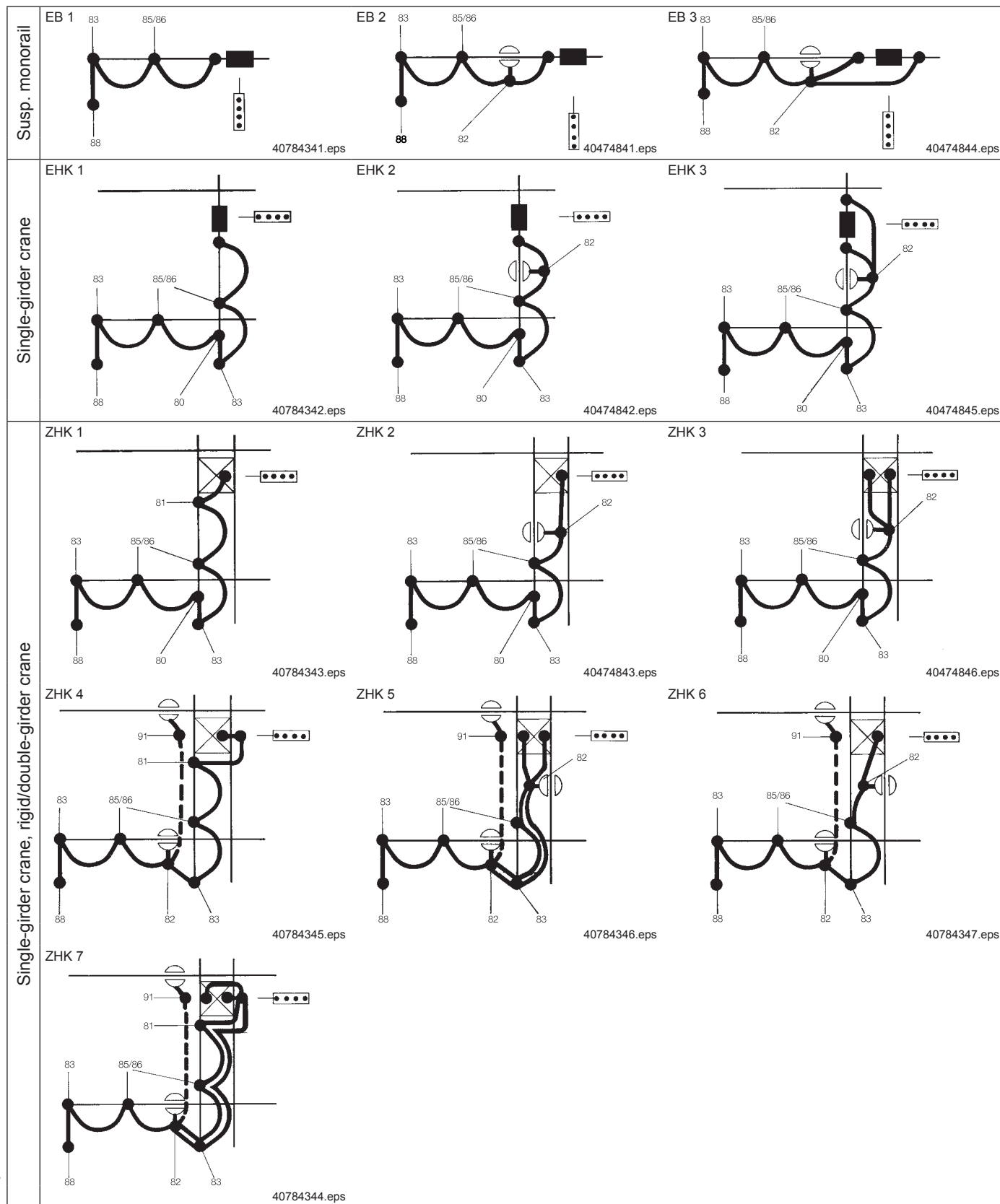
# 17.4 Schematic diagrams of cable arrangements and cable clamps

## Key to symbols

- Cable clamp
- Round cable (item 92), rigidly mounted on the crane bridge
- Flat cable (item 84), freely suspended
- Monorail hoist with cable entry on the hoist unit
- Double-rail hoist with cable entry on the hoist unit
- RF (friction wheel travel drive)
- Control element

Item	Designation	Section
80	Crane bridge cable clamp	16.1.3
81	Crab frame cable clamp	16.1.3
82	RF trolley cable clamp	16.1.3
83	Rail end cable clamp	16.1.3
85	Slider	16.1.3
88	Mains connection switch	16.1.3

Standard elec. equip.



## 17.5 Electric key values for DC-Pro, DC-Com, DCS-Pro, DCMS-Pro, DCRS-Pro

### DC-Pro chain hoist – mains connection delay fuse link

Voltage		220-240V	380-415V	500-525V	220-240V	380-400V	440-480V	575V
Frequency		50Hz			60Hz			
Size	Motor size	[A]	[A]	[A]	[A]	[A]	[A]	[A]
DC-Pro 1	ZNK 71 A 8/2	6	6	6	6	6	6	6
	ZNK 71 B 8/2							
DC-Pro 2	ZNK 71 B 8/2							
DC-Pro 5	ZNK 80 B 8/2	10			10			
DC-Pro 10	ZNK 100 A 8/2	-	10	10	-	16	10	10
	ZNK 100 B 8/2		16			16		
DC-Pro 15	ZNK 100 B 8/2		16			16	16	10

### DC-Pro chain hoist – Supply lines <sup>1)</sup> for 5% voltage drop $\Delta U$ and starting current $I_A$

Voltage		220-240V		380-415V		500-525V		220-240V		380-400V		440-480V		575V	
Frequency		50Hz						60Hz							
Size	Motor size	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]
DC-Pro 1	ZNK 71 A 8/2	1,5	89	1,5	100	1,5	100	1,5	76	1,5	100	1,5	100	1,5	100
	ZNK 71 B 8/2														
DC-Pro 2	ZNK 71 B 8/2														
DC-Pro 5	ZNK 80 B 8/2		31		94				26		75				
DC-Pro 10	ZNK 100 A 8/2	-	-	-	38	-	61	-	-	2,5	45	-	43	-	78
	ZNK 100 B 8/2														
DC-Pro 15	ZNK 100 B 8/2				46		73			1,5	36		52		90

### DC-Com chain hoist – mains connection delay fuse link

Voltage		220-240V	380-415V	500-525V	220-240V	380-400V	440-480V	575V
Frequency		50Hz			60Hz			
Size	Motor size	[A]	[A]	[A]	[A]	[A]	[A]	[A]
DC-Com 1	ZNK 71 A 8/2	6	6	6	6	6	6	6
	ZNK 71 B 8/2							
DC-Com 2	ZNK 71 B 8/4							
DC-Com 5	ZNK 80 A 8/4	10			10			
DC-Com 10	ZNK 100 A 8/2	-	10	10	-	16	10	-
	ZNK 100 B 8/2							

### DC-Com chain hoist – Supply lines <sup>1)</sup> for 5% voltage drop $\Delta U$ and starting current $I_A$

Voltage		220-240V		380-415V		500-525V		220-240V		380-400V		440-480V		575V	
Frequency		50Hz						60Hz							
Size	Motor size	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]	[mm <sup>2</sup> ]	[m]
DC-Com 1	ZNK 71 A 8/2	1,5	89	1,5	100	1,5	100	1,5	76	1,5	100	1,5	100	1,5	100
	ZNK 71 B 8/2														
DC-Com 2	ZNK 71 B 8/4														
DC-Com 5	ZNK 80 A 8/4		67						56		80				
DC-Com 10	ZNK 100 A 8/2	-	-	-	38	-	61	-	-	2,5	45	-	43	-	59
	ZNK 100 B 8/2														

### DCS-Pro, DCMS-Pro, DCRS-Pro chain hoist

		Mains connection delay fuse links		Supply lines <sup>1)</sup> for 5% voltage drop $\Delta U$ and starting current $I_A$			
Voltage		380-480 V, 3 ~					
Frequency		50/60 Hz					
Size	Motor size	[A]		[mm <sup>2</sup> ]		[m]	
DCS-Pro 1, DCS-Pro 2 DCMS-Pro 1, DCMS-Pro 2 DCRS-Pro 1, DCRS-Pro 2	ZNK 71 B 4	6		1,5		100	
DCS-Pro 5	ZNK 80 A 4						
DCS-Pro 10	ZNK 100 A 4	10				40	

<sup>1)</sup> The lengths of the supply lines are calculated on the basis of an earth-loop impedance of 200 mΩ.

**The current addresses of our sales offices, subsidiaries and agencies worldwide can be found on the Terex MHPS GmbH homepage at [www.demagcranes.com/Contact](http://www.demagcranes.com/Contact)**

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