



Technical Data

KBK ALULINE

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DEMAG

Contact information

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1 Introduction

1.1 About these instructions

1.1.1 How to use this information

This document is intended to provide technical information about the product and to complement instructions, not to replace them.

The manufacturer makes absolutely no warranty whatsoever regarding the contents of this document, express or implied, whether arising by operation of law or otherwise, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose.

1.1.2 Copyright notice

This document and the information contained herein, is the exclusive property of Demag Cranes & Components GmbH and represents a non-public, confidential and proprietary trade secret that may not be reproduced, disclosed to third parties, altered or otherwise employed in any manner whatsoever without the express written consent of Demag Cranes & Components GmbH. Demag Cranes & Components GmbH © 2024. All rights reserved.

1.1.3 Definition of terms

All brand names, product names and trademarks that are used in this document are registered trademarks of their respective owners.

The following terms and definitions may have been used in this document:

ANSI	American National Standards Institute
Authorized personnel	Persons who the owner authorizes and who have the necessary training to carry out operation or service actions.
Bridge	The bridge (main girder) moves along the runway.
CE marking	The CE marking of the crane is displayed on the door of the bridge electric panel. The symbol indicates that the crane complies with the appropriate CE regulations.
Check	A visual and functional assessment (not a test) of the crane without dismantling.
Controller	The pendant or other type of controller that the operator uses to give commands to the crane.
Crane operator	Person operating the crane for handling loads.
Electric panel	Power is controlled to the crane motors through the electric panel.
Emergency brake	A brake that the operator can apply, or automatically applied upon loss of power.
Expert	A person with extensive knowledge about the current subject matter.
Experienced technician	Experienced technicians are defined as persons who, owing to their technical training and experience, have sufficient knowledge in the field of the machine. They must be familiar with the relevant national industrial safety regulations, codes of practice, accident prevention regulations, directives and generally accepted engineering standards enabling them to judge the safe operating condition of machines.
Floor-operated crane	A crane which an operator controls by using a radio controller or a pendant station which is suspended from the crane.

Hoist	Drive mechanism for lifting and lowering the load.
Inspection	Looking at the crane for defects and checking the operation of the controls, limiting and indicating devices without loading the crane. This inspection is much more than a check but does not normally require any part of the crane to be dismantled other than for removal or opening of covers or housings.
ISO	International Organization for Standardization
Main girder	The main girder (bridge) moves along the runway.
Main isolation switch	The main isolation switch is the power switch for disconnecting power supply for all cranes on a runway. There may also be extra switches in the cubicle row for controlling individual cranes, such as a safety switch for power and control circuits and auxiliary circuits, air-conditioning.
Maintenance Instructions	Principal means by which the manufacturer provides information or instructions concerning the crane which are relevant to the crane maintenance personnel.
Micro Speed	A mode in which the movements of the crane are slower than normal at any push button or joystick position. It is used to make slow and precise crane movements.
Manufacturer	The manufacturer is the person who: manufactures the equipment under his or her own name and places it on the market for the first time, resells other manufacturers' equipment under his or her own name, whereby the reseller is not considered to be the manufacturer provided the name of the manufacturer appears on the equipment, imports the equipment into the country and places it on the market for the first time or exports equipment to another member state of the European Union and hands it over direct to a user in that country.
Operating Instructions	Principal means by which the manufacturer provides information or instructions concerning the crane which are relevant to the crane operator.
Operating and Maintenance Instructions	Principal means by which the manufacturer provides information or instructions concerning the crane which are relevant to the crane owner, operator and maintenance personnel.
Operating personnel/operator	Operating personnel or machine operators are defined as persons assigned by the owner of the machine to operate the machine. This person must be trained by the owner in accordance with the tasks to be performed.
Owner	Owners (employer, company) are defined as persons who own the machine and who use it as intended or allow it to be operated by suitable and trained persons.
Qualified personnel	One with necessary qualification, which is based on theoretical, and practical knowledge of hoists or and cranes, for required activities as listed in operating instructions. The person must be in a position to assess the safety of the installation with the application. Persons with the authority to undertake certain maintenance work on products of manufacturers include service engineers of the manufacturers and trained fitters with corresponding certification.

Qualified electrician	Qualified electricians are defined as persons who, owing to their technical training, knowledge and experience of electric machines as well as knowledge of the relevant valid standards, codes of practice and regulations, are able to assess the tasks given to them and to identify and eliminate potential hazards. This person must be trained by the owner in accordance with the tasks to be performed.
Radio-controlled crane	A crane which an operator controls by using an operating station which is not attached to the crane (for example, radio control).
Service control panel	A touch display panel that is fitted to the cubicle row of the crane that can be used as a backup control to drive the crane.
Specialist personnel	Specialist personnel are defined as persons assigned by the owner of the machine to carry out special tasks, such as installation, setting-up, maintenance and fault elimination. This person must be trained by the owner in accordance with the tasks to be performed.
Trolley	The trolley moves along the bridge (main girder).
Trained person	Trained persons are defined as persons who have been instructed and trained for the tasks assigned to them and on the possible hazards resulting from inappropriate conduct. Personnel must be informed about the required safety equipment, protective measures, relevant regulations, codes of practice, accident prevention regulations and operating conditions and must provide verification of their competence. This person must be trained by the owner in accordance with the tasks to be performed.
UKCA (UK Conformity Assessed)	The marking indicates that the product complies with the appropriate UK regulations.

1.1.4 Symbols and conventions

Familiarize yourself with the following symbols and conventions that are used in this document.

Symbol	Description
	Indicates that the product is slowing down or is moving at its slowest speed
	Indicates that the product is accelerating or moving at its highest speed
NOTE	Indicates items which require special attention by the reader. There is no obvious risk of injury that is associated with notes.
	Indicates fast steady movement
	Indicates slow steady movement
	Indicates rapidly accelerating movement

Symbol	Description
	Indicates slowly accelerating movement
	Time-related task
	Stop movement
	Product conforms to the ATEX directive
	Product conforms to the ATEX directive
	Measurement inspection
	Visual inspection
	Tools needed
	Operational inspection
	Grease brush lubrication needed
	Oil can lubrication needed
	Grease gun lubrication needed
	Noise check
	Ground symbol

1.1.5

Related information

For this product, there is technical information available for different purposes and audiences. Contact your supplier if you require any information listed here.

Operating Instructions	Describes the responsibilities of the operator and operating instructions.
Operating and Maintenance Instructions	Describes the responsibilities of the owner. Includes the functionality, usage, and maintenance of the product.
Mechanical drawings	Describes the mechanical design information.
Electrical drawings	Describes the electrical design information and item lists.
Certificates	Describes that the equipment is in conformity with directives and manufactured according to standards. Includes also testing results.
Log Book	Consists of records of the usage and service history.
Spare Parts Catalog	Includes part numbers for all parts supplied.
Maintenance Instructions	Describes the tasks that are related to routine maintenance, such as lubrication and inspections.
Installation and Commissioning Instructions	Contains instructions on the installation and commissioning of the product.

Further manuals are available for sub-assemblies or components in addition to these operating instructions. The corresponding manuals are supplied as necessary or can be ordered separately – also for special designs or if additional options are ordered which differ from these operating instructions.

NOTE *Store documents in a safe, dry place where they can be easily located when required.*

1.2 About this product

1.2.1 Ambient temperature

ALK installations are designed for operation indoors and for temperatures ranging from -20°C... +70 °C. Special measures must be implemented in the case of extreme temperatures, outdoor applications and exposure to aggressive atmospheres.

1.2.2 Standards and directives

Regulations

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

Relevant industrial safety regulations and codes of practice must be observed for planning, project engineering, and operating KBK Aluline installations.

KBK Aluline cranes and monorails designed in accordance with the project planning instructions that are contained in this guide 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, and the EC Machinery Directive.

Manufacturer's and conformity declarations and KBK Aluline log book for suspension cranes and monorails are supplied.

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

2 Product description

2.1 Construction kit

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

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

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

Spare parts

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

Spare parts not approved by us can 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 their appointed personnel, dealers, and representatives.

Inspection

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

For more information, see "Related information" and document "KBK Aluline operating instructions".

Information

It is important that all members of staff responsible for erection, safe operation, and maintenance of KBK Aluline installations receive the KBK Aluline operating instructions and all relevant documents.

2.2 Structure of the crane construction kit

General

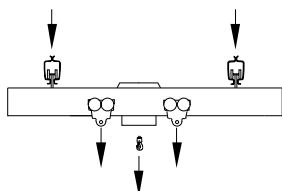
KBK Aluline installations are of modular design. The basic construction kit consists of simple, well engineered components. Standardized connection dimensions ensure rapid erection and allow existing installations to be easily modified or extended. All components are manufactured in series.

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.

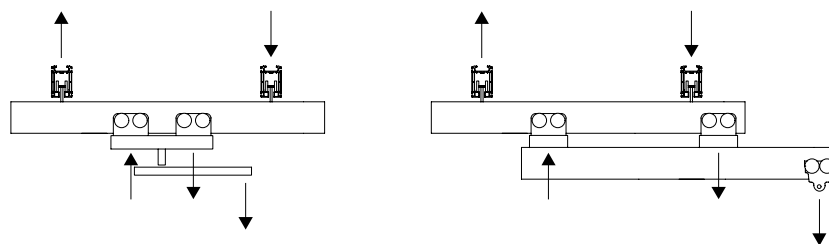
Classic

The KBK Aluline modular crane construction kit is designed for suspended loads with centric load transmission.



Ergo

More 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 planning/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

2.3.1 Smooth-running characteristics

KBK Aluline equipment is designed for the best possible ergonomics.

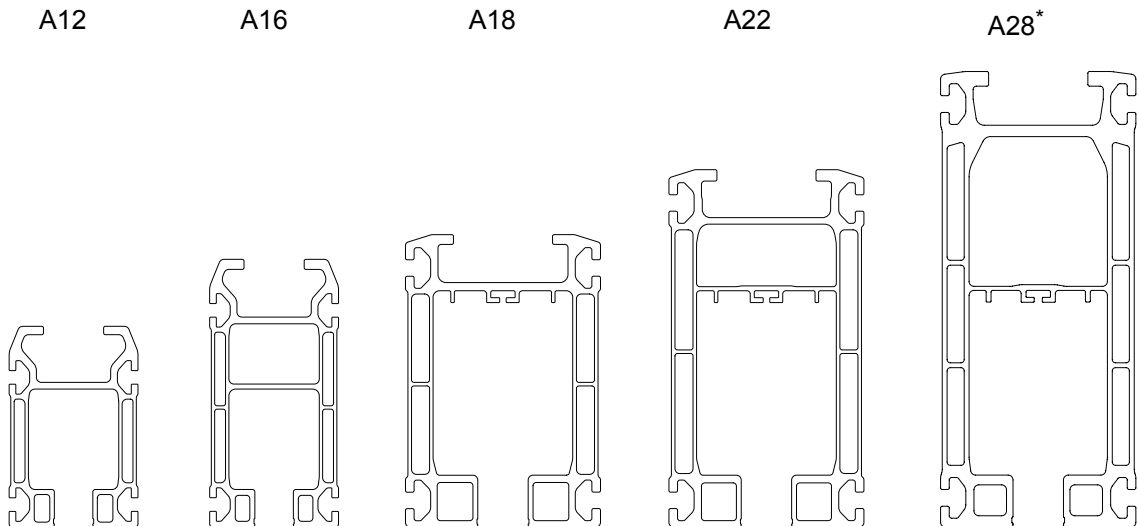
Note that the smooth-running characteristics of suspension crane systems depend on several factors. These include:

- quality of the trolleys (for more information, see "Single trolleys")
- deadweights,
- specification of the rail system with reference to deflection,
- position of the load on the crane,
- precision of assembly/installation, e.g.
 - alignment of the rails with reference to each other at joints in the track,
 - alignment of the crane runway to the support superstructure,
 - rigidity of the support superstructure,
 - general ambient conditions (dust, dirt, etc.)

When correctly specified and installed, KBK Aluline equipment offers excellent smooth-running characteristics without any unwanted motions or the need for additional effort to stop the load.

2.3.2 Profile sections

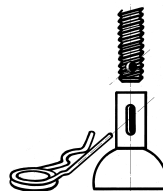
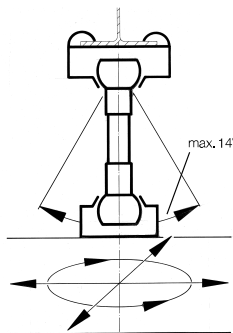
The basic elements of the KBK Aluline construction kit are special extruded profile sections made of aluminum with high rigidity optimized by hollow sections, low deadweight and anodized surfaces. The rails are of inside-running design to protect the trolleys. Lateral attachment slots offer a wide variety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



* A28 availability depends on region.

2.3.3 Suspension system

- Flexible track suspension (minimum lateral forces transmitted to the track system)
- Ball-and-socket universal joint suspension (minimum torque transmission to roof and ceiling superstructures)
- 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 rail system
- Low headroom dimension possible with short suspension fittings



2.3.4 Suspension system KBK Ergo

- KBK 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
- Articulated cranes must not be used on rigidly suspended crane runways.

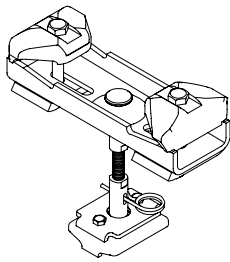


Figure 1. Classic suspension

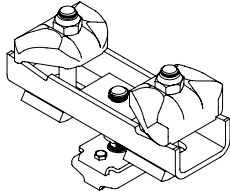


Figure 2. Ergo suspension

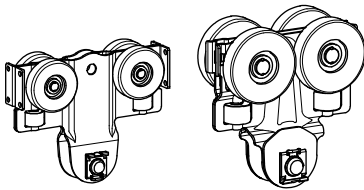
2.3.5 Horizontal forces

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 . For single and double-rail tracks, the value amounts to 5% of K .

2.3.6 Trolleys

- Quiet, smooth operation with plastic travel wheels mounted in anti-friction bearings
- High vertical load-bearing capacity
- Long service life
- Horizontally guided in the track profile
- Flexible and torque-free load connection via pin
- Horizontal load-bearing capacity up to 10% of the suspended vertical load



2.3.7 KBK Ergo trolleys

- Quiet, smooth operation with plastic travel wheels mounted in anti-friction bearings
- High vertical load-bearing capacity
- Long service life
- Horizontally guided in the track profile
- Rigid load connection via KBK Ergo load plate
- Suitable for accommodating vertical forces resulting from counter-pressure rollers

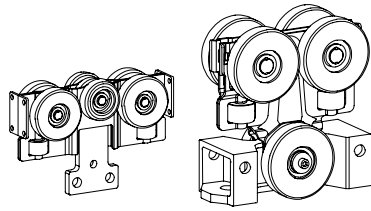
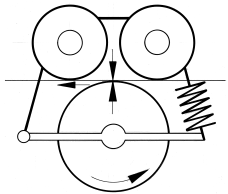


Figure 3. Ergo trolley

2.3.8 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.

2.3.9 Combined crane installations

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

2.3.10 Ergo crane installations

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

2.3.11 Push-travel cranes

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



2.3.12 Electric travel cranes

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

2.3.13 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, A22 and A28 can be provided with a 5-pole internal conductor line.

2.3.14 Electric and control equipment

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

2.3.15 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 galvanized, series track sections are anodized, other components are provided with a painted finish.

3 Project planning and drafting (Classic)

3.1 Project drafting of suspension crane installations

All information and data necessary for project planning must be collected for planning KBK Aluline installation projects. The project planning sheet in "Project planning sheet for KBK Aluline installations" 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 layout, position of the suspensions and joints and the number of carriers or cranes, branch sections and so on. For more information, see "Examples and symbols".

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

The screenshot shows the DEMAG KBK-HÄNGEKRAN Designer web application. The header features the DEMAG logo and navigation links for Kontakt, Deutsch, and ME metrisch. The main content area is titled "KBK-HÄNGEKRAN" and includes a sidebar with "Grunddaten", "Schnell Projektierung", and "Experten Projektierung". The main text area welcomes users and provides instructions to choose an entry point. Below this is a 3D rendering of a suspension crane system. At the bottom, there are buttons for "Schnell Projektierung" and "Experten Projektierung". The footer contains copyright information, legal links, and the slogan "We Can Handle It."

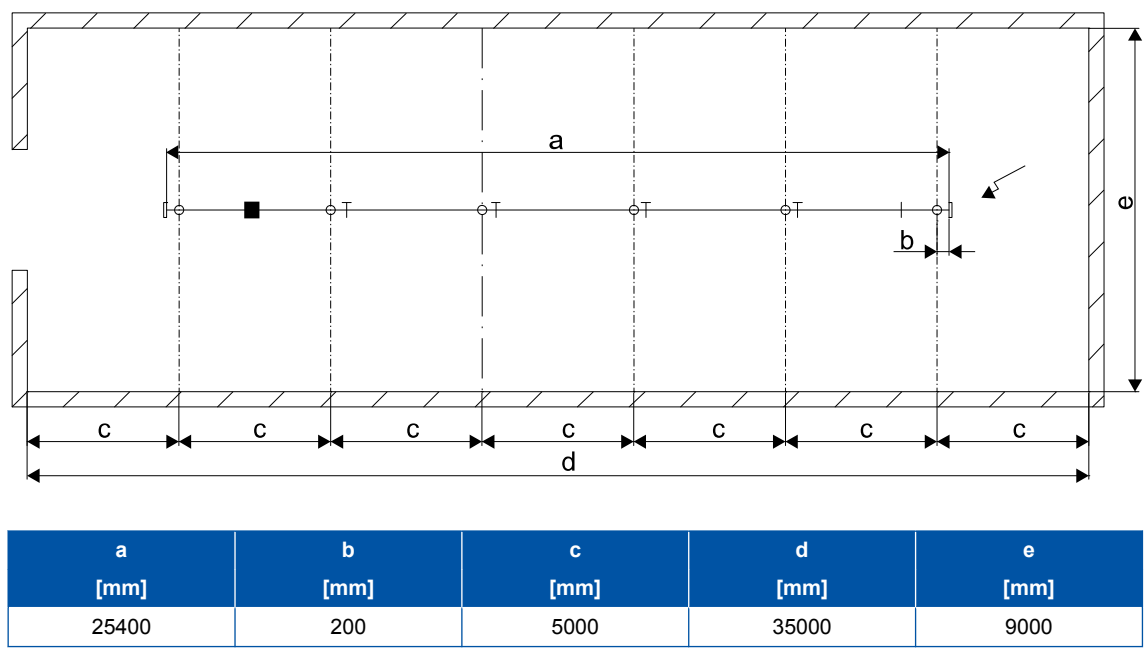
We recommend you use the KBK Designer tool for project engineering KBK suspension crane installations. Please refer to our homepage.

www.demagcranes.com

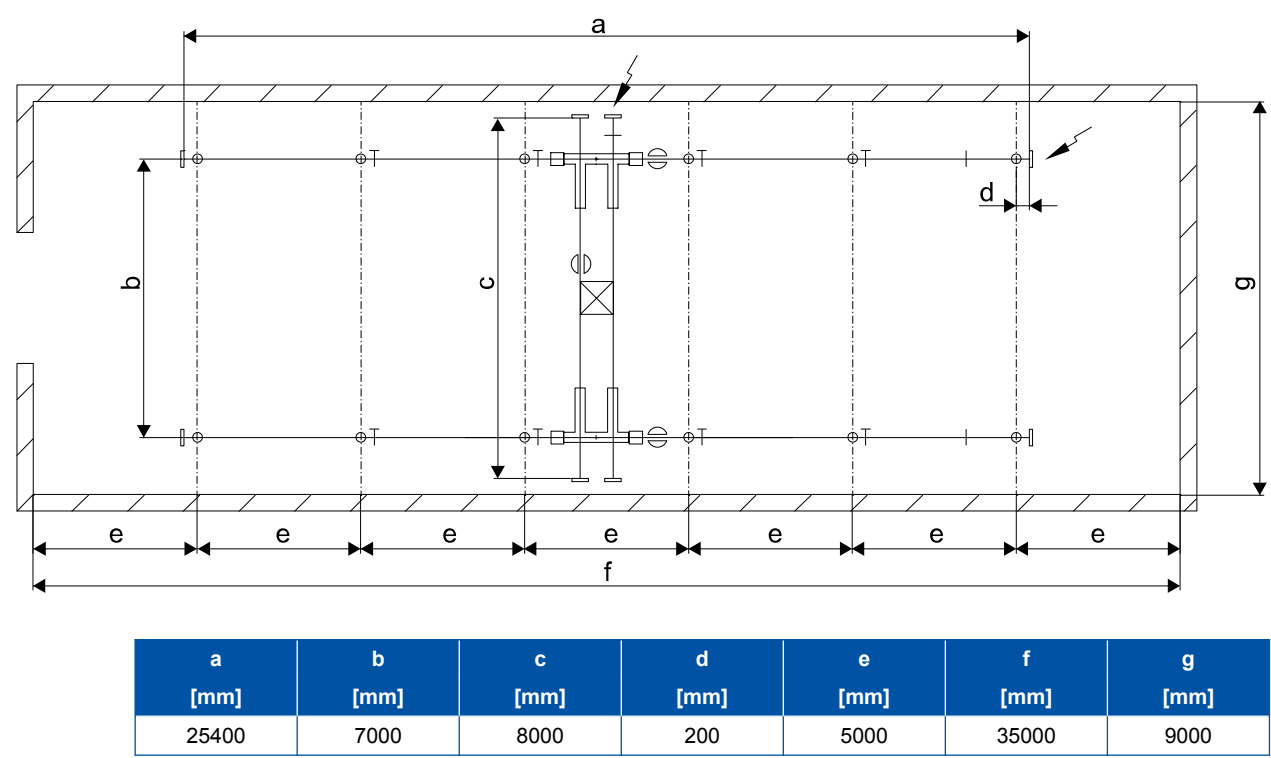
3.3

Examples and symbols

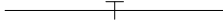
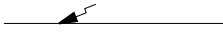
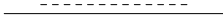
Suspension monorail



Double-girder crane



Symbols for use in drawings

Direction of travel		Rigid crane trolley	
Straight section		Monorail hoist	
Joint bolt set		Double-rail crab	
Internal buffer stop		Travel drive	
Cap with buffer		Travel drive with limit switch	
Suspension		Limit switch actuator	
V-type suspension fitting		Powerfeed	
Stiffener		Power supply	
Trolley		Current collector	

3.4 Project planning sheet for KBK Aluline installations

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

3.5 Profile lifting capacities according to the diagram

The diagram showing the lifting capacity of the profile sections provides the basis for determining the profile section sizes for cranes and tracks, crane span dimensions l_{kr} and distances between suspensions l_w .

The crane span dimension and distances between suspensions which are permitted 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.

(Curves apply if hoists are used with lifting speeds up to 16 m/min. For higher speeds, see "Hoists with KBK Aluline".)

Selecting the section

Determining the distance between suspensions or crane span dimension:

1. Determine load K_{Ges} according to "Steps for project planning and technical specification" and "Calculating load GAB on one suspension fitting".
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

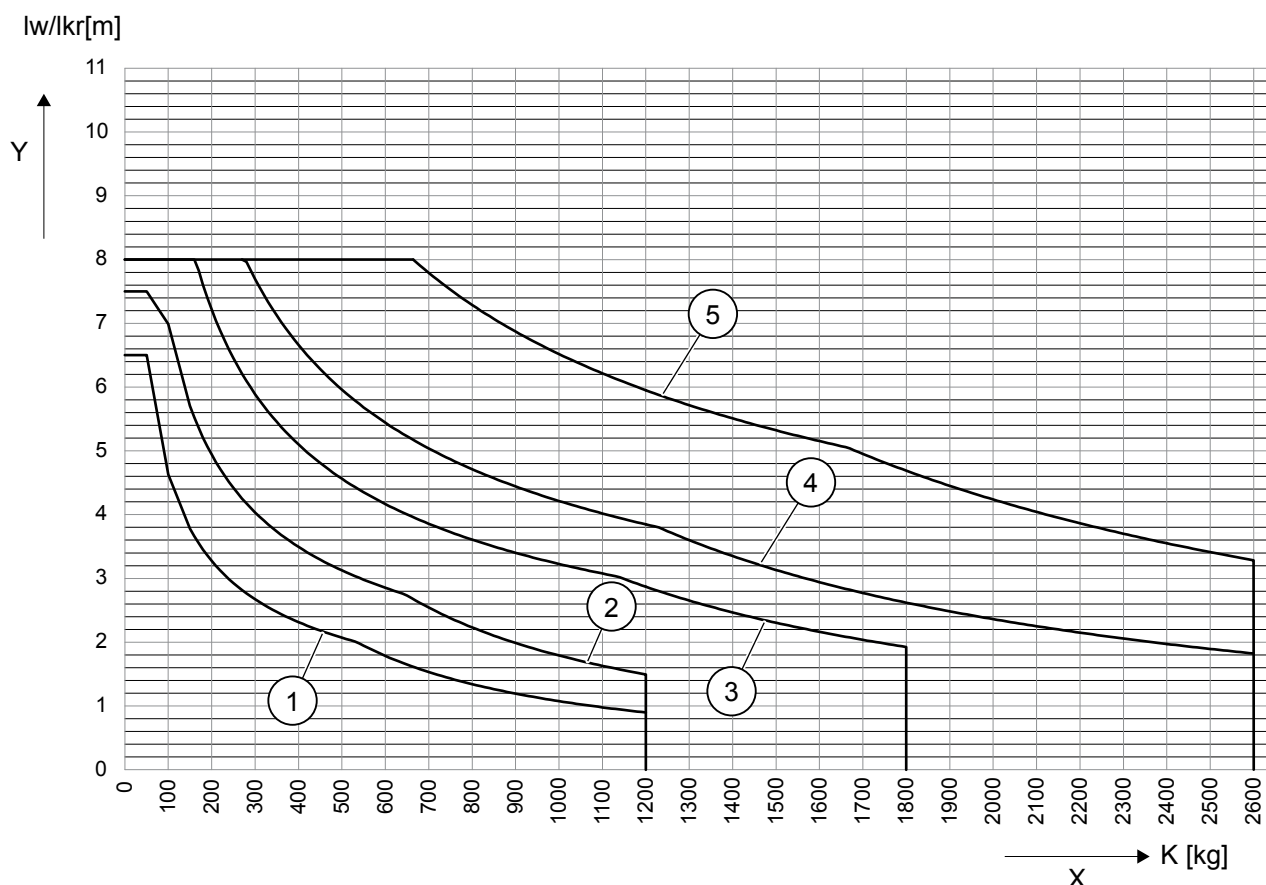
Suitable for electric travel

All profile section sizes

3.5.1 Standard profile

Technical values

KBK Aluline profile section	A12	A16	A18	A22	A28
Moment of inertia	313 cm ⁴	713 cm ⁴	1520 cm ⁴	2593 cm ⁴	6203 cm ⁴
Neutral axis	Approx. profile center				



1. A12
2. A16
3. A18

4. A22
5. A28*

* A28 availability depends on region.

K = Load on the profile section

lw = Distance between suspensions

lkr = Crane span dimension

Important: - - - Limit curves for maximum length of straight sections. Pay attention to the distance between supports and distances of joints (for more information, see "Calculating load GAB on one suspension fitting"). Lifted load coefficient ψ and dead load coefficient ϕ to DIN 15018 for crane group H1, B3 as well as the dead load of each loaded girder are already considered in the calculation diagrams.

3.6 Steps for project planning 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 favorable load

$$K = 0.5 (G_H + G_3 + GRFK)$$

(RF friction-wheel drive) is considered in the following

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 crane runway 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 load including fittings

G_2 = Dead load of crane trolleys including fittings (both ends together)

G_3 = Dead load of trolley including hoist, cross-travel drive and fittings

$GRFK$ = Dead load of cross-travel drive and fittings

3.7 Reading off from the diagram

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

3.7.1 Crane span dimension l_{Kr}

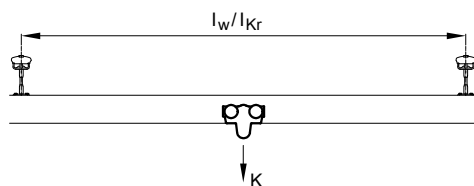
e_{Ka} = Distance between cross-travel trolleys or wheel axles

3.7.2 Distance between suspensions l_w

e_{KT} = Distance between crane trolleys or wheel axles (monorail track and crane runway)

3.7.3 Concentrated load

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.



3.7.4 Several loads

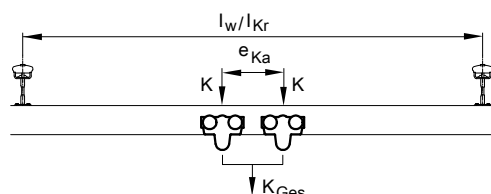
For two or more loads at a maintained distance in one panel, the max. l_w or l_{Kr} must never exceed the permissible limit for one of the individual loads.

3.7.5 Two identical loads or load bar

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:

$$\max. l_w = l_w(K_{Ges}) + 0.9 \times e_{Ka} \text{ (or } e_{KT})$$

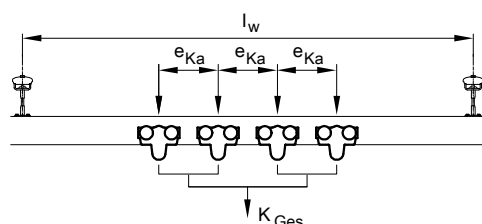
$$\max. l_{Kr} = l_{Kr}(K_{Ges}) + 0.9 \times e_{Ka} \text{ (or } e_{KT})$$



3.7.6 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:

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



3.8 Calculating load G_{AB} on one suspension fitting

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

Table 1. Max. permissible load G_{AB} on one suspension fitting

KBK Aluline profile section	A12	A16	A18	A22/M16 A28/M16	A22/M20 A28/M20
max. G_{AB} [kg]	750		1400	1700	2400

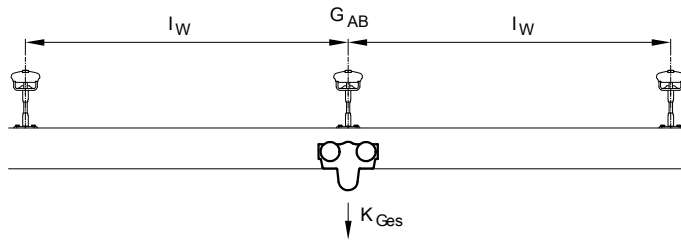
3.8.1 Concentrated load

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

Proportional track girder dead load = max. distance between suspensions x track girder weight/m x 1.25

$$G_B = \text{Track girder weight/m}; l_w = \text{Max. distance between suspension fittings}$$

$$G_{AB} = K_{Ges} + G_B \times l_w \times 1.25$$



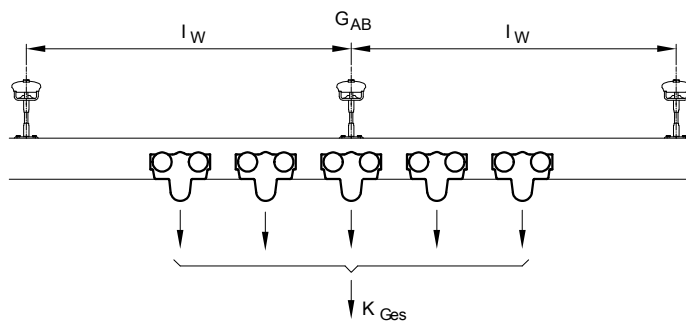
3.8.2 Two or more loads in one of the two panels between suspensions

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

- Reduce the distance between suspensions by providing additional suspensions
- Distribute the load by spacing loads at a safe distance

$$G_{AB} = K_{Ges} + G_B \times l_w \times 1.25$$

Several identical loads



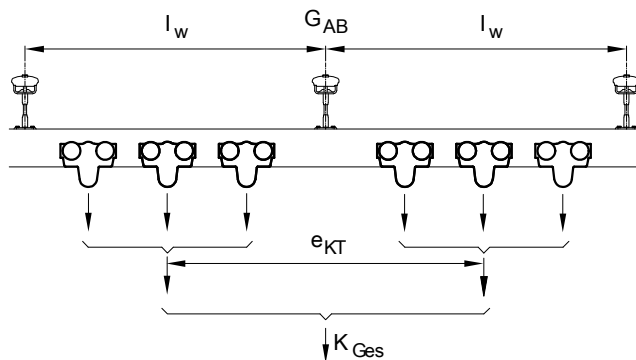
3.8.3 Two loads or groups of loads at a distance e_KT

$$e_{KT} = 0.5 \times l_w : G_{AB} = 0.9K_{Ges} + G_B \times l_w \times 1.25$$

$$e_{KT} = l_w : G_{AB} = 0.7K_{Ges} + G_B \times l_w \times 1.25 \text{ (load distance = distance between suspensions)}$$

$$e_{KT} = 1.5 \times l_w : G_{AB} = 0.5K_{Ges} + G_B \times l_w \times 1.25$$

Identical load groups



3.9 System dimensions and system limits

3.9.1 Overhang

			A12/A16	A18	A22/A28
Shortest possible overhang	u min	[mm]	40	50	125
Project planning 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 and cranes must not be lifted (for example, where the load is on the overhang).

If the girder is unstable (girder is lifted, suspension is relieved of load), the suspension 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.

3.9.2 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 carriers at the end of the track where they accumulate,
- unloaded spacer trolleys – by the corresponding overall dimension.

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

3.9.3 Track overhang

For more information, see crane selection tables "Specifying single and double-girder cranes according to selection tables" for the maximum lengths of overhang u (for single-girder cranes).

3.9.4 Approach dimension

Approach dimension l_{an} (load hook center to girder end) is determined by the dimensions of the individual components.

3.9.5 Permissible distance of joint from suspension st

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

			A12/A16	A18	A22	A28
Minimum distance	st min	[mm]	$l_w \leq 5 \text{ m}$	40	50	125
			$l_w > 5 \text{ m}$	$0.05 \times l_w$		
Maximum permissible distance	st max	[mm]		$0.25 \times l_w$		$0.15 \times l_w$

3.9.6 Drives

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.

3.9.7 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 KBK Aluline or steel profile sections.

3.10 Hoists with KBK Aluline

3.10.1 Higher lifting speeds

The layout diagrams shown in KBK Aluline guides apply for manufacturer's chain hoists with lifting speeds up to max. 16 m/min.

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

$$G_{Hneu} = G_H \times (0.97 + 0.002 \times v_H)$$

v_H = lifting speed in m/min

3.10.2 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 rates 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 maximum 60 m/min can be used if a factor of at least 1.1 is used to calculate load K by using the diagrams.

$$K = G_H \times 1.1 + G_3$$

This factor can be increased to avoid high deflections and unwanted vibrations.

Electric rope balancers with lifting speeds up to maximum 35 m/min can be used if a factor of at least 1.15 is used to calculate load K using the diagrams.

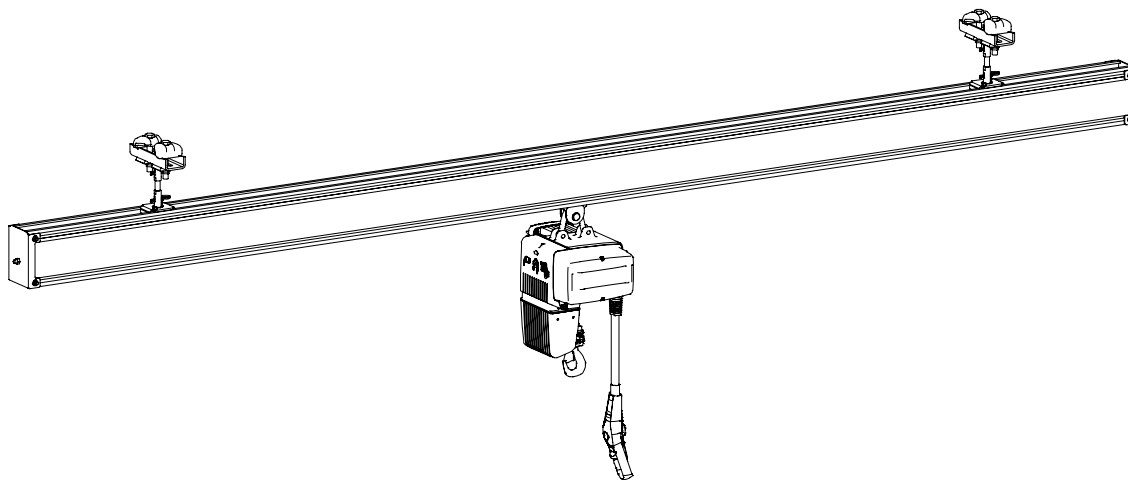
$$K = G_H \times 1.15 + G_3$$

Use the next highest load capacity for simplified use of the crane selection table.

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



Suspension monorail		
Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	Crane runway and crane girder basic components
Suspension	Suspension, short suspension, upper suspension bracket, upper suspension clamp, ball-head suspension rod, suspension rod, ball-head bolt, track suspension clamp, spring clip	Track suspension
Trolley combination	Trolley, articulated frame, traverse	Trolley combinations
Travel drive	RF 100, RF 125, TD 200 and DRF 200	Travel drives for crabs and cranes
Coupling elements	Trolley link, link bar, spacer bar	Coupling elements and spacer bars
Accessories	Buffers on crabs, trolley fittings	Buffers and end stops
Electric power supply	Cable slider, cable trolley, trailing cable, conductor line	Power supply to crabs and cranes
Pneumatic power supply	Cable trolley, protective hose, compressed air lines, fittings	Pneumatic power supply
Control system		Standard electric equipment

Type: Flexible track suspensions

3.11.2 Specifying monorails according to selection table

Classification in terms of DIN 15018, H1 B3

G_H = Lifted load

G_Z = Hoist unit weight

$K_{(1)}$ = Total load (live load + trolley dead weight)

$K_{(2)}$ = Total load with electric/ pneumatic drive

e_{Ka} = Distance between trolley axles (axle base)

G_{AB} = Suspension load for one trolley

l_w = Distance between suspensions for one trolley

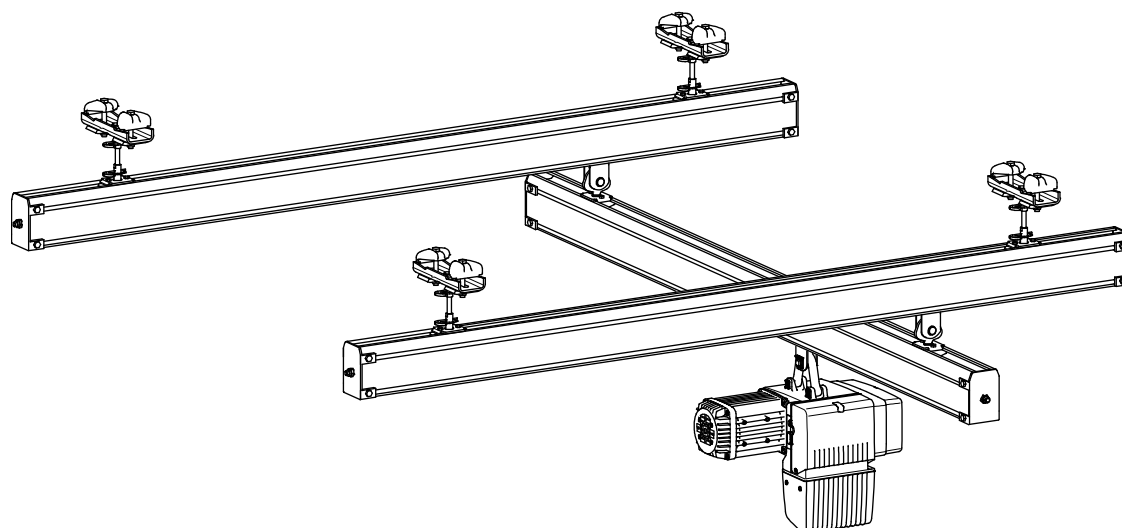
Selection basis: 1 load on the monorail track

In individual cases, exact static analysis calculations may lead to different results. Use KBK designer for precise specification of installations.

GH	Gz	A12				A16				A18				A22				A28			
		K(1)	eKa	lw	GAB	K(1)	eKa	lw	GAB	K(1)	eKa	lw	GAB	K(1)	eKa	lw	GAB	K(1)	eKa	lw	GAB
		K(2)				K(2)				K(2)				K(2)				K(2)			
[kg]	[kg]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]
125	30	160	0.065	3.70	184	160	0.065	5.55	207	160	0.085	8.00	263	160	0.085	8.75	290	160	0.085	8.75	357
		175	0.065	3.55	197	175	0.065	5.30	220	190	0.085	7.70	293	190	0.085	8.75	320	190	0.085	8.75	387
250	35	290	0.065	2.75	307	290	0.065	4.10	325	290	0.085	5.95	367	290	0.085	7.80	406	290	0.085	8.75	487
		305	0.065	2.70	321	305	0.065	4.00	338	320	0.085	5.80	397	320	0.085	7.60	436	320	0.085	8.75	517
500	75	565	0.210	2.00	577	565	0.210	2.90	591	560	0.085	4.25	620	560	0.085	5.60	648	560	0.085	8.65	760
		580	0.210	1.95	590	580	0.210	2.90	605	590	0.085	4.20	650	590	0.085	5.50	678	590	0.085	8.55	790
1000	85	-	-	-	-	-	-	-	-	1095	0.250	3.05	1136	1095	0.085	4.00	1155	1095	0.085	6.20	1235
		-	-	-	-	-	-	-	-	1125	0.250	3.05	1166	1125	0.085	3.95	1184	1125	0.085	6.10	1265
1250	-	-	-	-	-	-	-	-	-	-	-	-	-	1405	0.300	3.55	1455	1405	0.300	5.50	1528
		-	-	-	-	-	-	-	-	-	-	-	-	1435	0.300	3.50	1485	1435	0.300	5.45	1558
1600	-	-	-	-	-	-	-	-	-	-	-	-	-	1755	0.300	3.15	1797	1755	0.300	4.90	1864
		-	-	-	-	-	-	-	-	-	-	-	-	1785	0.300	3.15	1827	1785	0.300	4.85	1894
2000	-	-	-	-	-	-	-	-	-	-	-	-	-	2155	0.300	2.85	2189	2155	0.300	4.45	2252
		-	-	-	-	-	-	-	-	-	-	-	-	2185	0.300	2.80	2219	2185	0.300	4.40	2282

3.12 Single and double-girder cranes

3.12.1 Single-girder crane



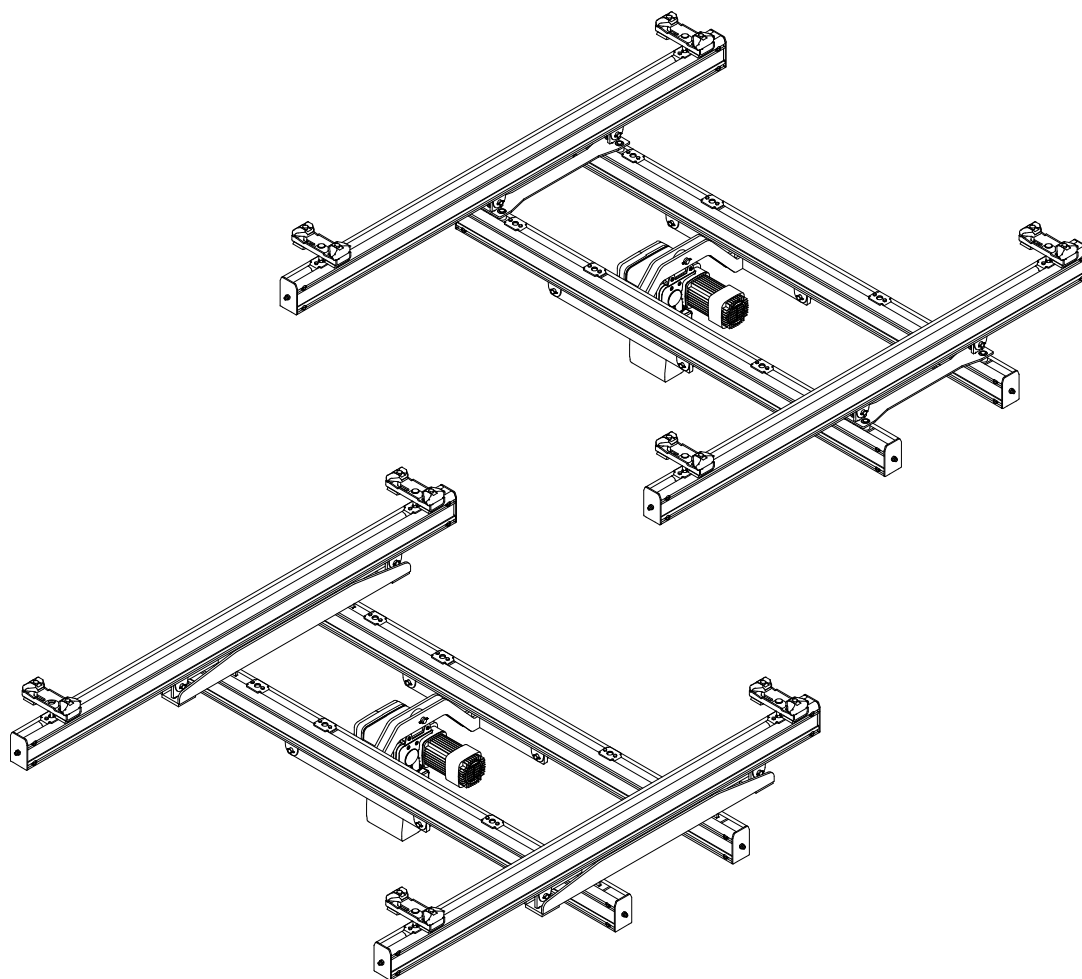
Single-girder crane		
Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	"Monorail track, crane runway and crane girder basic components"
Suspension	Suspension, short suspension, upper suspension bracket, upper suspension clamp, ball-head suspension rod, suspension rod, ball-head bolt, track suspension clamp, spring clip	"Track suspension"
Trolley combination	Trolley, articulated frame, load bar, crane trolley assembly, crane suspension eye, rigid crane end carriage	"Trolley combinations"
Travel drive	RF 125/TD 200	"Travel drives for crabs and cranes"
Link bars	Trolley link, link bar, spacer bar	"Coupling elements and spacer bars"
Accessories	Buffers on crabs and cranes	"Buffers and end stops"
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	"Power supply to crabs and cranes"
Pneum. power supply	Cable trolley, protective hose, compressed air lines, fittings	"Pneumatic power supply"
Control system		"Standard electric equipment"

Execution:

- Articulated track and crane suspensions (shown)
- Articulated track suspensions with rigid crane trolleys

Crane girder without a rail joint

3.12.2 Double-girder crane



Double-girder crane		
Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	"Monorail track, crane runway and crane girder basic components"
Suspension	Short suspension, upper suspension bracket, upper suspension clamp, ball-head suspension rod, suspension rod, track suspension clamp, spring clip	"Track suspension"
Trolley combination	Trolley, articulated frame, frame for double-girder crane, crab frame	"Trolley combinations"
Travel drive	RF 125/TD 200	"Travel drives for crabs and cranes"
Link bars	Trolley link, link bar, spacer bar	"Coupling elements and spacer bars"
Accessories	Buffers on crabs and cranes	"Buffers and end stops"
Elec. power supply	Cable slider, cable trolley, trailing cable, conductor line	"Power supply to crabs and cranes"
Control system		"Standard electric equipment"

Execution:

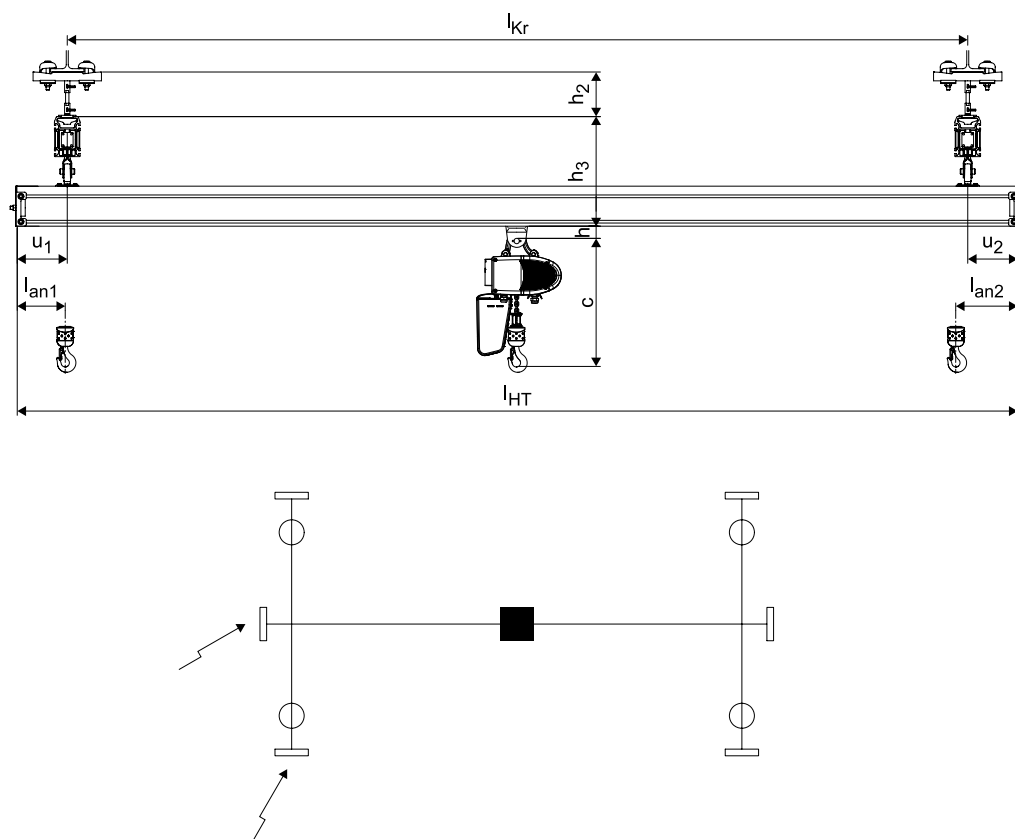
articulated track suspensions with rigid crane trolleys

(Articulated crane suspensions are not used).

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

Suspension monorail

Single-girder crane



Double-girder crane

l_{Kr} = Crane span dimension

h = Bottom edge of rail to top edge of pin

c = Hoist headroom dimension

l_{HT} = Crane girder length

h_2 = Bottom edge of I-beam to top edge of track girder

l_{an} = Approach dimension

u = Overhang

h_3 = Top edge of track girder to bottom edge of crane girder

st = distance joint to suspension point

The following selection tables show a few of the many possible combinations for building crane installations with KBK Aluline. Use KBK Aluline 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, tracks: 1/500,

frequency ≥ 2.8 Hz

Where there are several cranes on the same crane runway, the crane trolley assemblies 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 fittings.

Check suspension loads.

Classification in terms of DIN 15018, H1 B3

l_{HT} = Crane girder lengthl_{Kr} = Crane span dimensionl_w = Distance between track suspensions

Suspension loads on request

All dimensions in m

3.12.3.1 Load capacity: 125 kg, hoist weight: 30 kg, lifting speed: 30 m/min

All dimensions in m.

	Profile	l _{HT}	Single girder crane							Double girder crane								
			l _{Kr}			l _w				l _{Kr}			l _w					
			Min.	Max.	A12	A16	A18	A22	A28	Min.	Max.	A12	A16	A18	A22	A28		
Crane girder section, crane girder length	A12	1	0.80	-	0.90	3.55	5.30	7.75	8.75	8.75	-	-	-	-	-	-		
		2	1.70	-	1.90	3.50	5.20	7.60	8.75	8.75	1.50	-	1.75	3.30	4.95	7.10	8.75	8.75
		3	2.60	-	2.90	3.45	5.15	7.50	8.75	8.75	1.95	-	2.75	3.25	4.80	6.90	8.75	8.75
		4	3.40	-	3.55	3.40	5.05	7.40	8.75	8.75	2.70	-	3.75	3.15	4.70	6.75	8.75	8.75
		5	-	-	-	-	-	-	-	-	3.40	-	4.75	3.10	4.60	6.60	8.65	8.75
		6	-	-	-	-	-	-	-	-	4.05	-	4.90	3.00	4.40	6.30	8.25	8.75
		7	-	-	-	-	-	-	-	-	4.65	-	4.90	2.95	4.35	6.20	8.10	8.75
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A16	1	0.75	-	0.90	3.55	5.25	7.70	8.75	8.75	-	-	-	-	-	-	-	
		2	1.70	-	1.90	3.45	5.15	7.55	8.75	8.75	1.50	-	1.75	3.25	4.85	6.95	8.75	8.75
		3	2.55	-	2.90	3.40	5.10	7.40	8.75	8.75	1.90	-	2.75	3.15	4.70	6.75	8.75	8.75
		4	3.35	-	3.90	3.35	5.00	7.30	8.75	8.75	2.60	-	3.75	3.10	4.60	6.60	8.60	8.75
		5	4.10	-	4.90	3.30	4.90	7.15	8.75	8.75	3.20	-	4.75	3.00	4.50	6.40	8.35	8.75
		6	4.80	-	5.40	3.25	4.85	7.05	8.75	8.75	3.80	-	5.75	2.90	4.30	6.10	7.95	8.75
		7	-	-	-	-	-	-	-	-	4.30	-	6.75	2.85	4.20	6.00	7.80	8.75
		8	-	-	-	-	-	-	-	-	4.75	-	7.40	2.75	4.10	5.85	7.65	8.75
	A18	1	-	-	-	3.50	5.20	7.60	8.75	8.75	-	-	-	-	-	-	-	
		2	1.65	-	1.90	3.40	5.05	7.40	8.75	8.75	1.50	-	1.75	3.15	4.70	6.75	8.75	8.75
		3	2.45	-	2.90	3.30	4.95	7.20	8.75	8.75	1.60	-	2.75	2.95	4.40	6.30	8.20	8.75
		4	3.15	-	3.90	3.25	4.85	7.05	8.75	8.75	2.25	-	3.75	2.85	4.25	6.10	7.95	8.75
		5	3.85	-	4.90	3.15	4.70	6.90	8.75	8.75	2.80	-	4.75	2.75	4.10	5.90	7.70	8.75
		6	4.45	-	5.90	3.10	4.60	6.75	8.75	8.75	3.30	-	5.75	2.65	3.90	5.60	7.30	8.75
		7	5.00	-	6.90	3.05	4.50	6.60	8.65	8.75	3.70	-	6.75	2.60	3.80	5.45	7.10	8.75
		8	5.55	-	7.85	3.00	4.45	6.50	8.45	8.75	4.10	-	7.75	2.55	3.70	5.30	6.90	8.75
	A22	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		2	1.60	-	1.75	3.35	5.05	7.35	8.75	8.75	1.50	-	1.75	3.15	4.70	6.70	8.75	8.75
		3	2.40	-	2.75	3.25	4.90	7.15	8.75	8.75	1.55	-	2.75	2.90	4.30	6.20	8.05	8.75
		4	3.10	-	3.75	3.20	4.75	6.95	8.75	8.75	2.15	-	3.75	2.80	4.15	5.95	7.75	8.75
		5	3.70	-	4.75	3.10	4.65	6.75	8.75	8.75	2.65	-	4.75	2.70	4.00	5.75	7.50	8.75
		6	4.30	-	5.75	3.05	4.55	6.60	8.65	8.75	3.10	-	5.75	2.60	3.80	5.45	7.10	8.75
		7	4.80	-	6.75	2.95	4.45	6.45	8.45	8.75	3.50	-	6.75	2.50	3.70	5.30	6.90	8.75
		8	5.30	-	7.75	2.90	4.35	6.30	8.25	8.75	4.00	-	7.75	2.45	3.65	5.20	6.75	8.75
	A28	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		2	1.55	-	1.75	3.25	4.90	7.10	8.75	8.75	1.50	-	1.75	3.05	4.55	6.55	8.55	8.75
		3	2.20	-	2.75	3.15	4.70	6.85	8.75	8.75	1.50	-	2.75	2.80	4.15	5.95	7.75	8.75
		4	2.80	-	3.75	3.05	4.50	6.60	8.60	8.75	2.00	-	3.75	2.65	3.95	5.65	7.35	8.75
		5	3.30	-	4.75	2.95	4.35	6.40	8.35	8.75	2.50	-	4.75	2.55	3.80	5.40	7.05	8.75
		6	3.80	-	5.75	2.85	4.25	6.20	8.10	8.75	3.00	-	5.75	2.45	3.60	5.15	6.70	8.75
		7	4.20	-	6.75	2.75	4.10	6.00	7.85	8.75	3.50	-	6.75	2.40	3.50	5.00	6.55	8.75
		8	5.00	-	7.75	2.75	4.10	5.95	7.80	8.75	4.00	-	7.75	2.35	3.45	4.90	6.40	8.75

3.12.3.2 Load capacity: 250 kg, hoist weight: 35 kg, lifting speed: 20 m/min

All dimensions in m.

	Profile	IHT	Single girder crane							Double girder crane								
			l _{Kr}			l _w					l _{Kr}		l _w					
			Min.	Max.		A12	A16	A18	A22	A28	Min.	Max.	A12	A16	A18	A22	A28	
Crane girder section, crane girder length	A12	1	0.80	-	0.90	2.70	4.00	5.85	7.65	8.75	-	-	-	-	-	-	-	
		2	1.75	-	1.90	2.65 ¹⁾	3.95 ¹⁾	5.80	7.55	8.75	1.50	-	1.75	2.65	3.90	5.55	7.25	8.75
		3	-	-	-	-	-	-	-	-	2.05	-	2.75	2.60	3.85	5.50	7.15	8.75
		4	-	-	-	-	-	-	-	-	2.90	-	3.75	2.55	3.80	5.40	7.05	8.75
		5	-	-	-	-	-	-	-	-	3.70	-	3.75	2.50	3.75	5.35	6.95	8.75
		6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A16	1	0.80	-	0.90	2.70 ¹⁾	4.00 ¹⁾	5.85	7.60	8.75	-	-	-	-	-	-	-	-
		2	1.75	-	1.90	2.65 ¹⁾	3.95 ¹⁾	5.75	7.50	8.75	1.50	-	1.75	2.60	3.85	5.50	7.20	8.75
		3	2.65	-	2.90	2.60 ¹⁾	3.90 ¹⁾	5.70	7.45	8.75	2.00	-	2.75	2.55	3.80	5.40	7.05	8.75
		4	3.50	-	3.90	2.60 ¹⁾	3.85 ¹⁾	5.65	7.35	8.75	2.85	-	3.75	2.50	3.70	5.30	6.95	8.75
		5	-	-	-	-	-	-	-	-	3.60	-	4.75	2.50	3.65	5.25	6.80	8.75
		6	-	-	-	-	-	-	-	-	4.30	-	5.65	2.40	3.55	5.05	6.60	8.75
		7	-	-	-	-	-	-	-	-	4.95	-	5.65	2.40	3.50	5.00	6.50	8.75
		8	-	-	-	-	-	-	-	-	5.55	-	5.65	2.35	3.45	4.90	6.40	8.75
	A18	1	-	-	-	2.65 ¹⁾	3.95 ¹⁾	5.80	7.55	8.75	-	-	-	-	-	-	-	-
		2	1.70	-	1.90	2.60 ¹⁾	3.90 ¹⁾	5.70	7.45	8.75	1.50	-	1.75	2.55	3.80	5.40	7.05	8.75
		3	2.60	-	2.90	2.60 ¹⁾	3.85 ¹⁾	5.60	7.30	8.75	1.75	-	2.75	2.45	3.60	5.15	6.75	8.75
		4	3.40	-	3.90	2.55 ¹⁾	3.75 ¹⁾	5.50	7.20	8.75	2.50	-	3.75	2.40	3.55	5.05	6.55	8.75
		5	4.20	-	4.90	2.50 ¹⁾	3.70 ¹⁾	5.45	7.10	8.75	3.20	-	4.75	2.35	3.45	4.95	6.45	8.75
		6	4.95	-	5.90	2.50 ¹⁾	3.65 ¹⁾	5.35	7.00	8.75	3.80	-	5.75	2.30	3.35	4.75	6.20	8.75
		7	5.65	-	5.90	2.45 ¹⁾	3.65 ¹⁾	5.30	6.95	8.75	4.40	-	6.75	2.25	3.30	4.65	6.10	8.75
		8	-	-	-	-	-	-	-	8.75	4.95	-	7.75	2.20	3.20	4.60	5.95	8.75
	A22	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	1.70	-	1.75	2.60 ¹⁾	3.85 ¹⁾	5.65	7.40	8.75	1.50	-	1.75	2.55	3.75	5.40	7.00	8.75
		3	2.55	-	2.75	2.55 ¹⁾	3.80 ¹⁾	5.55	7.25	8.75	1.70	-	2.75	2.40	3.55	5.10	6.65	8.75
		4	3.35	-	3.75	2.50 ¹⁾	3.75 ¹⁾	5.45	7.15	8.75	2.45	-	3.75	2.35	3.50	4.95	6.50	8.75
		5	4.15	-	4.75	2.50 ¹⁾	3.70 ¹⁾	5.40	7.05	8.75	3.10	-	4.75	2.30	3.40	4.85	6.30	8.75
		6	4.85	-	5.75	2.45 ¹⁾	3.65 ¹⁾	5.30	6.95	8.75	3.70	-	5.75	2.25	3.30	4.65	6.10	8.75
		7	5.55	-	6.75	2.40 ¹⁾	3.55 ¹⁾	5.25	6.85	8.75	4.20	-	6.75	2.20	3.20	4.55	5.95	8.75
		8	6.15	-	7.70	2.40 ¹⁾	3.50 ¹⁾	5.15	6.75	8.75	4.70	-	7.75	2.15	3.15	4.50	5.85	8.75
	A28	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	1.65	-	1.75	2.55 ¹⁾	3.80 ¹⁾	5.55	7.25	8.75	1.50	-	1.75	2.50	3.70	5.30	6.90	8.75
		3	2.45	-	2.75	2.50 ¹⁾	3.70 ¹⁾	5.40	7.10	8.75	1.60	-	2.75	2.35	3.45	4.90	6.40	8.75
		4	3.15	-	3.75	2.45 ¹⁾	3.60 ¹⁾	5.30	6.95	8.75	2.20	-	3.75	2.25	3.30	4.75	6.15	8.75
		5	3.85	-	4.75	2.40 ¹⁾	3.55 ¹⁾	5.20	6.75	8.75	2.75	-	4.75	2.20	3.20	4.55	5.95	8.75
		6	4.45	-	5.75	2.35 ¹⁾	3.45 ¹⁾	5.05	6.65	8.75	3.25	-	5.75	2.10	3.10	4.40	5.70	8.75
		7	5.05	-	6.75	2.30 ¹⁾	3.40 ¹⁾	4.95	6.50	8.75	3.65	-	6.75	2.05	3.00	4.25	5.55	8.55
		8	5.55	-	7.75	2.25 ¹⁾	3.35 ¹⁾	4.85	6.35	8.75	4.05	-	7.75	2.00	2.90	4.15	5.40	8.30

1) Two trolleys on each end of crane

3.12.3.3 Lifting capacity: 500 kg, hoist weight: 75 kg, max. lifting speed: 15 m/min

All dimensions in m.

	Profile	IHT	Single-girder crane							Double-girder crane						
			l _{Kr}		l _w					l _{Kr}		l _w				
			Min.	Max.	A12	A16	A18	A22	A28	Min.	Max.	A12	A16	A18	A22	A28
Crane girder section, crane girder length	A12	1	0.75	- 0.90 ²⁾	2.05 ¹⁾	3.05 ¹⁾	4.45	5.80	8.75	-	-	-	-	-	-	-
		2	1.55	- 1.90 ²⁾	1.95 ¹⁾	2.85 ¹⁾	4.15	5.40	8.40	1.50	- 1.75	2.00 ³⁾	2.90 ³⁾	4.10	5.35	8.25
		3	-	-	-	-	-	-	-	2.15	- 2.75	1.95 ³⁾	2.85 ³⁾	4.05	5.30	8.15
		4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A16	1	0.75	- 0.90 ²⁾	2.05 ¹⁾	3.05 ¹⁾	4.45	5.80	8.75	-	-	-	-	-	-	-
		2	1.60	- 1.90 ²⁾	1.95 ¹⁾	2.85 ¹⁾	4.15	5.40	8.40	1.50	- 1.75	1.95 ³⁾	2.90 ³⁾	4.10	5.30	8.20
		3	2.60	- 2.85 ²⁾	1.90 ¹⁾	2.85 ¹⁾	4.15	5.40	8.40	2.15	- 2.75	1.95 ³⁾	2.85 ³⁾	4.05	5.25	8.10
		4	-	-	-	-	-	-	-	3.00	- 3.75	1.95 ³⁾	2.80 ³⁾	4.00	5.20	8.00
		5	-	-	-	-	-	-	-	3.85	- 4.05	1.90 ³⁾	2.80 ³⁾	3.95	5.15	7.95
		6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A18	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	1.75	- 1.90	2.00 ¹⁾	2.90 ¹⁾	4.10	5.40	8.35	1.50	- 1.75	1.95 ³⁾	2.85 ³⁾	4.05	5.25	8.10
		3	2.70	- 2.90	2.00 ¹⁾	2.85 ¹⁾	4.10	5.35	8.25	1.85	- 2.75	1.90 ³⁾	2.80 ³⁾	3.95	5.10	7.90
		4	3.60	- 3.90	2.00 ¹⁾	2.85 ¹⁾	4.05	5.30	8.20	2.75	- 3.75	1.90 ³⁾	2.75 ³⁾	3.90	5.05	7.80
		5	-	-	-	-	-	-	-	3.55	- 4.75	1.85 ³⁾	2.70 ³⁾	3.85	5.00	7.70
		6	-	-	-	-	-	-	-	4.30	- 5.75	1.85 ³⁾	1.85 ³⁾	3.75	4.90	7.50
		7	-	-	-	-	-	-	-	5.05	- 5.85	1.55 ³⁾	1.50 ³⁾	3.70	4.80	7.40
		8	-	-	-	-	-	-	-	5.75	- 5.85	1.30 ³⁾	1.30 ³⁾	3.65	4.75	7.35
	A22	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	1.75	- 1.75	2.00 ¹⁾	2.85 ¹⁾	4.05	5.35	8.30	1.50	- 1.75	1.95 ³⁾	2.85 ³⁾	4.00	5.25	8.05
		3	2.70	- 2.75	2.00 ¹⁾	2.85 ¹⁾	4.05	5.30	8.25	1.85	- 2.75	1.90 ³⁾	2.75 ³⁾	3.90	5.10	7.85
		4	3.55	- 3.75	2.00 ¹⁾	2.80 ¹⁾	4.00	5.25	8.15	2.70	- 3.75	1.90 ³⁾	2.70 ³⁾	3.85	5.00	7.70
		5	4.45	- 4.75	1.95 ¹⁾	2.80 ¹⁾	4.00	5.20	8.10	3.45	- 4.75	1.85 ³⁾	2.35 ³⁾	3.80	4.95	7.60
		6	5.30	- 5.45	1.95 ¹⁾	2.80 ¹⁾	3.95	5.15	8.00	4.20	- 5.75	1.55 ³⁾	1.25 ³⁾	3.70	4.80	7.40
		7	-	-	-	-	-	-	-	4.90	- 6.75	1.30 ³⁾	1.15 ³⁾	3.65	4.75	7.30
		8	-	-	-	-	-	-	-	5.60	- 7.65	1.10 ³⁾	1.10 ³⁾	3.60	4.70	7.20
	A28	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	1.70	- 1.75	2.00 ¹⁾	2.85 ¹⁾	4.05	5.30	8.25	1.50	- 1.75	1.95 ³⁾	2.80 ³⁾	4.00	5.20	8.00
		3	2.60	- 2.75	1.95 ¹⁾	2.80 ¹⁾	4.00	5.25	8.10	1.75	- 2.75	1.85 ³⁾	2.70 ³⁾	3.80	4.95	7.65
		4	3.45	- 3.75	1.95 ¹⁾	2.80 ¹⁾	3.95	5.15	8.00	2.55	- 3.75	0.90 ³⁾	1.65 ³⁾	3.75	4.85	7.50
		5	4.25	- 4.75	1.95 ¹⁾	2.75 ¹⁾	3.90	5.10	7.90	3.25	- 4.75	1.25 ³⁾	1.20 ³⁾	3.65	4.75	7.30
		6	5.05	- 5.75	1.90 ¹⁾	2.70 ¹⁾	3.85	5.05	7.80	3.90	- 5.75	0.95 ³⁾	1.00 ³⁾	3.55	4.60	7.10
7		5.75	- 6.75	1.90 ¹⁾	2.70 ¹⁾	3.80	5.00	7.70	4.50	- 6.75	0.90 ³⁾	0.90 ³⁾	3.50	4.55	7.00	
8		6.50	- 7.75	1.90 ¹⁾	2.60 ¹⁾	3.75	4.95	7.65	5.05	- 7.75	0.80 ³⁾	0.80 ³⁾	3.45	4.45	6.85	

- 1) Two trolleys on each end of crane
- 2) Double trolley unit
- 3) Quadruple trolley on each end of crane

3.12.3.4 Lifting capacity: 1000 kg, hoist weight: 85 kg, max. lifting speed: 15 m/min

All dimensions in m.

	Profile	IHT	Single-girder crane						Double-girder crane							
			l _{Kr}		l _w				l _{Kr}		l _w					
			Min.	Max.			A18	A22	A28	Min.	Max.	A12	A16	A18	A22	A28
Crane girder section, crane girder length	A18	1	-	2)			3.30 ¹⁾	4.30	6.65	-	-	-	-	-	-	-
		2	1.55	- 1.90 ²⁾			3.00 ¹⁾	3.95	6.10	1.50	- 1.75	0.55 ³⁾	0.55 ³⁾	3.00	3.90	6.00
		3	2.50	- 2.90 ²⁾			3.00 ¹⁾	3.90	6.05	1.95	- 2.75	-	-	2.95	3.85	5.90
		4	-	-			-	-	-	2.85	- 3.75	-	-	2.95	3.80	5.85
		5	-	-			-	-	-	3.75	- 4.35	-	-	2.95	3.80	5.85
		6	-	-			-	-	-	-	-	-	-	-	-	-
	A22	1	-	-			-	-	-	-	-	-	-	-	-	-
		2	1.70	- 1.75			3.00 ¹⁾	4.00	6.15	1.50	- 1.75	0.55 ³⁾	0.55 ³⁾	3.00	3.90	6.00
		3	2.70	- 2.75			3.00 ¹⁾	3.95	6.10	1.95	- 2.75	-	-	2.95	3.85	5.90
		4	3.65	- 3.75			3.00 ¹⁾	3.90	6.05	2.85	- 3.75	-	-	2.95	3.80	5.85
		5	-	-			-	-	-	3.70	- 4.75	-	-	2.90	3.75	5.80
		6	-	-			-	-	-	4.55	- 5.60	-	-	2.90	3.75	5.75
		7	-	-			-	-	-	5.40	- 5.60	-	-	2.85	3.70	5.70
	A28	1	-	-			-	-	-	-	-	-	-	-	-	-
		2	1.70	- 1.75			3.00 ¹⁾	3.95	6.05	1.50	- 1.75	0.55 ³⁾	0.55 ³⁾	3.00	3.85	5.95
		3	2.70	- 2.75			3.00 ¹⁾	3.90	6.00	1.90	- 2.75	-	-	2.90	3.80	5.80
		4	3.60	- 3.75			2.95 ¹⁾	3.85	6.00	2.75	- 3.75	-	-	2.90	3.75	5.75
		5	4.50	- 4.75			2.95 ¹⁾	3.85	5.95	3.55	- 4.75	-	-	2.85	3.70	5.65
		6	5.35	- 5.75			3.10 ¹⁾	3.80 ¹⁾	5.90 ¹⁾	4.35	- 5.75	-	-	2.80	3.65	5.60
		7	-	-			-	-	-	5.10	- 6.75	-	-	2.10	3.60	5.55
		8	-	-			-	-	-	5.80	- 7.75	-	-	1.55	3.55	5.45

1) Two trolleys on each end of crane

2) Double trolley unit

3) Quadruple trolley on each end of crane

3.12.3.5 Lifting capacity: 1250 kg, hoist weight: 115 kg, max. lifting speed: 10 m/min

All dimensions in m.

	Profile	l _{HT}	Single-girder crane						Double-girder crane							
			l _{Kr}		l _w				l _{Kr}		l _w					
			Min.	Max.			A18	A22	A28	Min.	Max.			A18	A22	A28
Crane girder section, crane girder length	A22	1	-			-	-	-	-			-	-	-		
		2	1.50	- 1.75 ²⁾			-	3.50 ¹⁾	5.45 ¹⁾	1.50	- 1.75			1.35	3.50	5.35
		3	2.45	- 2.75 ²⁾			-	3.50 ¹⁾	5.40 ¹⁾	2.05	- 2.75			1.10	3.50	5.35
		4	3.40	- 3.55 ²⁾			-	3.50 ¹⁾	5.40 ¹⁾	2.95	- 3.75			1.15	3.45	5.30
		5	-				-	-	-	3.85	- 4.75			1.10	3.45	5.25
		6	-				-	-	-	4.70	- 5.00			1.00	3.40	5.20
		7	-				-	-	-	-			-	-	-	
		8	-				-	-	-	-			-	-	-	
	A28	1	-			-	-	-	-			-	-	-		
		2	1.50	- 1.75 ²⁾			-	3.50 ¹⁾	5.45 ¹⁾	1.50	- 1.75			1.25	3.50	5.35
		3	2.40	- 2.75 ²⁾			-	3.50 ¹⁾	5.40 ¹⁾	2.00	- 2.75			1.10	3.45	5.25
		4	3.35	- 3.75 ²⁾			-	3.45 ¹⁾	5.35 ¹⁾	2.85	- 3.75			1.00	3.40	5.20
		5	4.25	- 4.75 ²⁾			-	3.45 ¹⁾	5.35 ¹⁾	3.70	- 4.75			1.00 ³⁾	3.40	5.15
		6	5.15	- 5.50 ²⁾			-	3.45 ¹⁾	5.30 ¹⁾	4.55	- 5.75			0.95 ³⁾	3.35	5.10
		7	-				-	-	-	5.35	- 6.75			0.90 ³⁾	3.30	5.05
		8	-				-	-	-	6.10	- 7.70			0.85 ³⁾	3.30	5.00

1) Two trolleys on each end of crane

2) Double trolley unit

3) Quadruple trolley on each end of crane

3.12.3.6 Lifting capacity: 1600 kg, hoist weight: 115 kg, max. lifting speed: 10 m/min

All dimensions in m.

	Profile	l _{HT}	Single-girder crane						Double-girder crane							
			l _{Kr}		l _w				l _{Kr}		l _w					
			Min.	Max.			A18	A22	A28	Min.	Max.			A18	A22	A28
Crane girder section, crane girder length	A22	1	-				-	-	-	-				-	-	-
		2	1.50	- 1.75 ²⁾			-	3.00 ¹⁾	4.90 ¹⁾	1.50	- 1.75			0.75 ³⁾	3.20	4.85
		3	2.45	- 2.75 ²⁾			-	2.95 ¹⁾	4.85 ¹⁾	2.05	- 2.75			0.75 ³⁾	3.15	4.80
		4	-				-	-	-	3.00	- 3.75			0.70 ³⁾	3.15	4.80
		5	-				-	-	-	3.90	- 4.50			0.70 ³⁾	3.10	4.75
		6	-				-	-	-	-				-	-	-
	A28	1	-				-	-	-	-				-	-	-
		2	1.50	- 1.75 ²⁾			-	2.95 ¹⁾	4.85 ¹⁾	1.50	- 1.75			0.75 ³⁾	3.15	4.80
		3	2.45	- 2.75 ²⁾			-	2.95 ¹⁾	4.85 ¹⁾	2.00	- 2.75			0.70 ³⁾	3.10	4.75
		4	3.40	- 3.75 ²⁾			-	2.90 ¹⁾	4.80 ¹⁾	2.90	- 3.75			0.70 ³⁾	3.10	4.75
		5	4.30	- 4.75 ²⁾			-	2.90 ¹⁾	4.80 ¹⁾	3.80	- 4.75			0.70 ³⁾	3.05	4.70
		6	-				-	-	-	4.65	- 5.75			0.65 ³⁾	3.00	4.65
		7	-				-	-	-	5.45	- 6.75			0.65 ³⁾	2.95	4.60
		8	-				-	-	-	6.25	- 6.90			0.65 ³⁾	2.90	4.60

1) Two trolleys on each end of crane

2) Double trolley unit

3) Quadruple trolley on each end of crane

3.12.3.7 Lifting capacity: 2000 kg, hoist weight: 115 kg, max. lifting speed: 5 m/min

All dimensions in m.

	Profile	IHT	Single-girder crane						Double-girder crane							
			l _{Kr}		l _w				l _{Kr}		l _w					
			Min.	Max.			A18	A22	A28	Min.	Max.			A18	A22	A28
Crane girder section, crane girder length	A22	1	-			-	-	-	-			-	-	-		
		2	1.50	- 1.75 ²⁾			-	2.50 ¹⁾	4.25 ¹⁾	1.50	- 1.75			0.60 ³⁾	2.75	4.40
		3	2.45	- 2.50 ²⁾			-	2.45 ¹⁾	4.20 ¹⁾	2.05	- 2.75			0.55 ³⁾	2.70	4.40
		4	-			-	-	-	3.00	- 3.75			0.55 ³⁾	2.70	4.35	
		5	-			-	-	-	3.95	- 4.10			0.55 ³⁾	2.65	4.35	
		6	-			-	-	-	-	-			-	-	-	
	A28	1	-	-			-	-	-	-	-			-	-	-
		2	1.50	- 1.75 ²⁾			-	2.50 ¹⁾	4.20 ¹⁾	1.50	- 1.75			0.60 ³⁾	2.70	4.40
		3	2.45	- 2.75 ²⁾			-	2.45 ¹⁾	4.20 ¹⁾	2.05	- 2.75			0.55 ³⁾	2.70	4.35
		4	3.40	- 3.75 ²⁾			-	2.45 ¹⁾	4.15 ¹⁾	2.95	- 3.75			0.55 ³⁾	2.15	4.30
		5	-			-	-	-	3.85	- 4.75			0.55 ³⁾	2.60	4.25	
		6	-			-	-	-	4.70	- 5.75			0.55 ³⁾	2.50	4.20	
		7	-			-	-	-	5.70	- 6.25			0.55 ³⁾	2.35	4.20	
		8	-			-	-	-	-	-			-	-	-	

1) Two trolleys on each end of crane

2) Double trolley unit

3) Quadruple trolley on each end of crane

4 Project planning and drafting (KBK Aluline Ergo)

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
- Cranes for handling equipment

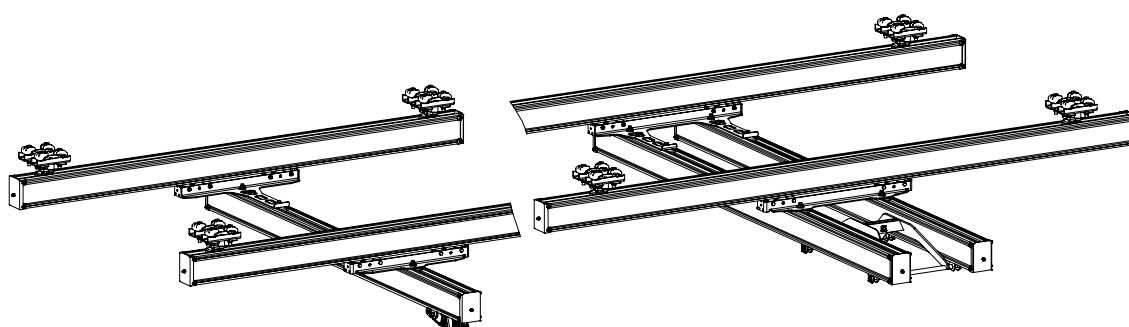
Rigid Ergo trolleys integrated into special end carriages and trolley frames, together with rigid suspensions accommodate load torques and forces acting in the opposite direction to the load. Ergo trolleys can accommodate horizontal forces resulting from handling devices.

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

4.1 Cranes with a large overhang

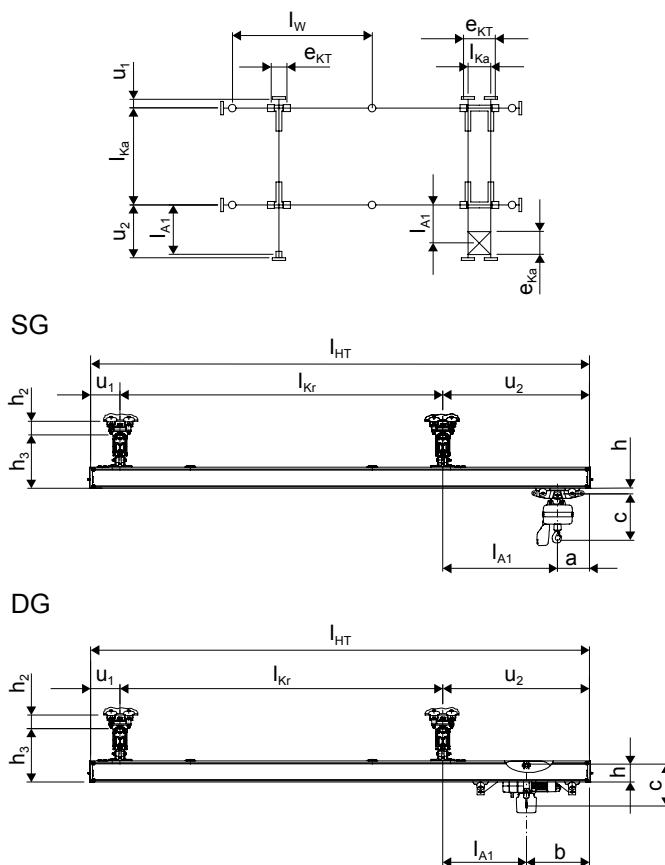
Single girder crane

Double girder crane



Single girder crane		
Assemblies	Components	See chapter or section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, shock absorber, information plates	"Monorail track, crane runway and crane girder basic components"
Suspension	Short suspension, Ergo suspension	"Track suspension"
Trolley combination	Trolley, Ergo crane trolley, Ergo crab trolley	"Trolley combinations"
Travel drive	RF 100, RF 125/TD 200 and DRF 200	"Travel drives for crabs and cranes"
Coupling elements	Trolley link, link bar, spacer bar	"Coupling elements and spacer bars"
Accessories	Buffers on crabs and cranes	"Buffers and end stops"
Electric power supply	Cable slider, cable trolley, trailing cable, conductor line	"Electric power supply"
Control system		"KBK standard electric equipment"

Design: rigid track suspensions and crane end carriages



SG: Single girder; DG: Double girder

	Single girder crane	Double girder crane
a [mm]	A18/A22: 235 (110)	-
b [mm]	-	A12/A16: 415 A18/A22: 500 (460)

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

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 $l_{HT} = 3$ m.)

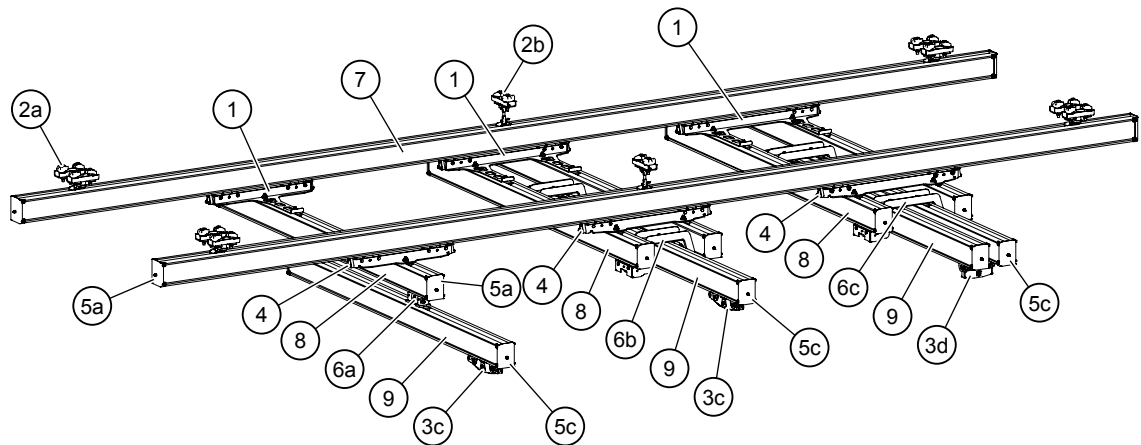
A KBK Aluline crab frame is used as the crab for double girder cranes. KBK Aluline end caps with rubber buffers are installed at the ends of the track and at the ends of the crane girders.

The hoist (load) connection is articulated.

- l_{Kr} = Crane span dimension
- l_{HT} = Crane girder length
- l_{Ka} = Crab track gauge
- e_{KT} = Distance between crane trolleys
- e_{Ka} = Distance between crab axles
- l_{A1} = Permissible overhang dimension
- u_1 = Overhang

- u_2 = Overhang
- h = LE of rail to pin top edge
- 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

4.2 Extending cranes



1. KBK Ergo crane end carriage
2. Suspension
 - a. KBK Ergo
 - b. KBK Classic
3. Traveling hoist
 - a. KBK Ergo crab frame
 - b. KBK Classic crab frame
 - c. KBK Classic single or double trolleys
 - d. Trolley load bar for extending crane B2/2
4. Buffer plate
5. End cap
 - a. KBK Ergo with rubber or cellular plastic buffers
 - b. KBK Ergo with shock absorbers
 - c. KBK Classic
6. KBK Ergo extending frame
 - a. Type A1/1
 - b. Type B2/1
 - c. Type B2/2
7. KBK crane runway
8. KBK crane girder

9. KBK extending rail
10. Drives
 - a. Electric
 - b. Pneumatic
11. Power supply
 - a. Electric
 - b. Pneumatic

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 unfavorable headroom dimension. For type B, the extending rails move between the crane girder rails.

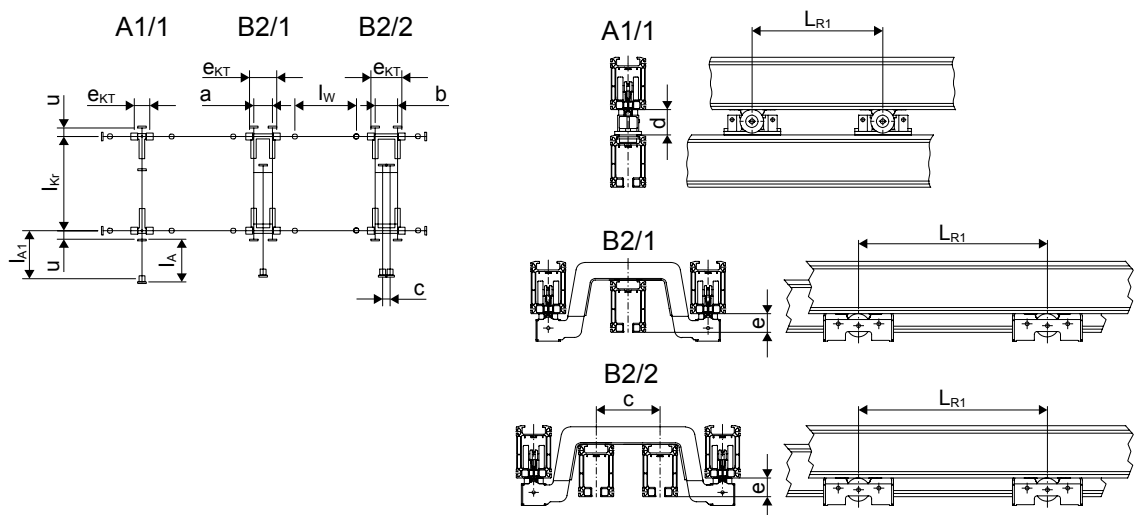
Crane types:

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

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 $l_{HT} = 3 \text{ m}$.) Trolley load bar 220 is used for type B2/2 (see section 9.3).

The extending rails are the same length as the crane girders. Shorter extending rails are available on request.

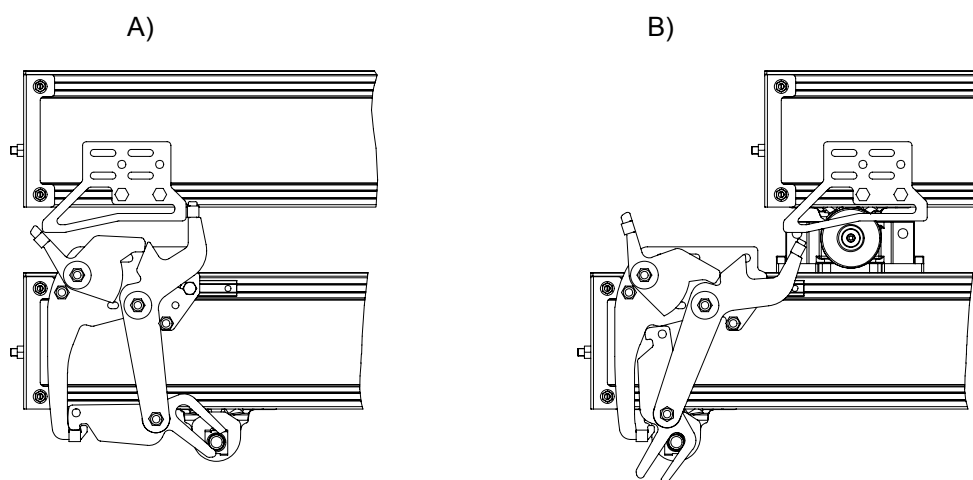
Example: A18



a [mm]	b [mm]	c [mm]	d [mm]	e [mm]
550	650	220	87	65

Item	Designation	Maximum load [kg]	A12/A16		A18		A22		A28	
			Weight [kg]	Part no	Weight [kg]	Part no	Weight [kg]	Part no	Weight [kg]	Part no
117	Extending frame A 1/1	-100 to +300	3.93	71552046	-	-	-	-	-	-
	Extending frame A 1/1	-400 to +800	-	-	11.51	71570546	11.51	71570546	11.51	71570546
118	Extending frame B 2/1	-400 to +1200	-	-	39.80	71544246	40.88	71570146	-	On request
119	Extending frame B 2/2		-	-	45.80	71544646	47.55	71570246	-	On request

4.3 Extension locking device



Item	Designation	Weight [kg]	Part no
153	Extension locking device A1/1	5.39	85554544

Extension locking devices are suitable for all combinations of KBK A18/A22 cranes and KBK A18/A22 extending rails on type A1/1 cranes that only extend on one side.

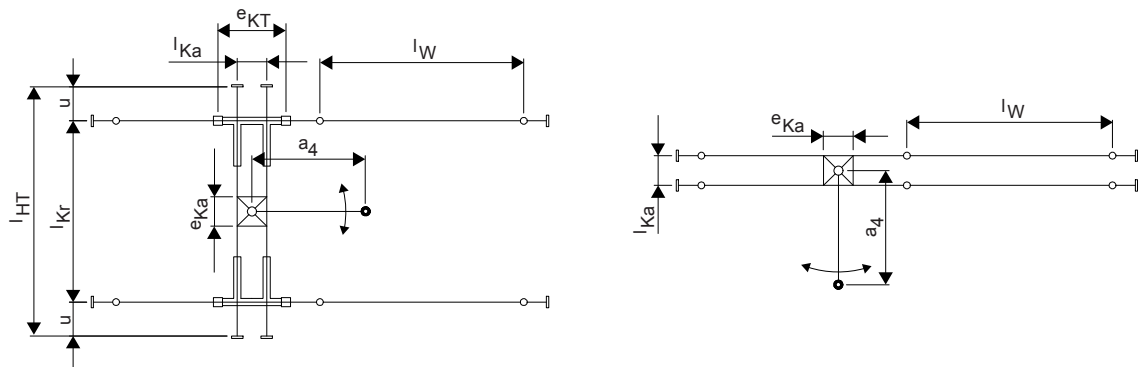
A) The locking device prevents unintended extension of the lower rail when it is retracted.

B) The trolley is held when it enters the locking device; this enables the arrangement to be extended. When the arrangement is retracted, the rail is first pressed back and the trolley is not released until the end.

The special pin for the trolley is included in the scope of delivery for the extension locking device.

Finish: galvanized

4.4 Cranes for handling equipment



Single girder crane		
Assemblies	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, shock absorber, information plates	"Monorail track, crane runway and crane girder basic components"
Suspension	Short suspension, Ergo suspension	"Track suspension"
Trolley combination	Trolley, Ergo crane trolley, Ergo crab trolley	"Trolley combinations"
Travel drive	RF 100, RF 125, and DRF 200	"Travel drives for crabs and cranes"
Coupling elements	Trolley link, link bar, spacer bar	"Coupling elements and spacer bars"
Accessories	Buffers on crabs and cranes	"Buffers and end stops"
Electrical power supply	Cable slider, cable trolley, trailing cable, conductor line	"Electric power supply"
Control system		"KBK standard electric equipment"

Design: rigid track and crane suspensions

4.4.1 Project engineering for handling devices

Offset loads and the associated moments on manipulators and handling devices 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.

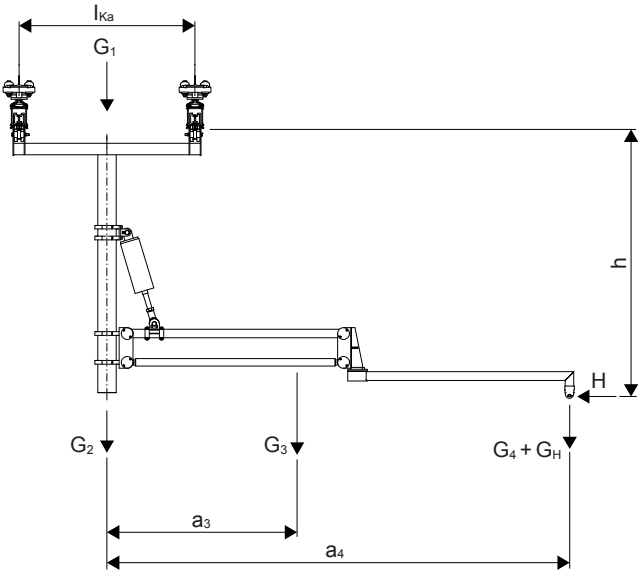
Manipulators and handling devices are bolted to a crab frame. The manipulator crab runs in a double-rail track or on a double girder crane.

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 loads 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.

Values required for project engineering



Example:

Loads:

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

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

Distances::

Arm:	$a_3 = 0.94 \text{ m}$
Device:	$a_4 = 2.60 \text{ m}$
Manual force:	$h = 3.00 \text{ m}$

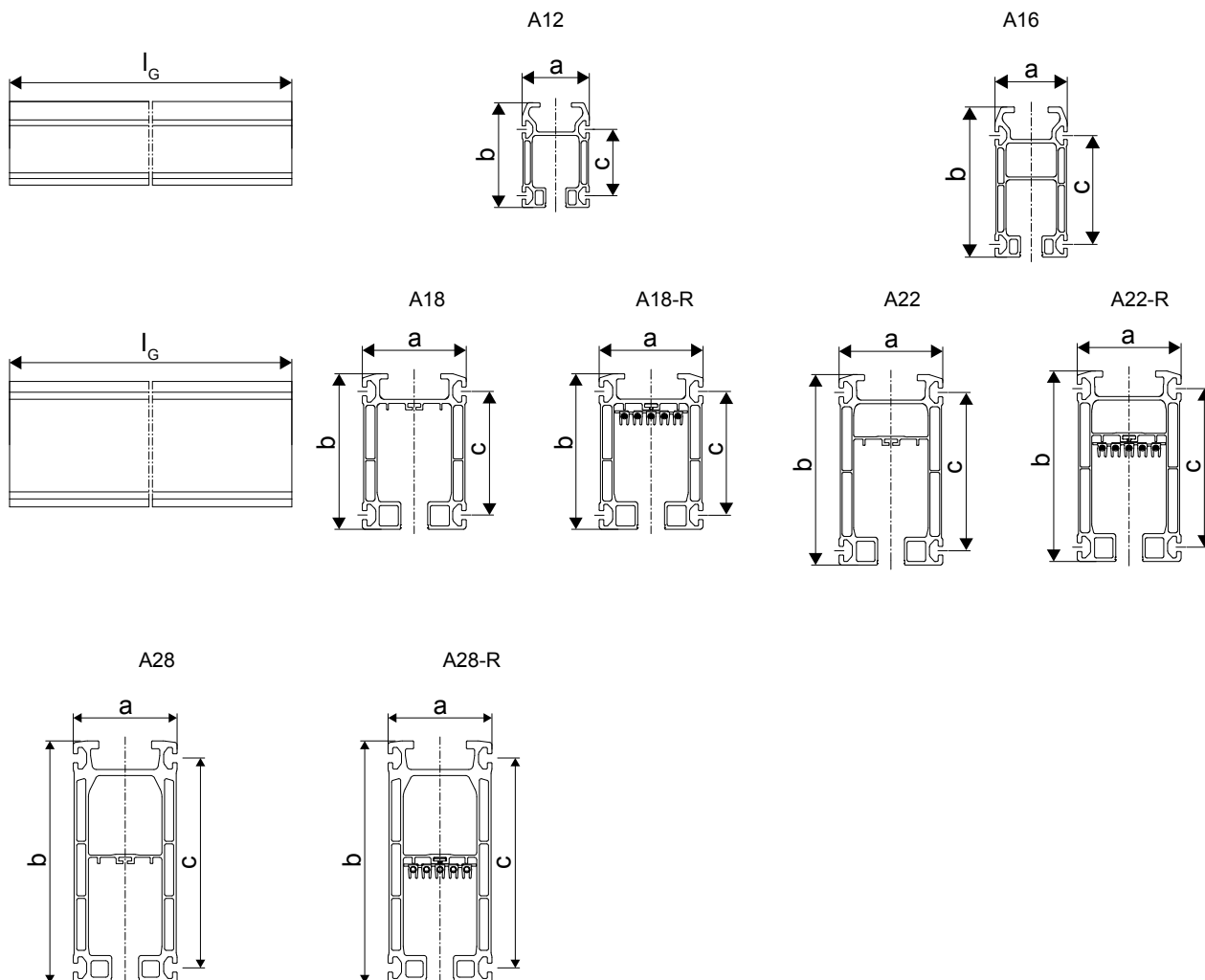
Moments:

Arm	$G_3 \times a_3 = 114.7 \text{ kgm}$
Device, load:	$(G_4 + G_H) \times a_4 = 104.0 \text{ kgm}$
Manual force:	$H \times h = 15.0 \text{ kgm}$
Total:	$M_{Ges} = 233.7 \text{ kgm}$

5 Monorail track, crane runway and crane girder basic components

5.1 Crane and track elements

5.1.1 Straight section (item 1)



	a [mm]	b [mm]	c [mm]
A12	77	120	76
A16		160	116
A18	120	180	143
A18-R			
A22		220	183
A22-R			
A28*		280	242
A28-R*			

* A28 availability depends on region.

Item	Designation	Length l _G		A12	A16	A18	A18-R	A22	A22-R	A28*	A28-R*
1	Straight section	1000 mm	Weight [kg]	5.45	7.02	10.30	11.50	12.27	13.47	18.00	18.9
			Part no.	85530144	85540144	85550144	85580144	85560144	85590144	85575144	85595144
		2000 mm	Weight [kg]	10.90	14.04	20.60	23.00	24.54	26.94	36.00	37.8
			Part no.	85530244	85540244	85550244	85580244	85560244	85590244	85575244	85595244
		3000 mm	Weight [kg]	16.35	21.06	30.90	34.50	36.81	40.41	54.00	56.7
			Part no.	85530344	85540344	85550344	85580344	85560344	85590344	85575344	85595344
		4000 mm	Weight [kg]	21.80	28.08	41.20	46.00	49.08	53.88	72.00	75.6
			Part no.	85530444	85540444	85550444	85580444	85560444	85590444	85575444	85595444
		5000 mm	Weight [kg]	27.25	35.10	51.50	57.50	61.35	67.35	90.00	95.5
			Part no.	85530544	85540544	85550544	85580544	85560544	85590544	85575544	85595544
		6000 mm	Weight [kg]	32.70	42.12	61.80	69.00	73.62	80.82	108.00	113.4
			Part no.	85530644	85540644	85550644	85580644	85560644	85590644	85575644	85595644
		7000 mm	Weight [kg]	38.15	49.14	72.10	80.50	85.89	94.29	126.00	132.3
			Part no.	85530744	85540744	85550744	85580744	85560744	85590744	85575744	85595744
		8000 mm	Weight [kg]	43.60	56.16	82.40	92.00	98.16	107.76	144.00	151.2
			Part no.	85530844	85540844	85550844	85580844	85560844	85590844	85575844	85595844

* A28 availability depends on region.

Integrated conductor line

A18-R, A22-R and A28-R straight track sections are fitted with five internal conductor rails (10 mm² 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.

Straight track sections with internal conductor rails are CSA approved.

KBK Aluline straight sections without protective earth conductor on application.

Type of enclosure:

IP 23 to DIN 40050.

Designation of conductor rails:

1-3 = L1- L3

4 = control conductor

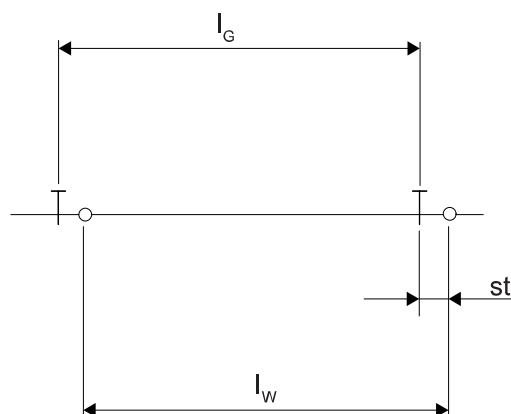
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Special lengths can be supplied ex works

(Minimum length: A12/A16 = 170 mm, A18/A22/A28 = 220 mm).

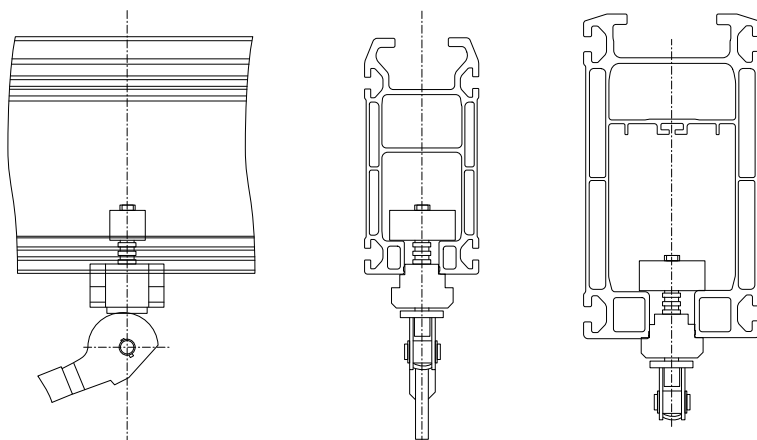
Finish: anodized

Suspension of straight sections



For distance between suspensions l_w and distance of joint from suspension fitting st , see "Reading off from the diagram" to "System dimensions and system limits"

5.1.2 Aligning device



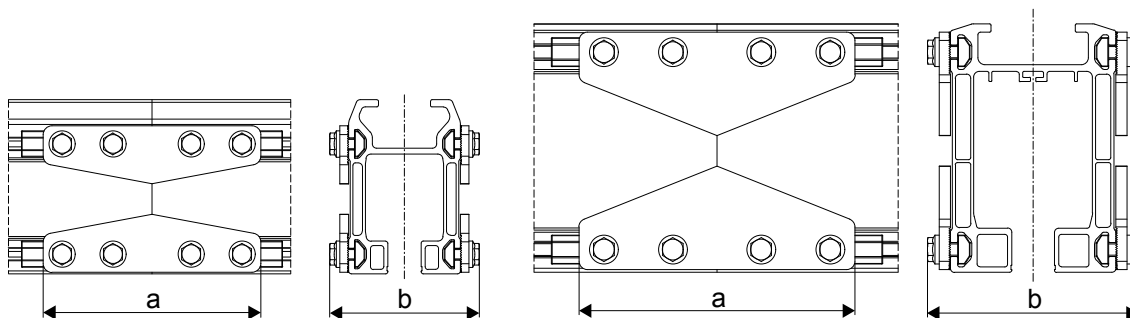
Item	Designation		A12/A16, A18/A22/A28
180	Aligning device	Weight [kg]	0.33
		Part no.	85519044

This device simplifies alignment of the profile sections with each other when tracks are joined together.

5.2 Joint bolt set (item 2) and conductor joint set (item 3)

A12/A16

A18/A22/A28



	a [mm]	b [mm]
A12/A16	150	103
A18/A22/A28	200	153

Item	Designation		A12/A16	A18/A22/A28	A18-R/A22-R/A28-R
2	Joint bolt set	Weight [kg]	1.35	4.09	
		Part no.	85546044	85566044	
3	Conductor joint set	Weight [kg]	-	-	0.07
		Part no.	-	-	87364944

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

For KBK Aluline-R sections, a conductor joint set is required in addition to the bolted connection at each track joint. The set consists of five conductor rail connectors which are pressure-fitted to establish electric contact, and one plastic connector ensuring the mechanical connection of the conductor rail system.

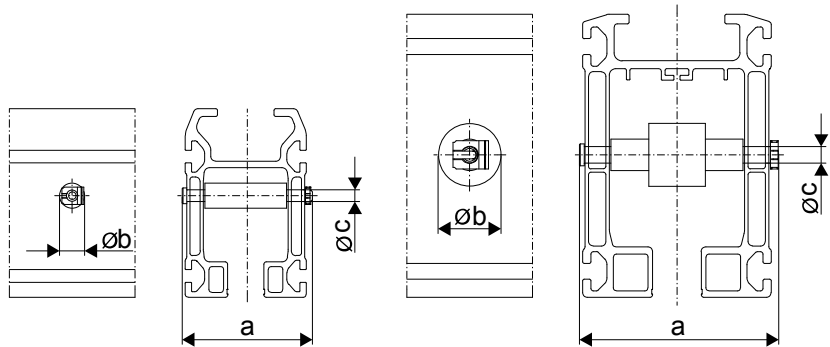
The connection is a positive and friction connection.

Finish: galvanized

5.3 Internal buffer stop (item 6)

A12/A16

A18/A22/A28

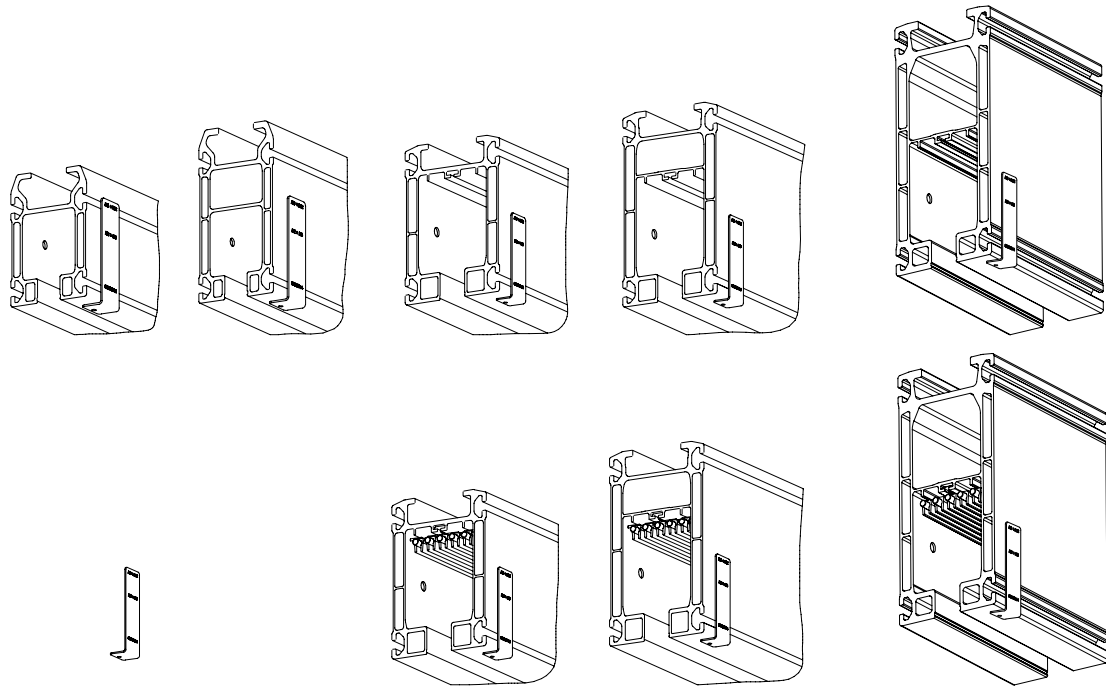


	a [mm]	Øb [mm]	Øc [mm]
A12/A16	83	16	8
A18/A22/A28	127	40	10.5

Item	Designation		A12/A16	A18/A22/A28
6	Internal buffer stop	Weight [kg]	0.04	0.25
		Part no.	85542044	85562044

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



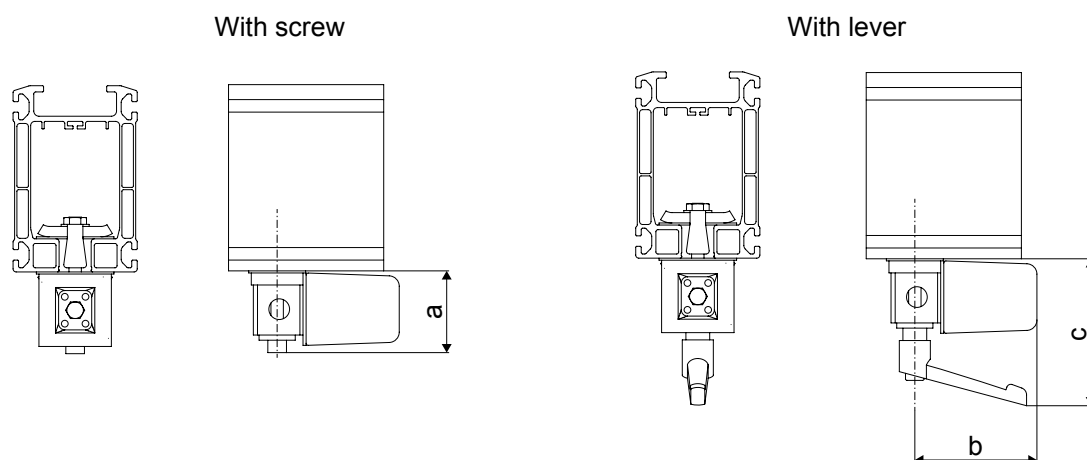
Item	Designation		A12/A16	A18/A22/A28
175	Drilling template	Weight [kg]	0.04	
		Part no.	85569144	

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

5.4 Movable travel limiter (Item 172)

Movable travel limiter (A18, A22, A28)

The movable travel limiter is available with a lever or a screw.



a [mm]	b [mm]	c [mm]
79	118	142

Item	Designation		A18/A22/A28
172	Movable travel limiter with lever	Weight [kg]	1.29
		Part no.	85520144
	Movable travel limiter with screw	Weight [kg]	1.25
		Part no.	85520444

These travel limiters must not be used as a final travel limitation at the end of the profile. Approaching in normal operation is not permitted as well. Same as with the series buffers and end stops.

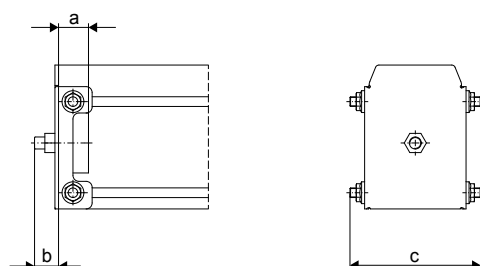
The attachment through the driving gap of the profile is possible. Depending on the trolley, a suitable plate or buffer must be fixed to it. For more information, see "Buffers and end stops".

Finish: galvanized, black (RAL 9005)

5.5 End cap with buffer (Item 7 and item 7e)

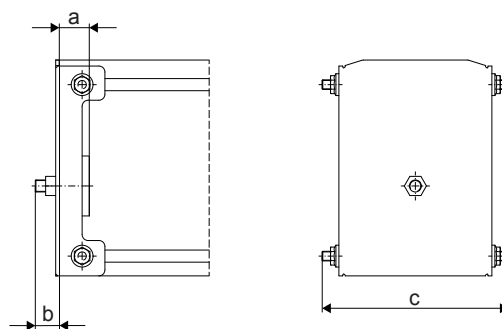
A12/A16

End cap with buffer

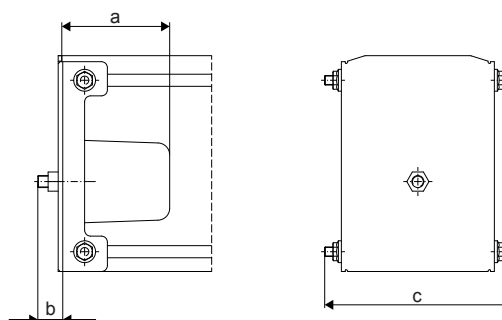


A18/A22/A28

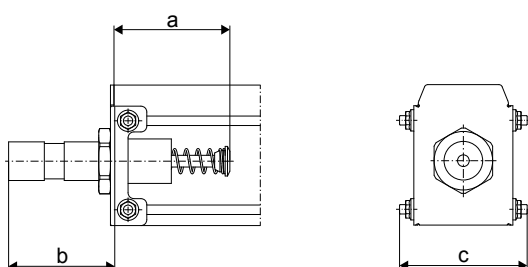
End cap with buffer



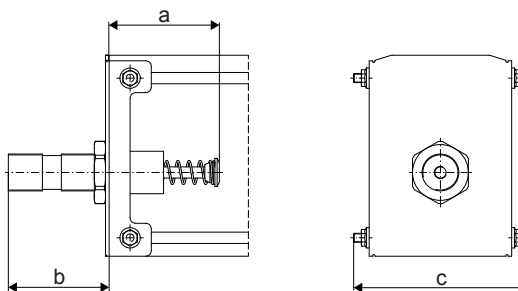
End cap with cellular plastic buffer



End cap with shock absorber



End cap with shock absorber



	a [mm]	b [mm]	c [mm]
A12/A16 end cap with buffer	25	17	109
A18/A22/A28 end cap with buffer			155
End cap with cellular plastic buffer	90		
End cap with shock absorber A12/A16	99	87	109
End cap with shock absorber A18/A22/A28	99	87	155

Item	Designation		A12	A16	A18	A18-R	A22	A22-R	A28	A28-R
7	End cap with buffer	Weight [kg]	0.38	0.45	0.71	0.93	0.81	1.04	1.04	1.04
		Part no.	85532644	85542644	85552644	85582644	85562644	85592644	85576544	85597144
7e	End cap with foamed plastic buffer ¹⁾	Weight [kg]	-	-	0.85	-	0.95	-	1.49	-
		Part no.	-	-	85553044	-	85563044	-	85576644	-
	End cap with shock absorber	Weight [kg]	1.08	1.15	1.41	-	1.52	-	1.75	-
		Part no.	85533344	85543344	85553344	-	85563344	-	85576444	-

¹⁾ Use trolley buffer plate, for more information, see "Buffer on/single trolley inside the profile section".

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 foamed plastic buffers can be used on A18/A22/A28 for heavy loads, electric and pneumatic drives, and for crane runways.

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

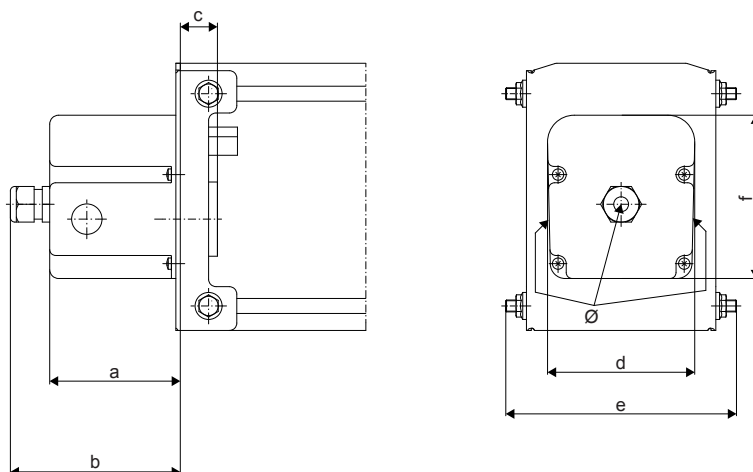
All installations must be dimensioned in such a way that the end caps and internal buffer stops are not approached during normal operation.

Finish: black (RAL 9005), steel

5.6 R components

The following components can be used in installations that have internal conductor lines (for more information on R profile sections, see "Crane and track elements").

5.6.1 Powerfeed end cap (item 8)



a	b	c	d	e	f	Ø
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
85	115	25	99	155	110	20.5

Item	Designation		A18-R	A22-R	A28-R
8	Powerfeed end cap	Weight [kg]	1.08	1.19	1.74
		Part no.	85582044	85592044	85597044

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

The terminal box includes an M20 cable gland 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 mm²).

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

Powerfeed end caps are CSA approved.

Finish: black

5.6.2 DFL fixed points (item 200)

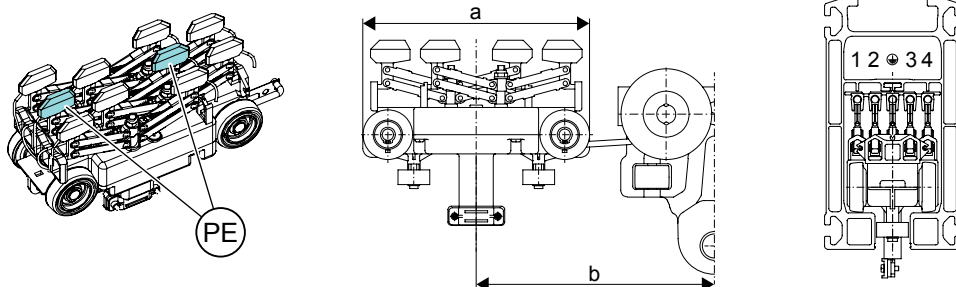
Item	Designation		A18/A22/A28
200	Fixed points (40 pcs)	Weight [kg]	0.04
		Part no.	85591244

A DFL internal conductor line can be added to A18, A22 and A28 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.

5.6.3 Current collector trolley (item 12)



a	b
[mm]	[mm]
200	210

Designation of the sliding contacts:

1 = L1

2 = L2



= PE

3 = L3

4 = Control conductor

Item	Designation		A18-R/A22-R/A28-R	
			4-pole	5-pole
12	Current collector trolley	Weight [kg]	1.23	1.35
		Part no.	85598344	85598544

For reliable current collection, the 5-pole KBK Aluline-R current collector is fitted with two sliding contacts mounted on individually spring-loaded double pantographs for each conductor rail.

Maximum load: 16 A at 100% cyclic duty factor.

The 4-pole current collector is particularly smooth in operation thanks to the use of a pantograph for each conductor. The PE conductor has a double pantograph for safety reasons. 4-pole collector trolleys can only be used on push-travel trolleys and cranes.

The connecting cable is 2 m long.

The current collector trolley is guided by two support 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. 0.5–1 kg. A coupling is used for connection to a KBK Aluline load trolley.

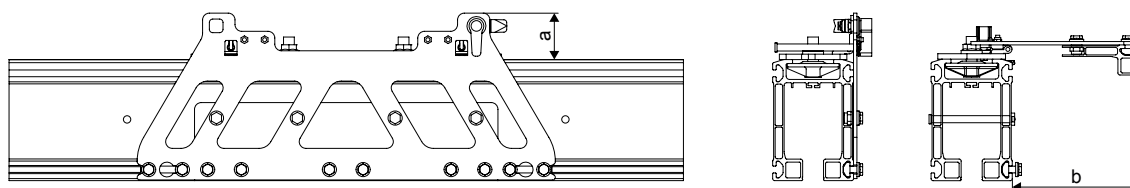
Current collector trolleys must always be arranged to run between two trolleys. These are used to protect against collisions.

Current collector trolleys without protective earth conductor available on application.

The current collector trolleys have CSA approval.

5.7 Maintenance sections

A maintenance section is recommended for the installation, removal and maintenance of trolleys and current collector trolleys. It should be incorporated in monorail tracks of considerable length and in crane runways for more than two electrically powered cranes.



$a = 69 \text{ mm}$

$b = 248 \text{ mm}$

Item	Designation		A12	A16	A18	A18-R	A22	A22-R	A28	A28-R
11	Maintenance section	Weight [kg]	-	-	18.45	19.71	20.43	21.61	-	-
		Part no.	-	-	71574546	71599846	71574846	71599946	-	-

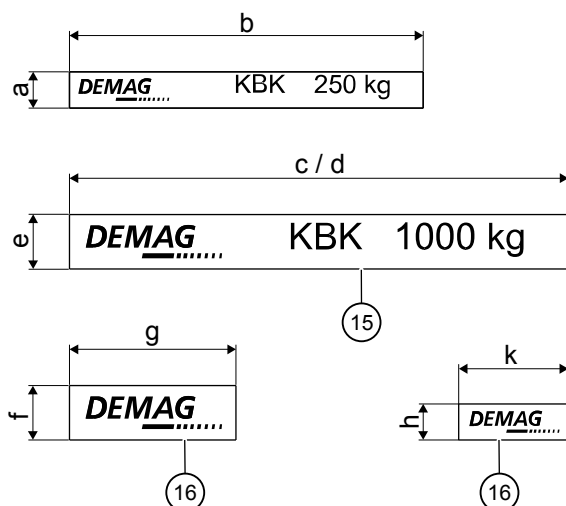
Maintenance section is used to install and remove travel units. Free rail ends on both sides can be used as installation openings when the cover is opened. Before removal, the installation must be free of tension or pressure and there must be no load on the travel unit. The maintenance section can be used with loaded trolley when it is closed.

Maintenance sections for A12, A16, A28 and A28-R are on request.

5.8 Information plates

Capacity plate (item 15)

Name plate (item 16)



$a = 40 \text{ mm}$

$b = 285 \text{ mm}$

$c / d = 420 / 440 \text{ mm}$

$e = 60 \text{ mm}$

$f = 60 \text{ mm}$

$g = 250 \text{ mm}$

$h = 40 \text{ mm}$

$k = 122 \text{ mm}$

Item	Designation	Load capacity	A12 $h = 40\text{mm}$	A16/A18/A22/A28 $h = 60\text{mm}$
		[kg]	Part no.	Part no.
15	Capacity plate	50	98086144	-
		80	98086244	-
		100	98086344	-
		125	98086444	85186444
		160	98086544	-
		200	98086644	-
		250	98086744	85149144
		315	98086844	-
		400	98086944	-
		500	98087044	85149244
		630	-	85149344
		800	-	85149444
		1000	-	85149544
		1250	-	85149644
		1600	-	85149744
		2000	-	85149844
	Special capacity plate	10-500	71554046	-
		100-2000	-	71556046
16	Name plate	-	85115944	85015044

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 that is stated on the hoist and on the crane or suspension monorail must be identical.

Capacity plates measuring 60 mm in height should be used for KBK Aluline A16 section sizes and larger.

Type -

Self-adhesive foil

6 Track suspension

6.1 Notes and overview

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

Supporting structure

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

Short suspension fitting

Low suspension heights can be achieved by using short suspension arrangements.

Sloping steel superstructure

Suspension from sloping superstructures is also possible.

Stiffeners

On long suspension arrangements, with suspension rod lengths from approximate 600 mm upwards, undesirable pendulation of the track may occur. (This can 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 should be fitted at approximately every 15 m for A12/A16 and approximately every 20 m for A18/A22/A28 for crane runway tracks. One stiffener is sufficient in the longitudinal direction. All crane runways must be provided with stiffeners.

Transverse and longitudinal stiffeners are of V-type stiffener design.

V-type suspension fittings

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

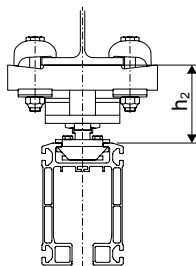
Load capacity, dimensions for suspension from I-beam superstructures, height compensation

	Thread	Lifting capacity ¹⁾	Suspension dimension h ₂			h ₁
			Ergo [mm]	Adjustable short suspension [mm]	Suspension with suspension rod 80/100 [mm]	Maximum suspension rod length [m]
A12/A16	M10	750	73 ± 4	73 ± 4	134 ± 9	1
A18	M16 x 1.5	1400	115 ± 12	115 ± 7	195 ± 14	3
A22/M16	M16 x 1.5	1700	115 ± 12	115 ± 7	195 ± 14	3
A28/M16	M16 x 1.5	1700	-	115 ± 7	195 ± 14	3
A22/M20	M20 x 1.5	2400	-	132 ± 7	206 ± 14	1
A28/M20	M20 x 1.5	2400	-	132 ± 7	206 ± 14	1

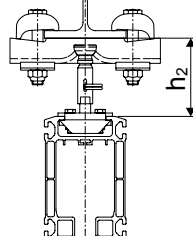
¹⁾ Static or alternating load

Examples

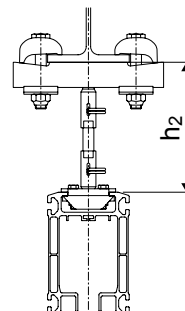
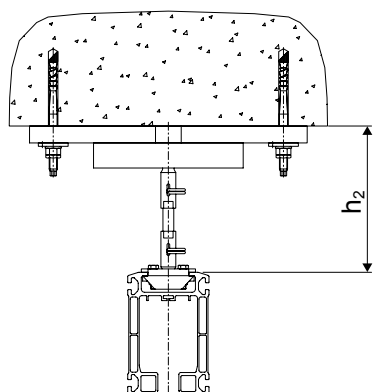
Ergo



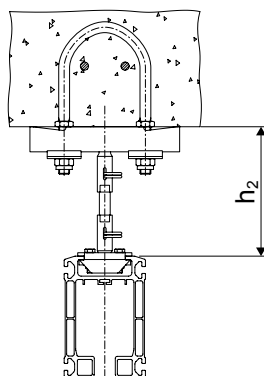
Short, adjustable



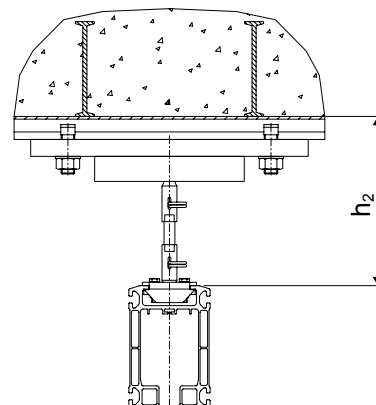
With suspension rod

On anchor bolts ¹⁾

From U-bolt

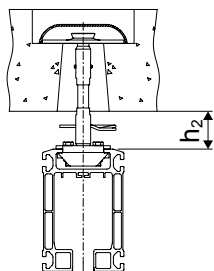


From brackets

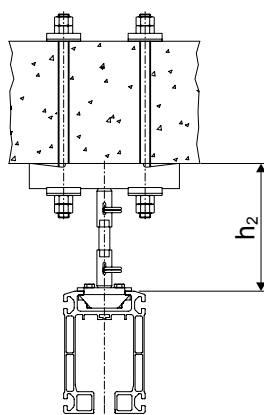


¹⁾ For description see document 20327644.

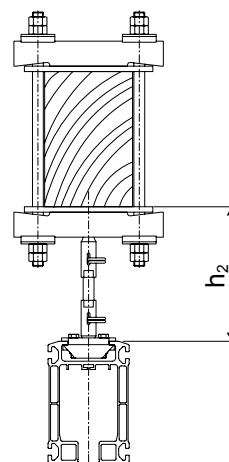
With floor plate



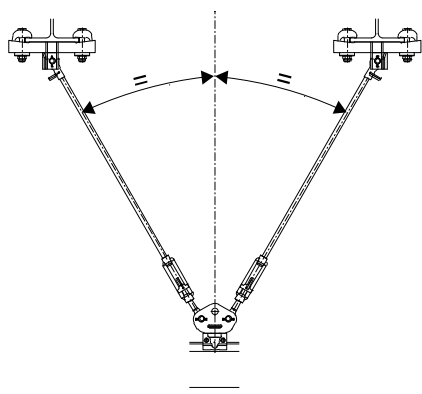
Drilled



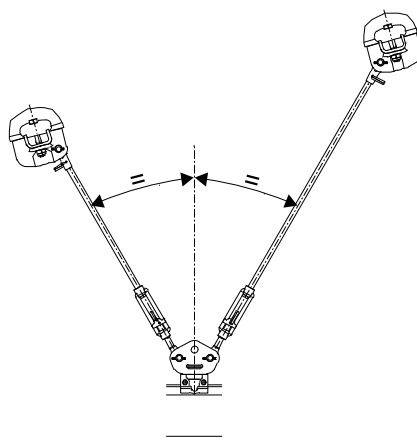
On wooden beam



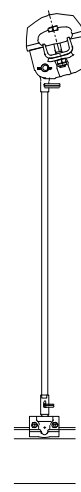
V-type suspension fitting



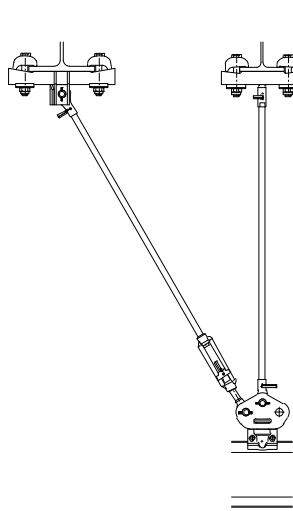
Sloping V-type suspension



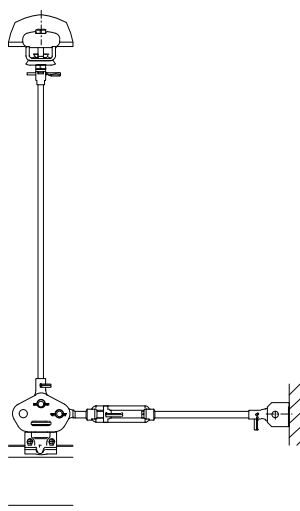
Sloping suspension



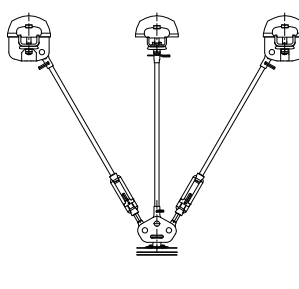
Lateral stiffener



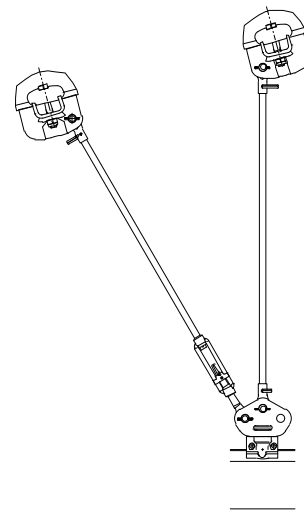
Lateral stiffener



V-type stiffener



Sloping stiffener



6.2 Vertical suspension on I-beams

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.

6.2.1 I-beam assignment

Profile	Size		Suitable for profile sections			
			I	IPE	HE-A (IPBL)	HE-B (IPB)
A12/A16	M10	Upper suspension bracket A	140 - 260	120 - 270	-	100 - 140
		Upper suspension bracket B	-	220 - 450	-	120 - 200
A18/A22/A28	M16	Upper suspension bracket A	140 - 320	140 - 270	-	100 - 120
		Upper suspension bracket B	220 - 450	180 - 500	-	100 - 200
		Upper suspension bracket C	-	-	200 - 450	280 - 320

Profile	Size		Suitable for profile sections			
			I	IPE	HE-A (IPBL)	HE-B (IPB)
A22/A28	M20	Suspension plate B	220 - 450	180 - 500	-	100 - 200
		Suspension plate C	-	450 - 600	200 - 450	200 - 340

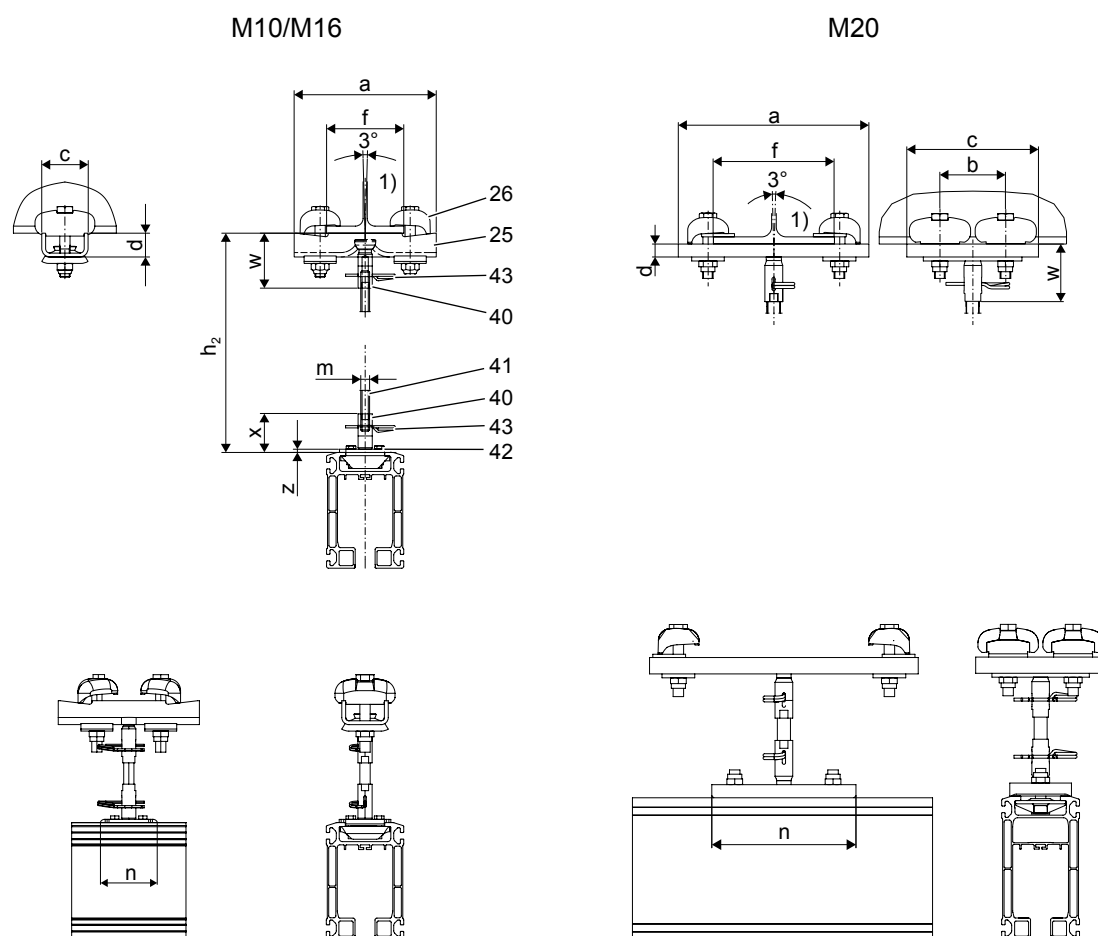
Upper suspension bracket A can be used on roof structures and steel profile sections; upper suspension bracket B and C (bracket ends project beyond contact surface) are only suitable for steel profile sections.

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

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

For more information on upper suspension bracket S and upper suspension clamp S for further steel sections with larger flange widths for various flange thicknesses, see "Operating instructions".

6.2.2 Suspension with suspension rod



1) Max. girder gradient $\pm 1.5^\circ$

Profile	h2	m	n	x	z
	[mm]	[mm]	[mm]	[mm]	[mm]
A12/A16	$54 + h_1 \pm 9$	M10	70	40	4
A18/A22/A28 (M16)	$95 + h_1 \pm 14$	M16x1.5	90	60	5
A22/A28 (M20)	$110 + h_1 \pm 14$	M20x1.5	240	88	20

Profile		a	f	c	b	d	w
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M10	Upper suspension bracket A	205	66 - 142	70	-	27	60
	Upper suspension bracket B	270	110 - 210	70	--	23	60
M16 x 1.5	Upper suspension bracket A	221	71 - 139	72	-	37	95
	Upper suspension bracket B	290	100 - 208	76	-	36	95
	Upper suspension bracket C	400	200 - 315	76	-	40	98
M20 x 1.5	Suspension plate B	290	96 - 208	200	100	20	90
	Suspension plate C	410	180 - 315	200	100	25	93

6.2.2.1 Complete suspension fittings, pre-assembled (item 30)

Item	Designation	Suspension rod	Upper suspension bracket	A12/A16 (750 kg)		A18 (1400 kg) A22/M16 (1700 kg)		A22/M20 (2400 kg)	
		h ₁ = [mm]	Type	Weight	Part no.	Weight	Part no.	Weight	Part no.
				[kg]		[kg]		[kg]	
30	Complete suspension with suspension rod	80	A	2.10	85516944	-	-	-	-
			B	2.33	51772946	-	-	-	-
		100	A	-	-	4.18	85517544	-	-
			B	-	-	5.02	85517644	16.77	85519644
			C	-	-	6.38	85520944	23.27	85521144
		300	A	2.23	51773046	4.50	51774046	-	-
			B	2.47	51773146	5.34	51774146	17.22	71602046
			C	-	-	6.8	71606046	23.69	71606346
		600	A	2.42	51773246	4.97	51774246	-	-
			B	2.65	51773346	5.81	51774346	17.81	71602246
			C	-	-	7.22	71606146	24.11	71606446
		1000	A	2.66	51773446	5.60	51774446	-	-
			B	2.90	51773546	6.44	51774546	18.74	71602446
			C	-	-	7.78	71606246	24.67	71606546

6.2.2.2 Suspension fitting component parts

Item	Designation		Qty./susp.	A12/A16 (750 kg)		A18 (1400 kg) A22/M16 (1700 kg)		A22/M20 (2400 kg)	
					A28/M16 (1700 kg)		A28/M20 (2400 kg)		
		h1 [mm]		Weight [kg]	Part no.	Weight [kg]	Part no.	Weight [kg]	Part no.
25	Upper suspension bracket A		1	0.65	98030244	1.20	98230244	-	-
	Upper suspension bracket B/Suspension plate B			0.85	98030444	2.40	98230444	11.50	85830444
	Upper suspension bracket C/Suspension plate C			-	-	5.07	85115844 ¹⁾	17.95	85840444
26	Upper suspension clamp		2	0.45	98032644	1.00	98232644	4 off included	
40	Ball-head suspension rod		2	0.08	98033344	0.15	98233344	0.27	85834344
41	Suspension rod	80	1	0.07	98034644	-	-	-	-
		100		-	-	0.22	98244644	0.22	85034644
		300		0.18	98034744	0.53	98244744	0.67	85034744
		600		0.33	98034844	1.01	98244844	1.34	85034844
		1000		0.53	98034944	1.64	98244944	2.23	85034944
		3000		-	-	4.80	98244544	-	-
42	Track suspension clamp		1	0.30	85502044	0.80	85502544	4.45	85519844
43	Spring clip		2	0.01	55083442	0.20	55083439	0.04	55083438

¹⁾ Two of upper suspension clamp (item 26) included.

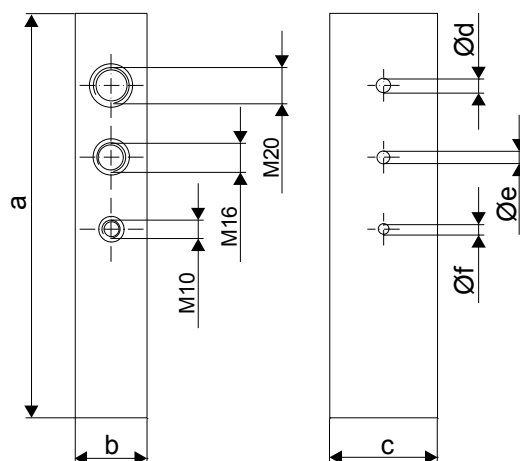
The ball-head suspension rod (item 40) and suspension rod coupling (item 50) are provided with slotted holes. The threaded rod (item 41) has a cross-hole at both ends. If standard threaded suspension rods have to be shortened, a new transverse hole must be drilled at the end of the threaded rod.

Finish: galvanized

Wearing parts

Item	Designation		A12/A16	A18/A22/A28 (M16)	A22/A28 (M20)
42d	Sliding shell for ball-head suspension rod/ball-head bolt (25 pcs)	Weight [kg]	0.02	0.05	-
		Part no.	98081544	85139444	
	Sliding shell for ball-head suspension rod/ball-head bolt (1 pc)	Weight [kg]	-	-	0.025
		Part no.			85034244

6.2.2.3 Drilling jig (item 38)



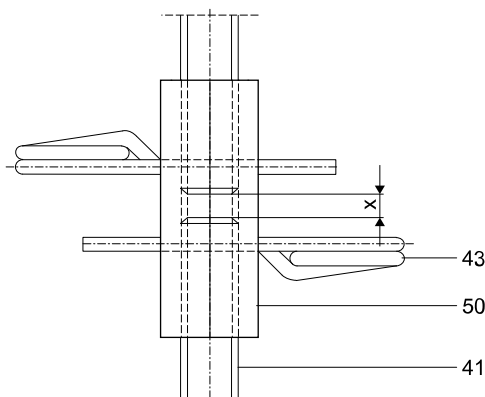
a [mm]	b [mm]	c [mm]	Ød [mm]	Øe [mm]	Øf [mm]
225	40	60	5	4	3.3

The drilling jig facilitates drilling transverse holes in suspension rods after they have been shortened on site. This ensures that the distance to the end of the rod is reliably maintained.

Item	Designation		
38	Drilling jig for suspension rods	Weight [kg]	3.92
		Part no.	98201744

Finish: galvanized

6.2.3 Coupling for suspension rod (item 50)



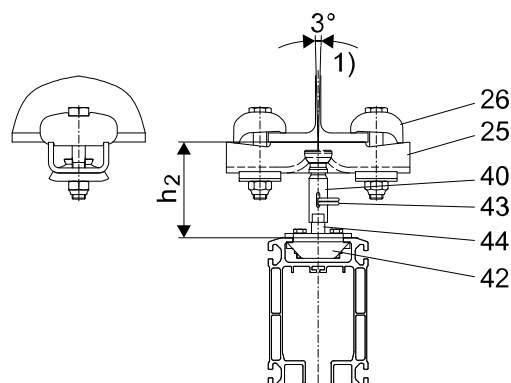
	x [mm]
A12/A16	0–3
A18/A22/A28 (M16)	0–4
A22/A28 (M20)	0–3

Item	Designation		A12/A16	A18/A22/A28 (M16)	A22/A28 (M20)
50	Coupling for suspension rod	Weight [kg]	0.10	0.17	0.16
		Part no.	98027744	98227744	85827744

Use couplings to connect several suspension rods.

Finish: galvanized

6.2.4 Short suspension arrangement with height adjustment



	h2
	[mm]
A12/A16	73 ± 4
A18/A22/A28	115 ± 7

6.2.4.1 Complete suspension fittings, pre-assembled (item 31)

Item	Designation	Upper suspension bracket	A12/A16 (750 kg)		A18 (1400 kg) A22/M16 (1700 kg) A28/M16 (1700 kg)		A22/M20 (2400 kg) A28/M20 (2400 kg)	
			Weight	Part no.	Weight	Part no.	Weight	Part no.
		Type	[kg]		[kg]		[kg]	
31	Complete suspension, short, adjustable	A	2.02	85516744	3.98	85517344	-	-
		B	2.25	51772746	4.82	85517444	16.51	85519444
		C	-	-	5.97	85520844	22.95	85521044

6.2.4.2 Suspension fitting component parts

Item	Designation	A12/A16 (750 kg)			A18 (1400kg) A22/M16 (1700 kg) A28/M16 (1700 kg)		A22/M20 (2400 kg) A28/M20 (2400 kg)	
		Qty./susp.	Weight	Part no.	Weight	Part no.	Weight	Part no.
			[kg]		[kg]		[kg]	
25	Upper suspension bracket A	1	0.65	980 30244	1.20	98230244	-	-
	Upper suspension bracket B		0.85	98030444	2.40	98230444	11.50	85830444
	Upper suspension bracket C/ Suspension plate C.		-	-	5.07	85115844 ¹⁾	17.95	85840444
26	Upper suspension clamp	2	0.45	98032644	1.00	98232644	4 off Included	
40	Ball-head suspension rod	1	0.08	98033344	0.15	98233344	0.27	85834344
44	Ball-head bolt	1	0.06	98028344	0.14	98228344	0.25	85828344
42	Track suspension clamp	1	0.30	85502044	0.80	85502544	0.40	85819844
43	Spring clip	1	0.01	55083442	0.02	55083439	0.04	55083438

¹⁾ Suspension clamp included.

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

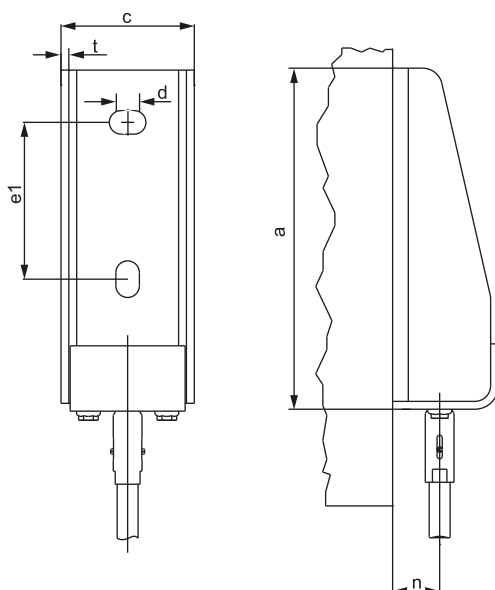
Finish: galvanized

Wearing parts

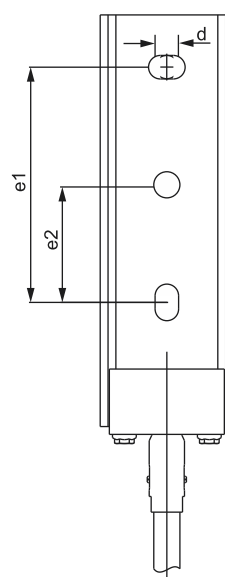
Item	Designation		A12/A16	A18/A22/A28 (M16)	A22/A28 (M20)
42d	Sliding shell for ball-head suspension rod/ball-head bolt (25 off)	Weight [kg]	0.02	0.05	-
		Part no.	98081544	85139444	
	Sliding shell for ball-head suspension rod/ball-head bolt (1 off)	Weight [kg]	-	-	0.025
		Part no.			85034244

6.3 Vertical side connection suspension

M10/M16



M20



Side suspension	a [mm]	c [mm]	d [mm]	e1 [mm]	e2 [mm]	t [mm]	n [mm]
M10	238	85	14	100	-	4	39
M16	261	102	18	120	-	6	36
M20	321	102	18	180	90	6	36

Item	Designation	Qty./ susp.	A12/A16 750 kg		A18/A22/A28/M16 1700 kg		A22/A28/M20 2400 kg	
			Weight	Part no.	Weight	Part no.	Weight	Part no.
			[kg]		[kg]		[kg]	
165	Side connection bracket	1	1.91	98085544	3.09	85162544	3.96	85830044

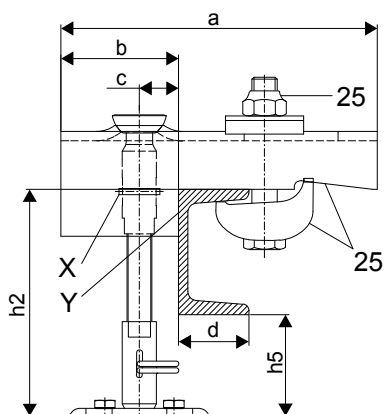
Brackets for side suspension can be installed by means of a bolted connection, anchor bolt or threaded rods with a strength class equivalent to 8.8 grade bolts.

The free swing angle of the suspension fitting may be limited by the on-site support structure. Use stiffeners, as required, to avoid any collision during operation.

Secure the connection between the ball-head suspension rod and the suspension rod with the enclosed sprin pin.

Finish: galvanized.

6.4 Vertical suspension from U-sections



	h2 [mm]	h5 [mm]	a [mm]	b [mm]	c [mm]	d [mm]
A12/A16	$20 + h_1 \pm 9 > \text{track section height} + 40$	40	202 x 72	75	25	45–80
A18/A22/A28	$50 + h_1 \pm 14 > \text{track section height} + 65$	65				

Upper U-type suspension brackets 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]	Part no.	Max. load on suspension GAB [kg]	Steel girder section
25	A12/A16	2	98037744	750	U 80 - U 220
	A18/A22/A28	2	98437744	750	U 80 - U 100
				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 steel profile section. Use stiffeners, as required, to avoid any collision during operation.

Secure the connection between the ball-head suspension rod and the suspension rod with the enclosed spring pin (see “X”).

Edge “Y” of the upper 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.

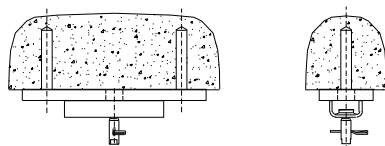
Finish: galvanized

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

6.5 Ceiling attachment

6.5.1 Suspension with anchor bolt connection

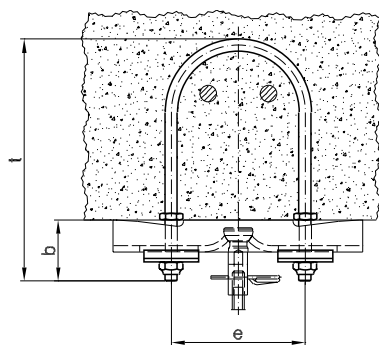
Anchor bolt connection



KBK Aluline equipment can 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 also refer to data sheet 20327644.

6.5.2 U-bolt with upper suspension bracket A

U-bolt (item 27)



	b [mm]	e [mm]	t [mm]
A12/A16	50	110	200
A18/A22/A28	70	120	225

Item	Designation	Qty/susp.	A12/A16		A18/A22/A28	
			Weight [kg]	Part no.	Weight [kg]	Part no.
27	U-bolt (complete)	1	0.15	98033044	0.8	98233044

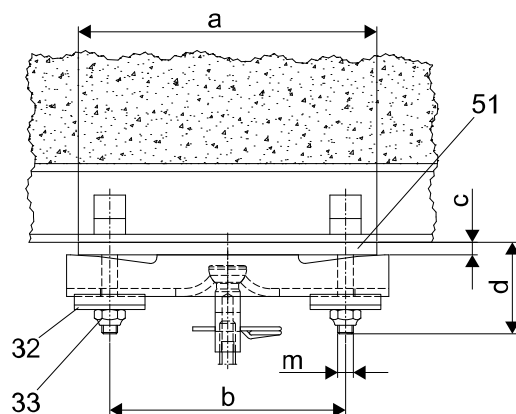
For new buildings, U-bolts can be cast in reinforced ceilings at the KBK Aluline track suspension points while the building is still undergoing construction. This must be discussed with the structural engineer. U-bolts are used to secure upper suspension bracket A.

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

6.5.3 Suspension from ceiling section rails with upper suspension bracket A

Packing plate (item 32), locknut (item 33), packing plate for upper suspension bracket (item 51)



	a [mm]	b [mm]	c [mm]	d [mm]	m ¹⁾ [mm]
A12/A16	190	150	8	70	M10
A18/A22/A28				80	M16

¹⁾ or as indicated for cast-in section rail for upper suspension bracket H

See data referring to cast-in section rail for tightening torque M

Item	Designation	Qty/susp.	A12/A16		A18/A22/A28	
			Weight [kg]	Part no.	Weight [kg]	Part no.
32	Packing plate	2	0.10	98042944	0.21	98432944
33	Locknut	2	-	52790743	-	52847421
51	Packing plate for upper suspension bracket	1	1.6	98408844	1.6	98408844

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 two special bolts with nuts and tab washers. The M10 special bolts for A12/A16 and M16 for A18/A22/A28 should be provided by the customer or can be supplied on application (specify section rail type).

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

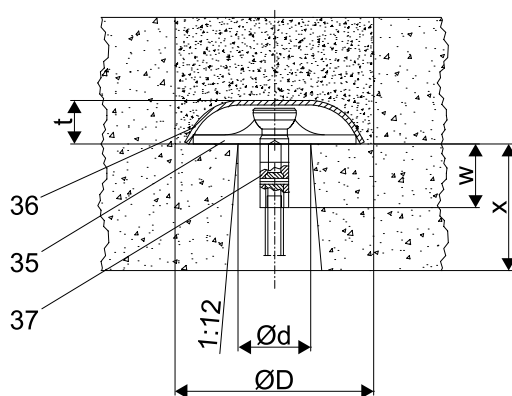
Important: This KBK Aluline suspension fitting must be regarded as a concentrated load on the section rail (**low load-bearing capacity**).

Upper suspension brackets H with bore hole spacing ≥ 250 mm count as dual load suspensions.

Finish: galvanized

6.5.4 Suspension with floor fixture plate and cover

Floor fixture plate (item 35), cover for floor fixture plate (item 36), spring pin (item 37)



	Ød	ØD	t	w
	[mm]	[mm]	[mm]	[mm]
A12/A16	40	110	25	35
A18/A22/A28	60	150	28	60

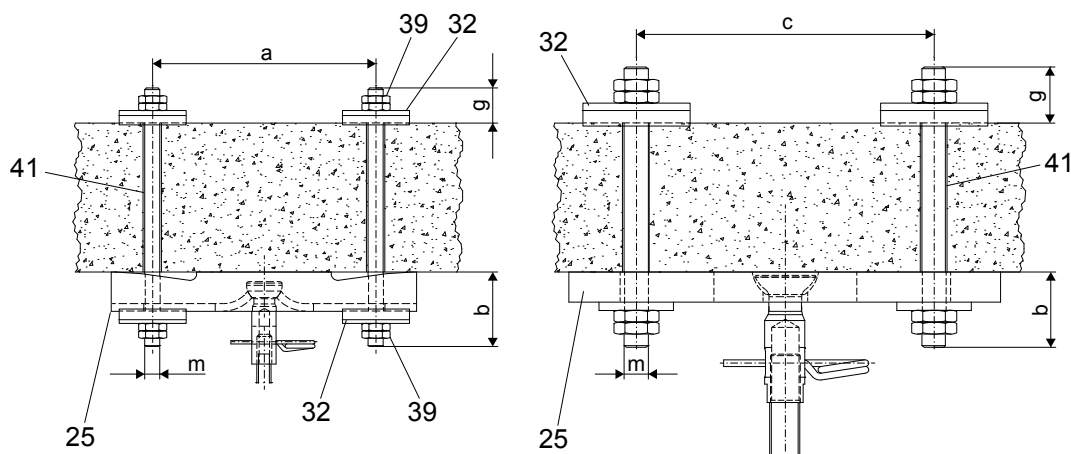
Item	Designation	A12/A16		A18/A22/A28	
		Weight	Part no.	Weight	Part no.
		[kg]		[kg]	
35	Floor slab	0.25	98033644	0.42	98233644
36	Cover	0.2	98033844	0.35	98233844
37	3 x 18 spring pin	-	52498635	-	-
	4 x 26 spring pin	-	-	-	52433746

In existing concrete buildings it is impossible to install a steel profile section 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 spring pin instead of a spring clip. Arrangement of these suspension fittings, the loads to which they are subjected and dimension X should be agreed with the structural engineer or architect responsible.

Finish: galvanized

6.5.5 Suspension with upper suspension bracket A or suspension plate B and suspension rods or positive anchors

Nut for suspension rod (item 39)



	a [mm]	b [mm]	c [mm]	g [mm]	m [mm]
A12/A16	120	60	200 x 100	35	M10
A18/A22/A28	120	85	200 x 100	50	M16 x 1.5

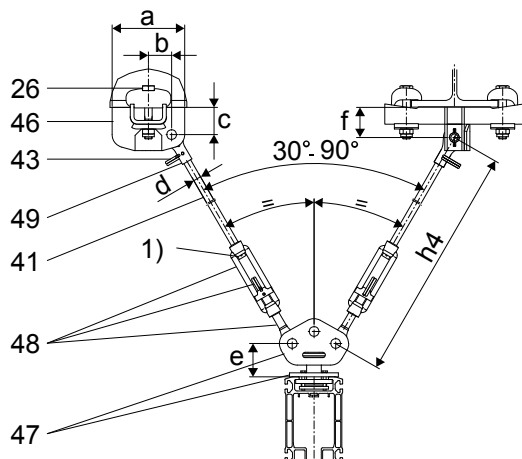
Item	Designation		Qty./susp.		A12/A16 Part no.	A18/A22/A28 Part no.	A22/A28(M20) Part no.
25	Upper suspension bracket A		1	Weight [kg]	0.76	1.15	-
				Part no.	98030244	98230244	-
	Suspension plate B without suspension clamp		1	Weight [kg]	-	-	8.71
				Part no.	-	-	85830644
32	Packing plate		4	Weight [kg]	0.18	0.26	
				Part no.	98042944	98432944	
39	Nut for suspension rod		8	Weight [kg]	-	-	-
				Part no.	53711147	55028228	-
			16	Weight [kg]	-	-	-
				Part no.	-	-	55028228
41	Suspension rod length h1 [mm]	80	2*	Weight [kg]	0.04	-	
				Part no.	98034644		
		100		Weight [kg]	-	0.14	
				Part no.	-	98244644	
		300		Weight [kg]	0.15	0.42	
				Part no.	98034744	98244744	
		600		Weight [kg]	0.30	0.84	
				Part no.	98034844	98244844	
		1000		Weight [kg]	0.50	1.40	
				Part no.	98034944	98244944	
		3000		Weight [kg]	-	4.20	
				Part no.	-	98244544	

* = 4 pieces for suspension plate 85830644

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

The distance between suspension rods for M20 suspensions (M16 x 1.5) measures: 200 x 100 [mm].

6.6 V-type suspension fitting



1) No spring clip fitted here

Profile	h4 [mm]	a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	f [mm]
A12/A16	$h_1 + 155 \pm 30$	150	50	40	M10	51	65
A18/A22/A28	$h_1 + 220 \pm 40$			55	M16 x 1.5	69	

h_1 = suspension rod length

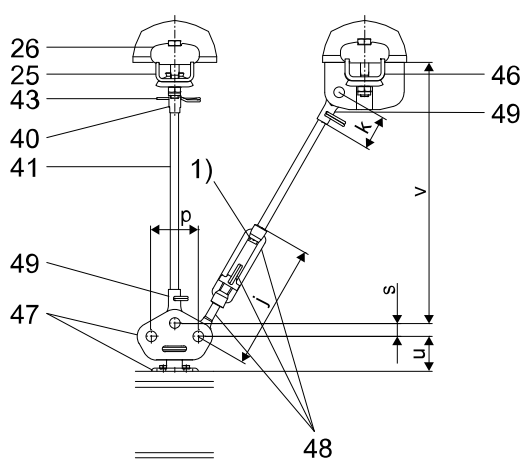
Item	V-type suspension fitting, parallel or perpendicular	h1 [mm]	Qty./susp.	A12/A16 (750 kg)		A18 (1400 kg) A22/A28 (1700 kg)	
				Weight [kg/unit]	Part no.	Weight [kg/unit]	Part no.
26	Upper suspension clamp		4	0.45	98032644	1.00	98232644
40	Ball-head suspension rod			0.08	98033344	0.15	98233344
41	Suspension rod	80	2	0.07	98034644		
		100				0.22	98244644
		300		0.18		0.53	98244744
		600		0.33	98034844	1.01	98244844
		1000		0.53	98034944	1.64	98244944
		3000	-			4.80	98244544
43	Spring clip		2	0.01	55083442	0.02	55083439
46	V-type upper suspension bracket B		2	1.39	98036044	3.20	98407544
47	V-type suspension clamp		1	1.24	85516044	2.69	85519544
54	Pin with BoClip for third hinged end piece		-	0.08	85130544	0.16	85131744
48	Suspension rod strainer		2	0.29	98031044	0.85	98408544
49	Hinged end piece		2	0.10	98031544	0.30	98408344

V-type suspensions are fitted as shown in the diagrams. V-type hinged suspension clamp (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

6.7 Stiffener



1) No spring clip fitted here

Profile	j	k	p	s	u	v
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A12/A16	165 ± 15	50	60	20	51	$h_1 + 65 \pm 4$
A18/A22/A28	235 ± 20	65	90	25	69	$h_1 + 100 \pm 7$

h_1 = suspension rod length

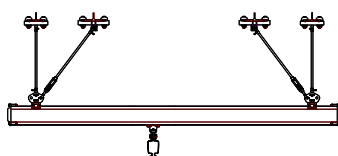
Item	Lateral stiffener, parallel or perpendicular	h1 [mm]	Qty./susp.	A12/A16 (750 kg)		A18 (1400 kg) A22/A28 (1700 kg)	
				Weight	Part no.	Weight	Part no.
				[kg/unit]		[kg/unit]	
25	Upper suspension bracket A		1	0.65	98030244	1.20	98230244
	Upper suspension bracket B			0.85	98030444	1.40	98230444
	Upper suspension plate C			-	-	5.07	85115844*
26	Upper suspension clamp		4	0.45	98032644	1.00	98232644
40	Ball-head suspension rod		1	0.08	98033344	0.15	98233344
41	Suspension rod	80	1+1	0.07	98034644		
		100				0.22	98244644
		300		0.18	98034744	0.53	98244744
		600		0.33	98034844	1.01	98244844
		1000		0.53	98034944	1.64	98244944
		3000	-	-	-	4.80	98244544
43	Spring clip		3	0.01	55083442	0.02	55083439
46	V-type upper suspension bracket B		1	1.39	98036044	3.20	98407544
47	V-type suspension clamp			1.24	85516044	2.69	85519544
54	Pin with BoClip for third hinged end piece			0.08	85130544	0.16	85131744
47a	Filler plates for sloping surface			-	-	0.60	51683346
48	Suspension rod strainer		1	0.29	98031044	0.85	98408544
49	Hinged end piece		2	0.10	98031544	0.30	98408344

1) Upper suspension clamp included

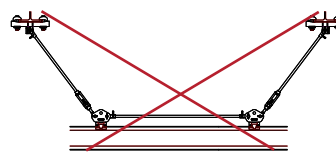
Crane runway stiffener, perpendicular direction



Track stiffener, longitudinal direction



Not permitted for any profile sections



Stiffeners are fitted as shown in the diagrams. V-type hinged suspension clamp (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).

Finish: galvanized

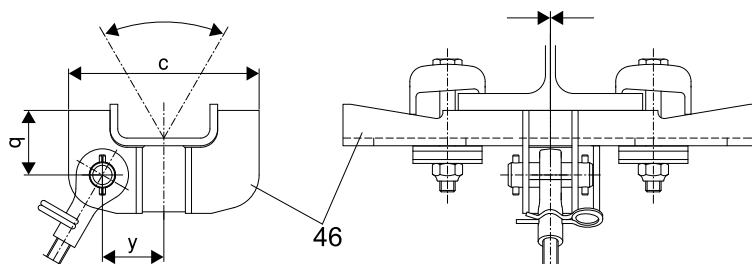
6.8 Component parts for V-type suspension/stiffener arrangement

6.8.1 V-type upper suspension bracket (item 46)

Pin axis parallel to V-type upper suspension bracket

1. May slope in this plane

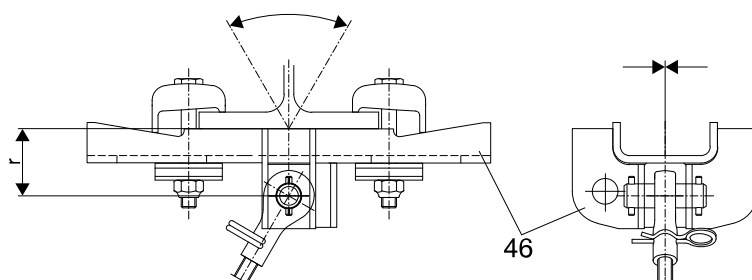
2. Additional sloping plane is not possible



Pin axis perpendicular to V-type upper suspension bracket

1. May slope in this plane

2. Additional sloping plane is not possible



Profile	c [mm]	q [mm]	r [mm]	y [mm]
A12/A16	125	40	45	40
A18/A22/A28	150	55	65	50

Item	Designation		A12/A16	A18/A22/A28
46	V-type upper suspension bracket B	Weight [kg]	1.39	3.20
		Part no.	98036044	98407544

Possible mounting configurations

V-type upper suspension brackets have a pin with spring pins (no hinged end piece).

Fit V-type upper suspension brackets 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 torsion forces. For smaller girders: adapters available on request.

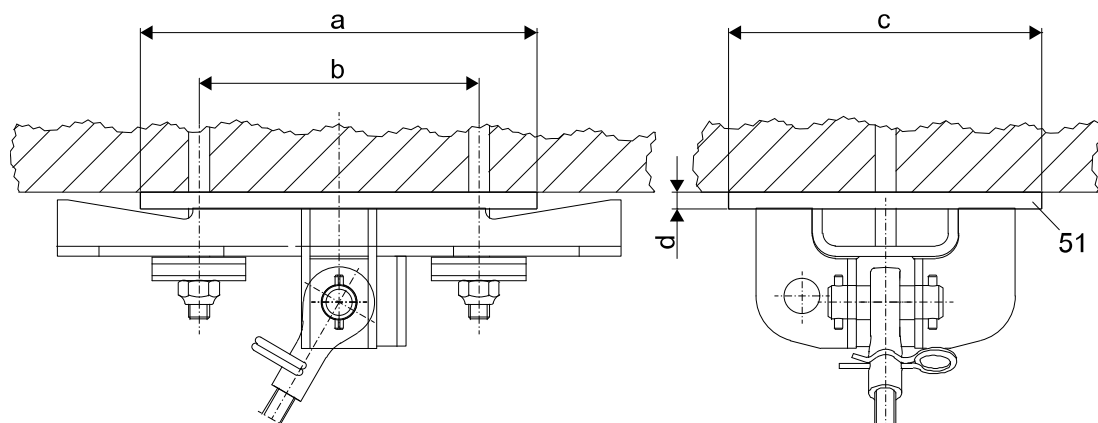
The V-type upper suspension bracket is designed for connecting **one** suspension rod by means of a hinged end piece (item 49) (pin axis either parallel or perpendicular to V-type upper suspension bracket). If two or more connections are fitted, a corresponding number of V-type upper suspension brackets 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 clamp (item 47) and perpendicular to the suspension rod axis. V-type upper suspension brackets on sloping superstructures must be anchored against movement. If V-type upper suspension brackets are not fitted to steel profile sections, packing plate (item 51) must be used.

Finish: galvanized

For further information on **clamp section with V-type upper suspension bracket V** for steel sections with larger flange widths for various flange thicknesses, see technical data 20307244.

6.8.2 Packing plate for upper suspension bracket

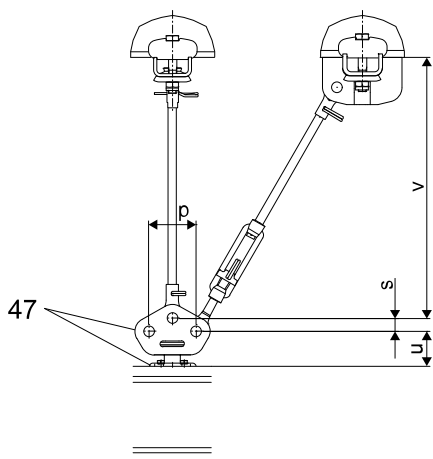


a [mm]	b [mm]	c [mm]	d [mm]
190	150	150	8

Item	Designation		
51	Packing plate for upper suspension bracket	Weight [kg]	1.79
		Part no.	98408844

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, and so on. Connections with U-bolt on request.

6.8.3 V-type hinged suspension clamp (item 47)



Profile	p [mm]	s [mm]	u [mm]	v [mm]
A12/A16	60	20	51	$h1 + 65 \pm 4$
A18/A22/A28	90	25	69	$h1 + 100 \pm 7$

$h1$ = suspension rod length

Item	Designation		A12/A16	A18 (1400 kg) A22/A28 (1700 kg)
47	V-type hinged suspension clamp	Weight [kg]	1.24	2.69
		Part no.	85516044	85519544
54	Pin with BoClip for third hinged end piece	Weight [kg]	0.08	0.16
		Part no.	85130544	85131744

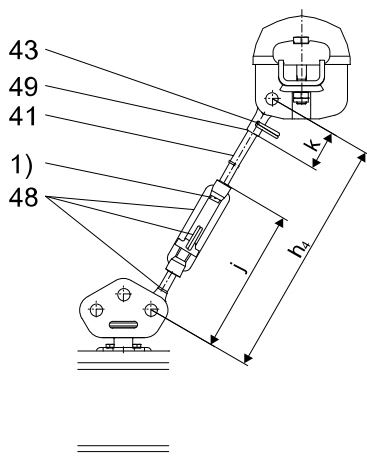
Possible mounting configurations

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

The V-type hinged suspension clamp 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 center and one outer hole.

The V-type hinge can be adjusted in the suspension clamp 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.

6.8.4 Spring clip (item 43), suspension rod strainer (item 48) and hinged end piece (item 49)



1) No spring clip fitted here

Profile	h ₄ [mm]	j [mm]	k [mm]
A12/A16	h ₁ + 155 ± 30	165 ± 15	60
A18/A22/A28	h ₁ + 220 ± 40	235 ± 20	65

h₁ = suspension rod length

Item	Designation		A12/A16	A18/A22/A28
43	Spring clip	Weight [kg]	0.01	0.02
		Part no.	55083442	55083439
48	Suspension rod strainer	Weight [kg]	0.29	0.85
		Part no.	98031044	98408544
49	Hinged end piece	Weight [kg]	0.10	0.30
		Part no.	98031544	98408344

Possible mounting configurations

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, the track can also be suspended 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:

A12/A16: 20 mm

A18/A22/A28: 25 mm

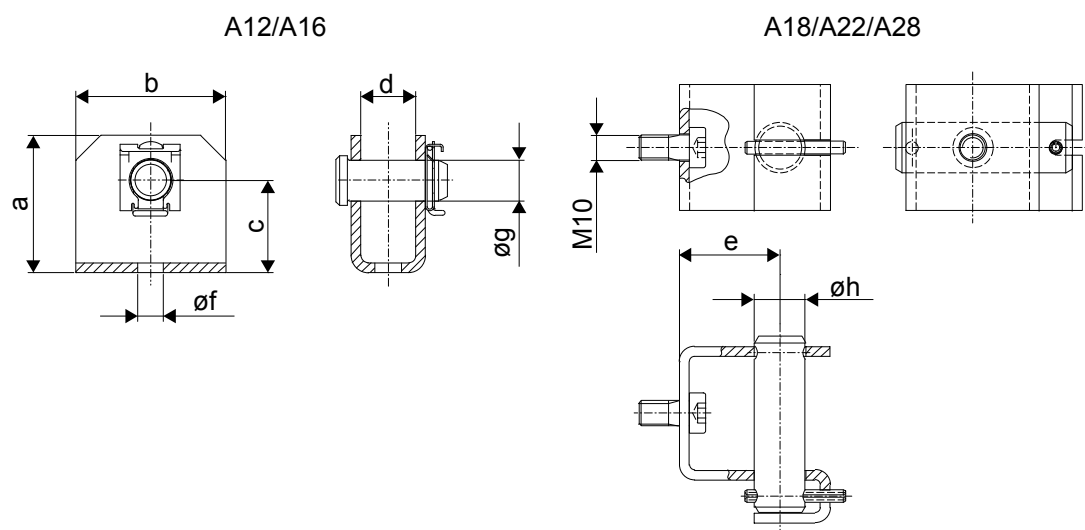
Length of the left-hand thread of the hinged end piece and of the suspension rod thread in the strainer nut:

A12/A16: 45 mm

A18/A22/A28: 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 strainer nut and suspension rod is not provided with a spring clip.

6.8.5 Wall fixture

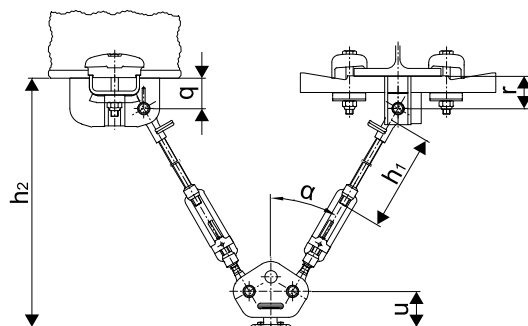


a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	Øf [mm]	Øg [mm]	Øh [mm]
55	60	37	22	40	10.5	16.2	20

Item	Designation		A12/A16	A18/A22/A28
34	Hinged block/connector section	Weight [kg]	0.2	0.46
		Part no.	98027244	85039944
54	Pin with BoClip	Weight [kg]	0.08	-
		Part no.	85130544	-

The hinged block/connection block can be used as a wall anchorage for a stiffener arrangement. For more information, see "Stiffener".

6.9 Determining suspension rod length h₁ for V-type suspensions and stiffeners



	q [mm]	r [mm]	u [mm]
A12/A16	40	45	51
A18/A22/A28	55	65	69

Suspension rod length h₁ can be determined depending on:

- KBK Aluline profile section,
- Steel superstructure alignment,
- Distance between lower edge of steel superstructure and upper edge of KBK Aluline section (dimension h₂),
- Opening angle α.

The following simplified formula can be used, because the suspension rod strainer offers a wide range of adjustment.

$$h_1 = \frac{h_2 - a}{\cos \alpha} - b$$

A12/A16:

a = 95 mm

b = 155 mm

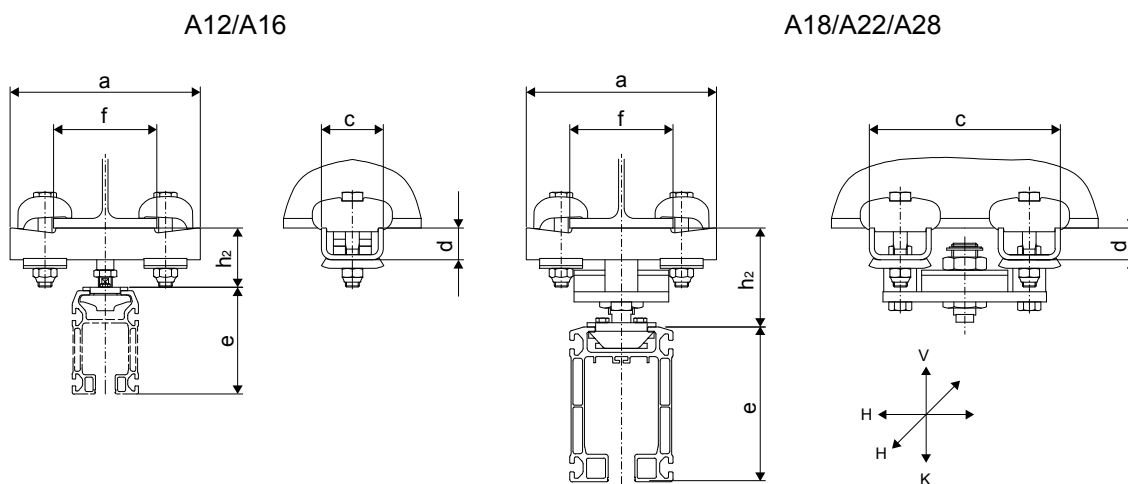
A18/A22/A28:

a = 135 mm

b = 220 mm

6.10 Ergo suspension

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



Profile	Upper suspension bracket	a [mm]	c [mm]	d [mm]	f [mm]	e [mm]	h2 [mm]
A12/A16	Upper suspension bracket A	221	72	37	71 - 139	120	73 ± 4
A18/A22/A28	Upper suspension bracket A	221	247	37	71 - 139	180	115 ± 12
	Upper suspension bracket B	290	251	36	100 - 208		

Item	Designation	A12/A16		A18		A22/A28	
		Weight [kg]	Part no.	Weight [kg]	Part no.	Weight [kg]	Part no.
31e	Ergo A suspension fitting	4.25	85503144	10.23	85566344	10.23	85566344
	Ergo B suspension fitting			11.92	85566444	11.92	85566444
	Load capacity	Load K [kg]		Load V [kg]		Load H [kg]	
		750		1400		1700	
		100		200		200	

KBK Aluline Ergo suspensions are complete suspension fittings. KBK Aluline Ergo suspensions 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 track. In addition, the rubber element provides more 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.

The KBK Aluline Ergo suspension fitting headroom dimension corresponds to the short Classic suspension fitting. Larger suspension heights must be adapted to suit the steel superstructure.

Short Classic suspension fittings and Ergo suspension fittings can be used alternately.

Ergo suspension fittings must be used at track ends.

Finish - galvanized

7 Trolley combinations

7.1 Single trolleys

The traction resistance of a loaded trolley is $<0.2\%$ of the attached load with constant displacement.

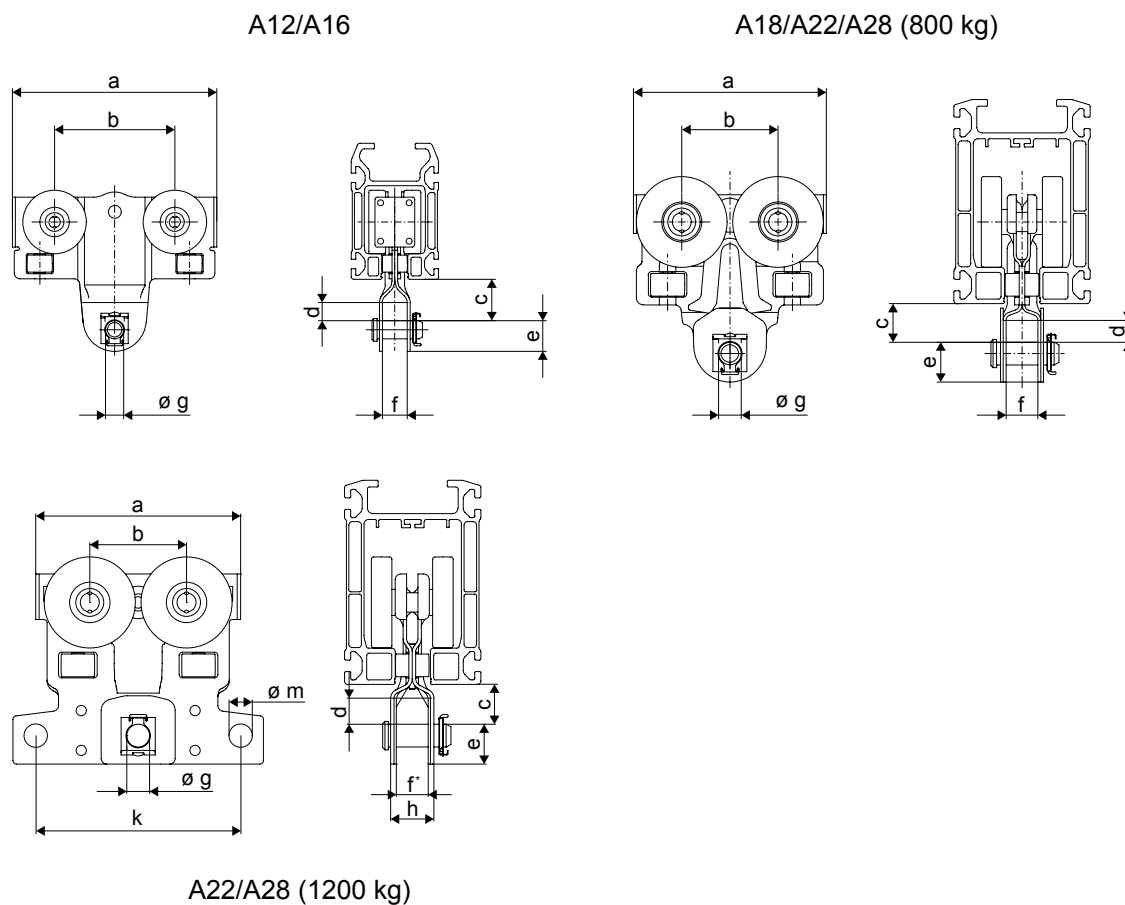
Start-up traction resistance is between 0.5% and 0.8% of the attached load depending on the load and time at standstill.

For further information on smooth-running characteristics, see "Design principles."

The permissible load on trolleys is reduced for:

Continuous temperature [°C]	Possible load [%]
-20	50
-15	80
-10...40	100
50	90
60	75
70	50

7.1.1 Classic trolleys (item 55)



	a	b	k	c	d	e	f	h	Øg	Øm
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A12/A16	180	106	-	37	16	27	22	-	16	-
A18/A22/A28 (800 kg)	170	85	-	35	20	35	28	-	20	-
A22/A28 (1200 kg)	180	85	180	35	23	35	28 *	38	20	20.5

* Width at load pin.

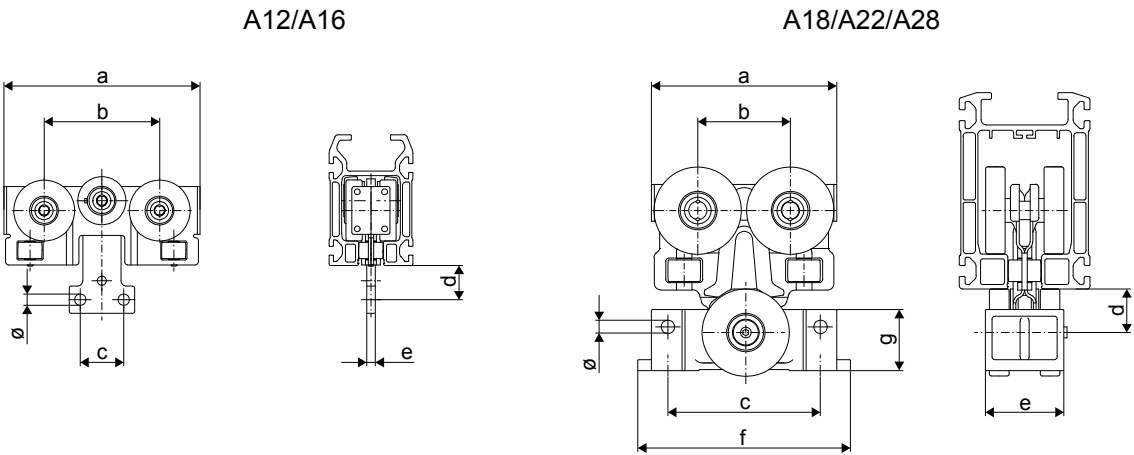
Item	Designation	A12/A16			A18/A22/A28 (800 kg)			A22/A28 (1200 kg)		
		Max. load [kg]	Weight [kg]	Part no.	Max. load [kg]	Weight [kg]	Part no.	Max. load [kg]	Weight [kg]	Part no.
55	Trolley	300	1.20	85525044	800	2.47	85528044	1200	2.51	85568044

Quiet-running KBK Aluline trolleys are fitted with four plastic travel 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.

Connection option for link bars, spacer bars, and so on with link (item 61)

Finish: black (RAL 9005), steel

7.1.2 Ergo trolleys



	a	b	c	d	e	f	g	Ø
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A12/A16	180	106	40	32	8	-	-	10.5
A18/A22/A28	170	85	140	40	72	195	56	12.5

Item	Designation	A12/A16					A18/A22/A28				
		Load K [kg]	Load V [kg]	Load H [kg]	Weight [kg]	Part no.	Load K [kg]	Load V [kg]	Load H [kg]	Weight [kg]	Part no.
55e	Ergo trolley	300	100	50	1.30	85525544	800	400	100	2.77	85527544

Ergo trolleys can accommodate forces in all axes.

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

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

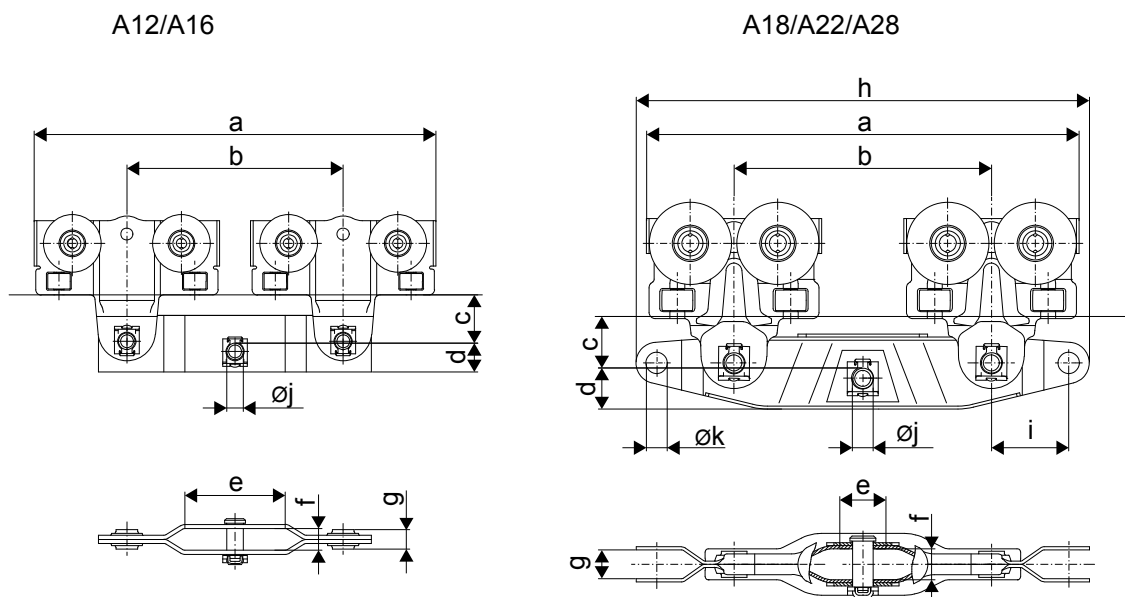
Finish: black (RAL 9005), steel,

Ergo connecting element for KBK Aluline A18/A22/A28: Aluminium

7.2

Double trolleys

Classic articulated frame



	a	b	c	d	e	f	g	h	i	Øj	Øk
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A12/A16	390	210	47	28	90	21	19	-	-	16	-
A18/A22/A28	420	250	50	40	45	30	28	440	75	20	20.5

Item	Designation	A12/A16			A18/A22/A28		
		Max. load [kg]	Weight [kg]	Part no.	Max. load [kg]	Weight [kg]	Part no.
56	Double trolley end carriage, completed (articulated frame + 2 trolleys)	600	3.40	85542244	1200	6.95	85562244
57	Articulated frame	600	1.00	98030544	1200	1.88	98230544

A double trolley is created by joining two trolleys with an articulated frame. Holes drilled in the ends of A18/A22 articulated frames are provided for fitting spacer bars and link bars, they are not designed for connecting loads.

Finish: black (RAL 9005), steel

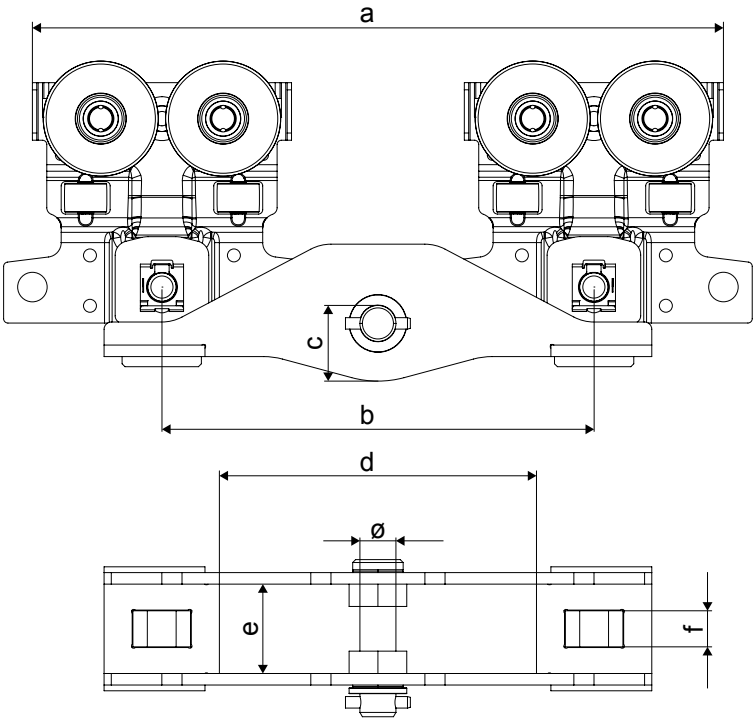
Table 2. Wearing parts for single and double trolleys

Item	Designation		A12/A16	A18/A22/A28
54	Pin with BoClip	Weight [kg]	0.08	0.16
		Part no.	85130544	85131744
185	Box BoClip D = 16 mm (16 pcs)	Weight [kg]	0.12	-
		Part no.	98055944	-
	Box BoClip D = 20 mm (12 pcs)	Weight [kg]	-	0.14
		Part no.	-	85155944

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

7.3.1 Load bar 300 (Item 59, 60)

A22/A28 (2400 kg)



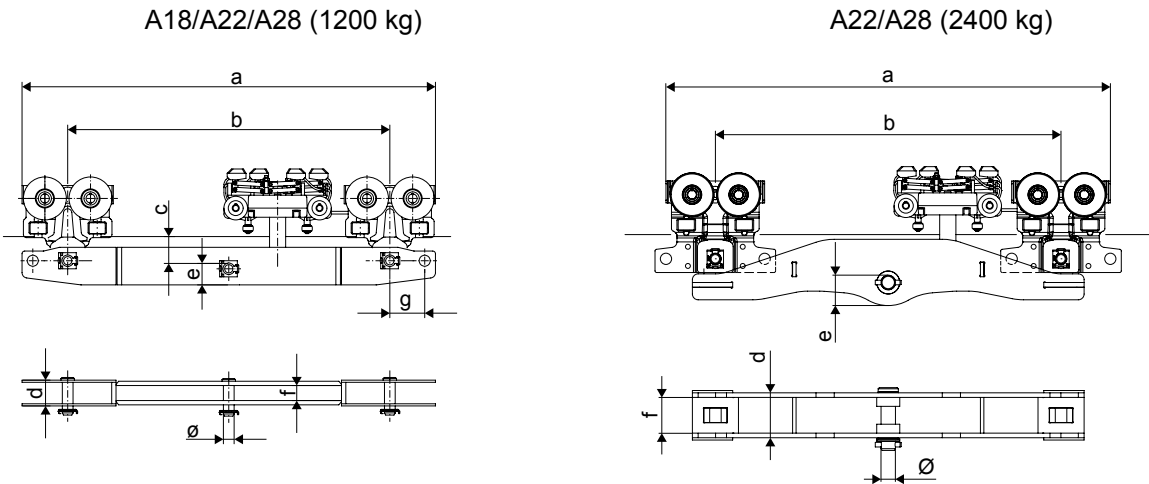
	a	b	c	d	e	f	Ø
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A22/A28 (2400 kg)	480	300	53	220	62	25	25

Load bar 300 for creating a double trolley as trolley and single girder crane trolley load bar.

Finish - black (RAL 9005)

Item	Designation	A22/A28		
		Max. load	Weight	Part no.
		[kg]	[kg]	
60	Load bar 300, completed	2400	9.85	85570044
59	Load bar 300		4.83	85828544

7.3.2 Load bar 600 (items 59, 60)



	a	b	c	d	e	f	g	Ø
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A18/A22/A28 (1200 kg)	770	600	50	48	40	28	65	20
A22/A28 (2400 kg)	780	600	-	78	53	62	-	25

Load bar 600 for use in KBK Aluline-R crane installations and straight monorails as trolley and single girder crane trolley load bar.

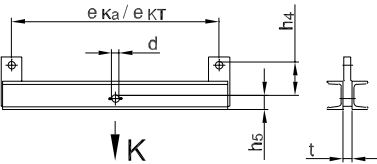
The current collector trolley is protected against collision between the trolleys.

Item	Designation	A18/A22/A28			A22/A28		
		Max. load [kg]	Weight [kg]	Part no.	Max. load [kg]	Weight [kg]	Part no.
60	Load bar 600, completed	1200	10.00	85566544	2400	13.88	85571044
59	Load bar 600		5.82	85860044		8.35	85829044

Finish - black (RAL 9005)

7.3.3 Load bar type A (Item 59)

Load bar for crane trolleys (EHK)



Item	Track	eKT [mm]	Kmax [kg]	h5 [mm]	h4 [mm]	d [mm]	t [mm]	Weight [kg]	Part no.
59	A12/A16	600	780	35	65	20	25 ¹⁾	6.43	71580046
		1000	770					15.82	71580146
		1200						18.66	71580246
		1600	760					24.32	71580346
		2000						29.99	71580446
	A18/A22/A28	1000	1300	40	72	20	25 ¹⁾	16.13	71582146
		1200			87			18.96	71582246
		1600						29.65	71582346
		2000			107			44.24	71582446
		1000	2360	50	97	30 ²⁾	30	23.72	71583146
		1200			117			27.94	71583246
		1600						45.28	71583346
		2000			2320			137	66.59

DC hoists with long suspension eye,

¹⁾ not for DC 10

²⁾ Only for crane suspension 85570544

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 crane are fitted with normal crab frames.

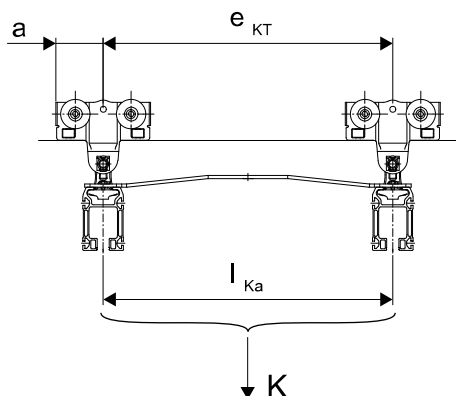
Two frames and two crane end carriages are required for each crane.

Link bars, spacer bars or buffer fittings can be connected using single-trolley links or articulated frames. For more information, see "Coupling elements and spacer bars" and "Buffers and end stops".

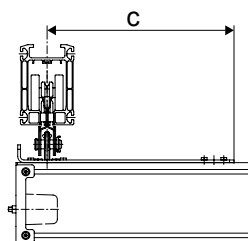
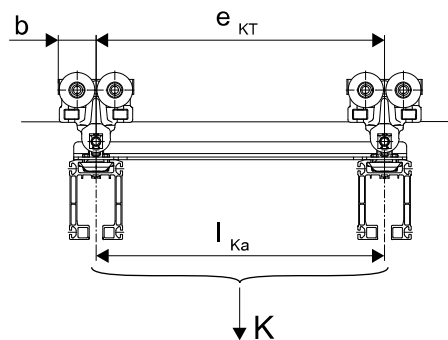
Frame and crane end carriage not including trolleys and articulated frames.

7.4.1 Frame for double-girder crane (item 63)

A12/A16



A18/A22/A28



	a [mm]	b [mm]	c [mm]
A12/A16	90	-	350
A18/A22/A28	-	85 ¹⁾	420

¹⁾ b = 90 mm with trolley 85568044.

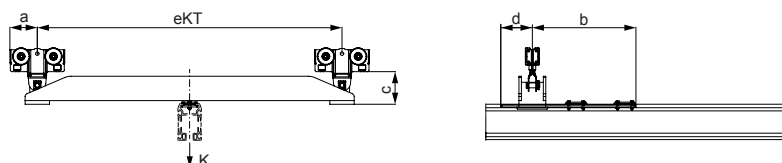
Item	Designation	l _{Ka} = e _{KT} [mm]		A12/A16	A18/A22/A28	
				Max. load		
				595 kg	1190 kg	2390 kg
63	Frame for double-girder crane	550	Weight [kg]	4.30	7.10	-
			Part no.	85518144	85518344	-
		610	Weight [kg]	-	8.60	-
			Part no.	-	71576046	-
		650	Weight [kg]	-	-	8.70
			Part no.	-	-	85518544
		762	Weight [kg]	-	-	9.30
			Part no.	-	-	71576246
		915	Weight [kg]	-	-	9.90
			Part no.	-	-	71576446
		1000	Weight [kg]	-	-	10.30
			Part no.	-	-	71576646

Trolleys to be ordered separately.

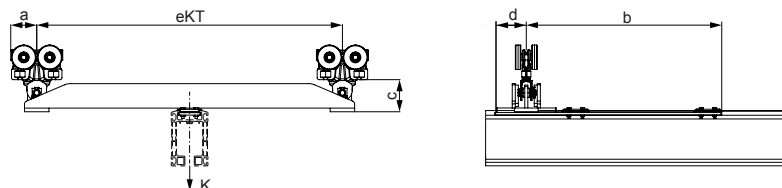
Frames are using the crane suspension (item 75).

7.4.2 Rigid single-girder crane end carriage (item 62)

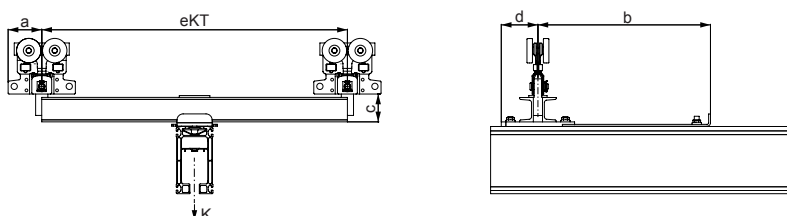
A12/A16



A18/A22/A28



A22/A28 (2400 kg)



	a [mm]	b [mm]	c [mm]	d [mm]	eKT [mm]	Maximum load K [kg]
A12/A16	90	340	110	105	1000	580
A18/A22/A28	85	640	110	105		1170
A22/A28 (2400 kg)	110	565	91	120	600	2370
					1000	

Item	Designation	eKT [mm]	A12/A16		A18/A22/A28		A22/A28 (2400 kg)	
			Weight [kg]	Part no.	Weight [kg]	Part no.	Weight [kg]	Part no.
62	Rigid single-girder crane end carriage	600	-	-	-	-	17.94	71637546
		1000	14.00	51767246	25.00	51767846	26.72	71637746

Check trolley loads.

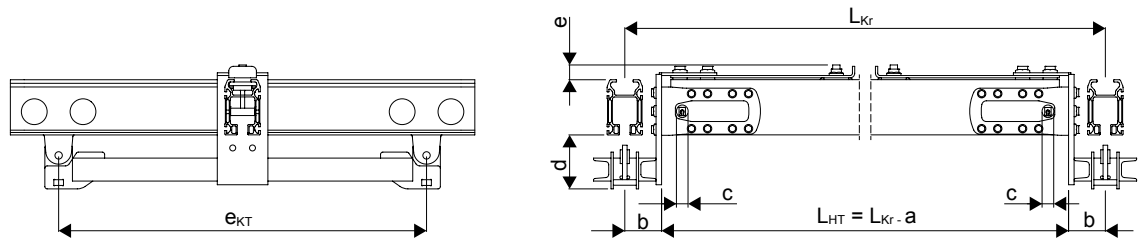
Finish: black (RAL 9005), steel

Trolleys to be ordered separately.

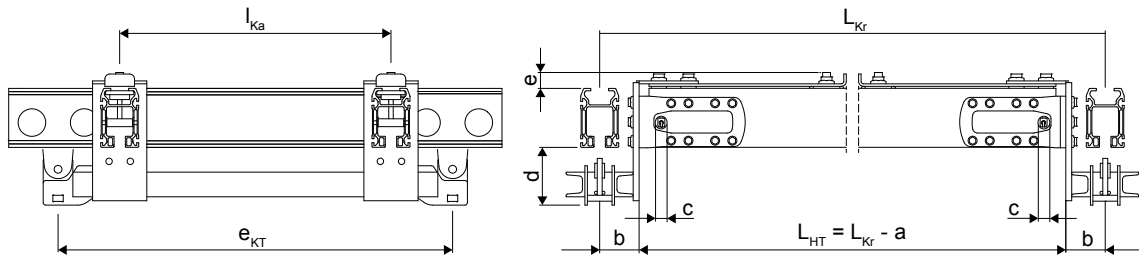
7.4.3 Crane end carriage, rigid, raised

Samples for raised end carriages:

A12 crane end carriage, raised
Single-girder suspension crane (EHK)



A12 crane end carriage, raised
Double-girder suspension crane (ZHK)

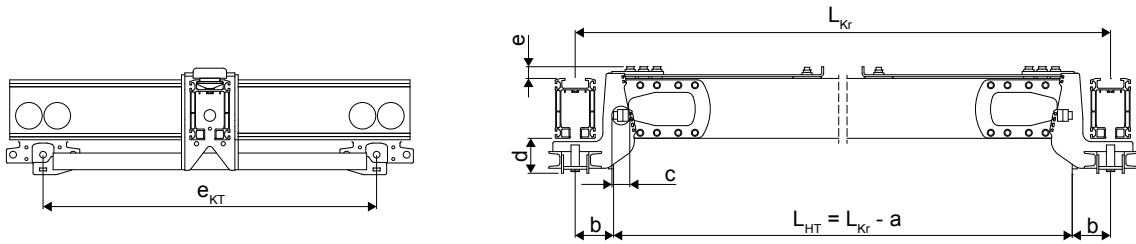


Following dimensions are valid for all A12/A16 runway – A12/A16 single and double crane combinations. But for crane girder A12/A16 on crane runway A18/A22: $L_{HT} = L_{Kr} - 260$ and approach dimension to buffer 160 mm.

Dimensions				
a	b	c	d	e
[mm]	[mm]	[mm]	[mm]	[mm]
160	80	53	117	32

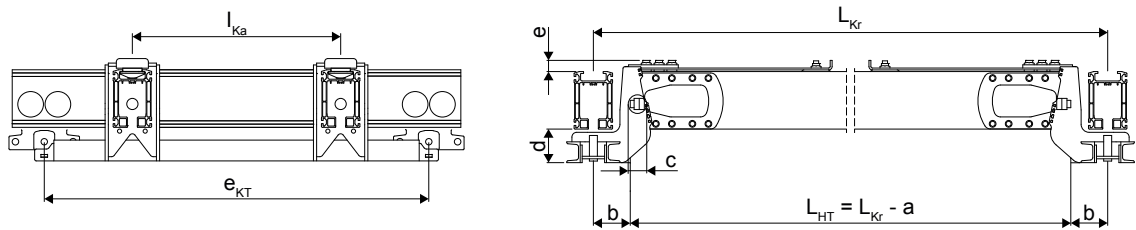
A18 crane end carriage, raised

Single-girder suspension crane (EHK)



A18 crane end carriage, raised

Double-girder suspension crane (ZHK)



Following dimensions are valid for all A12/A16/A18/A22 runway – A18/A22 single and double crane combinations.

Dimensions				
a	b	c	d	e
[mm]	[mm]	[mm]	[mm]	[mm]
230	115	53	105	35

Single-girder crane												
Crane profile	Runway profile	A12		A16		A18			A22			
	ект [mm]	450	800	450	800	450	600	1000	450	600	1000	
A12	Load [kg]	580		580		600		-	-	600	-	-
	Weight [kg]	14.38	18.28	14.38	18.28	16.59				16.59		
	Part no.	71625946	71626046	71625346	71625446	71633146				71631446		
A16	Load [kg]	580		580		600		-	-	600	-	-
	Weight [kg]	15.38	19.29	15.38	19.29	17.16				17.16		
	Part no.	71625746	71625846	71625146	71625246	71633046				71631346		
A18	Load [kg]	-				-	1200	1200	-	1200	1200	
	Weight [kg]						29.41	33.78		29.86	34.12	
	Part no.						71632846	71632946		71631146	71631246	
	Load [kg]						2350	2350		2350	2350	
	Weight [kg]						31.23	40.09		31.68	40.48	
A22	Part no.	-				-	71632046	71632146	-	71630446	71630346	
	Load [kg]						1200	1200		1200	1200	
	Weight [kg]						30.51	34.97		30.96	35.42	
	Part no.						71632646	71632746		71630946	71631046	
	Load [kg]						2350	2350		2350	2350	
A22	Weight [kg]	-				-	32.33	41.19	-	32.78	41.58	
	Part no.						71631846	71631946		71630146	71630246	

All combinations with A28 on request.

Double-girder crane									
Crane profile	Runway profile	A12	A16	A18			A22		
	l _{ka} [mm]	550	550	550	550	650	550	550	650
	ект [mm]	800	800	1000	1000	1200	1000	1000	1200
A12	Load [kg]	570	570	570	-	-	600	-	-
	Weight [kg]	25.89	25.89	32.44			32.44		
	Part no.	71626746	71626446	71634946			71634146		
A16	Load [kg]	570	570	600	-	-	600	-	-
	Weight [kg]	26.90	26.90	33.45			33.45		
	Part no.	71626646	71626346	71634846			71634046		
A18	Load [kg]	-		-	1200	2330	-	1200	2330
	Weight [kg]				54.74	60.78		55.63	61.68
	Part no.				71634746	71634446		71633946	71633646
A22	Load [kg]	-		-	1200	2330	-	1200	2330
	Weight [kg]				56.95	62.98		57.84	63.89
	Part no.				71634646	71634346		71633846	71633546

All combinations with A28 on request.

KBK Aluline cranes with raised girders of single or double-girder design can be used where height is very limited, for example, in low rooms.

The crane girders are arranged at the same height between the crane runways using raised crane end carriages.

The crane end buffers are already included in the crane end carriages.

An internal buffer stop should be fitted to protect the accumulated cable sliders and cable trolleys.

Cranes fitted with raised crane end carriages are rigid, which means that single-girder cranes and double-girder cranes can also be fitted with electric travel drives.

The travel drives are connected in the same way as for rigid cranes.

Crane suspensions, spacer bars for double-girder cranes and bracing frames are not required.

The trolleys must be ordered separately.

There must be no track joints in the crane girder.

Finish: crane end carriages, black (RAL 9005)

7.5

Trolleys for special hoists

7.5.1

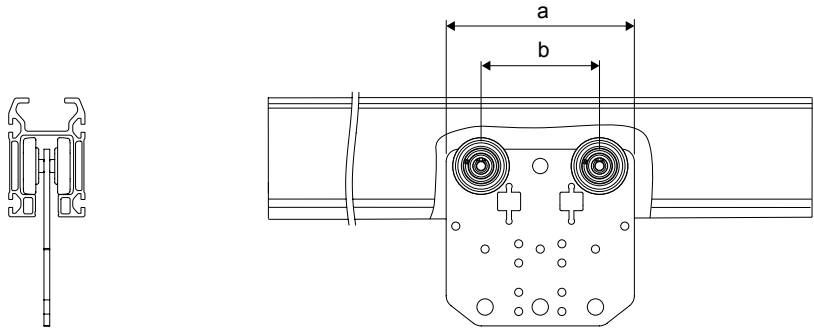
Low-headroom frame for monorail hoists

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

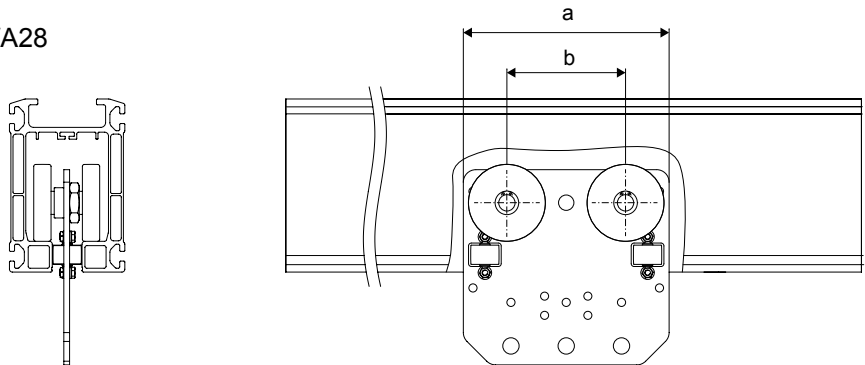
More information on request.

7.5.2 Load trolley for D-BP II (Item 55)

A12/A16



A18/A22/A28



	a	b
	[mm]	[mm]
A12/A16	196	123
A18/A22/A28	214	123

Item	Designation	A12/A16	A18/A22/A28
55	Load trolley for D-BP II	Max. load [kg]	300
		Weight [kg]	2.60
		Part no.	56319051
			56560225

These trolleys are designed to fit the D-BP II.

Finish: galvanized

7.6 Ergo crane end carriages (Item 62e)

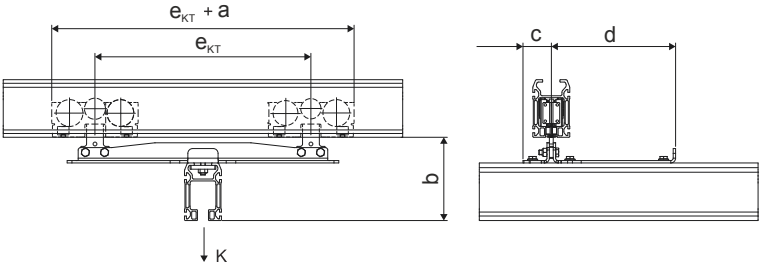


Figure 4. A12/A16 single girder crane end carriage, A12/A16 track section

a	b	c	d
[mm]	[mm]	[mm]	[mm]
170	260	120	540

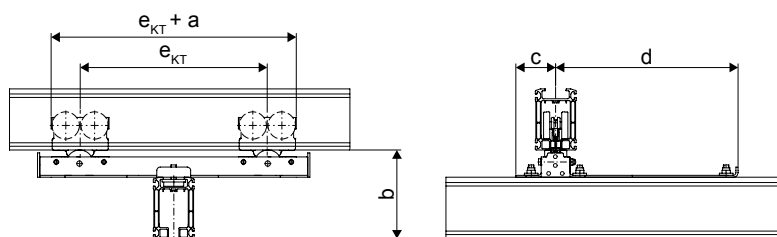


Figure 5. A18/A22/A28 single girder crane end carriage, A18/A22/A28 track section

a [mm]	b [mm]	c [mm]	d [mm]
170	260	120	540

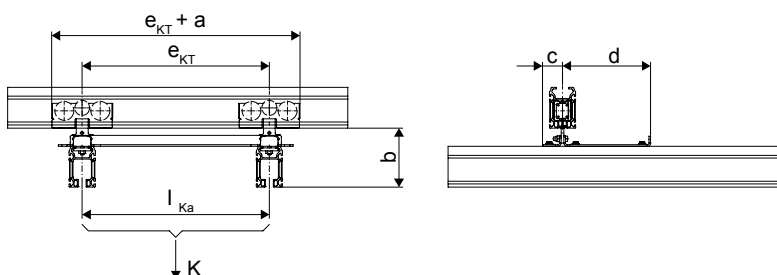


Figure 6. A12/ 16 double girder crane end carriage, A12/A16 track section

a [mm]	b [mm]	c [mm]	d [mm]
180	174	600	260

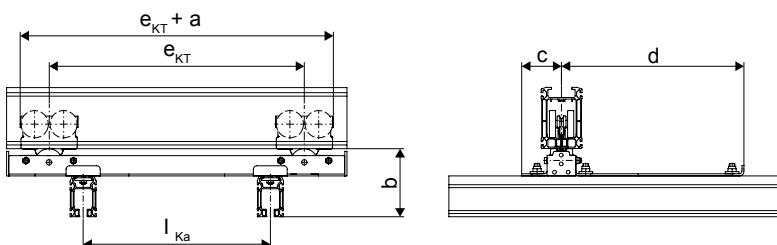


Figure 7. A12/A16 double girder crane end carriage, A18/A22/A28 track section

a [mm]	b [mm]	c [mm]	d [mm]
170	200	120	540

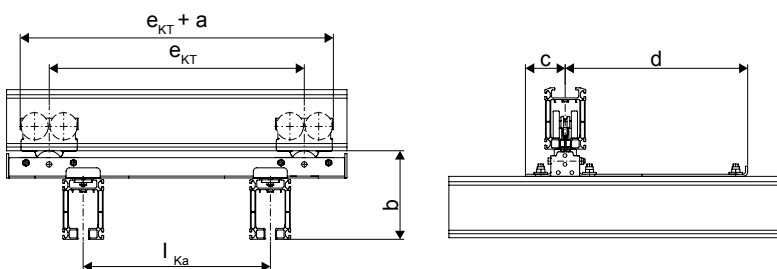


Figure 8. A18/A22/A28 double girder crane end carriage, A18/A22/A28 track section

a [mm]	b [mm]	c [mm]	d [mm]
170	260	120	540

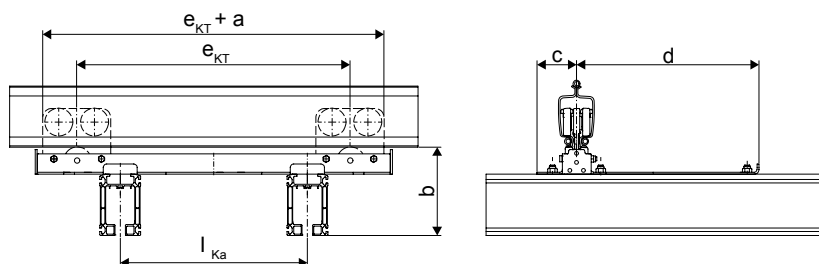


Figure 9. A18/A22/A28 double girder crane end carriage, KBK II-L, II, II-H track section

a [mm]	b [mm]	c [mm]	d [mm]
200	260	120	540

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

Longer end carriages should be used to achieve larger distances between suspensions and to reduce suspension loads.

Item	Designation	Ergo single girder crane end carriage							Ergo double girder crane end carriage						
62e	Track	A12/A16							A12/A16						
	l_{Ka}	-							550	610	650	762	800	915	
	e_{KT}	450 650							550	610	650	762	800	915	
	Crane	Load K [kg] -200 to +600							-200 to +600						
	A12/A16	Weight [kg] 6.99 7.99							8.17	8.45	8.63	9.15	9.32	9.86	
		Part no. 71584546							71585546						
	Track	A18/A22/A28							A18/A22/A28						
	l_{Ka}	- - - - - - -							550	610	650	762	800	915	1000
	e_{KT}	450 ¹⁾	550	650	800	900	1050	1250	750	810	850	962	1000	1115	1200
	Crane	Load K [kg] -200 to +750							-400 to +1200						
	A12/A16	17.40	18.50	20.50	22.40	23.70	28.50	31.00	25.30	25.90	26.20	27.30	27.70	28.70	29.50
		Part no. 71561546							71562546						
	Crane	Load K [kg] -400 to +1200							-400 to +1200						
	A18/A22/A28	16.70	17.80	19.80	21.70	23.00	27.80	30.30	23.90	24.50	24.80	25.90	26.30	27.30	28.10
		Part no. 71547346							71547446						
	Track								KBK II-L, KBK II, KBK II-H						
	l_{Ka}								550	610	650	762	800	915	1000
	e_{KT}								750	810	850	962	1000	1115	1200
	Crane	Load K [kg] -400 to +1200							-400 to +1200						
	A18/A22/A28	25.40	26.00	26.30	27.40	27.80	28.80	29.60							
		Part no. 71562346													

¹⁾ Current collector trolleys cannot be installed between the trolleys on the crane end carriage.

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

Finish: black (RAL 9005), steel

Example for ordering:

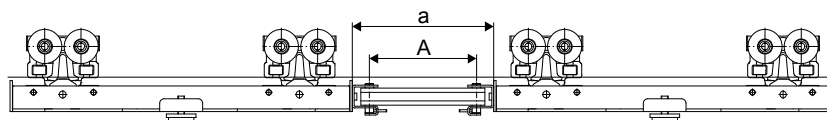
2 off KBK Aluline A18 Ergo single girder crane end carriage, e_{KT} = 550 mm.

Part no. 715 473 46

The given loads apply only for vertical forces transmitted free of any moments.

For offset loads or if moments are transmitted, the maximum permissible load must not be exceeded on the individual trolleys and suspension points.

Ergo tandem crane end carriages



$$a = A + 80 \text{ mm}$$

Tandem crane end carriages are made up of Ergo single girder crane end carriages in connection with a spacer bar. They are used when the load limit of a double girder crane end carriage is exceeded.

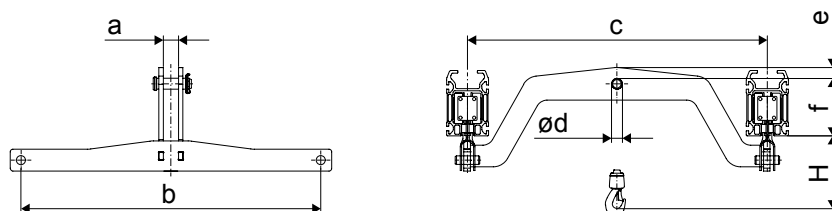
In this way, trolley track gauges that differ from those of double girder crane end carriage can also be achieved.

8 Double-rail crab

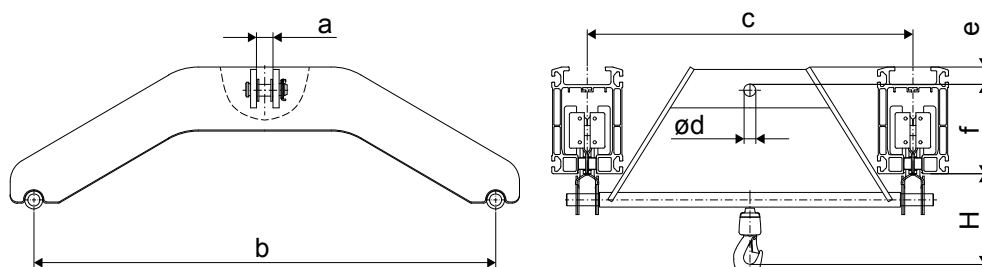
8.1 Crab frame (Item 78)

Crab frame

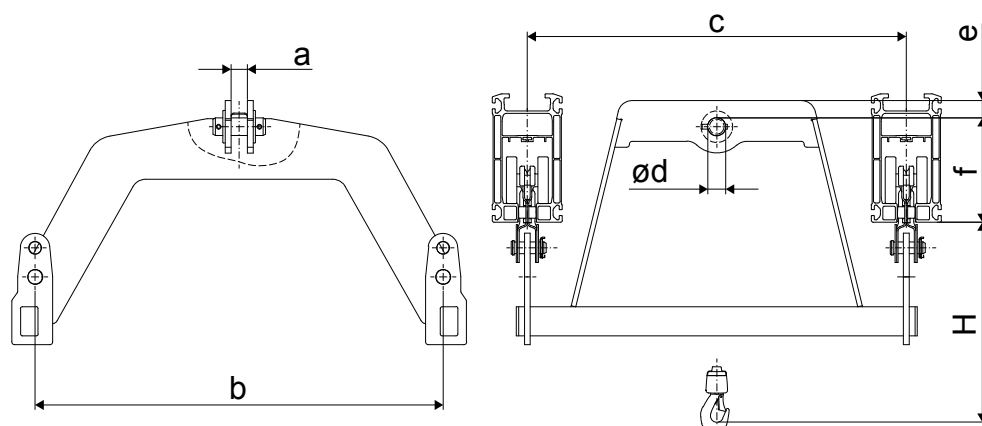
A12/A16



A18/A22/A28



A22/A28



	a	b	c	φd	e	f
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A12/A16	28	550	550	20	20	105
A18/A22/A28	28	780	550	20	30	150
A22/A28	28	700	650	30	30	179

Item	Designation	A12/A16			A18/A22/A28			A22/A28		
		Max. load K [kg]	Weight [kg]	Part no.	Max. load K [kg]	Weight [kg]	Part no.	Max. load K [kg]	Weight [kg]	Part no.
78	Crab frame	600	8.90	98060244	1200	16.40	85811044	2200	25.24	85567544

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/A28	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/A28. 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

Table 3. Wearing parts on the hoist support pin

Item	Designation		
54	Pin with BoClip	Weight [kg]	0.18
		Part no.	85131844
185	Box BoClip D = 20 [mm] (12 off)	Weight [kg]	0.14
		Part no.	85155944

RF trolley in crab frame

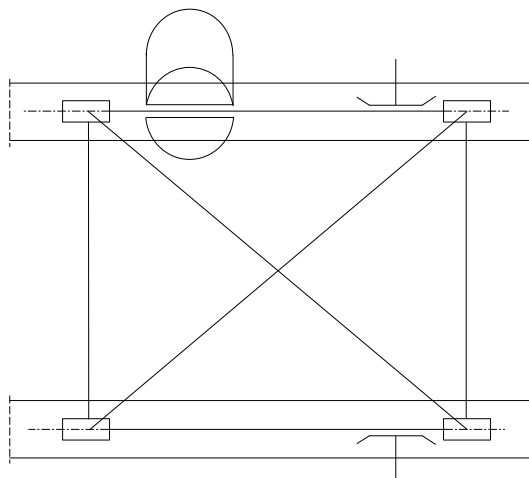
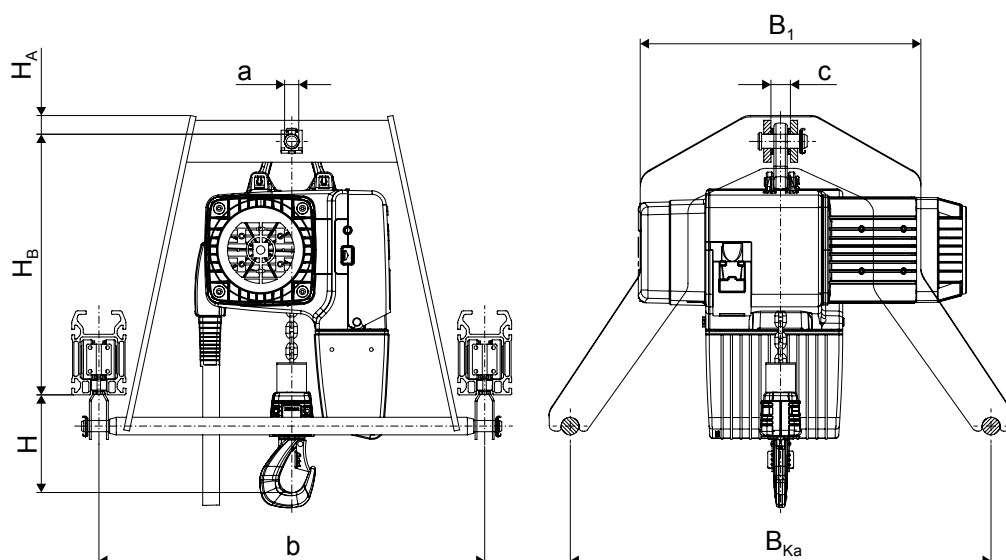


Table 4. Travel drive connection

Profile	Crab frame	with	Part no.
A12/A16	98060244	Trolley with short link bar and single-trolley link	85525144
			+ 85507044
A18/A22/A28	85811044	Trolley with short link bar	85509544
A22/A28	85567544	Trolley with short link bar and coupling 125	85509544
			+ 85557444

8.2 Raised crab frame (Item 77)



Profile	a [mm]	b [mm]	c [mm]	H _A [mm]	B _{Ka} [mm]	B ₁ [mm]
A12/A16	20	550	28	27	600	400
A18/A22/A28				32	700	510

Item	Profile	Max. load [kg]	for Hoist unit	alternativ e 1)	H _B [mm]	H			Weight [kg]	Part no.
						DC 1/2 [mm]	DC 5 [mm]	DC 10 1/1 [mm]		
77	A12/A16	600	DC 1/2	DC 5	319	45	97	-	15.7	51789046
			DC 5	-	371	-	45	-	16.7	51790046
	A18/A22/ A28	1200	DC 1/2	DC 5/10	320	44	96	185	26.7	51791046
			DC 5	DC 10	372	-	44	133	28.7	51792046
			DC 10	-	461	-	-	44	30.9	51793046

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.

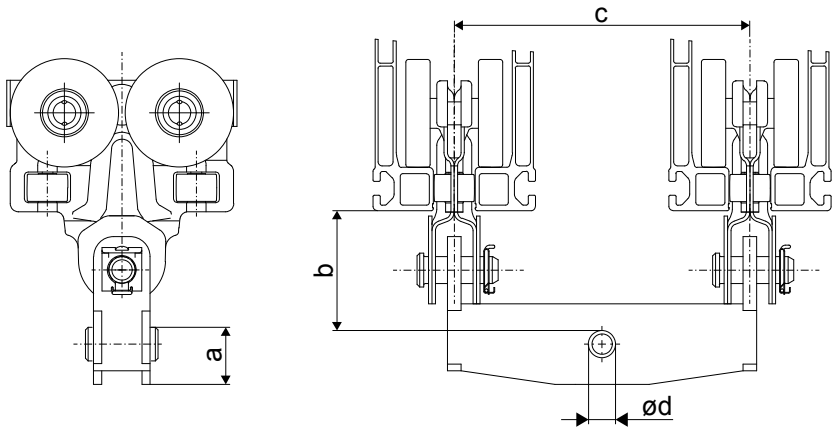
All hoists must be used with the long suspension eye.

Finish - black (RAL 9005)

Table 5. Wearing parts on the hoist support pin

Item	Designation		
54	Pin with BoClip	Weight [kg]	0.18
		Part no.	85131844
185	Box BoClip D = 20 [mm] (12 off)	Weight [kg]	0.14
		Part no.	85155944

8.3 Trolley load bar 220



a [mm]	b [mm]	c [mm]	ød [mm]
40	A18/A22/A28 = 89	220	20

Table 6. Wearing parts on the hoist support pin

Item	Designation		A18/A22/A28
	Load bar 220	Weight [kg]	1.80
		Part no.	85152044

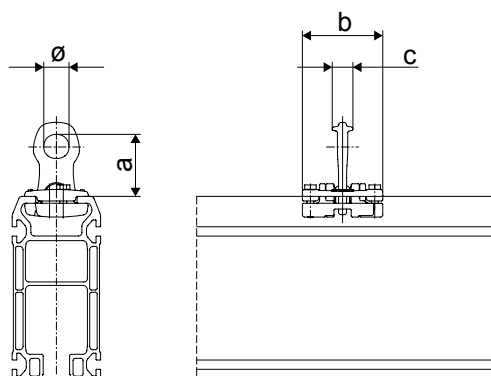
Trolley load bar 220 is used as a load trolley in extending frame B2/2.

Finish - black (RAL 9005)

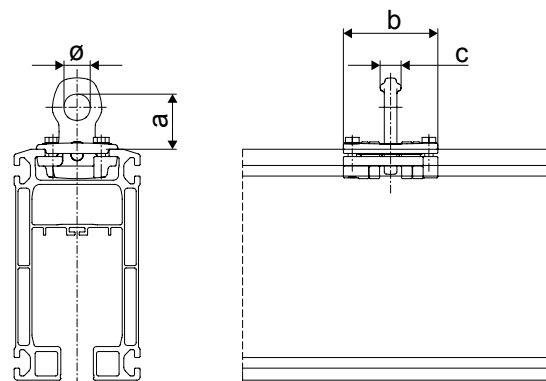
9

Crane suspension eye**Crane suspension eye (item 75)**

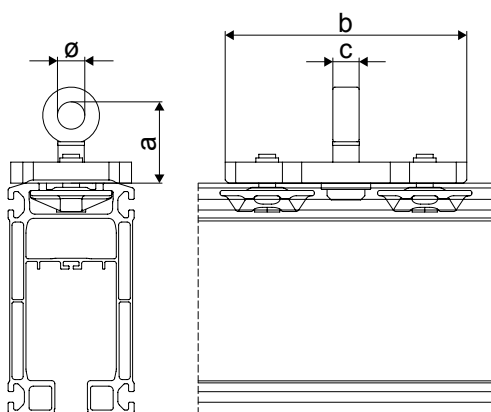
A12/A16



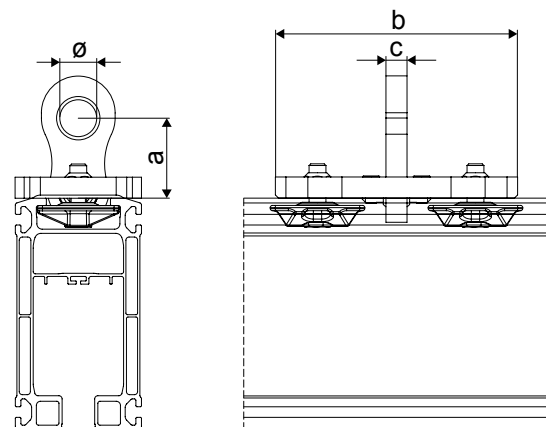
A18/A22/A28(1400 kg)



A22 (2400 kg) (85568544)



A22/A28 (2400 kg) (85570544)



	Ø [mm]	a [mm]	b [mm]	c [mm]
A12	22	55	70	18
A16		54		
A18	25	53	90	20
A22		51		
A28				
A22 (2400 kg) (85568544)	32	85	230	25
A22/A28 (2400 kg) (85570544)	35	94	230	25

Item	Designation		A12/A16	A18/A22/A28	A22 (2400 kg) (Until Q4/2023)	A22/A28 (2400 kg) (From Q4/2023)
75	Crane suspension eye	Max. load K [kg]	600	1400	2400	2400
		Weight [kg]	0.42	0.84	4.98	5.54
		Part no.	85545544	85565544	85568544	85570544

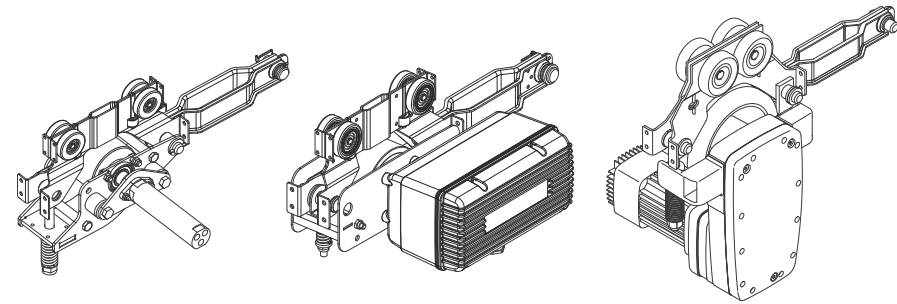
The crane suspension connects crane girders with the trolley or the articulated frame of the runway girder.

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

Finish: galvanized steel, black (RAL 9005)

10 Travel drives for crabs and cranes

RF 100 travel drive	RF125 travel drive	DRF 200 travel drive
Pneumatically driven	Electrically driven	Electrically driven
KBK Aluline A12/A16	KBK Aluline A12/A16	KBK Aluline A18/A22/A28
KBK Aluline A18/A22/A28	KBK Aluline A18/A22/A28	



10.1 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 a friction wheel.

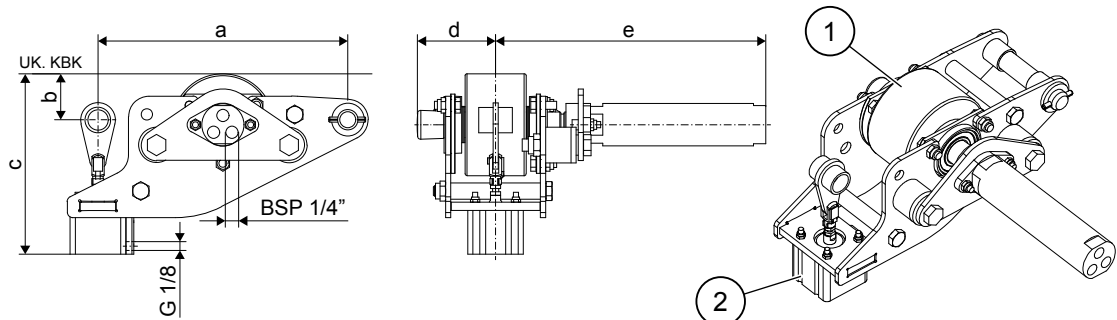
The drive is controlled pneumatically or electrically and is intended to be used as a starting help.

Technical data

Table 7. Reversible oil-free air motor

Travel speed m/min	Rated speed m/min	Output [W]	Operating pressure [bar]	Recommended operating pressure [bar]	Air demand at 4 bar [l/s]	CDF [%]	Max. displaceable load [kg]
10–50	20	80	3–6	approx. 4	4.5	50	500

10.1.1 Travel drive with disengaging cylinder (Item 70)



1. Friction wheel

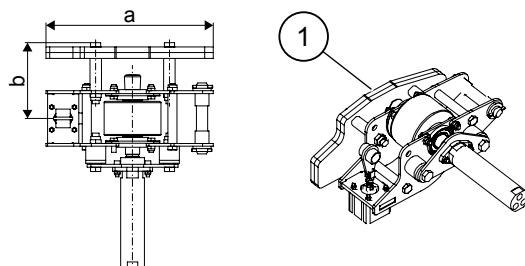
2. Disengaging cylinder

a [mm]	b [mm]	c [mm]	d [mm]	e [mm]
245	45	180	77	265 (295 with control)

Item	Designation		
70	RF 100 PN with disengaging cylinder	Weight [kg]	7.30
		Part no.	85807844

The friction wheel is pressed against the bottom flange of the rail by 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.

10.1.2 Counterweight (Item 70a)



1. Counterweight

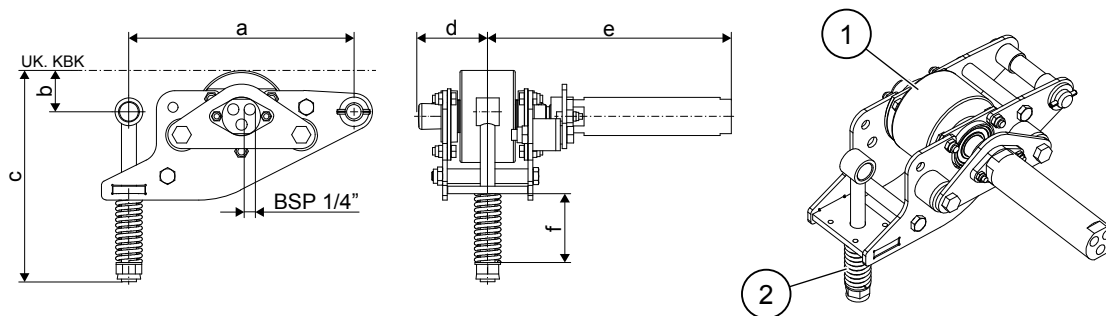
a = 295 mm and b = 134 mm.

Item	Designation		
70a	Counterweight	Weight [kg]	4.50
		Part no.	85120544

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

Finish: black (RAL 9005)

10.1.3 Travel drive with pressure spring (Item 70)



1. Friction wheel

2. Pressure spring

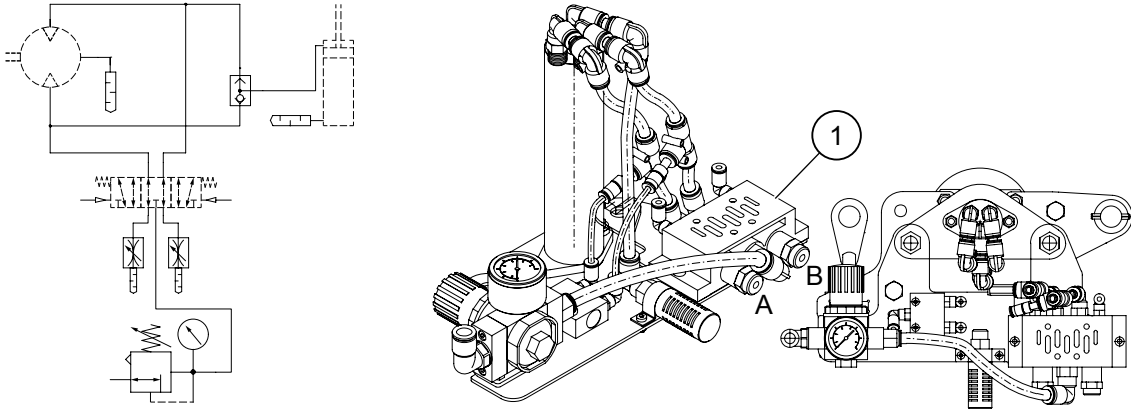
a	b	c	d	e	f
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
245	45	230	77	265 (295 with control)	60

Item	Designation		
70	RF 100 PN with pressure spring	Weight [kg]	7.20
		Part no.	85107944

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

10.1.4 RF 100 PN controls

RF pneumatic equipment base block (Item 113)



1. Standard connection plate for ISO 1 valves

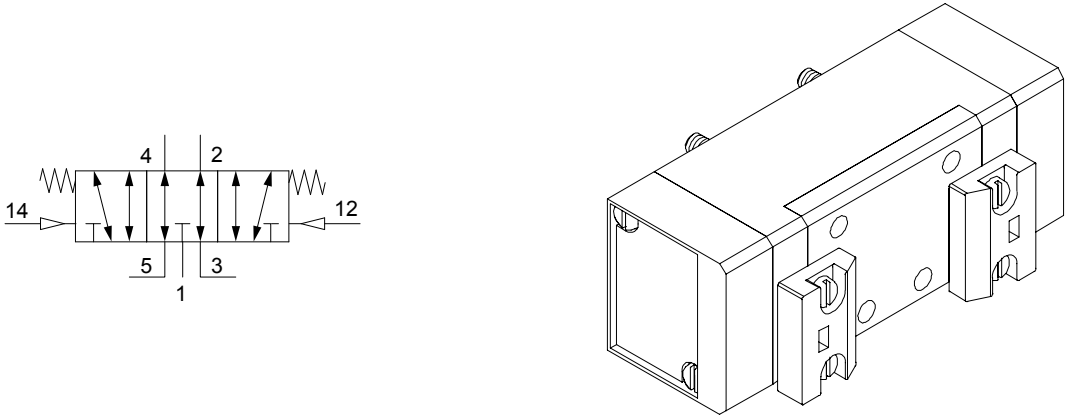
Speed can be adjusted by throttles A and B.

The motor and pneumatic block can also be installed on the other side.

Item	Designation		
113	RF pneumatic equipment base block	Weight [kg]	1.55
		Part no.	85120144

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

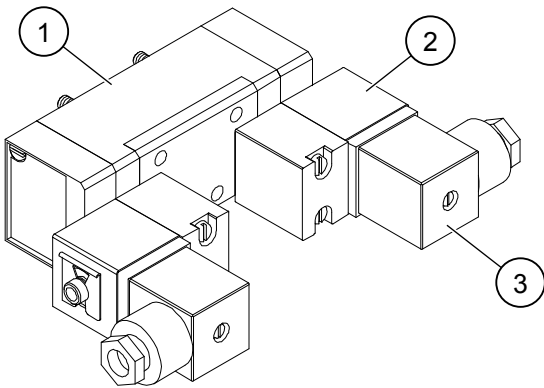
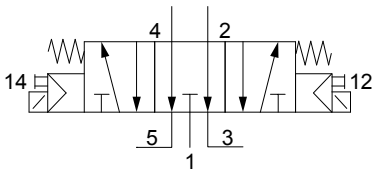
Pneumatic control, pneumatic valve (Item 114)



Item	Designation		
114	Pneumatic valve	Weight [kg]	0.39
		Part no.	55606655

The directional control valve is used to close, open, or divert compressed air pipes. 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)



1. Solenoid valve
2. Magnet coil
3. Socket can be turned by 90°

Item	Designation	Rated voltage		
115	Electric control	24 VDC	Weight [kg]	0.62
			Part no.	85120344
		230 VAC	Weight [kg]	0.62
			Part no.	85120444

- The unit consists of:
- Solenoid valve
 - Magnet coil 24 V_{DC} or 230 V_{AC} (2 off)
 - Standard socket (2 off)

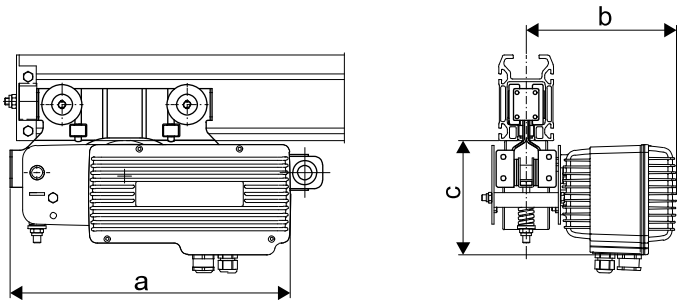
Example for ordering

Designation	Part no.
Trolley with link bar 270, A18/A22/A28	85509644
Counterweight	85120544
RF 100 PN	85107844
base block	85120144
Pneumatic valve	55606655

RF 100 PN travel drive with disengaging cylinder, suitable for KBK Aluline A18/A22/A28 with RF pneumatic equipment base block and pneumatic valve with 5/3-way function.

10.2

RF 125/TD 200 friction-wheel travel drive (Item 70)



a [mm]	b [mm]	c [mm]
392	235	159

Technical data

Table 8. E22-C DC motor with worm gearbox

Type	Travel speed at full load ¹⁾	Min. travel speed ¹⁾	Max. travel speed at partial load ¹⁾	Travel speed, variable operation, at full load ¹⁾	Travel speed, variable operation, at partial load ¹⁾	Max. displaceabl e lifted load incl. dead load	Output	ED	Voltage	Frequen cy	Weight	Part no.
	[m/min]	[m/min]	[m/min]	[m/min]	[m/min]	[kg]	[W]	[%]	[V]	[Hz]	[kg]	
RF 125	3.5/28	0.7	33	0.7 - 28	0.7 - 33	2400	50/200	20/40	3 ~ 220–480	50/60	6.90	71690145
TD 200	4.5/45	1.1	53	1.1 - 45	1.1 - 53	600						

¹⁾ By programming the parameters, travel speeds can be changed.

For more information, see the assembly instructions for E-type travel drives.

The friction-wheel travel drives are developed especially for crane requirements with regulated acceleration and braking. depending upon the used rocker, for more information, see "RF 125 rocker (item 135)" and "TD 200 rocker (item 136)".

RF 125: for loads up to 2000 kg.

TD 200: for loads up to 500 kg.

Possible inclines: up to 1% (for both).

Finish - black (RAL 9005)

10.2.1 Drive data

The output of the electric 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 eliminates the need for a holding brake.

10.2.2 Control system

The control board features a wide voltage range input (220–480 V/50/60 Hz). 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.

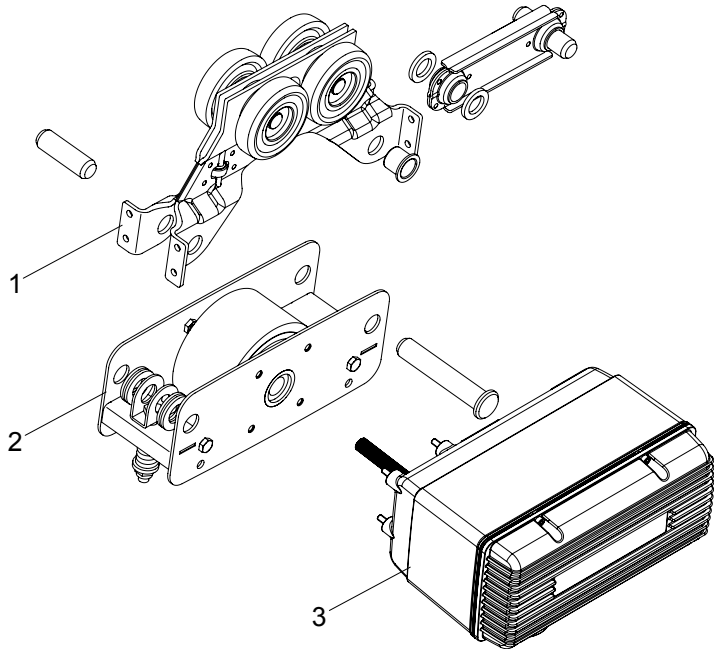
The control system includes the following features as standard:

- 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 visible through a window from the outside for operating status, error messages, parameter programming;
- Programmable parameters for speed, acceleration, etc.;
- Temperature monitoring and cut-off on overheating;
- Control with tri-state signals (half-wave evaluation) or with PWM signals
- Optimum long travel characteristics thanks to master/slave operation with up to 3 drives (1 master, 2 slaves)
- Simple parameter programming by control pendant or by separately available keypad terminal.

10.2.3 Connection to hoist

When the travel drive is connected with a hoist with 110 V control voltage, it is necessary to use enclosure 55321504 together with plate 55336988 in between.

10.2.4 RF 125 rocker (item 135)

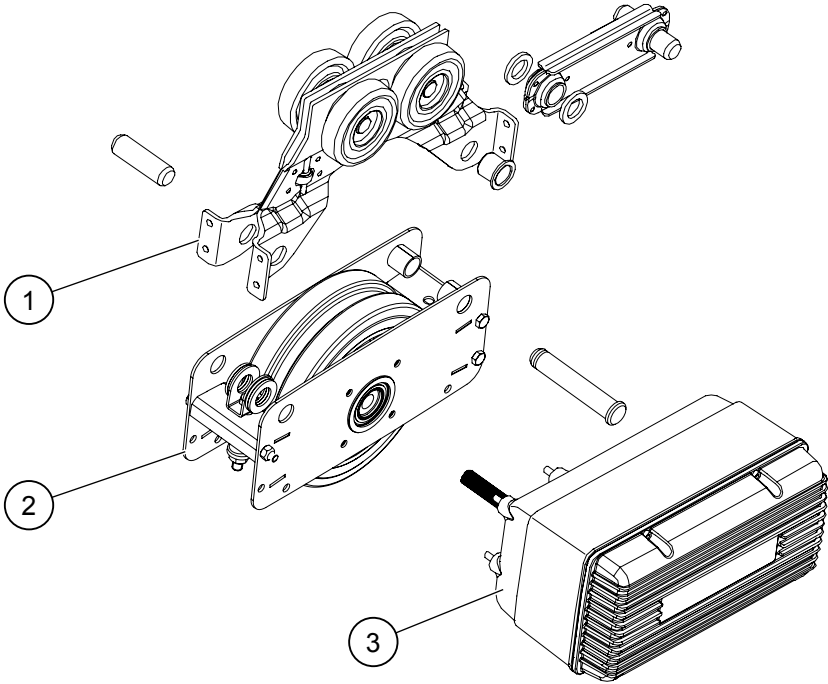


1. Tractor trolley
2. RF 125 rocker
3. E22-C travel drive

Item	Designation		
135	RF 125 rocker	Weight [kg]	4.40
		Part no.	85824544

Finish: black (RAL 9005); galvanized

10.2.5 TD 200 rocker (Item 136)



1. Tractor trolley
2. TD 200 rocker
3. E22-C travel drive

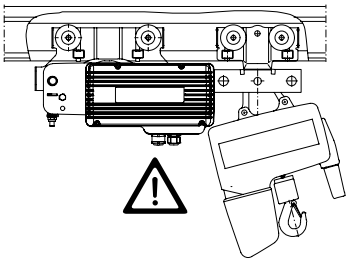
Item	Designation		
136	TD 200 rocker	Weight [kg]	5.36
		Part no.	85844544

Finish: black (RAL 9005); galvanized

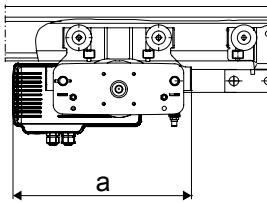
10.2.6 Possible arrangements

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

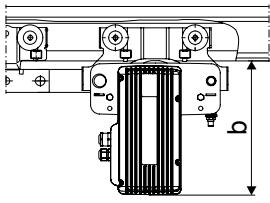
Long link bar required.



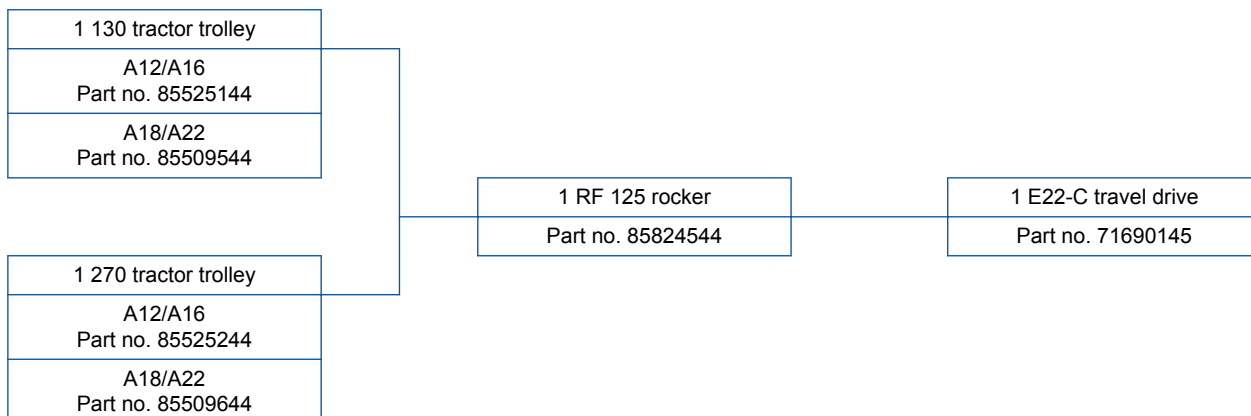
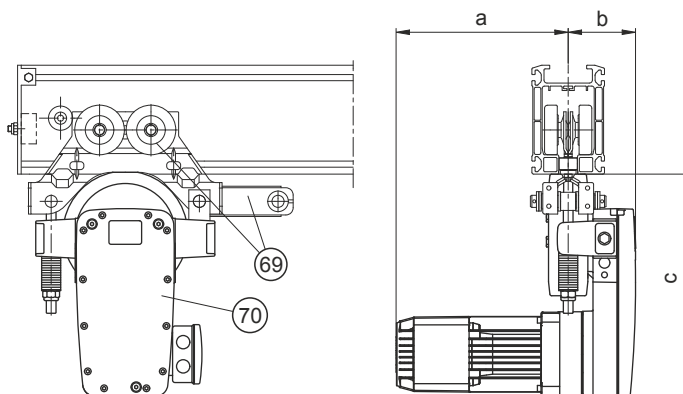
Consider approach dimension.



Consider overall height.



a [mm]	b [mm]
392	293

Example for ordering RF 125**10.3 DRF 200 friction-wheel travel drive (Item 70)**

a = 284.5 mm, b = 110 mm, c = 370 mm

Table 9. Technical data - ZBF 63 and 71 travel motors for DRF 200 (motor size assignment) ¹⁾

Travel speed m/min	Output [kW]		CDF [%]	Maximum displaceable weight in kg ²⁾									
				1000	1500	2000	2500	3000	3500				
10	0.13		100	ZBF 63 A4 B003						3500	-		
12.5				ZBF 63 A4 B003						3000	-		
16				ZBF 63 A4 B003		2300	-						
20	0.26			ZBF 63 A2 B003						3500	-		
25				ZBF 63 A2 B003				3000	-				
31.5				ZBF 63 A2 B003				2300	-				
40				ZBF 63 A2 B003		1800	-						
5/20				ZBF 63 A8/2 B003						3000	ZBF 71 A8/2 B003		
6.3/25	0.06/0.25	0.09/0.34		40	ZBF 63 A8/2 B003				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.

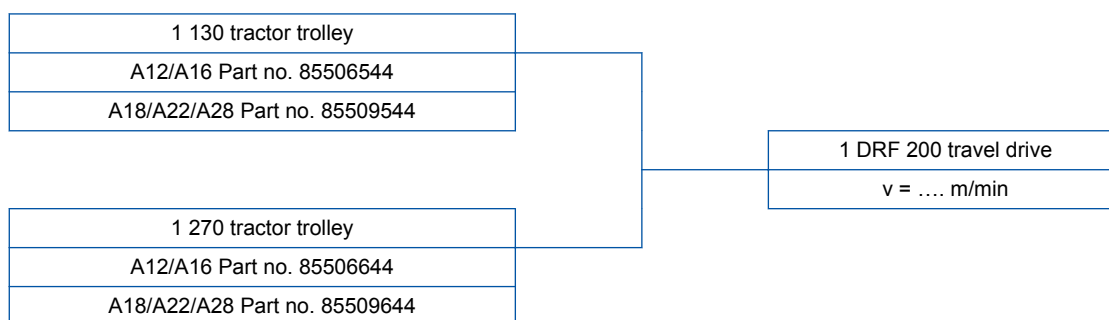
²⁾ Dry, horizontal track. Operation on inclined tracks on request.

Item	Designation		
70	DRF 200 friction-wheel travel drive with wide friction wheel (73 mm), A18/A22/A28	Weight [kg]	25.00
		Part no.	Technical data

DRF 200 friction-wheel travel drives transmit the output of the travel motor, which is specially developed for crane duty, through 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 affected direct or through contactors. Contactor control and timed mechanical braking, or timed mechanical braking elements in the pendant controller are required if pole-changing travel drives are used.

Finish - blue (RAL 5009)

Example for ordering DRF 200 -



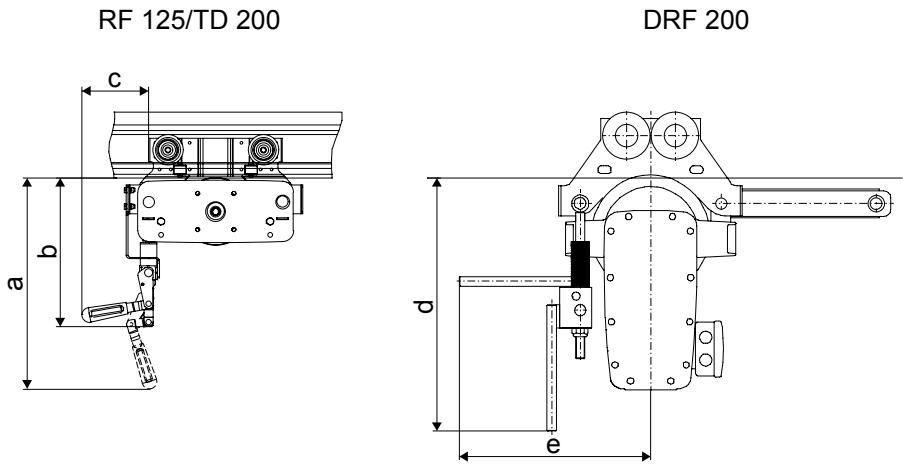
10.4 Disengaging devices

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

The use of a disengaging device is recommended 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

10.4.1 Manually actuated disengaging devices (Item 137)



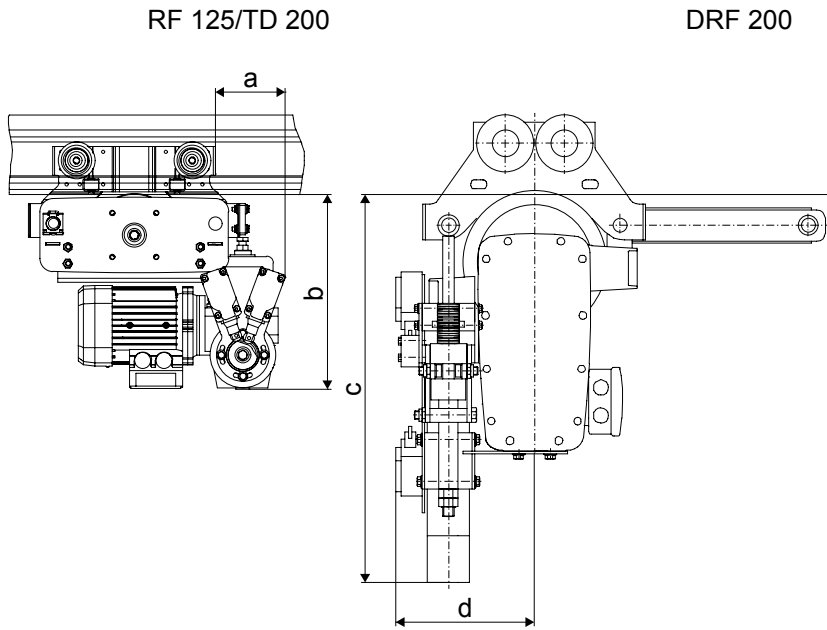
a [mm]	b [mm]	c [mm]	d [mm]	e [mm]
388	272	122	440	350

Item	Designation		
137	RF 125/TD 200 manual disengaging device	Weight [kg]	1.10
		Part no.	85134044
	DRF 200 manual disengaging device	Weight [kg]	2.00
		Part no.	84115044

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

The figure shows the engaged (with wheel contact) state.

10.4.2 Electrically actuated disengaging devices (Item 138)



Profiles	Travel Drive	a [mm]	b [mm]	c [mm]	d [mm]
A12/A16	RF125	105	295	-	-
	TD200	105	392		
A18/A22/A28	RF125	152	295	-	-
	TD200	152	392		
	DRF200	-	-	540	225

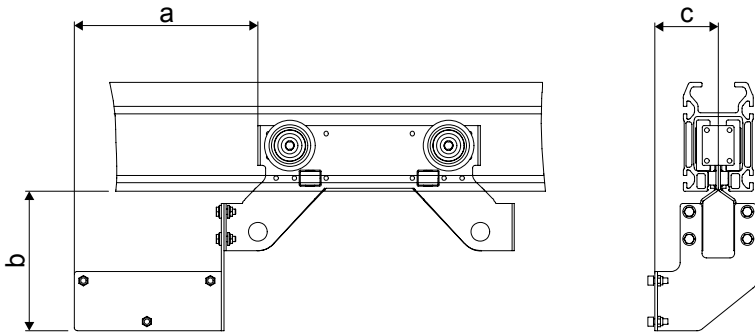
Item	Designation	Disengaging time [s]	CDF [%]	Voltage [V]	Frequency [Hz]	Output [W]		
138	RF 125/ TD200 electrically actuated disengaging device	1	50	380-415	50	120	Weight [kg]	9.30
				440-480	60	140	Part no.	85835044
	DRF 200 electrically actuated disengaging device	3	10	230	50	30	Weight [kg]	5.00
							Part no.	On application

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

Control system

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

10.4.3 Angle bracket for housing (Item 92)



a = 203 mm, b = 154 mm, 70 mm.

Item	Designation		
92	Angle bracket	Weight [kg]	0.55
		Part no.	71550446

Angle brackets are used to attach a housing (77239045/77239545) to a tractor trolley when an RF 125 travel drive is also installed together with an electrically actuated disengaging device.

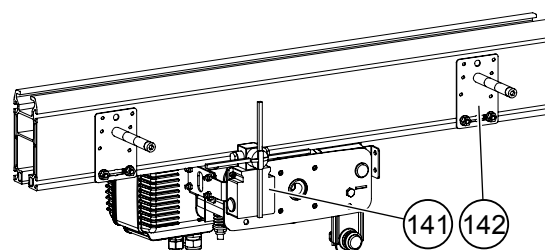
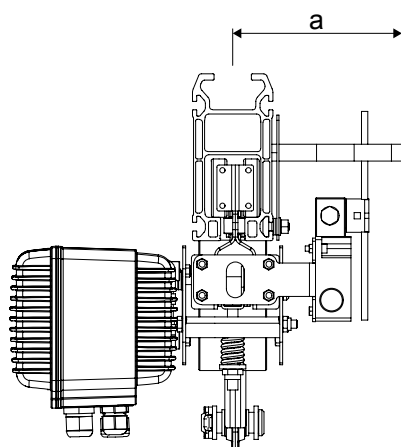
The control system for the disengaging device is in the housing.

10.5 Travel limit switches

10.5.1 Mechanically operated switch

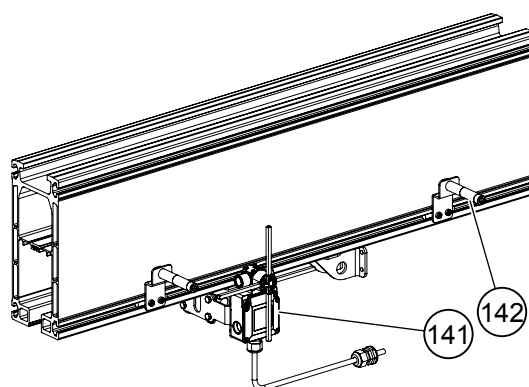
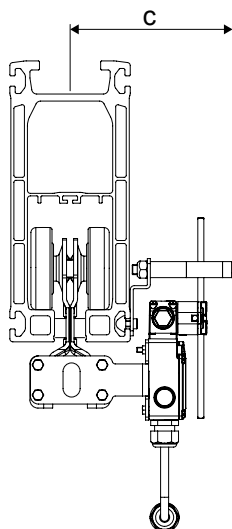
RF 125/TD 200 limit switch fitting (items 141, 142)

A12/A16



a = 165 mm

A18/A22/A28



c = 162 mm

Item	Designation		A12/A16	A18/A22/A28
141	Limit switch, cpl.	Weight [kg]	0.85	0.85
		Part no.	85835144	85835144
142	Switching vane, cpl.	Weight [kg]	0.75	0.55
		Part no.	85535544	85579044

Limit switch fittings are designed to be used with RF 125/TD 200 travel drives on KBK Aluline systems. They can be used for reliable switch-over from fast to slow travel, or from slow travel to the stop function.

This is utilized when travel against the limit stops needs to be avoided.

Crane applications

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 including the fittings for attachment to the rail.

Finish: galvanized

10.5.2 Optical distancing

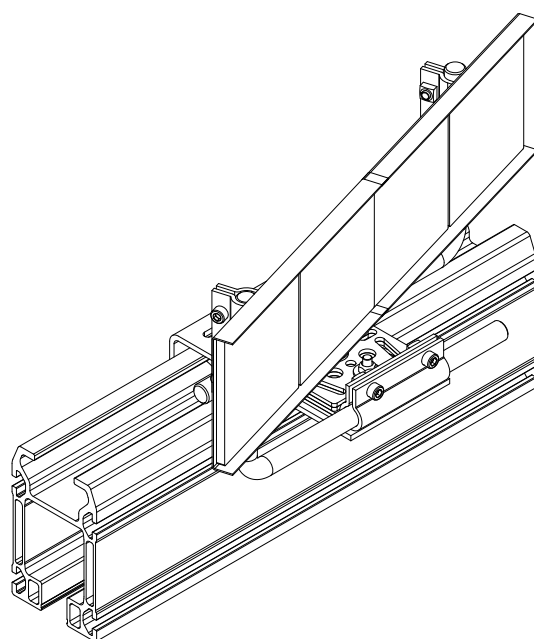


Figure 10. Optical distancing fitting (reflectors)

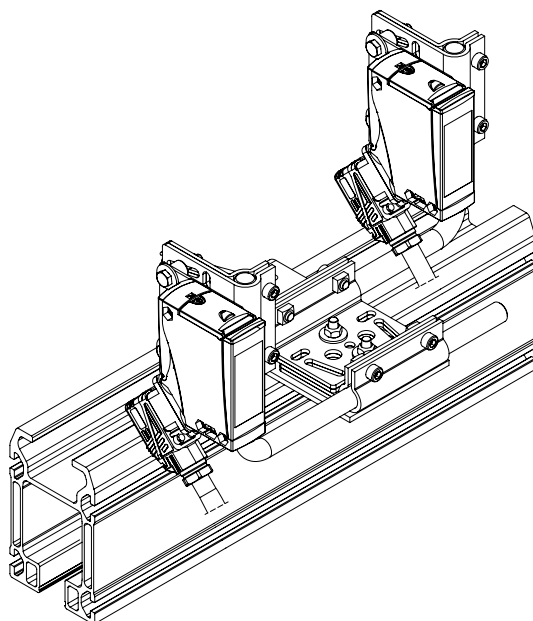


Figure 11. Optical distancing fitting (light sensors)

Item	Designation		A12/A16	A18/A22/A28
	Attachment set	Weight [kg]	2.27	2.34
		Part no.	85545644	85563644
	Light sensor	Weight [kg]	1.16	
		Part no.	85159944	
	Reflector	Weight [kg]	0.68	
		Part no.	99148844	

Configuration on one attachment set can be mounted either:

- 2 x light sensors
- 2 x reflectors

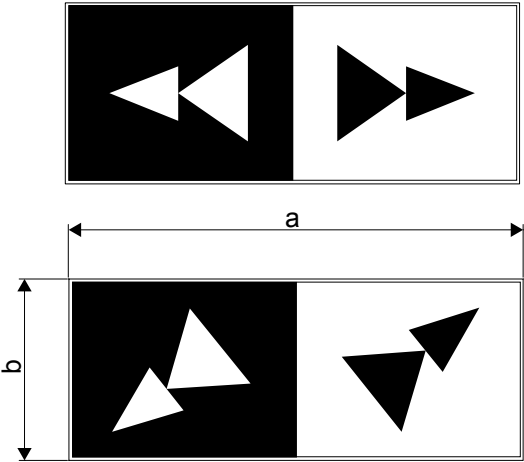
Optical distancing fitting use travel drives to switch from fast to slow travel and from slow travel to the stop function. It also work for mutual approaching.

Optical distancing fittings are mandatory if more than one crane on the runway and one or more cranes has remote controlled electrical travel motion.

Optical distancing fittings configuration on demand.

10.6 Additional components for wireless control systems

10.6.1 Travel direction plates (item 146)



a [mm]	b [mm]
250	100

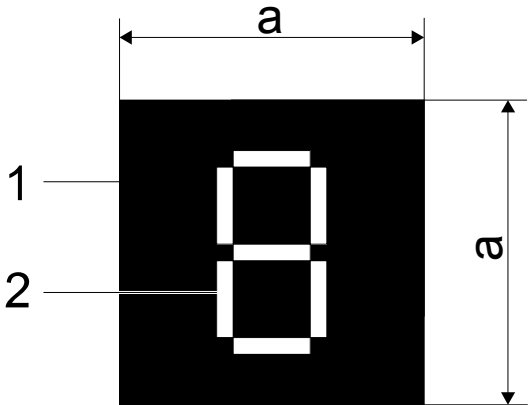
Item	Designation	Use for		
146	Travel direction plates	Cross travel, 2 speeds, variable	Weight [kg]	0.03
			Part no.	85152544
		Long travel, 2 speeds, variable	Weight [kg]	0.03
			Part no.	85152644

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

The adhesive plates shown can be fitted direct to the profile section for size A16 and higher or to the small attachment bracket (item 93).

Type: foil, printed yellow/black

10.6.2 Identification signs for the installation



a = 150 mm

Item	Designation		
1	Black background foil	Weight [kg]	-
		Part no.	89563944
2	Yellow segment	Weight [kg]	-
		Part no.	89564044

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

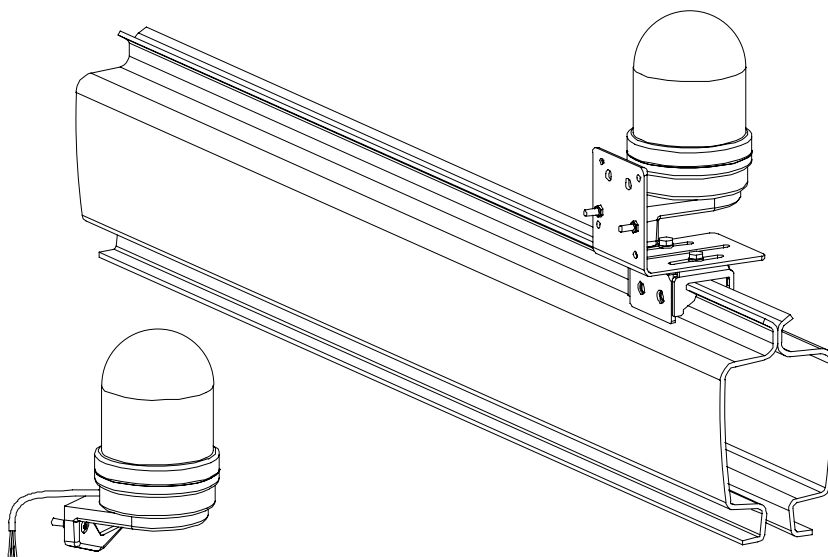
The coding labels are used to show the crane ID on the crab or the crane.

The crane identification shown by the coding labels must be identical to the crane identification shown on the hand-held transmitter

display.

Travel direction symbols on the crane and the crab must match the directions of movement shown by the buttons on the hand-held control unit.

10.6.3 Warning lamp, set (Item 148)



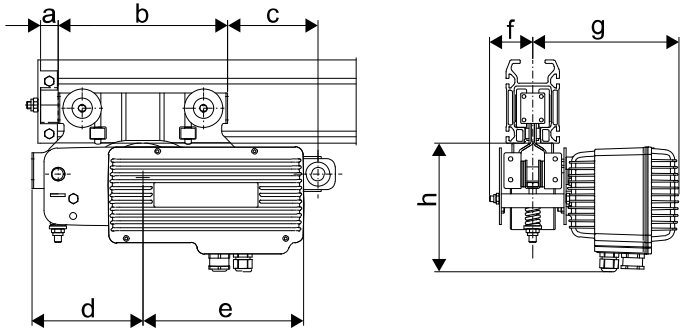
Item	Designation		
148	Warning lamp, set	Weight [kg]	0.11
		Part no.	73049645

For cranes that have wireless controls, a red warning lamp indicates the state of readiness of the crane 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.

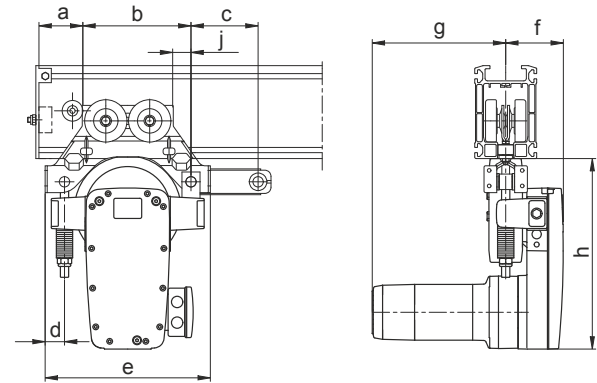
11 Trolleys for travel drives

RF and DRF trolley (item 69), DRF 200 friction-wheel travel drive (item 70), and 125 trolley coupling (item 71)

A12/A16 with RF 125



A18/A22/A28 with DRF 200



	a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	f [mm]	g [mm]	h [mm]	j [mm]
A12/A16 with RF 125/TD 200	25	245	130/270	160	232	62	235	185	-
A18/A22/A28 with RF 125/TD 200	85	210							320
A18/A22/A28 with DRF 200									

Item	Designation		A12/A16	A18/A22/A28
69	130 trolley	Weight [kg]	3.0	4.0
		Part no.	85525144	85509544
	270 trolley	Weight [kg]	3.5	4.3
		Part no.	85525244	85509644
71	125 trolley coupling	Weight [kg]	-	0.25
		Part no.	-	85557444

The trolleys that are shown are suitable for the following drives:

Trolley for A12/A16 - RF 100, RF 125, TD 200

Trolley for A18/A22/A28 - RF 100, RF 125, TD 200, DRF 200

Drive trolleys can be connected to Ergo end carriages with a connector section. For more information, see "Articulated spacer bar".

Finish - black (RAL 9005)

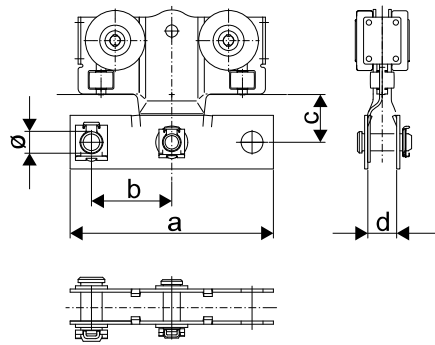
12 Coupling elements and spacer bars

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

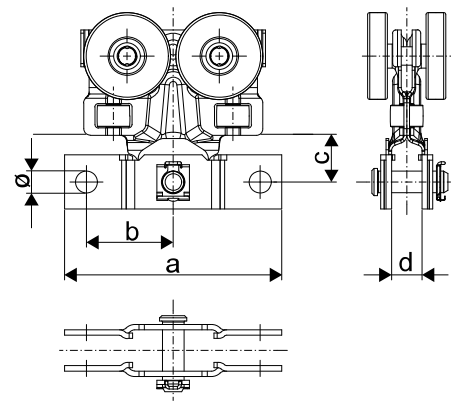
The travel drive must always be connected to the load trolley.

12.1 Link for single trolley (item 61)

A12/A16



A18/A22/A28



	Ø [mm]	a [mm]	b [mm]	c [mm]	d [mm]
A12/A16	20.5	184	72	45	27
A18/A22/A28		200	80	43	28

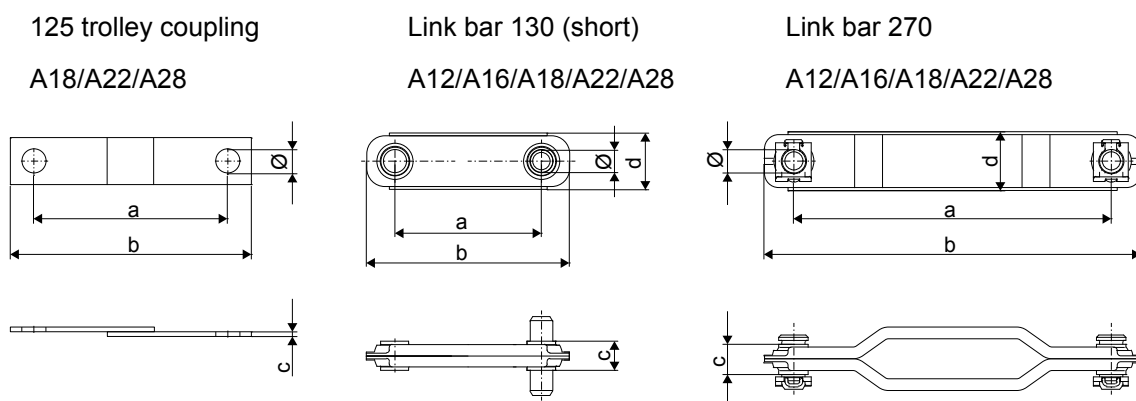
Item	Designation		A12/A16	A18/A22/A28
61	Link for single trolley	Weight [kg]	0.70	0.80
		Part no.	85507044	85520544

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

This item is not needed with 85568044.

Finish: black (RAL 9005), steel

12.2 125 trolley coupling/long link bar



	a [mm]	b [mm]	c [mm]	d [mm]	Ø [mm]
125 trolley coupling	125	165	4	-	20.5
Link bar 130 (short)	130	180	26	50	20
Link bar 270 (long)	270	320	26	50	20

Item	Designation		A12/A16	A18/A22/A28
71	125 trolley coupling	Weight [kg]	-	0.25
		Part no.	-	85557444
	Link bar 130 (short)	Weight [kg]	0.56	0.56
		Part no.	98234044	98234044
	Link bar 270 (long)	Weight [kg]	0.74	0.74
		Part no.	98234544	98234544

125 trolley couplings are used to connect friction wheel units in A18, A22 and A28 crab frames.

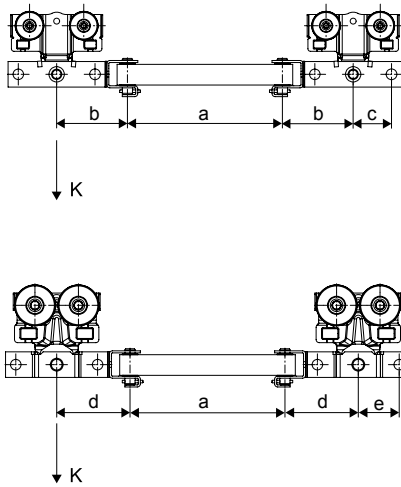
Long link bars can be used for any trolley combinations and special applications.

Finish: black (RAL 9005), steel

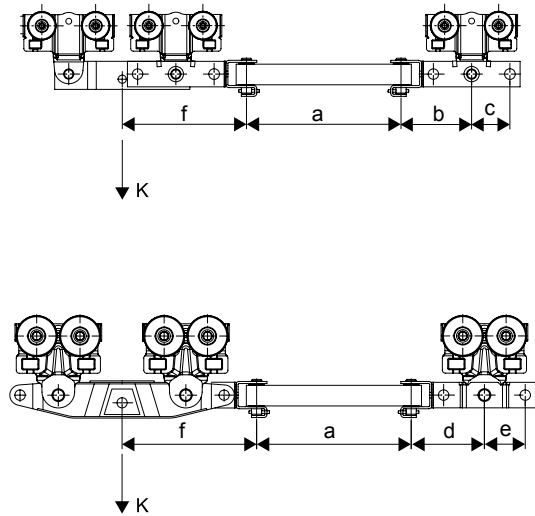
12.3 **Articulated spacer bars (Items 72, 73)**

Examples

Spacer bar on single trolley

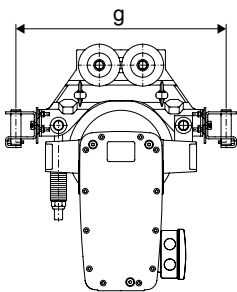
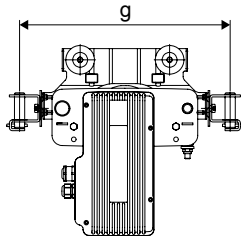


On double trolley



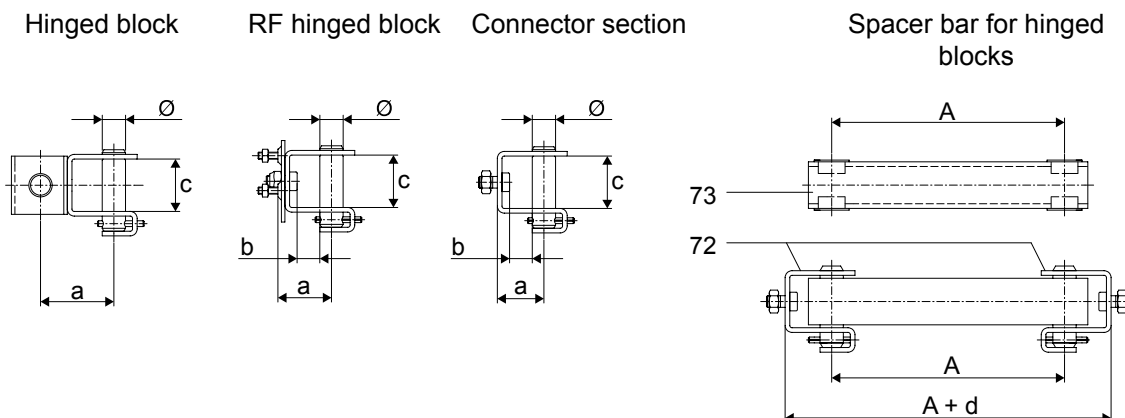
a [mm]		b [mm]	c [mm]	d [mm]	e [mm]	f [mm]
min. 70	max. 2500	138	75	143	80	243

On trolley for RF (one or both sides)



g = 412 mm

Components



	a [mm]		b [mm]	c [mm]	Ø [mm]	d [mm]	A [mm]
Hinged block	63		-			-	-
RF hinged block	46		-			-	-
Connector section	40		20	45	20	-	-
Spacer bar for hinged blocks	-	-	-	-		80	min. 70 max. 2500 1 spacer bar for hinged blocks, A = 700

Item	Designation	Length A min. [mm]	Length A max. [mm]		
72	Hinged block	70	2500	Weight [kg]	0.75
				Part no.	98240244
	RF hinged block			Weight [kg]	0.65
				Part no.	98239944
	Connector section			Weight [kg]	0.46
				Part no.	85039944
73	Spacer bar for hinged blocks	70	2500	Weight [kg]	5.0/m
				Part no.	85033744

Spacer bars are used to distribute loads safely by separating several monorail hoist trolleys running on the same track. Specify the spacer bar length according to the information given in "Examples and symbols", "Project engineering sheet for KBK installations", and "Profile load capacities according to the diagram". The deadweight 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 - black metal parts (RAL 9005); galvanized pins, nuts, and bolts.

Example for ordering -

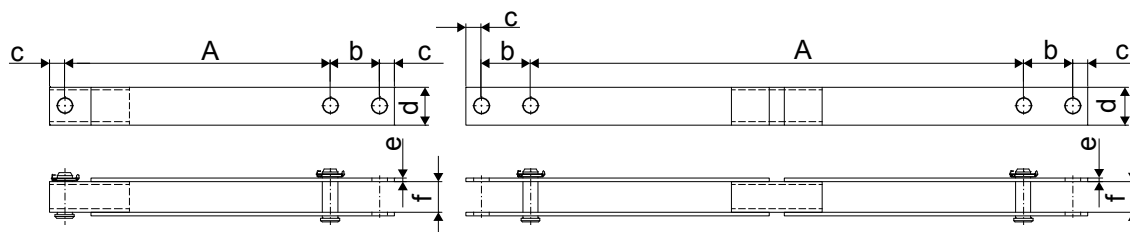
Two hinged blocks, order no. 98240244

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

12.4 Spacer bars for straight track, A18/A22/A28 (item 76)

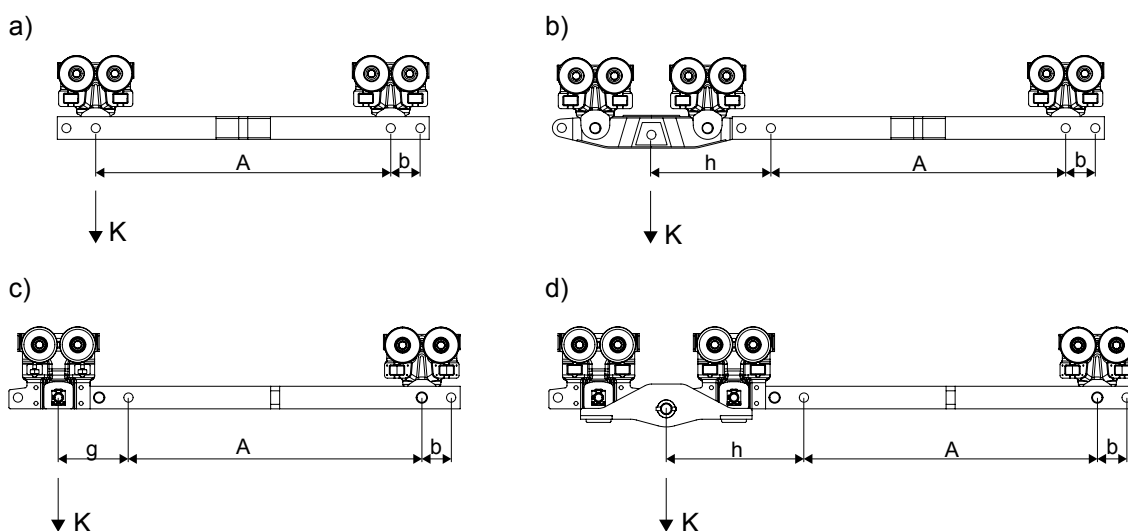
Spacer bar with one open end

Spacer bar with two open ends



	A [mm]		b [mm]	c [mm]	d [mm]	e [mm]	f [mm]
Spacer bar with one open end	min. 400	max. 3500	65	20	50	5	40
Spacer bar with two open ends	min. 650	max. 3500					

Examples with two open ends



- a) Spacer bar on single trolley for double-girder crane with two open ends
- b) Spacer bar on double trolley for double-girder crane with two open ends
- c) Spacer bar on single trolley for double-girder crane with two open ends (1200 kg)
- d) Spacer bar on double trolley for double-girder crane with two open ends (2400 kg)

Table 10.

b [mm]	h [mm]	g [mm]
65	265 - Spacer bar on double trolley for double girder crane with two open ends, b	155
	305 - Spacer bar on double trolley for double girder crane with two open ends (2400 kg), d	

Item	Designation	Fitted to	Weight [kg]	Part no.
76	Spacer bar with one open end	Spacer bar, trolley	4.8/m + 0.5	20480246
	Spacer bar with two open ends	Single trolley, articulated frame	4.8/m + 1.0	20480146

Spacer bars can be 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: Sheet metal parts black (RAL 9005); bolts, screws, nuts galvanized

Examples for ordering:

Two spacer bar with one open end, A = 3000 mm

13 Buffers and end stops

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

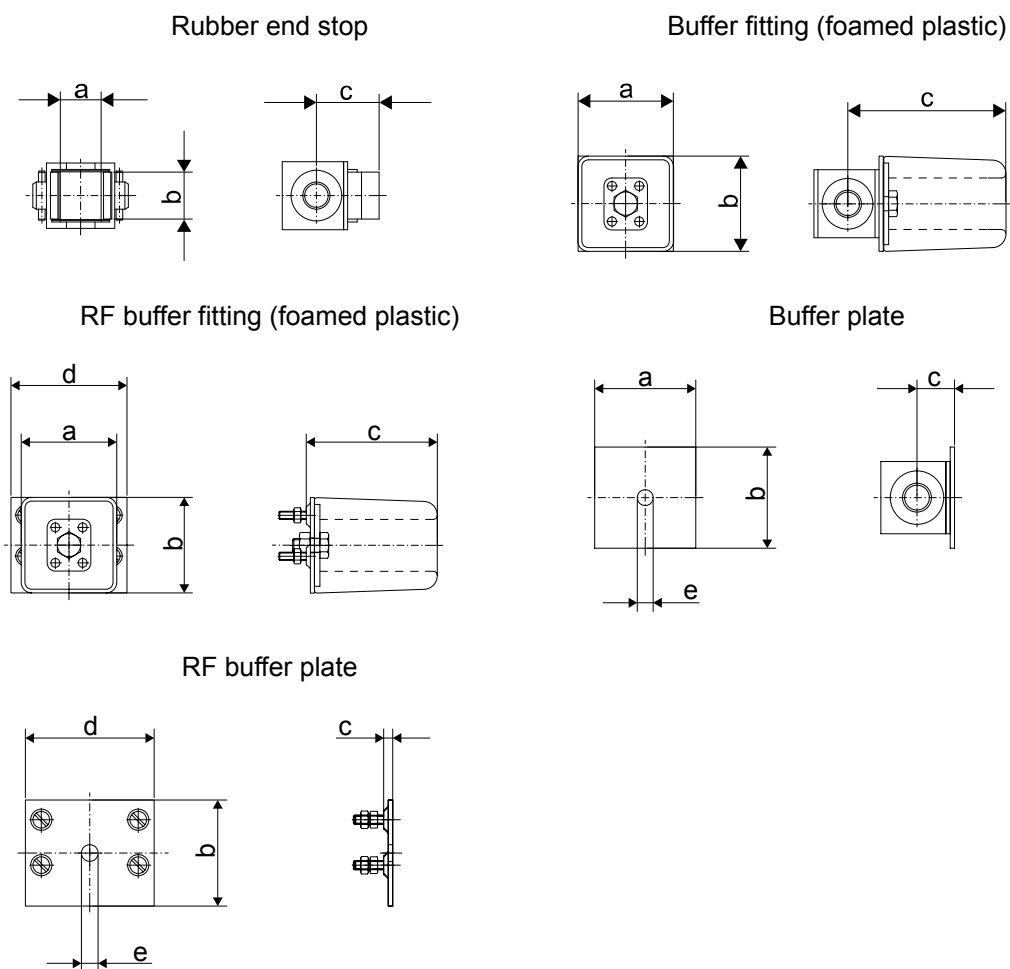
To lessen the impact forces of several monorail hoists or cranes on the same track and/or to reduce the noise of impact, buffers should be provided between the trolleys or cranes.

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

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

13.1 Buffers on crabs and cranes outside the profile section (Item 98)

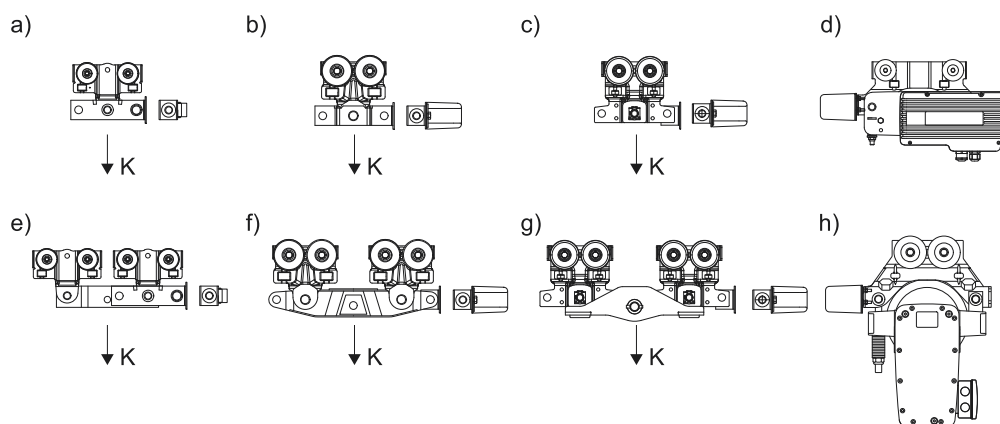
KBK Aluline buffer components



	a [mm]	b [mm]	c [mm]	d [mm]
Rubber end stop	30	35	45	-
Buffer fitting (foamed plastic)	70	70	115	-
Buffer plate	85		95	70
RF buffer fitting (foamed plastic)	70		25	11
RF buffer plate	85		6	

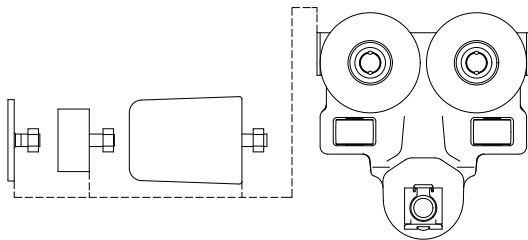
Item	Designation	Fitted to	Weight [kg]	Part no.
98	Rubber end stop	Single-trolley link, articulated frame, spacer bar with two open ends, spacer bar with one open end	0.44	98239544
	Buffer fitting (foamed plastic)		0.80	98237844
	Buffer plate		0.49	98237744
	RF buffer fitting (foamed plastic)	RF 100, RF 125, TD 200 and DRF 200 trolley	0.45	85837544
	RF buffer plate		0.16	85837444

KBK Aluline buffer examples



a)	Buffer plate or buffer fitted to A12/A16 single-trolley link
b)	Buffer plate or buffer fitted to A18/A22 single-trolley link
c)	Buffer plate or buffer fitted to A18/A22 single-trolley link (1200 kg)
d)	RF buffer fitted to RF trolley
e)	Buffer plate or buffer fitted to A12/A16 double-trolley link
f)	Buffer plate or buffer fitted to A18/A22 articulated frame
g)	Buffer plate or buffer fitted to A18/A22 load bar Aluline (2400 kg)
h)	RF buffer fitted to DRF trolley

13.2 Buffer on A18/A22/A28 single trolley inside the profile section

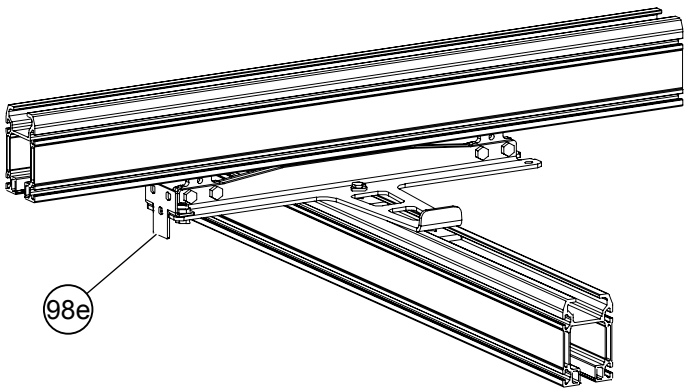


The following parts can be attached direct to A18/A22/A28 single trolleys:

Item	Designation		A18/A22/A28
98	Stop plate	Weight [kg]	0.13
		Part no.	85567044
	Rubber buffer	Weight [kg]	0.10
		Part no.	85506244
	Foamed plastic buffer	Weight [kg]	0.25
		Part no.	85569544

13.3 End stops for Ergo load bars (Item 98e)

13.3.1 Stop plate

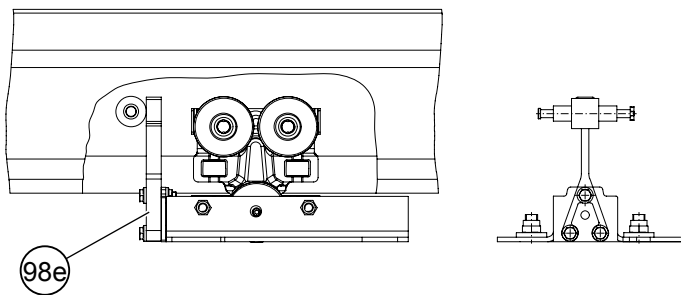


Item	Designation		A12/A16
98e	Stop plate	Weight [kg]	0.19
		Part no.	85534344

The following components can be attached to KBK Ergo end carriages by using a stop plate:

- Buffers
- Rail end clamps
- Travel drives.

13.3.2 End stop



Item	Designation		A18/A22/A28
98e	End stop cpl	Weight [kg]	0.68
		Part no.	85151944

End stops can be used together with an internal buffer stop to limit the travel motion.

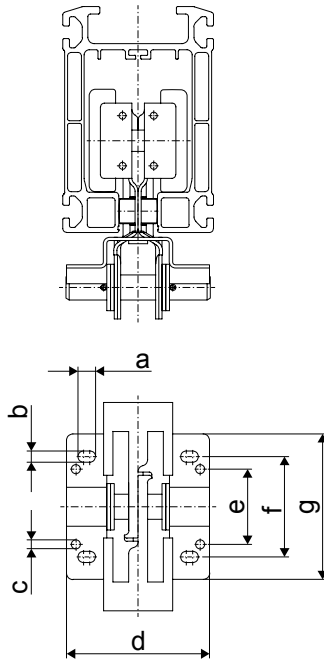
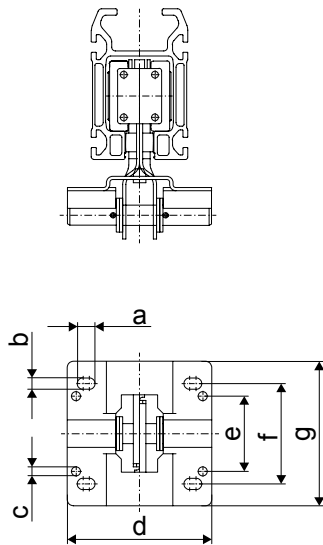
14

Fittings

14.1 Trolley attachment bracket with pin (Item 53)

A12/A16

A18/A22/A28



	a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	f [mm]	g [mm]
A12/A16	14	9	7	115	60	80	115
A18/A22/A28	14	9	7	114	60	80	116

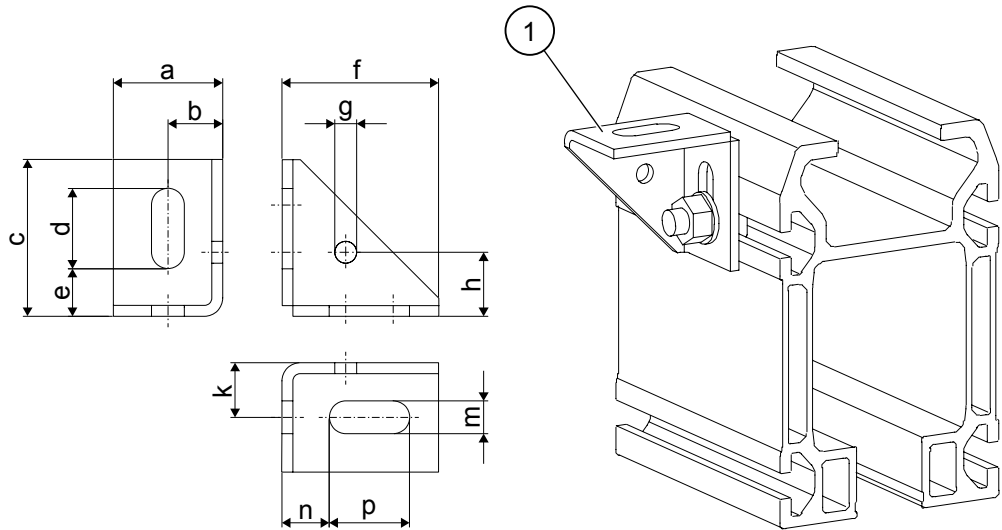
Item	Designation		A12/A16	A18/A22/A28
53	Trolley attachment bracket with pin	Weight [kg]	0.72	0.66
		Part no.	71602946	98204144

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)

14.2 Mounting bracket, screw set (Item 89)



1. Mounting bracket and screw set

a	b	c	d	e	f	g	h	k	m	n	p
[mm]											
30	15	43	22	13	43	6	17.5	15	9	13	22

Item	Designation	Weight [kg]	Part no.
89	Attachment bracket	0.07	71227547
	M8x 20 screw set	0.02	71232547

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

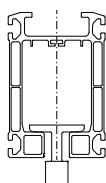
15 Power supply to crabs and cranes

15.1 Trailing cable, general information

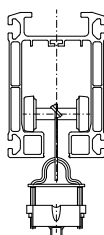
A cable (4 x 1.5 mm) running on cable sliders and larger or several cables running on cable trolleys in the Aluline section is the most economical power supply system.

Alternative - cable trolleys running in KBK 0 or KBK 25 rail, fitted to the side of the Aluline section.

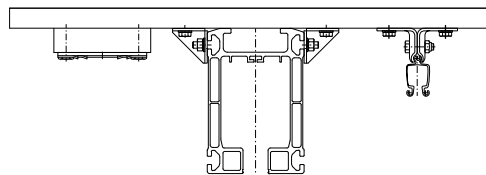
Trailing cable with cable slider



Trailing cable with cable trolley



Trailing cable with KBK 0, KBK 25



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 cable sliders or cable trolleys

The quantity of cable sliders or cable trolleys required for a crane or track must be calculated considering cable sag and track or crane girder length.

Maximum trailing cable length with cable sliders - 40 m (for push travel)

Maximum trailing cable length with cable trolleys - 50 m (for push travel), 70 m (for electric travel)

Required quantity of cable carriers n:

$$n = \frac{a}{b \times 2} - 1$$

a = Track or crane girder length [m]

b = Cable sag [m]

Approach dimension

The approach dimension of the crane or traveling hoist is increased by the distance required for close accumulation of cable sliders and cable trolleys. Install an internal buffer stop to protect the accumulated cable carriers.

For KBK Aluline installations with KBK 0 / KBK 25 fitted on the side, the approach dimension can be reduced by arranging the cable trolley accumulating section next to the crane or traveling hoist, or by extending the KBK 0 / KBK 25 rail beyond the end of the track.

Two trolleys or cranes on one track

If two traveling hoists operate on one monorail track or two crane girders on one crane runway, power supply can be provided via one flat cable for each of them from opposite ends of the track.

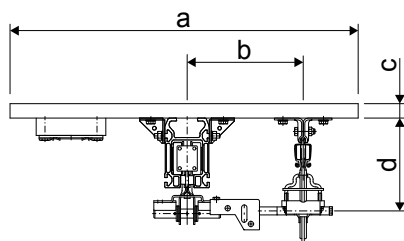
See technical data sheet 20261744 for details (KBK 0, KBK 25, KBK 100 trailing cable power supply).

More than two trolleys or cranes on one track

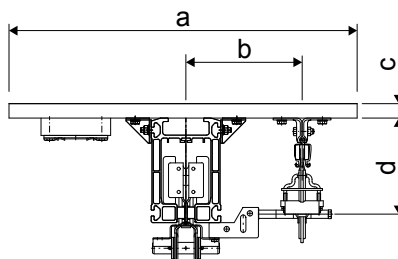
Power supply by flat cable is not possible if more than two traveling hoists or two crane girders operate on one track. In these cases, power must be supplied through an external conductor line (for more information, see "External Demag DCL-Pro compact conductor line") or internal conductor line (for more information, see "KBK Aluline-R components").

External KBK 0, KBK 25 trailing cable power supply

A12/A16



A18/A22/A28

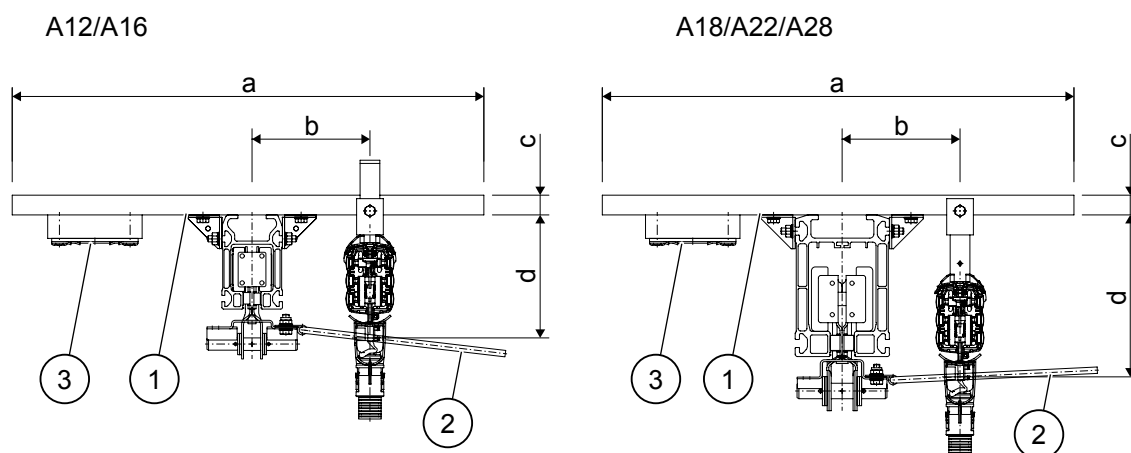


	a [mm]	b [mm]	c [mm]	d [mm]
A12 / A16	600	200	25	160
A18/A22/A28	600	200	25	165

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 20261744 for details.

15.2 External Demag DCL-Pro compact conductor line



	a [mm]	b [mm]	c [mm]	d [mm]
A12/A16	600	150	25	155
A18/A22/A28	600	150	25	206

A compact conductor line is arranged at the side of the Aluline rail if more than two traveling 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 ... +70°C.

For more information, see "Technical data 20338744 (Demag DCL-Pro compact line)" and "Technical data 20351044 (DCL-Pro on KBK)."

Items required for fitting to Aluline rails

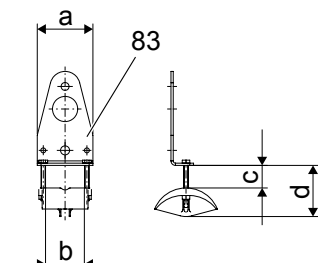
Item	Fitting KBK 0 and DCL-Pro to Aluline	Weight [kg]	Part no.
1	600 C-rail fitting	1.6	85509944
2	Towing arm fitting for DCL-Pro current collector		Standard drawing ¹⁾
	Towing arm fitting for KBK 0/A12/A16 towing trolley	0.9	85510444
	Towing arm fitting for KBK 0/A18/A22/A28 towing trolley	1.1	85510544
3	C-rail counterweight fitting		Standard drawing ¹⁾

¹⁾ See technical data 20351044.

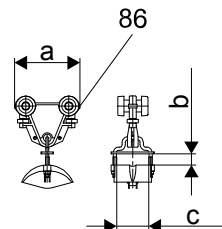
15.3 Trailing cable, components and fittings

15.3.1 Rail end cable clamp (item 83), flat cable with PE (item 84), cable slider (item 85) and cable trolley (item 86)

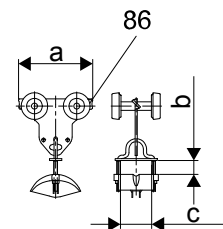
A12/A16/A18/A22/A28



A12/A16

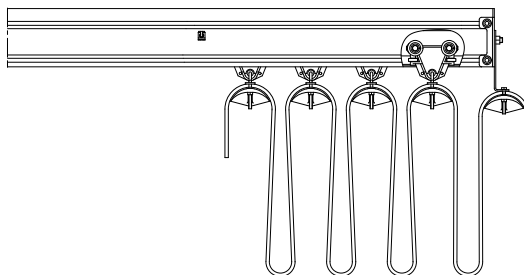


A18/A22/A28

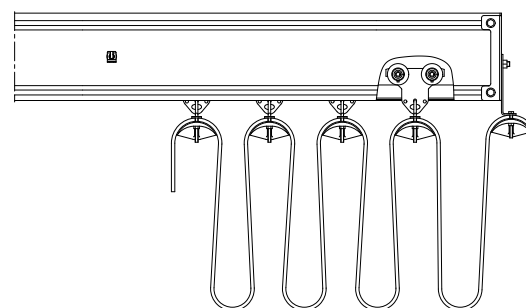


Item	Designation	a	b	c	d
		[mm]	[mm]	[mm]	[mm]
83	Rail end cable clamp	74	52	30	68
86	Cable trolley A12/A16	105	≤ 23	≤ 50	-
86	Cable trolley A18/A22/A28	125			-
85	Cable slider A12/A16	40	-	-	-
85	Cable slider A18/A22/A28	60	-	-	-

A12/A16



A18/A22/A28



Item	Designation	No. of conductors x rated cross-section [mm ²]	External dimensions [mm]	A12/A16		A18/A22/A28	
				Weight [kg]	Part no.	Weight [kg]	Part no.
83	Rail end clamp			0.23	85522044	0.23	85522044
84	Flat cable with PE	4 x 1.5	14.8 x 5.2	0.21/m	56955939	0.21/m	56955939
		4 x 2.5	21 x 8	0.26/m	53713565	0.26/m	53713565
		8 x 1.5	33 x 8	0.35/m	50422644	0.35/m	50422644
		13 x 1.5	31 x 12	0.55/m	89517144	0.55/m	89517144
85	Cable slider	Only for 4 x 1.5 and 4 x 2.5 flat cable		0.03	98075944	0.04	85169044
86	Cable trolley	-		0.22	98247044	0.50	85508544

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 favorable fixing point for the cable between the crane girder and track girder.

The plastic-sheathed flat cable (cold-resistant) can be used in buildings with a dry or humid atmosphere. Flat cable is flexible in one plane. Temperature range from -20°C...+70°C.

Cable sliders are suitable for one flat cable with maximum external dimensions of 8 mm x 22 mm. They are made of temperature-resistant plastic. Temperature range from -20°C...+70°C.

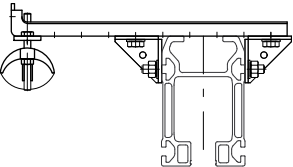
Cable trolleys can be used to support cables, compressed air or water hoses. Additional holes are provided for attaching strain relief cords.

Finish:

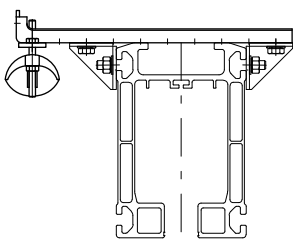
Rail end cable clamp:	galvanized
Cable slider:	plain plastic
Clamping plate:	black plastic
A12/A16 cable trolley:	black plastic
A18/A22/A28 cable trolley:	galvanized

15.3.2 Crane girder cable clamp (item 80)

A12/A16



A18/A22/A28

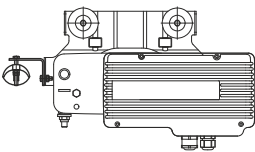


Item	Designation		
80	Crane girder cable clamp	Weight [kg]	0.6
		Part no.	85510644

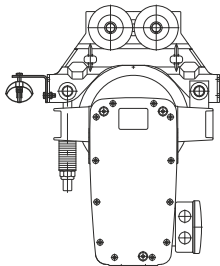
Crane bridge cable clamps are used for push-travel single/double-girder cranes to prevent the flat cable running from the crane runway to the crane girder from being subjected to side pull.

15.3.3 RF trolley cable clamp (Item 82)

A12/A16



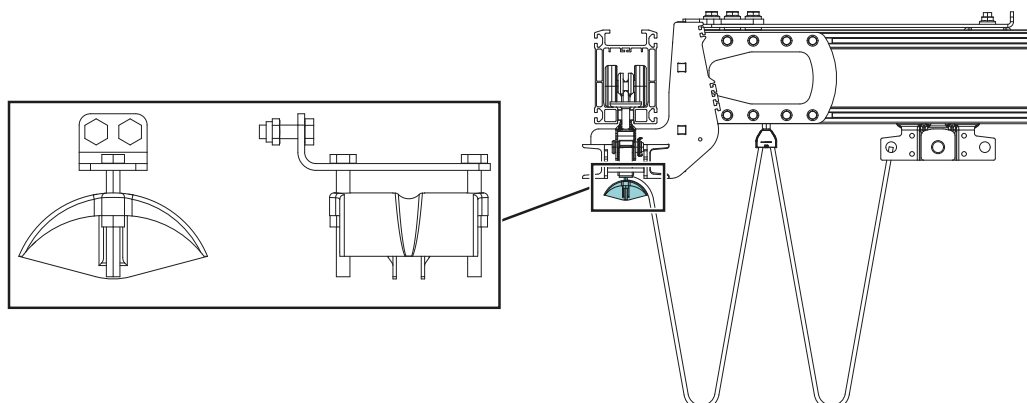
A18/A22/A28



Item	Designation		
82	RF trolley cable clamp	Weight [kg]	0.6
		Part no.	98257844

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

15.3.4 Cable clamp for raised end carriages (item 187)



Item	Designation		
187	Cable clamp for raised end carriages	Weight [kg]	0.14
		Part no.	85535344

Cable clamps for raised end carriages can be used to prevent the flat cable running from the crane runway to the crane girder from being subjected to side pull.

15.4 Round cable and crane drive connection

Item	Designation		
92	3 x 0.5 mm ²	Weight [kg]	0.042
		Part no.	55028553
	4 x 1.5 mm ² , 1 kV	Weight [kg]	0.109
		Part no.	52396125
	5 x 1.5 mm ² , 500 V	Weight [kg]	0.150
		Part no.	50493244
	7 x 1.5 mm ² , 1 kV	Weight [kg]	0.178
		Part no.	47195744
	8 x 1.5 mm ² , 500 V	Weight [kg]	0.250
		Part no.	47195844
	10 x 1.5 mm ² , 1 kV	Weight [kg]	0.388
		Part no.	47196044

A round cable has to be laid along the crane girder to complete the electrical connection between the two travel drives on the track girder for electric travel cranes.

If RF 125 or TD 200 is used with E22-C

■ To connect the crane bridge enclosure with the (master) drive

■ One 8 x 1.5 mm² round cable

■ To connect both drives (master or slave)

■ One 4 x 1.5 mm² round cable and one 3 x 0.5 mm² round cable

If DRF 200 is used

■ To connect the crane bridge enclosure with the (master) drive and to connect the two drives:
one 7 x 1.5 mm² round cable

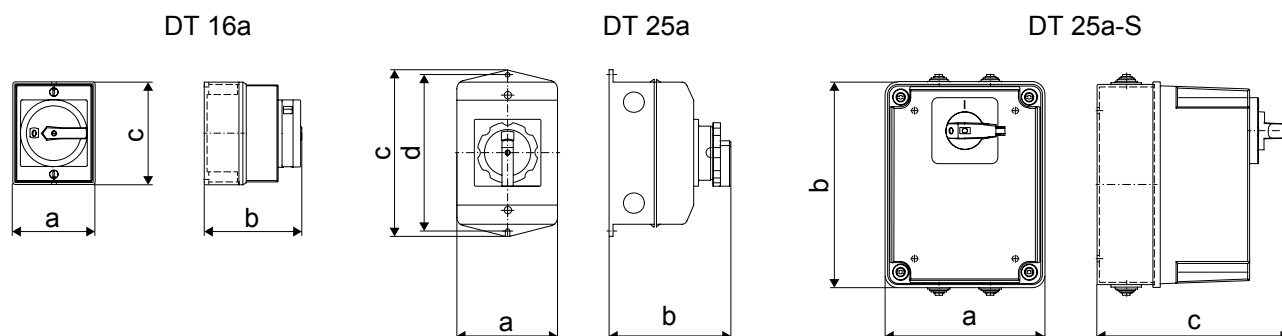
Required cable length to connect the two drives

Crane span dimension $l_{kr} + 2.5$ m.

The round cable is placed into the upper part of the profile section.

Two 5×1.5 mm² round cables are required to connect the crane bridge enclosure with the powerfeed of the conductor line on the crane girder.

15.5 Mains connection switch/isolating switch (item 88)



	a [mm]	b [mm]	c [mm]	d [mm]
DT 16a	80	100	95	-
DT 25a	100	115	163	152
DT 25a-S	155	200	187	-

Item	Designation	Size	Voltage [V]	Current [A]		
88	Load isolating switch	DT 16a	≤ 500	Max. 20	Weight [kg]	0.32
					Part no.	57547944
		DT 25a	≤ 690	Max. 25	Weight [kg]	0.40
					Part no.	57548044
		DT 25a-S			Weight [kg]	1.41
					Part no.	47303744

Table 11. Fuse links and inserts for DT 25a-S

Rated current [A]	D fuse link, delayed action Part no.	D screw-in adapter for fuse insert Part no.
6	55076138	55076832
10	55076245	55076838
16	55076100	55076839
20	55076140	55076840
25	55076167	55076841

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.

Isolating switch: on-board switch-isolator on cranes 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.

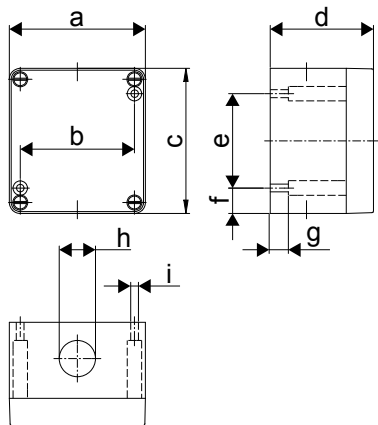
Two M20 x 1.5 cable entries are available. IP 55 enclosure.

DT 16a switch-isolator without fuses,

DT 25a switch-isolator without fuses,

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

15.6 Terminal box (item 94)



a	b	c	d	e	f	g	Øh	Øi
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
75	63	80	57	52	14	10	20.5	4

Item	Designation		
94	Terminal box	Weight [kg]	0.40
		Part no.	50465044

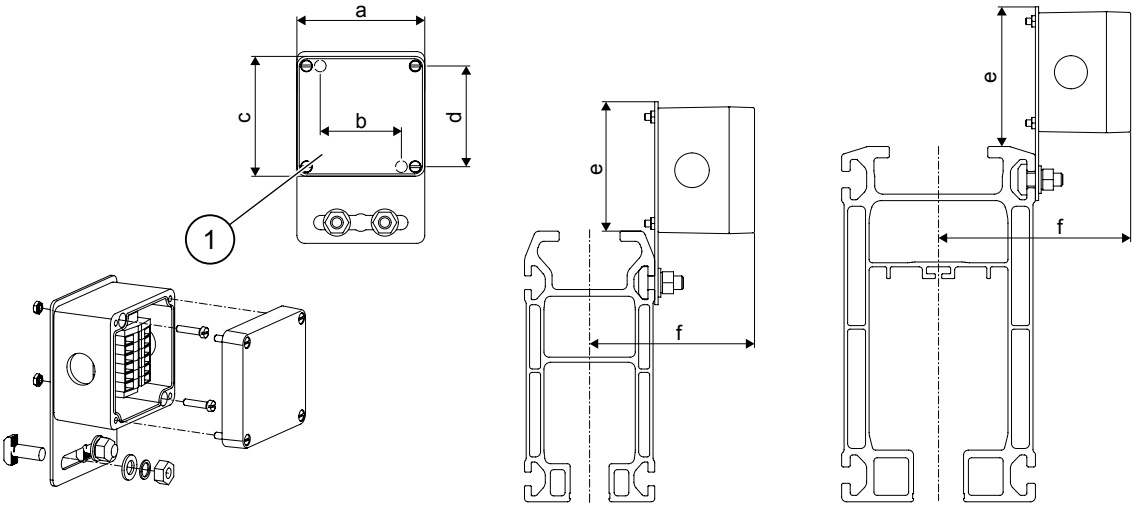
A terminal box must be provided as the junction with the fixed round cable when flat cables are used to supply power to KBK Aluline equipment.

For more information on cable sets, see "Cable union sets (item 190)".

Finish: aluminum enclosure with 6 modular spring-loaded terminals (grey) (up to 2.5 mm²) fitted on mounting rail, light grey (RAL 7035)

15.7 Mounting brackets for switches and terminal boxes

15.7.1 Mounting bracket for terminal box (item 92)



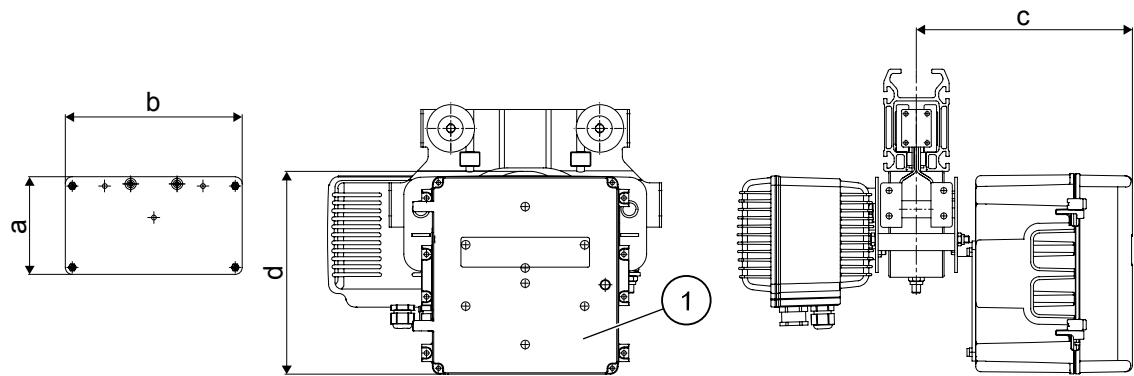
1. Terminal box 50465044

	a	b	c	d	e	f
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
A12/A16	80	52	75	63	77	97
A18/A22/A28					87	117

Item	Designation		
92	Mounting bracket for terminal box	Weight [kg]	0.17
		Part no.	85521544

Finish: galvanized

15.7.2 Mounting bracket for enclosure on RF 125/TD 200 (item 92)



1. Enclosure, part no. 77241745/58208469

a	b	c	d
[mm]	[mm]	[mm]	[mm]
139	252	250	239

Item	Designation		
92	RF 125/TD 200 enclosure mounting bracket	Weight [kg]	1.04
		Part no.	85153344

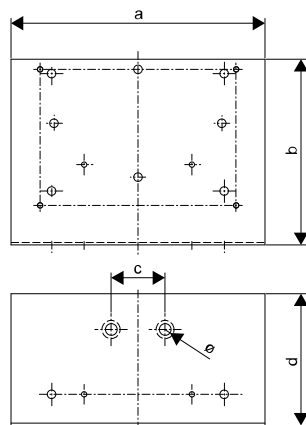
The mounting bracket is used to attach the enclosure, part no. 77241745/58208469.

Finish: black

15.7.3 Attachment bracket (Item 93)

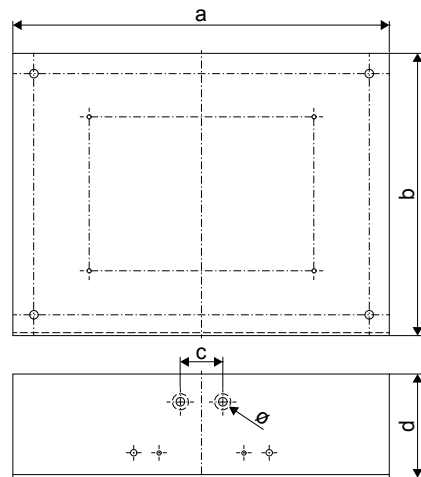
Small attachment bracket

for a, b, c, e, g, h



Large attachment bracket

for a, b, d, f



	a	b	c	d	Ø
	[mm]	[mm]	[mm]	[mm]	[mm]
Small attachment bracket	260	175	45	110	10
Large attachment bracket	400	300	45	110	10

Item	Designation	Weight [kg]	Part no.
93	Small attachment bracket	0.90	85122244
	Large attachment bracket	3.90	85122044

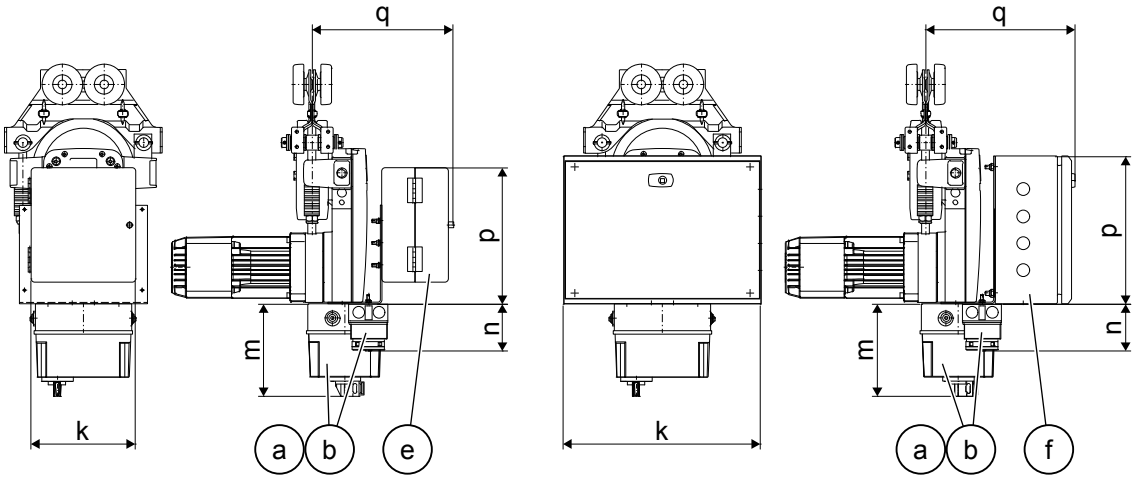
Item	Designation		Part no.	
a	Mains connection/isolating switch	DT 16 a	57547944	
b		DT 25 a	57548044	
		DT 25 a-S	47303744	
c	Terminal box	180 x 130 x 75 mm	57535144	
d		255 x 180 x 75 mm	57535244	
e	Crane bridge enclosure 1	232 x 257 x 126 mm	77240045	
	Crane bridge enclosure 2		77241045	
f	Housing	400 x 300 x 155 mm	57538244	
g	Receiver		DRC-MP	77343244
h	Terminal box, electric equipment box 185 x 163 x 102 mm	Universal electric equipment box		77216745
		Terminal box	3T3	77217445
			Manual crab	77217545
			DC/Diode	77216545
		Polu-box		77228045
		Signal converter	3TK	77217645
			KT3	77217745
			DT3	77216645

Finish - galvanized

Example - fitted to DRF

Small DRF attachment bracket

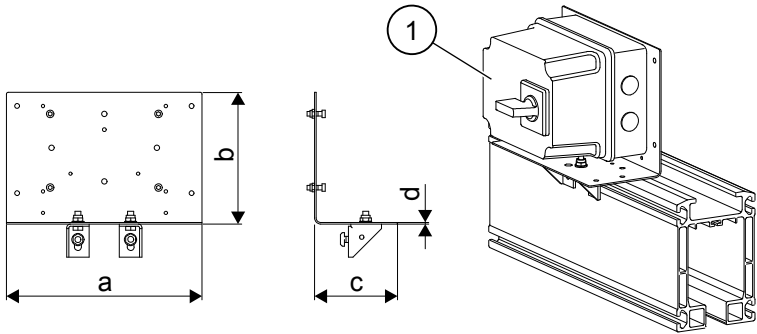
Large DRF attachment bracket



	k [mm]	m [mm]	n [mm]	p [mm]	q [mm]
Small DRF attachment bracket	212	187	95	276	287
Large DRF attachment bracket	400	187	95	300	303

15.7.4 Bracket for isolating switch (item 90)

A12/A16/A18/A22/A28



1. DT 25a-S

a	b	c	d
[mm]	[mm]	[mm]	[mm]
260	175	110	2

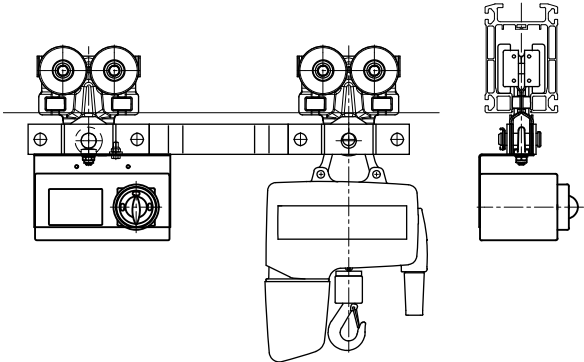
Item	Designation		
90	Bracket for isolating switch	Weight [kg]	0.7
		Part no.	85515244

The bracket for isolating switches can be used to attach isolating switches and terminal boxes. See small mounting bracket for possible connections.

Finish: galvanized

15.7.5 Switch and terminal box mounting brackets (item 90)

Switch and terminal box mounting brackets on push-travel monorail hoists

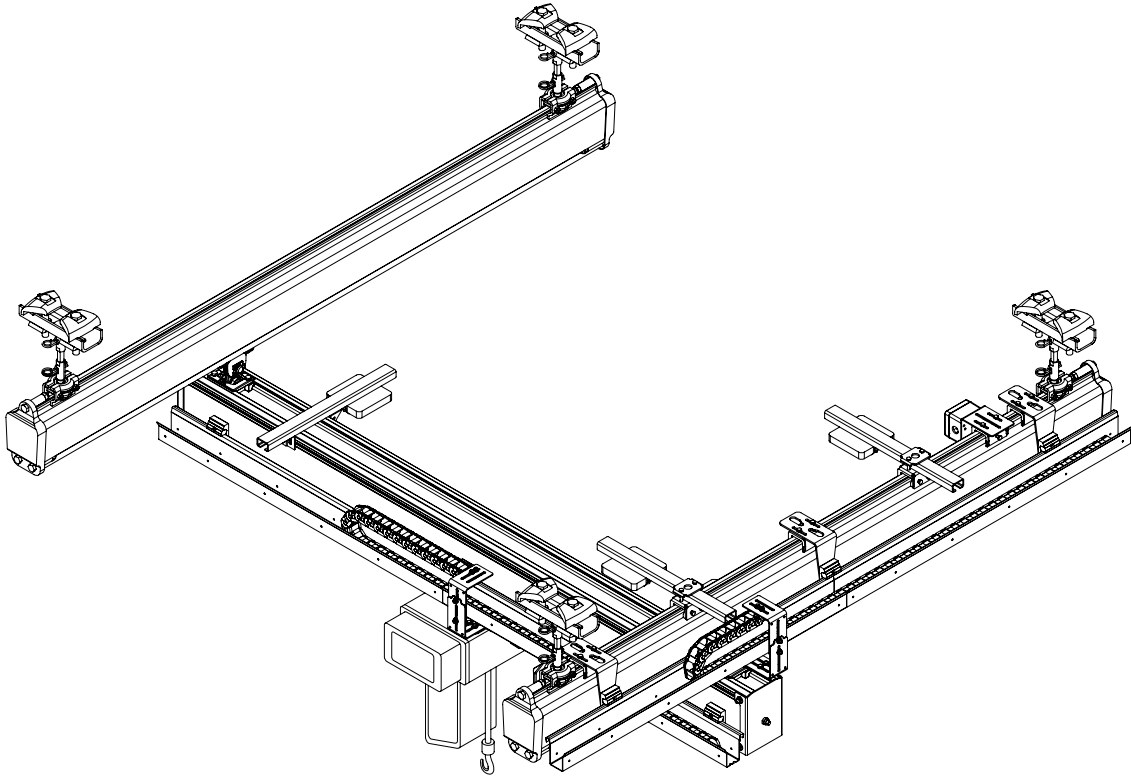


Item	Designation		
90	Switch bracket	Weight [kg]	0.75
		Part no.	85122344

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 mounting plate, 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 plate. See small mounting bracket for possible connections.

15.8 Energy chain



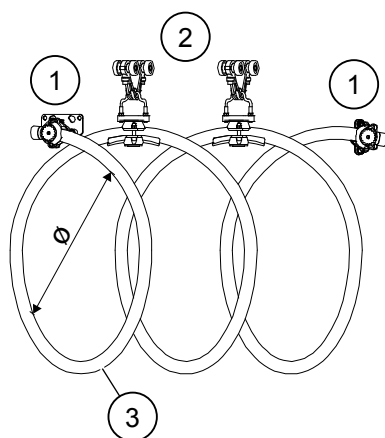
Item	Designation		A12	A16	A18	A22	A28
Trolley, end carriage and crab attachments							
	Trolley attachment, single trolley	Weight [kg]	on request				
		Part no.					
	Trolley attachment, single trolley (1200 kg)	Weight [kg]	on request				
		Part no.					
	Attachment crab frame	Weight [kg]	on request				
		Part no.					
	Towing arm	Weight [kg]	on request				
		Part no.					
Profile attachments							
	Profile attachment for energy chain	Weight [kg]	on request				
		Part no.					

15.9 Pneumatic power supply

15.9.1 General information

Special power supply lines are required for pneumatic hoist units.

In some applications, pneumatic energy and electric power are needed on the crab.



1. Fixed point

2. Cable trolley

3. Right handed protective hose

The supply lines are laid in a protective hose and attached to special fixed points on 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 approximately 500 mm.

Length of protective hose

= Travel path [m] x 1.3 + connecting length on both sides [m]

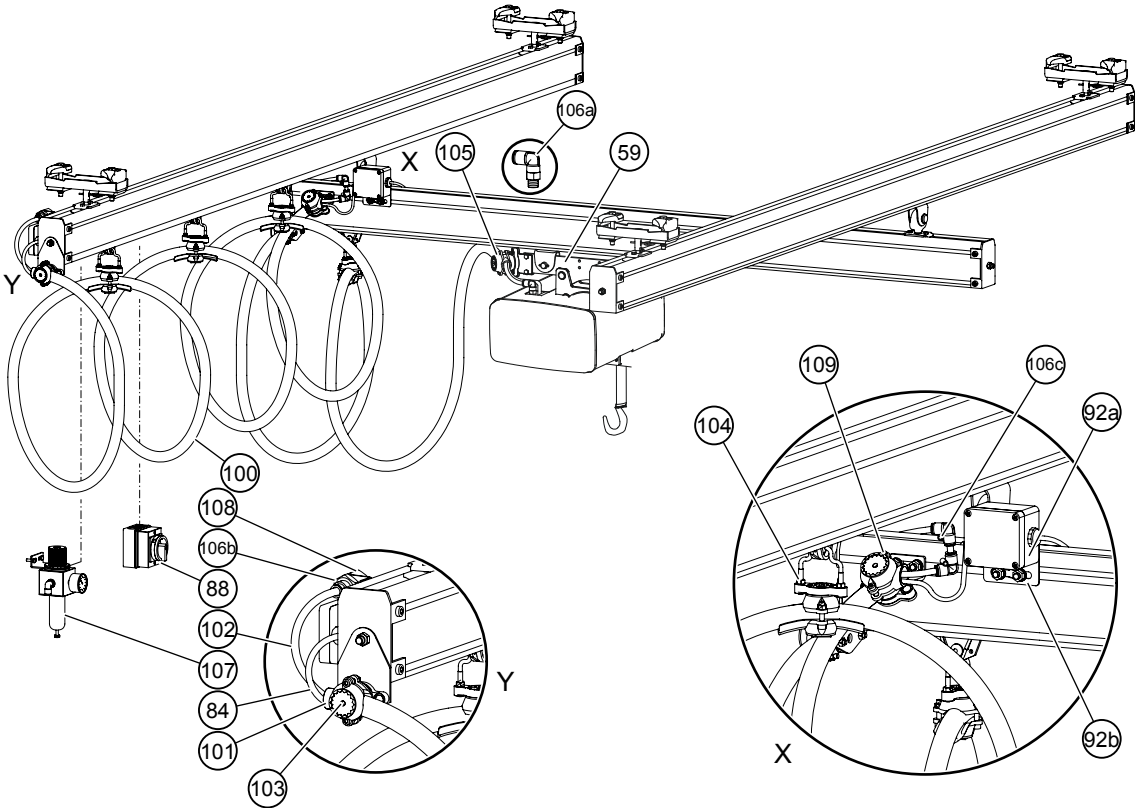
Quantity of cable trolleys

= Length of travel path (rounded off to full meters) -1

Length of cable accumulating section

= (Quantity of cable trolleys + reserve) x length of cable trolley

Example: KBK Aluline A12/A16 single girder crane

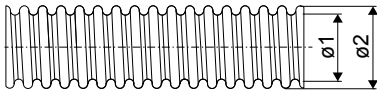


Power supply separated: Transfer point ⇒ crane bridge / crane runway (Detail X)

Power supply interface: End of crane runway (Detail Y)

15.9.2 Components

Protective hose (Item 100)



$\phi 1 = 22 \text{ mm}$, $\phi 2 = 27 \text{ mm}$

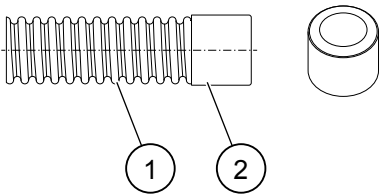
Item	Designation		
100	Protective hose	Weight [kg/m]	0.29
		Part no.	52410067

Finish:

Outer sheath: PVC (grey)

Internal spiral: PVC coated spring steel wire

End sleeve for protective hose (Item 101)

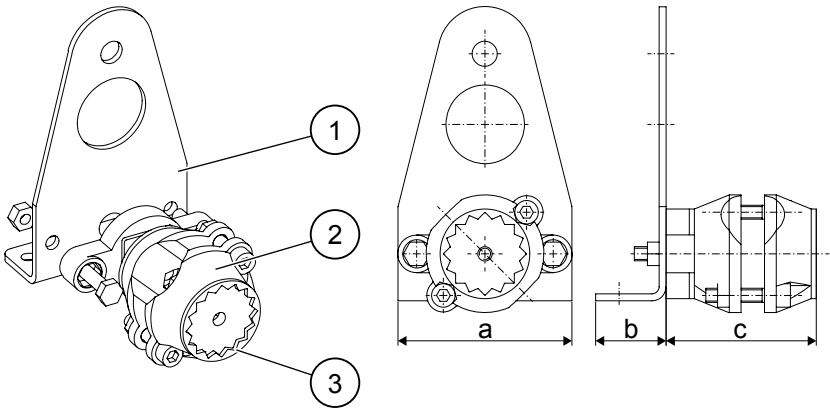


1. Protective hose
2. End sleeve

Item	Designation		
101	End sleeve for protective hose	Weight [kg]	0.03
		Part no.	52828625

Finish: plastic (grey)

Mounting bracket with hose clip (Item 103)



1. Retaining plate
2. Hose clip set 2
3. 22.5° interval

Item	Designation		
103	Mounting bracket with hose clip	Weight [kg]	0.31
		Part no.	85521844

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 can be used. The position of the hose can be changed by adjusting the angle (at 22.5° intervals).

Finish:

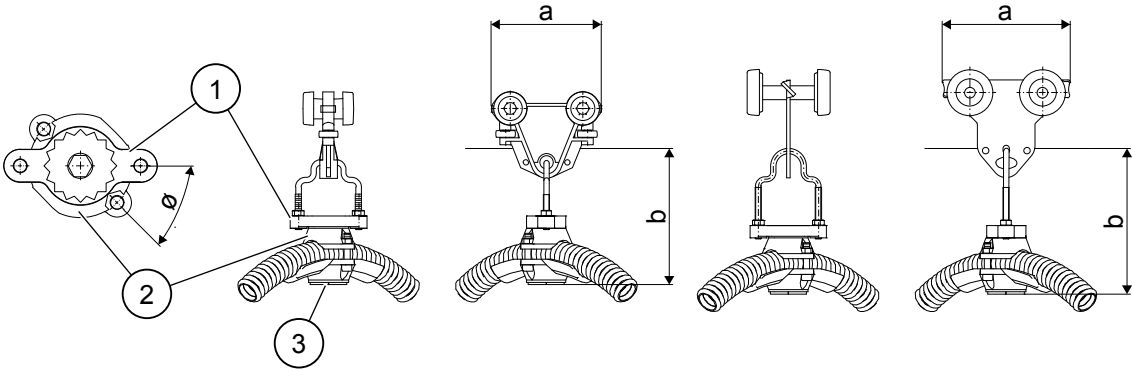
Retaining plate: Galvanized

Hose clip set 2: Black plastic

Cable trolley with hose clip (Item 104)

A12/A16 (Max. load = 25 kg)

A18/A22/A28 (Max. load = 40 kg)



1. Retaining plate

2. Clamp section
3. Hose clip

	a [mm]	b [mm]
A12/A16 (Max. load = 25 kg)	105	130
A18/A22/A28 (Max. load = 40 kg)	125	140

Item	Designation		A12/A16	A18/A22/A28
104	Cable trolley with hose clip	Weight [kg]	0.37	0.65
		Part no.	85514844	85514944

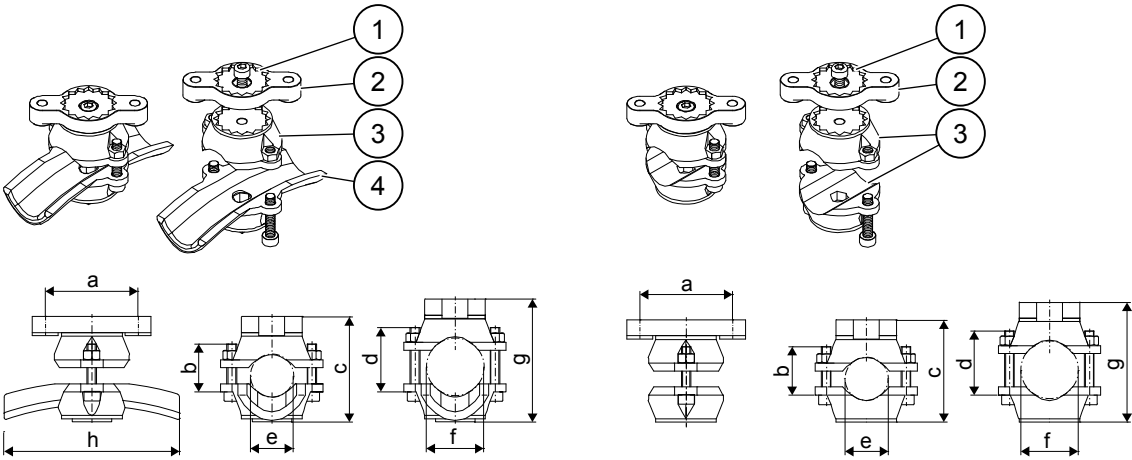
Cable trolleys are suitable for protective hoses with an external diameter of 18 mm to 36 mm. The retaining plate and clamp section on cable trolleys are pre-assembled at an angle of 45° to the direction of travel. Adjustment of the angle is possible at intervals of 22.5°. The protective hose is fitted by bolting the clamp section with the hose clip from below.

Temperature range: -20°C... +70°C

Hose clip set (Item 105)

Hose clip set 1

Hose clip set 2



1. 22.5° interval

2. Retaining plate
3. Clamp section

4. Hose clip

	a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	f [mm]	g [mm]	h [mm]
Hose clip set 1	58	30	66	40	27	36	77	110
Hose clip set 2			64				75	-

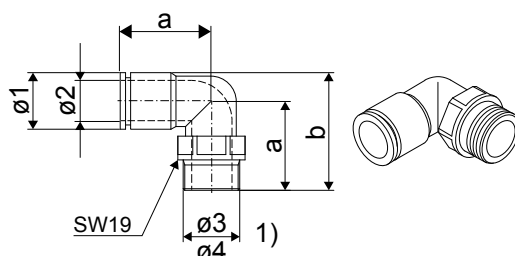
Item	Designation		
105	Hose clip set 1	Weight [kg]	0.16
		Part no.	85513544
	Hose clip set 2	Weight [kg]	0.14
		Part no.	85514544

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: black plastic

Angle connector for balancer (Item 106a)

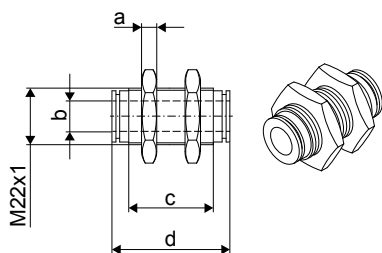


a [mm]	b [mm]	φ1 [mm]	φ2 [mm]	φ3	φ4
27	35	17	12	3/8	1/2

Item	Designation		
106a	3/8" angle connector	Weight [kg]	0.06
		Part no.	52828863
106a	1/2" angle connector	Weight [kg]	0.06
		Part no.	52828862

Finish: nickel-plated brass

Bulkhead gland (Item 106b)

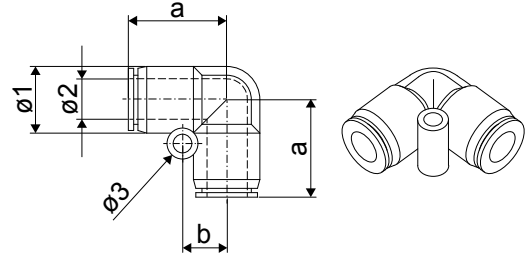


a [mm]	b [mm]	c [mm]	d [mm]
6	12	33	46.2

Item	Designation		
106b	Bulkhead gland	Weight [kg]	0.09
		Part no.	55606610

Finish: nickel-plated brass

Angle connector (Item 106c)



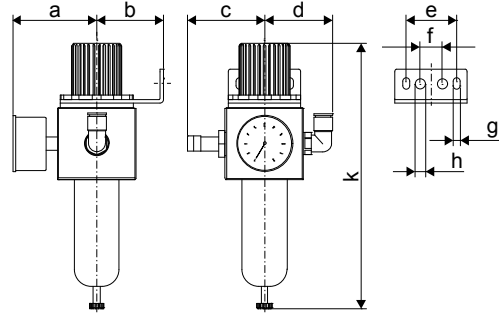
a [mm]	ø1 [mm]	ø2 [mm]	ø3 [mm]	b [mm]
29	21	12	4.2	14

Item	Designation		
106c	Angle connector	Weight [kg]	0.05
		Part no.	52829312

Two hose ends (nominal size 12) can be connected to each other.

Finish: black plastic

Maintenance unit (Item 107)



a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	f [mm]	g [mm]	h [mm]	k [mm]
75	60	69	61	45	20	6.2	9	240

Item	Designation		
107	Maintenance unit	Weight [kg]	1.35
		Part no.	85119944

Input pressure: 0 to max. 16 bar

Pressure regulating range: 0.5-10 bar

Filter element: 5 µm

Condensed water drainage: Manual

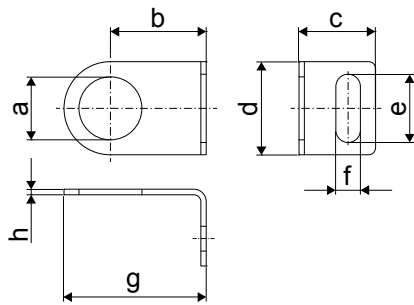
Input:

Sleeve suitable for hose with 13 mm internal diameter

Output:

Angle connector for plastic hose with 12 mm external diameter

Angle for bulkhead gland (Item 108)



a	b	c	d	e	f	g	h
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
23	35	28	34	25	9	52	2

Item	Designation		
108	Angle for bulkhead gland	Weight [kg]	0.03
		Part no.	98469644

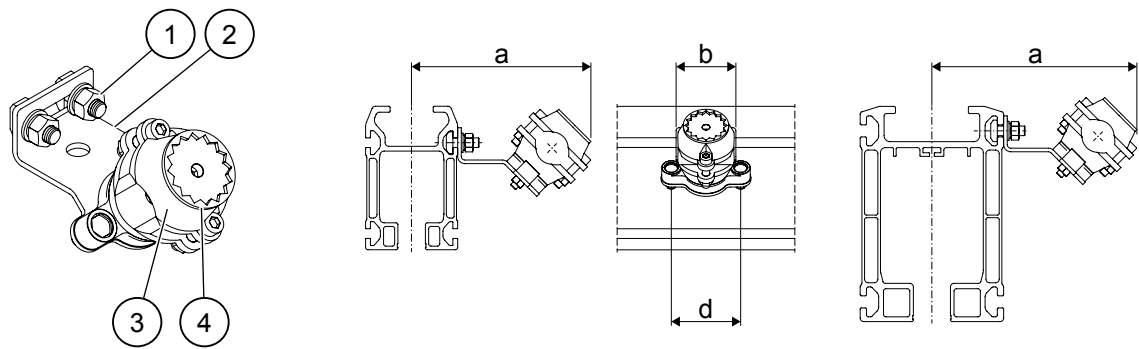
Attached with screw set (item 89)

Finish: galvanized

AL anchorage bracket (Item 109)

A12/A16

A18/A22/A28



1. Screw set
2. Anchorage plate
3. Hose clip set 2
4. 22.5° interval

	a	b	c
	[mm]	[mm]	[mm]
A12/A16	150	50	58
A18/A22A28	170		

Item	Designation		
109	AL anchorage bracket	Weight [kg]	0.28
		Part no.	85514744

The bracket is used for transfer between a crane bridge and crane runway and is fitted in the lateral grooves of the crane bridge by means of a screw set. The position of the protective 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 can be used.

Finish:

Anchorage plate: galvanized steel

Hose clip set 2: black plastic

Other components for combination of pneumatic and electric power supply

Item	Designation		Weight	Part no
84	Highly flexible round cable 3G x 1.5 mm ²		0.09 kg/m	52828386
	Highly flexible round cable 5G x 1.5 mm ²		0.14 kg/m	52828387
	4 x 1.5 mm ² flat cable with PE		0.21 kg/m	56955939
	4 x 2.5 mm ² flat cable with PE		0.26 kg/m	53713565
	8 x 1.5 mm ² flat cable with PE		0.35 kg/m	52396154
	13 x 1.5 mm ² flat cable with PE		0.55 kg/m	89517144
88	Mains connection switch	DT16a	0.32 kg	57547944
		DT 25a	0.40 kg	57548044
		DT 25a-S	1.60 kg	47303744
89	M8x20 screw set		0.02 kg	71232547
102	Plastic hose, silver in colour, 12 mm external diameter and 8 mm internal diameter		0.08 kg/m	52397235

16 Standard electric equipment

16.1 General

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

Contactor control

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

Conversion

Systems can be converted to wireless controls, IR, or radio remote, in connection with contactor control.

Electromagnetic compatibility (EMC)

KBK installations comply in full with the provisions of the EC EMC Directives.

Special protection

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

Such measures may be required in:

- Explosion hazard atmospheres
- Pickling plants
- Galvanizing plants
- Outdoors.

Regulations

All Demag component parts and assemblies fully comply with relevant rules and regulations. All relevant national or local regulations must be taken into account when planning electric equipment.

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 connection 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 the same power supply line.
3. Each hoist must be fitted with an emergency-stop device which brings the motion 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 "Electric specifications for DC-Pro, DC-Com, DCS-Pro, DCMS-Pro, or DCRS-Pro".

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

16.2 KBK standard electric equipment with DC

Selection table for installations with 2-stage DC-Pro/DC-Com chain hoist and RF 125 / TD 200							KBK item with	Required cables on								
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		the crane bridge				the crab				
							DC-Pro 1-10 DC-Com 1-10	Showing EB, EHK, ZHK see section 17.3	4 x 1.5 flat cable Part no. 569 559 39	13 x 1.5 flat cable Part no. 895 171 44	3 x 0.5 round cable Part no. 894 725 44	4 x 1.5 round cable Part no. 471 954 44	DC power cable → E22-C Part no. 720 072 45	DC control cable → E22-C Part no. 720 070 45	Required number of poles on the crane bridge (PE = protective earth)	
Contactor control	DSC	Manual	Trailing cable	O			x	1	1							3+PE
	DSE-C	Electric		O		O	x	2	1					1	1	3+PE
		Electric with crane switch contactor		O		O	E20	3	1					1	1	3+PE
				O		O	E28	7		1	1	1			8+PE	
			Conductor line	O		O	E28L			1	1	1			8+PE	
			Trailing cable	O	O	O	E32	6		1	1	1	1	1	8+PE	
			Conductor line	O	O	O	E32L					1	1	1	1	8+PE

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

Selection table for installations with variable-speed DCS-Pro chain hoist and RF 125 / TD 200							KBK item with	Required cables on									
								the crane bridge				the crab					
Type of control	Control pendant	Travel motion	Power supply on the crane bridge	Lifting/lowering Variable	Cross travel Variable	Long travel Variable	DCS-Pro 1-10	Showing EB, EHK, ZHK see section 17.3	4 x 1.5 flat cable Part no. 569 559 39	13 x 1.5 flat cable Part no. 895 171 44	3 x 0.5 round cable Part no. 894 725 44	4 x 1.5 round cable Part no. 471 954 44	DC power cable → E22-C Part no. 720 072 45	DC control cable → E22-C Part no. 720 070 45	Required number of poles on the crane bridge (PE = protective earth)		
Contactor control	DSC-S	Manual	Trailing cable	O			x	1	1							3+PE	
	DSE-10C S	Electric		O			O	x	2	1					1	1	3+PE
		Electric with crane switch contactor		O			O	E20	3	1					1	1	3+PE
				O		O	7		1	1	1			8+PE			
			Conductor line	O	O	1)			1	1			8+PE				
			Trailing cable	O	O		O	6		1	1	1	1	1	8+PE		
			Conductor line	O	O		O				1	1	1	1	8+PE		

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

1) On application

Contents

Contents	Designation	Part no.
E20	Crane bridge enclosure	77227845
E32	RF 125 / TD 200 enclosure mounting bracket	85127044
E32L	Circuit diagram	
E28 E28L	Manual traveling hoist terminal box	77207545
	Fibox enclosure bracket DC	71654045
	Crane bridge enclosure	77207845
	RF 125 / TD 200 enclosure mounting bracket	85127044
	Circuit diagram	

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

Flat and round cables are supplied by the meter, whereas the cables for the traveling 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.

16.3 Cable union sets (items 190, 191)

Item	Designation			
190	Flat cable set	4 x 1.5 mm ²	Weight [kg]	0.11
			Part no.	87398944
		4 x 2.5 mm ²	Weight [kg]	0.15
			Part no.	87399044
		13 x 1.5 mm ²	Weight [kg]	0.10
			Part no.	87399144
191	Round cable set	5 x 1.5 mm ²	Weight [kg]	0.11
			Part no.	87399244

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

Assignment of the sets for the given application is described below. Contents of the cable sets:

87398944: 2 x M20 flat cable twist-type entry glands, M20 counter-nut, M25-M20 reducer, M25 counter-nut, M20 union

87399044: 2 x M25 flat cable twist-type entry glands, 2 x M20 counter-nuts, 2 x M20-M25 adapters, M20 union

87399144: 2 x M25 flat cable twist-type entry glands

87399244: 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 mm² trailing cable: 1 x 87398944 per powerfeed point

■ 4 x 2.5 mm² trailing cable: 1 x 87399044 per powerfeed point

■ Conductor line: no cable set required

■ Crane power supply (see table below)

Electric motion			Isolating switch on the crane	Crane power supply (per crane):				
				Conductor line	Trailing cable			
Lifting	Cross travel	Long travel			1.5 mm ² cross-section		2.5 mm ² cross-section	
					4 x 1.5 mm ²	13 x 1.5 mm ²	4 x 2.5 mm ²	4 x 2.5 mm ² + 8 x 1.5 mm ²
O								
O			O	1 x 87399244	1 x 87398944		1 x 87399044	
O	O							
O	O		O	1 x 87399244	1 x 87398944		1 x 87399044	
O		O		2 x 87399244		1 x 87399144		1 x 87398944
O		O	O	3 x 87399244		1 x 87399144 1 x 87399244		1 x 87399044 1 x 87399244
O	O	O		2 x 87399244		1 x 87399144		1 x 87398944
O	O	O	O	3 x 87399244		1 x 87399144 1 x 87399244		1 x 87399044 1 x 87399244

16.4 Schematic diagrams of cable arrangements and cable clamps

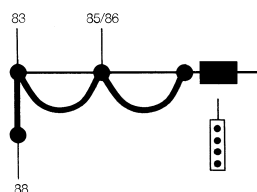
Key to symbols

●	Cable clamp	Item 80	Designation Crane girder cable clamp	Section "Trailing cable, components and fittings"
---	Round cable (item 92), rigidly mounted on the crane bridge	Item 81	Designation Crab frame cable clamp	Section "Trailing cable, components and fittings"

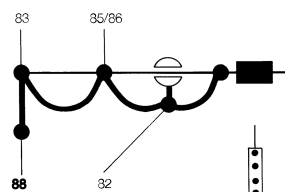
	Flat cable (item 84), freely suspended	82	RF trolley cable clamp	"Trailing cable, components and fittings"
	Monorail hoist with cable entry on the hoist unit	83	Rail end clamp	"Trailing cable, components and fittings"
	Double-rail crab with cable entry on the hoist unit	85	Cable slider	"Trailing cable, components and fittings"
	RF (friction-wheel travel drive)	88	Mains connection switch	"Mains connection switch/ isolating switch (item 88)"
	Control element	91	Round cable and crane drive connection	"Round cable and crane drive connection"

Suspension monorail (EB)

EB 1

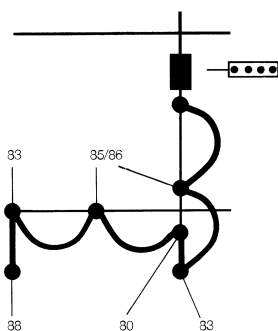


EB 2

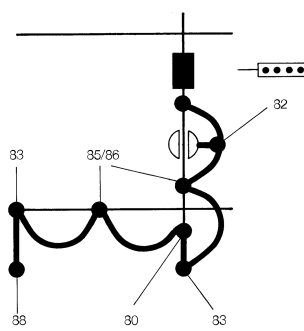


Single-girder crane (EHK)

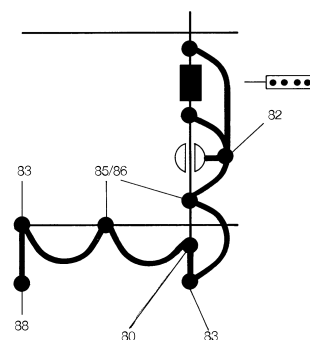
EHK 1



EHK 2

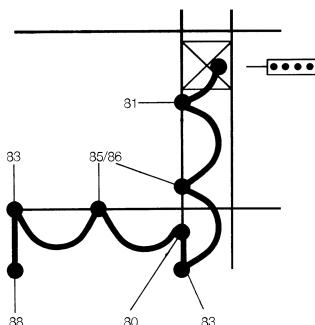


EHK 3

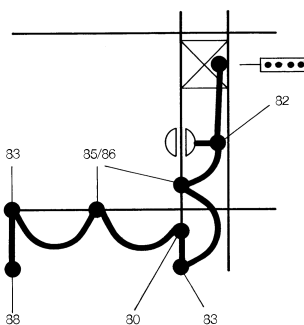


Single-girder crane, rigid/double-girder crane (ZHK)

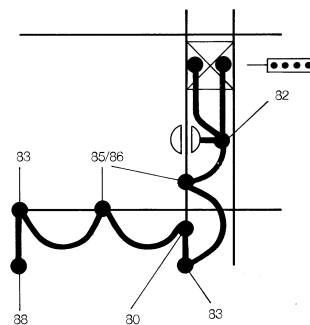
ZHK 1



ZHK 2

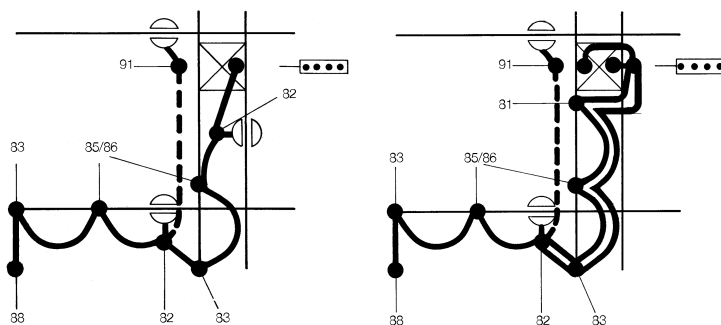


ZHK 3



ZHK 6

ZHK 7



16.5 Electric specifications for DC-Pro, DC-Com, DCS-Pro, DCMS-Pro, DCRS-Pro

Table 12. DC-Pro chain hoist – mains connection delay fuse link

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

Table 13. DC-Pro chain hoist – Supply lines ¹⁾ for 5% voltage drop Δu and start-up current I_a

Voltage		220-240 V		380-415 V		500-525 V		220-240 V		380- 400 V		440-480 V		575 V									
Frequency		50 Hz						60 Hz															
Size	Motor	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[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															31	94	61	-	2.5	45	43	78
DC-Pro 5	ZNK 80 B 8/2																						
DC-Pro 10	ZNK 100 A 8/2																						
	ZNK 100 B 8/2																						
DC-Pro 15	ZNK 100 B 8/2	-	-		46		73	-	-	1.5	36		52		90								

¹⁾ The cable lengths are calculated on the basis of an earth-loop impedance of 200 mΩ.

Table 14. DC-Com chain hoist – mains connection delay fuse link

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

Table 15. DC-Com chain hoist – Supply lines ¹⁾ for 5% voltage drop ΔU and start-up current I_A

Voltage		220-240 V		380-415 V		500-525 V		220-240 V		380- 400 V		440-480 V		575 V										
Frequency		50 Hz						60 Hz																
Size	Motor	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[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																					
DC-Com 10	ZNK 100 A 8/2		34																					
	ZNK 100 B 8/2	-	-		38		61	-	-		26		43		59									

¹⁾ The cable lengths are calculated on the basis of an earth-loop impedance of 200 mΩ.

Table 16. DCS-Pro, DCMS-Pro, DCRS-Pro chain hoist

Voltage		Mains connection delay fuse link	Supply lines ¹⁾ for 5% voltage drop Δu and start-up current I _A	
		380-480 V, 3 ~		
Frequency		50 / 60 Hz		
Size	Motor size	[A]	[mm ²]	[m]
DCS-Pro 1, DCS-Pro 2	ZNK 71 B 4	6	1.5	100
DCMS-Pro 1, DCMS-Pro 2				
DCRS-Pro 1, DCRS-Pro 2				
DCS-Pro 5	10	40		
DCS-Pro 10				ZNK 80 A 4
	ZNK 100 A 4			

¹⁾ The cable lengths are calculated on the basis of an earth-loop impedance of 200 mΩ.

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