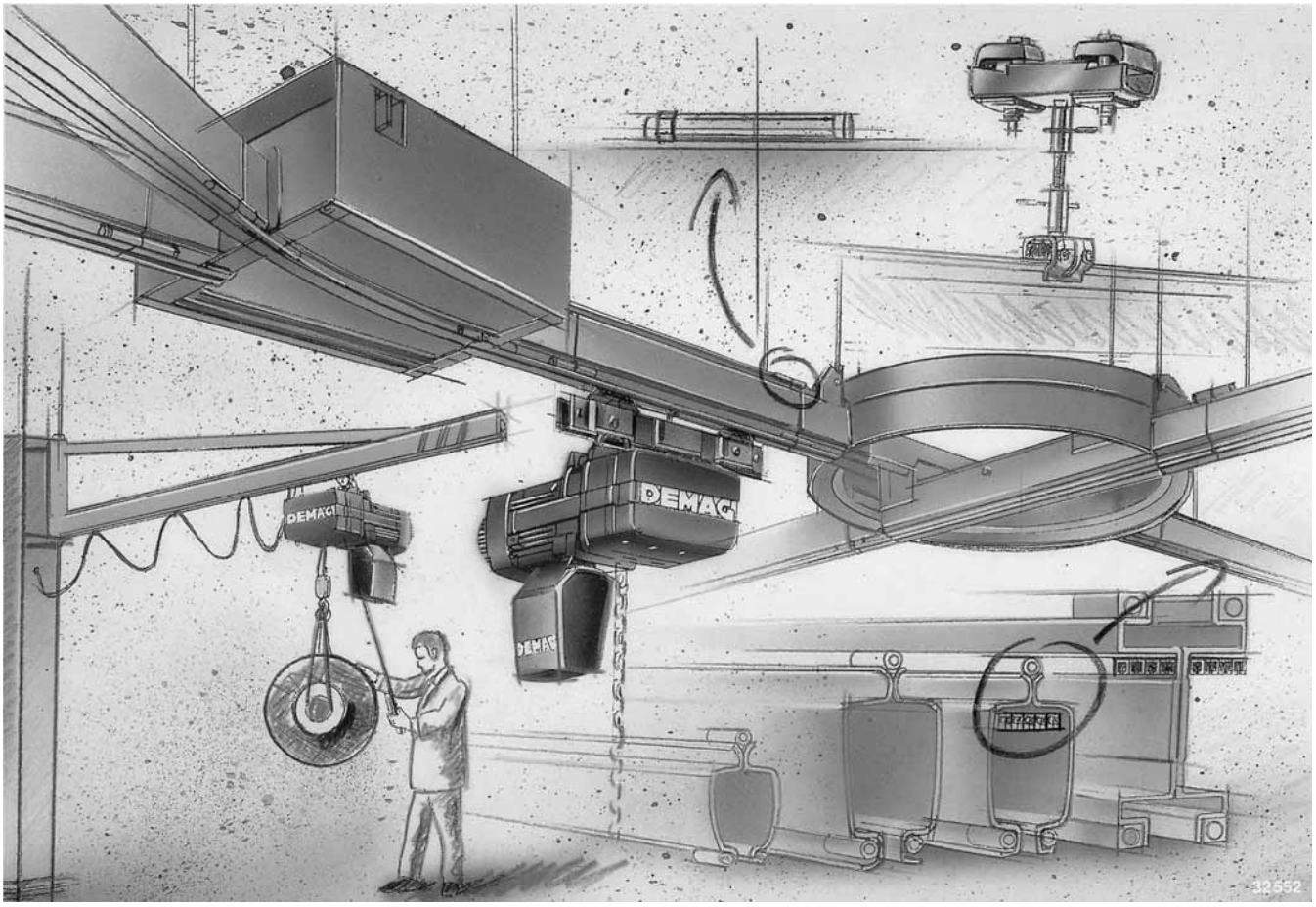
DEMAG
Cranes & Components

KBK classic

KBK 100, I, II-L, II, III crane construction kit Project drafting and components

Design principles, selection criteria, components



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For project drafting sheet, see inside back cover, fold-out page

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1 Supplementary documents and other publications

Title	Part no.
Brochures	
KBK crane construction kit	208 385 44
KBK pillar and wall-mounted slewing jib cranes	208 755 44
KBK Aluline crane construction kit	213 051 44
Technical data sheets for KBK installations	
KBK installations with KBK 100, I , II (II-L) drop sections	202 772 44
KBK II-R busbar lines, resistance	202 779 44
DKK arrangement on KBK cranes and tracks	202 588 44
Engaging attachment for DKK current collector trolleys on KBK trolleys	202 589 44
KBK 0, 25, 100 trailing cable power supply	202 617 44
Mechanical disengaging device, friction wheel travel drive	202 774 44
KBK II and II-R single-girder crane latching device	202 731 44
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KBK suspensions upper suspension bracket H (profile section rail), upper suspension bracket S, clamp S (large steel profiles), clamp section V-type suspension arrangement	203 072 44
Trolley pin B6	203 080 44
KBK Aluline 120, 180	203 245 44
KBK ergo	203 309 44
Redundant systems in the KBK crane construction kit	203 334 44
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KBK Aluline installations classic and ergo	214 173 44
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Demag chain hoist	
Demag DKUN, DKM chain hoists	202 846 44
Demag DC-Pro 1 to DC-Pro 20, DCM-Pro chain hoists	203 525 44
Demag DC-Com 1 to DC-Com 20 chain hoists	203 571 44

Various other data sheets, operating instruction manuals, spare parts lists for electric chain hoist types DK, DC, DS1 (rope winch), DB block winches, DRF friction wheel travel drive units and busbars are also available.

2 KBK crane construction kit, general remarks

2.1 Introduction

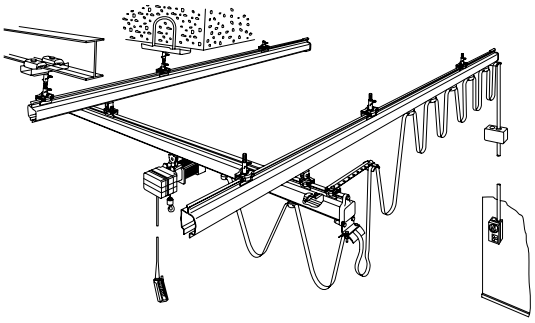
The KBK crane construction kit is the efficient and reliable solution for the construction of suspension monorails and suspension cranes.

The construction kit consists of standardized mechanical and control components. This facilitates planning, erection and maintenance. KBK installations can be altered and extended at any time. Straight and curved track sections, track switches, turntables and lift and drop sections can be combined to provide the widest range of materials handling solutions.

Installations can range from straight connection between two workplaces with only a few metres of track, to complex monorail networks, and from simple manual control to automatic systems with computer-controlled integration of the various system areas. KBK installations can be easily adapted to new material handlingrequirements.

KBK crane installations utilize the free space above working and production areas, thus, valuable floor space is available for materials handling tasks at all times.

Single-girder suspension crane



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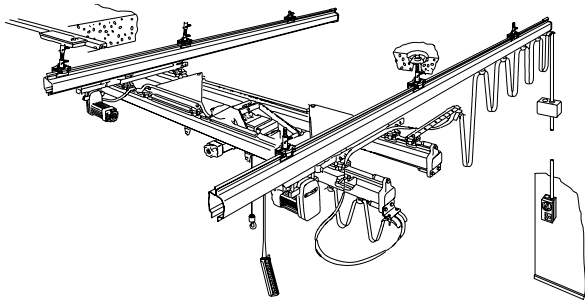
Double-girder suspension crane



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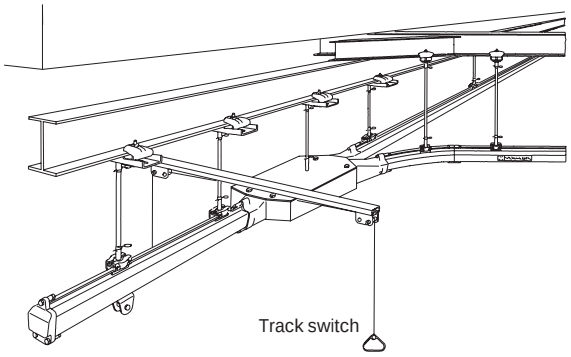
Suspension monorail



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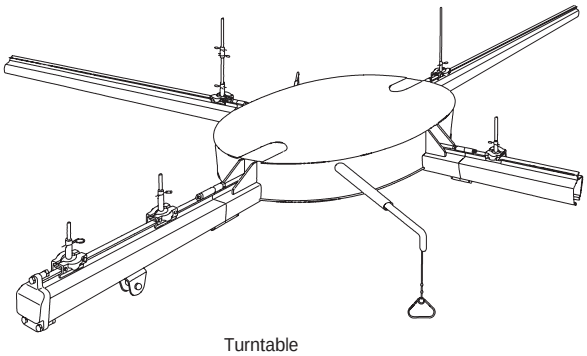

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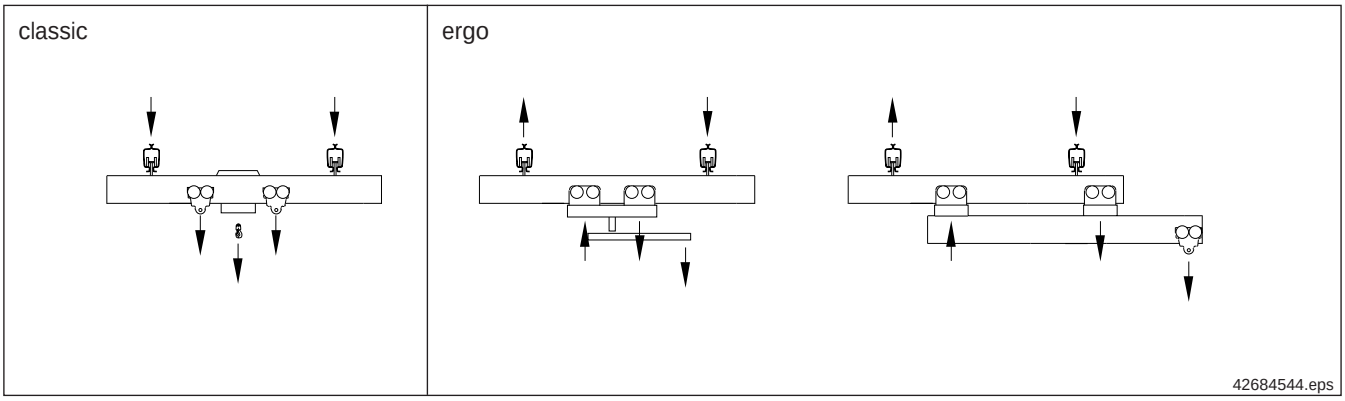
2.2 Structure of the KBK crane construction kit

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

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 suspended loads. For components specially developed to accommodate load moments and forces arising in the opposite direction to the load (kick-up forces), see separate data sheet, ident. no. 203 309 44, KBK ergo.

The KBK Aluline crane construction kit, KBK classic and KBK ergo systems with aluminium profile section rails are referred to in technical data sheet 203 245 44.

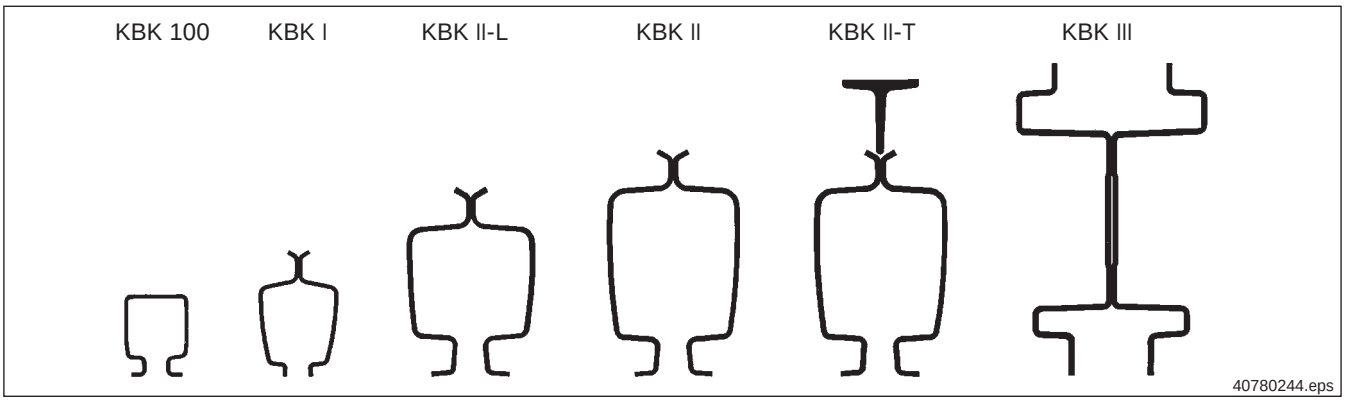


2.3 KBK design principles

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

Profile sections

The basic element of the KBK crane construction kit is a cold-rolled special track section in steel with a smooth surfacefinish, high rigidity and low dead weight. Special guide surfaces and slightly inclined running surfaces guarantee smooth trolley travel. The tracks in the lower and medium SWL range are of inside-running design to protect trolleys and internal (enclosed) busbars. In the upper SWL range and especially in the case of automatic installations, the outside-running design ensures easy accessibility to trolleys and busbars.

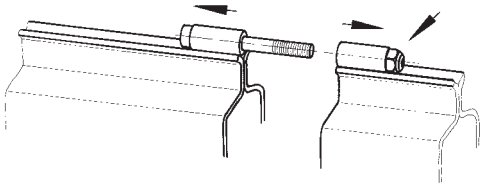


Track joint

All components of each system size (straight and curved sections, track switches, turntables, etc), have uniform mating dimensions and are easily assembled with bolted connections.

- Positive and non-positive connections
- Adjustable (within the coupling tube/screw tolerance range)
- Connections secured against loosening (lock nuts)
- Torque transmission via the track joint

Track joint



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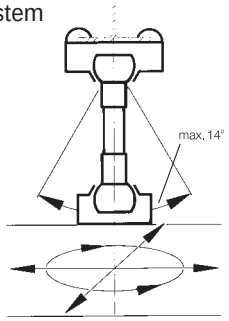
Suspension system

- 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
- Any angle possible between superstructure and track
- Threaded connections for height adjustment
- Spring clip through cross hole locks connection
- Slotted holes for height adjustability
- Universal suspension fittings for virtually any superstructure – provided as standard
- High suspension load bearing capacities adapted to the track system
- Low headroom possible with short suspension fittings

Suspension system



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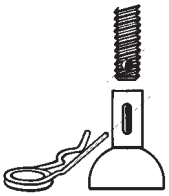

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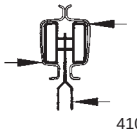
Trolleys

- Quiet, smooth operation with plastic wheels mounted in anti-friction bearings
- Flexible and torque-free load connection via pin
- High vertical load bearing capacity (horizontal up to 10 % of the suspended vertical load)
- Long service life (FEM classification: 3 m)
- Horizontally guided in the track profile
- KBK III trolleys can be removed from any point along the track

Trolleys KBK 100, I KBK II-L, II KBK III



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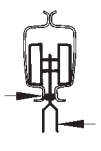

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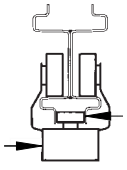

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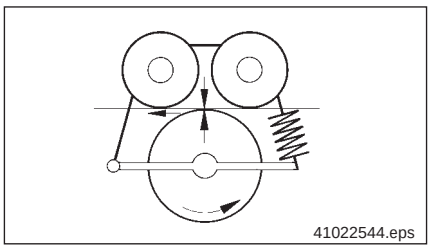
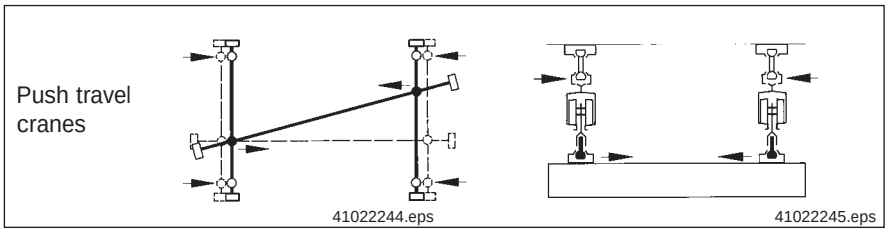
Travel drives



Friction wheels with a high friction coefficient ensure the reliable transmission of the drive torque. Used in KBK systems II-L, II, II-T, III with special trolleys. Pressure applied by springs. Low-noise system.

Push travel cranes

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



Electric travel cranes

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

Complex components

Track switches and turntables for branch sections in monorail tracks. Drop sections and step sections for vertical load movements in the case of trolleys with no hoist unit. Latching devices on cranes for transfer of trolleys from the crane onto monorail and double track systems.

Mechanical safety devices and positive interlocks ensure that the load is secure.

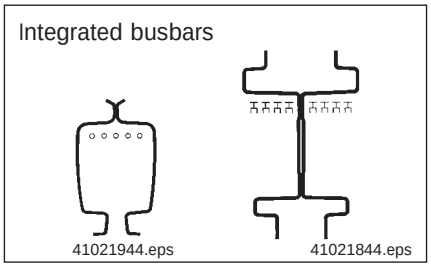
Combined crane installations

Cranes and runways of different section types can be combined (e.g. KBK I track with KBK II crane)

KBK ergo

Manipulator cranes and trolleys, cranes with a large overhang, extending cranes and trolleys for handling offset loads which transfer kick-up forces to the KBK components are designed with special parts. See technical data sheet 203 309 44.

Power supply systems



In KBK 100, I, II-L, II, flat cable power lines run on cable sliders or cable trolleys in the same track section; the KBK 25 system is used with KBK III. Integrated 5-pole busbar for KBK II (KBK II-R), and up to 10 poles for KBK III (DEL). Protected against accidental contact. Current collector trolleys with single (KBK III) and double pantograph arms (KBK II, III).

Electrical and control equipment

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

Anti-corrosion protection

KBK components are protected against corrosion as standard.

Suspension components are zinc-galvanized, standard series-produced track sections are powder-coated, other components are provided with a painted finish; special paint finishes are possible.

Environmental conditions

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

3 Planning and project drafting with KBK

Regulations

KBK installations are dimensioned on the basis of standards DIN 15018 Cranes, DIN 4132 Crane runways and DIN 18800 Part 1, Steel structures.

Relevant industrial safety regulations and codes of practice as stipulated in BGV D6 must be observed for planning, project drafting and operating KBK installations. KBK cranes and suspension monorails designed in accordance with the project drafting instructions contained on the following pages with relevant codes of practice concerning the safeguarding of machinery and prevention of accidents, including German technical equipment legislation, accident prevention (UVV) and DIN VDE regulations, and machinery directive 98/37/EC. Manufacturer's and conformity declarations and KBK test and inspection booklets for suspension monorails and cranes as well as for pillar and wall-mounted slewing jib cranes are supplied. Instructions in the operating and assembly manuals must be complied with.

Only genuine Demag parts may be used for KBK installations. These parts guarantee the safety of your crane installations. Unauthorised modifications, incorrect usage and incorrect installation exempt the manufacturer from liability for any damages resulting therefrom.

Inspection

KBK suspension monorails and KBK suspension cranes require little maintenance. However, 1-2 months after commissioning of an installation, all bolted connections and pin connections should be checked and retightened or secured as necessary. This check should be repeated at least once a year.

Also see KBK suspension crane and monorail operating instructions 206 076 44.

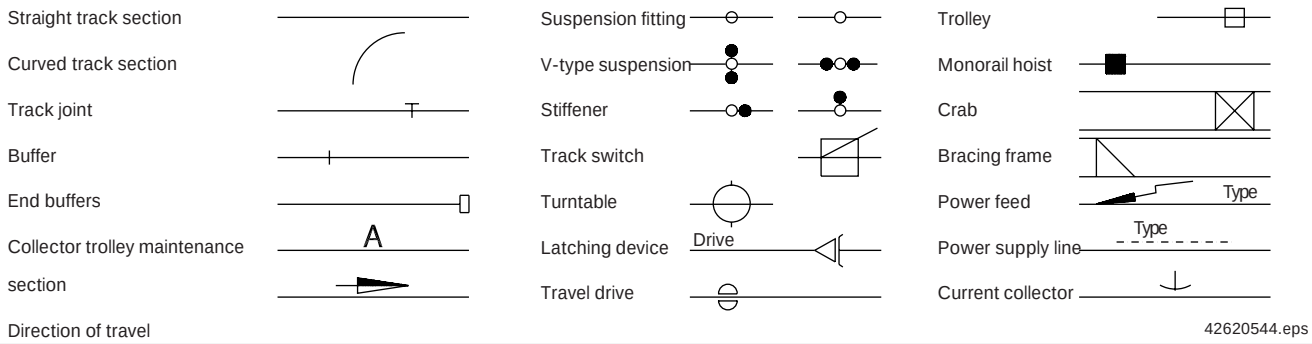
It is important that all members of staff responsible for erection, operation, operational reliability and servicing of KBK installations receive the KBK operating instructions and any relevant literature.

Planning and project drafting

All information and data necessary for project drafting can be found in summary form on the Guidelines for Project Drafting KBK installations sheet.

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

Symbols for use in drawings



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3.1 Planning and project drafting KBK suspension crane and suspension monorail installations

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

The span and spacing between supports which are permissible for the individual crane and track sections can be read off for a given load. Ensure compliance with the permissible length of overhang, distances of joints from suspension assemblies, and maximum loads on suspension assemblies and trolleys.

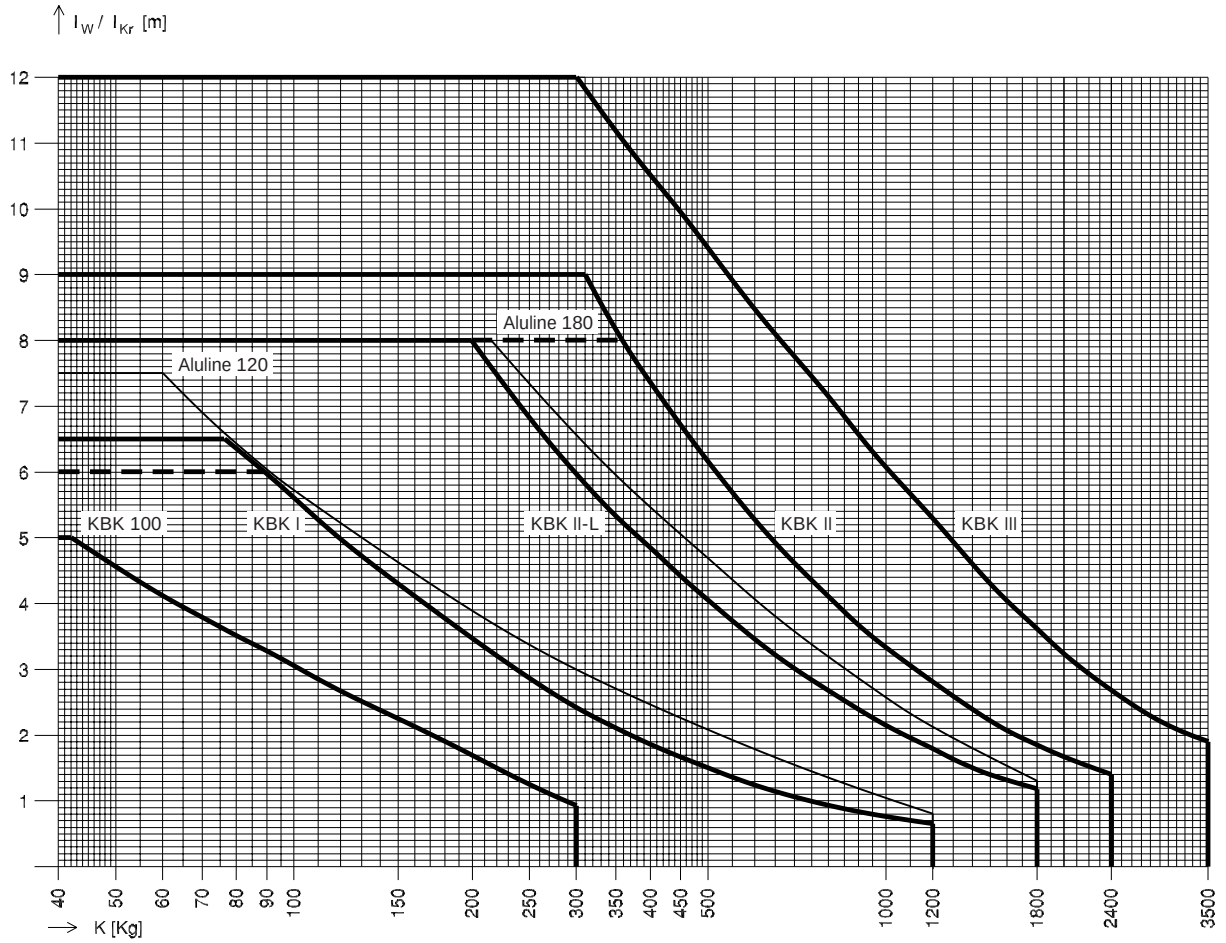
Diagram for crane and track selection

Diagram: Spacing between supports, crane spans

(Curves apply if hoists are used with lifting speeds up to 15m/min.

For higher speeds, see notes on section 3.6 Hoists on KBK.)

Section inertia moments
KBK 100: 26 cm⁴
KBK I: 80 cm⁴
KBK II-L: 345 cm⁴
KBK II: 660 cm⁴
KBK III: 1,785 cm⁴
Neutral axis approx.:
KBK 100: 35 mm from lower edge
KBK I, II-L, II, III: section centre



Attention: - - - Limit curves for maximum length of straight sections. Pay attention to the distance between supports and distances of joints (see section 3.4).

K = Loaded section l_w = Distance between supports l_{Kr} = Span

(KBK II-T is provided for crane girders only; see crane selection table.)

The lifted load coefficient ψ, dead weight coefficient φ to DIN 15018 and the oscillation coefficient φ to DIN 4132 for crane groups H1, B3 and the dead weight of each loaded girder have been included in the diagram calculations.

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Selecting the section	Selection of the section sizes KBK 100, KBK I, KBK II-L, KBK II, KBK II-T or KBK III depends on the following factors: Load K; distance between supports l_w or crane span l_{Kr}; drive type
Suitable for push travel	all profile section sizes
Suitable for electric travel	KBK II, KBK II-L, KBK II-T and KBK III

3.2 Steps for project drafting and technical specification

Determining load K l_{Kr} and l_w

Monorail track and single-girder crane $K = G_H + G_3$

Double-girder crane

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

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

Crane runway

Load does not travel on overhung portion of crane girder $K = G_H + G_3 + 0{,}50\ (G)_1 + G_2)$

Load travels on overhung portion of crane girder $K = G_H + G_3 + 0{,}80\ (G)_1 + G_2)$

Crane travels on more than two tracks (centre track) $K = G_H + G_3 + 0{,}65\ (G)_1 + G_2)$

where:

G_H = SWL including load handling attachment
G_1 = Crane girder dead weight including attachments
G_2 = Dead weight of crane trolleys including attachments (both ends together)
G_3 = Dead weight of trolley including hoist, cross travel drive and attachments
G_{RFK} = Dead weight of cross travel drive and attachments

3.3 Reading off from the diagram

Span l_{Kr}

Distance between track supports l_w

(Monorail track and crane runway)

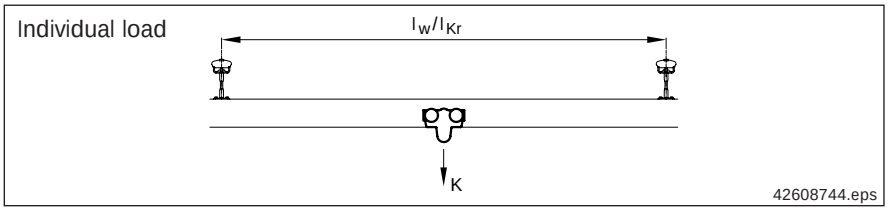
A distinction is made between concentrated load, two identical loads or more than two identical loads in one panel.

e_{Ka} = Distance between trolleys or wheel axles

e_{KT} = Distance between crane trolleys or wheel axles

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

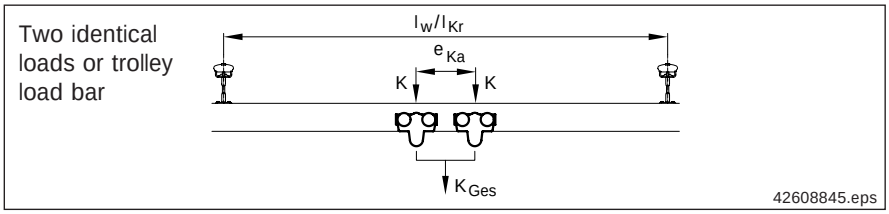
Individual load



Two identical loads or load bar

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

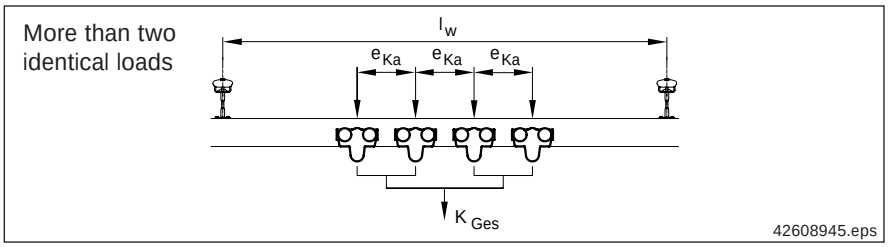
max. $l_w = l_{w(KGes)} + 0{,}9 \cdot e_{Ka}$ [1)] max. $l_{Kr} = l_{Kr(KGes)} + 0{,}9 \cdot e_{Ka}$ [1)]



More than two identical loads at equal distances

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

max. $l_w = l_{w(KGes)} + \frac{n}{2} \cdot e_{Ka}$ [1)]; n = number of loads K



For two or more loads at a maintained distance in one panel, the max. l_w or l_{Kr} must not be greater than the permissible limit for one of the individual loads. The minimum distance (e_{Ka}, e_{KT}) between loaded trolleys is that defined by the trolley load bar or crane traverse.

Pay attention to the maximum permissible trolley loads!

1) or e_{KT}

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3.4 Determining the suspension load G_{AB}

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

Max. G_{AB} [kg]	KBK 100	KBK I	KBK II/M10	KBK II-L	KBK II	KBK III	KBK III/M20
	400	750	750	1400	1700	1700	2600

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

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

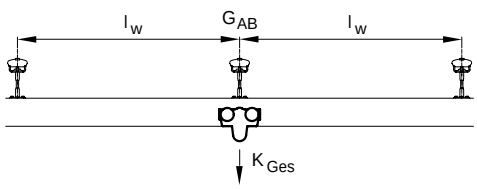
Individual load

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

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

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

Individual load



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Planning

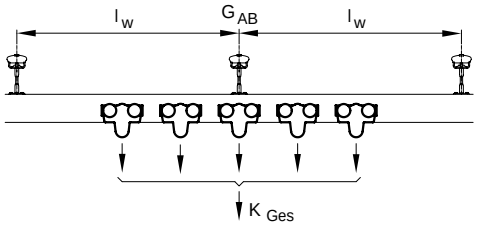
Two or more loads in one or two panels between supports

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

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

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

Several identical loads



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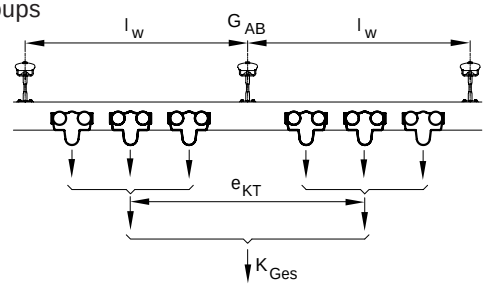
Two loads or groups of loads at a distance e_{KT}

$e_{KT} = 0{,}5 \cdot l_w$: $G_{AB} = 0.9\ K_{Ges} + G_B \cdot l_w \cdot 1{,}25$

$e_{KT} = l_w$: $G_{AB} = 0{,}7\ K_{Ges} + G_B \cdot l_w \cdot 1{,}25$ (Distance between loads = Spacing of supports)

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

Identical load groups



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3.5 System dimensions and system limits

Overhang lengths

			KBK 100	KBK I	KBK II-L	KBK II	KBK III
Shortest possible overhang	[mm]	u_{min}	65	70	120	120	155
Project drafting values for overhang	[mm]	u	100	200	300	300	200

The stability of the girder must be checked for short tracks and crane girders. (Multiply load on overhang by a factor of 1.2; crane girder forms counter torque).
KBK tracks or cranes must not be lifted (e.g. where the load is on the overhang).

Important

If the girder is unstable (lifting of girder and/or suspension fitting), the suspension fitting is subjected to impact loading which causes wear and can lead to premature failure of the connection.

See: Solution with KBK ergo.

Crane overhang

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

The length of overhang u can be increased for

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

Track overhang

The maximum lengths of overhang u for single-girder cranes can be referred to in the crane selection tables.

Approach dimension

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

Permissible distance st of joint from suspension fitting

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

Distance st between track joint and suspension fitting

				KBK 100	KBK I	KBK II-L	KBK II	KBK III
Smallest distance	[mm]	st_{min}	$l_w \leq 5$ m	65	70	120	120	155
			$l_w > 5$ m	$0{,}05 \cdot l_w$				$0{,}1 \cdot l_w$
Maximum permissible distance	[mm]	st_{max}		$0{,}1 \cdot l_w$				$0{,}2 \cdot l_w$

Crane girder lengths

	KBK 100	KBK I	KBK II-L	KBK II	KBK II-T	KBK III
Articulated single-girder cranes, push travel [1]	1 - 4m	1 - 6m	1 - 8m	1 - 8m	4 - 7m	1 - 8m, 9m (7+2m)
Rigid single-girder cranes, push [1] or electric travel	-		1,8 - 6m electiric travel, - 8m push travel		-	2 - 8m, 9m (7+2m)
Double-girder cranes, braced push [1] or electric travel	3 - 5m (push travel only)	3 - 9m	3 - 10m	3 - 12m	4 - 9m	2 - 14m
Rigid double-girder cranes, push [1] or electric travel	-		3 - 10m	3 - 12m	-	2,35 - 14m

Single-girder cranes manufactured from just one rail section without girder joint (exception KBK III : 9 m).

1) The push travel capability of larger cranes is limited.

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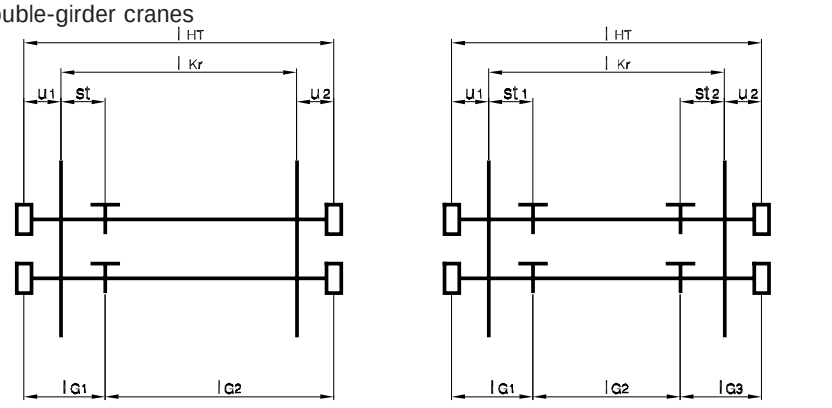
Double-girder cranes with track joint

In the case of double-girder cranes, the individual girders of which consist of several straight sections due to the length of crane required, the permissible distance of track joint to suspension fitting must be taken into consideration.

Construction of double-girder cranes with assembled girders

These cranes must be assembled as indicated in the table below. Double-girder cranes running on more than two tracks should be selected from the diagram. In the case of assembled KBK II-T cranes, only the centre track consists of KBK II-T rails (KBK II outside). Single-girder cranes are constructed without a track joint owing to lateral forces and the buffer joint; KBK III is an exception to this rule.

Double-girder cranes



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Crane girder length in m	KBK I			KBK II-L			KBK II			KBK II-T			KBK III			
l_{HT}	l_{G1}	l_{G2}	l_{G3}	l_{G1}	l_{G2}	l_{G3}	l_{G1}	l_{G2}	l_{G3}	l_{G1}	l_{G2}	l_{G3}	l_{Kr}	l_{G1}	l_{G2}	l_{G3}
7	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	2	6	-	-	-	-	-	-	-	1	6	1	-	-	-	-
9 [1]	2	5	2	1	8	-	1	8	-	1	7	1	6,2 - 8,7	2	7	-
10	-			2	8	-	2	8	-	-			5,8 - 7,0	3	7	-
				-	-	-	-	-	-				7,0 - 9,7	2	8	-
11	-			-			2	7	2	-			6,2 - 8,0	3	8	-
							-	-	-				8,0 - 10,7	2	7	2
12	-			-			2	8	2	-			6,6 - 8,5	3	6	3
							-	-	-				8,5 - 11,6	2	8	2
13	-			-			-			-			7,0 - 8,0	4	5	4
													8,0 - 11,6	3	7	3
14	-			-			-			-			7,3 - 9,0	4	6	4
													9,0 - 11,6	3	8	3

1) Also for single-girder cranes with KBK III according to crane selection table.

Possible combinations of sections for crane and crane runway

Runway \ Crane	KBK 100	KBK I	KBK II-L	KBK II	KBK II-T	KBK III
KBK 100	X	X	X	-	-	-
KBK I				X		
KBK II-L					X	
KBK II						X
KBK III	-	-				

Drives

KBK single and double-girder cranes, monorail and double-rail trolleys can be easily moved by hand. Trolleys and cranes running on KBK II-L, KBK II, KBK II-T or KBK III rails can also be provided with electric travel motors.

Cranes with a girder length of 6 m or more must be fitted with electric travel motors if long travel is to be possible with the trolley in a position outside the central third of the crane girder length. It is also recommended that crabs and cranes with a load capacity greater than 1000 kg SWL be fitted with electric travel drives.

Travel speeds: 5 to 40 m/min.

Deflection

Under live loading, the deflection of cranes in accordance with the diagram or selection table is always below 1/250 of the span. If the maximum spacing between supports/crane span is selected from the middle load range in the selection diagram, the deflection ratio ranges from 1/350 to 1/500. Monorail tracks and crane runways have deflection ratios below 1/350. Deflection can be reduced by using larger KBK profile sections.

3.6 Hoists with KBK

The layout diagrams and tables in KBK documentation are valid for Demag chain hoists with lifting speeds up to max. 15m/min.

Higher hoist speeds

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

$G_{Hnew} = G_H \cdot (0{,}97 + 0{,}002 \cdot v_H)$

v_H = Hoist speed in m/min

Use of balancer with KBK

Balancers on KBK:
When using rope balancers with KBK, the following must be taken into consideration:

- Rope balancers operate at higher speeds and have higher acceleration values than chain hoists. This increases the lifted load coefficient. The air cushion reduces the effect of the high acceleration.
- In load handling applications, smaller deflections and vibrations are often required than in classic crane engineering applications.

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

- at least factor 1,1 is used when calculating the load K by means of the diagrams
  $\Rightarrow K = G_H \cdot 1{,}1 + G_3$
  (this factor may be increased in order to avoid high deflections and unwanted vibrations)
- the selection table for 80kg is used for the D-BP 55 and the selection table for 160 kg is used for the D-BP 110 (at rated SWL) in a simplified manner.

3.7 Selection table for KBK monorail tracks

Tracks according to DIN 4132: H1; B3

G_H = Load on hoist (load including dead load of load handling attachment)
$K_{(1)}$ = Total load (live load + trolley dead weight)
$K_{(2)}$ = Total load with electric drive
e_{Ka} = Distance between trolley axle (axle base)
l_w = Spacing between supports for one trolley
G_{AB} = Max. suspension load for one trolley

Selection basis: 1 load on the monorail track

In individual cases, exact static analysis calculations may lead to different results. Values relating to higher or multiple loads on one track available on request.

	KBK 100				KBK I				KBK II-L				KBK II (II-R)				KBK III			
G_H	$\frac{K_{(1)}}{K_{(2)}}$	e_{Ka}	l_w	G_{AB}	$\frac{K_{(1)}}{K_{(2)}}$	e_{Ka}	l_w	G_{AB}	$\frac{K_{(1)}}{K_{(2)}}$	e_{Ka}	l_w	G_{AB}	$\frac{K_{(1)}}{K_{(2)}}$	e_{Ka}	l_w	G_{AB}	$\frac{K_{(1)}}{K_{(2)}}$	e_{Ka}	l_w	G_{AB}
kg	kg	m	m	kg	kg	m	m	kg	kg	m	m	kg	kg	m	m	kg	kg	m	m	kg
50	75	0,065	3,7	95	75	0,065	5,4	130	75	0,085	8	215	75	0,085	8	260	-			
	-				-				105	0,085	8	245	105	0,085	8	290				
80	105	0,065	3	125	105	0,065	5	145	105	0,085	8	245	105	0,085	8	290	-			
	-				-				135	0,085	8	275	135	0,085	8	320				
125	160	0,21	2,4	175	160	0,065	4,1	195	170	0,085	7,2	295	170	0,085	8	355	-			
	-				-				200	0,085	7	320	200	0,085	8	365				
160	205	0,21	1,85	215	205	0,065	3,4	235	205	0,085	7	320	205	0,085	8	390	-			
	-				-				235	0,085	6,5	340	235	0,085	8	420				
200	-				245	0,065	2,95	270	245	0,085	6,4	350	245	0,085	8	430	-			
					-				275	0,085	6	380	275	0,085	8	460				
250	-				300	0,065	2,5	320	305	0,085	5,8	405	305	0,085	8	465	320	0,095	8	620
					-				335	0,085	5,55	430	335	0,085	7,5	495	360	0,095	8	660
315	-				370	0,385	2,2	390	370	0,085	5,15	455	370	0,085	7	530	385	0,095	8	685
					-				400	0,085	4,8	480	400	0,085	7	560	425	0,095	8	725
400	-				455	0,385	1,8	470	455	0,085	4,35	520	455	0,085	6,7	610	470	0,095	8	770
					-				485	0,085	4,1	555	485	0,085	6,25	625	510	0,095	8	810
500	-				590	0,385	1,6	605	590	0,085	3,5	650	590	0,085	5,4	715	600	0,095	8	900
					-				620	0,085	3,25	675	620	0,085	5,1	735	640	0,095	8	940
630	-				-				710	0,25	3,15	765	710	0,25	4,7	820	730	0,095	7,7	1020
									740	0,25	3	790	740	0,25	4,6	845	770	0,095	7,4	1050
800	-				-				890	0,25	2,6	935	890	0,25	3,9	980	900	0,095	6,7	1160
									920	0,25	2,5	965	920	0,25	3,8	1010	940	0,095	6,5	1190
1000	-				-				1090	0,25	2,15	1130	1090	0,25	3,25	1165	1100	0,095	5,7	1320
									1120	0,25	2,1	1155	1120	0,25	3,2	1195	1140	0,095	5,5	1350
1250	-				-				-				1380	1	3,3	1455	1380	0,500[1)]	5	1570
													1410	1	3,3	1485	1420	0,500[1)]	4,9	1610
1600	-				-				-				1740	1,5	3	1700	1740	0,500[1)]	4,1	1895
													1770	1,5	3	1700	1780	0,500[1)]	4	1930
2000	-				-				-				2140	1,5	1,5	1540	2140	0,500[1)]	3,4	2270
													2170	1,5	1,5	1610	2180	0,500[1)]	3,3	2305
2500	-				-				-				-				-			
																	2740	1	2	2550
3200	-				-				-				-				-			
																	3500	1,5	1,5	2550

1) For travel through track switch e_{Ka} = 0,8 m

3.8 Selection table for KBK single and double-girder cranes

l_W data apply to <u>one crane</u> on the crane runway.
Crane girder overhangs are always the same on both sides of the crane.
Deflection limits Cranes 1/275, frequency ≥ 2,8 Hz
Runways 1/350

l_{HT} = Crane girder length
l_{Kr} = Span
l_W = Distance between supports
Suspension loads on request
All dimensions in m

Crane girder section, crane girder length

50 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_W 100	I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_W 100	I	II-L	II
KBK 100	1	0,85 - 0,85	3,4	5,5	8	8	-	-	-	-	-
	2	1,7 - 1,85	3,3	5,4	8	8	-	-	-	-	-
	3	2,5 - 2,85	3,2	5,0	8	8	2,0 - 2,85	2,9	5,0	7	8
	4	3,3 - 3,7	3,1	5,0	8	8	2,6 - 3,85	2,8	5,0	7	8
	5	-	-	-	-	-	3,2 - 4,85	2,7	5,0	7	8
KBK I	1	0,8 - 0,85	3,3	5,4	8	8	-	-	-	-	-
	2	1,65 - 1,85	3,2	5,3	8	8	-	-	-	-	-
	3	2,5 - 2,85	3,1	5,0	8	8	1,8 - 2,85	2,6	4,8	7	8
	4	3,0 - 3,85	3,0	5,0	8	8	2,3 - 3,85	2,5	4,6	7	8
	5	3,6 - 4,85	2,9	5,0	8	8	3,0 - 4,85	2,4	4,4	7	8
	6	4,2 - 5,4	2,7 [1]	4,5	8	8	4,5 - 5,85	2,3	4,2	7	8
	7	-	-	-	-	-	5,6 - 6,2	2,2	4,0	7	8
	8	-	-	-	-	-	5,0 - 5,1	2,1	3,9	7	8
	9	-	-	-	-	-	6,0 - 6,2	-	3,8	7	8
KBK II-L	1	0,75 - 0,75	3,0	5,0	8	8	-	-	-	-	-
	2	1,4 - 1,75	2,9	5,0	8	8	-	-	-	-	-
	3	1,95 - 2,75	2,7	5,0	8	8	1,6 - 2,75	-	3,2	7,0	8
	4	2,4 - 3,75	2,5	4,7	7	8	2,0 - 3,75	-	3,0	6,6	8
	5	3,0 - 4,75	2,4	4,5	7	8	3,0 - 4,75	-	2,9	6,5	8
	6	3,5 - 5,75	2,2	4,3	7	8	3,5 - 5,75	-	2,8	6,3	8
	7	4,0 - 6,75	2,1	4,1	7	8	4,0 - 6,75	-	2,7	6,1	8
	8	5,0 - 7,5 [2]	1,8 [1]	3,5 [1]	7	8	6,6 - 7,75	-	2,6	6,0	8
	9	-	-	-	-	-	7,8 - 8,75	-	2,6	6,0	8
	10	-	-	-	-	-	7,0 - 7,6	-	2,5	5,8	8
KBK II	1	0,7 - 0,75	-	5,0	7	8	-	-	-	-	-
	2	1,4 - 1,75	-	5,0	7	8	-	-	-	-	-
	3	1,8 - 2,75	-	5,0	7	8	1,5 - 2,75	-	3,3	6,5	8
	4	2,2 - 3,75	-	4,8	7	8	2,0 - 3,75	-	3,1	6,2	8
	5	3,0 - 4,75	-	4,5	7	8	3,0 - 4,75	-	2,8	6,2	8
	6	3,5 - 5,75	-	4,2	7	8	3,5 - 5,75	-	2,6	5,9	8
	7	4,0 - 6,75	-	4,0	7	8	4,0 - 6,75	-	2,5	5,7	8
	8	5,0 - 7,75 [2]	-	3,4 [1]	7	8	6,6 - 7,75	-	2,2	5,7	7,7
	9	-	-	-	-	-	7,8 - 8,75	-	2,1	5,6	7,3
	10	-	-	-	-	-	7,0 - 7,6	-	2,0	5,4	7,0
	11	-	-	-	-	-	8,0 - 8,8	-	1,9	5,2	6,7
	12	-	-	-	-	-	9,0 - 10,0	-	-	4,7	6,4

80 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_W 100	I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_W 100	I	II-L	II
KBK 100	1	0,85 - 0,85	3,0 [1]	5,0	8	8	-	-	-	-	-
	2	1,7 - 1,85	2,9 [1]	5,0	8	8	-	-	-	-	-
	3	2,6 - 2,85	2,8 [1]	5,0	8	8	2,0 - 2,85	2,55	4,7	7	8
	4	-	-	-	-	-	2,7 - 3,85	2,45	4,5	7	8
	5	-	-	-	-	-	3,4 - 4,2	2,4	4,2	7	8
KBK I	1	0,85 - 0,85	2,9 [1]	5,0	8	8	-	-	-	-	-
	2	1,7 - 1,85	2,8 [1]	5,0	8	8	-	-	-	-	-
	3	2,5 - 2,85	2,7 [1]	5,0	8	8	1,9 - 2,85	2,3	4,2	7	8
	4	3,2 - 3,85	2,6 [1]	5,0	8	8	2,5 - 3,85	2,2	4,0	7	8
	5	3,9 - 4,85	2,5 [1]	4,8	8	8	3,1 - 4,85	2,1	3,9	7	8
	6	4,55 - 4,65	2,4 [1]	4,0	8	8	4,5 - 5,85	2,0	3,8	7	8
	7	-	-	-	-	-	5,6 - 6,2	1,9	3,6	7	8
	8	-	-	-	-	-	5,0 - 5,1	1,8	3,5	7	8
	9	-	-	-	-	-	6,0 - 6,2	-	3,4	7	8
KBK II-L	1	0,75 - 0,75	2,8 [1]	4,9	7	8	-	-	-	-	-
	2	1,5 - 1,75	2,6 [1]	4,7	7	8	-	-	-	-	-
	3	2,15 - 2,75	2,5 [1]	4,5	7	8	1,7 - 2,75	-	3,0	6,6	8
	4	2,7 - 3,75	2,3 [1]	4,2	7	8	2,2 - 3,75	-	2,8	6,3	8
	5	3,15 - 4,75	2,2 [1]	4,0	7	8	3,1 - 4,75	-	2,7	6,1	8
	6	3,6 - 5,75	2,1 [1]	3,8	7	8	3,5 - 5,75	-	2,6	5,9	8
	7	4,0 - 6,75	1,9 [1]	3,5	7	8	4,0 - 6,75	-	2,5	5,7	8
	8	5,1 - 7,4 [2]	1,5 [1]	3,0 [1]	6,5	8	6,6 - 7,75	-	2,4	5,6	8
	9	-	-	-	-	-	7,8 - 8,75	-	2,3	5,4	7,8
	10	-	-	-	-	-	7,0 - 7,6	-	2,2	5,2	7,8
KBK II	1	0,75 - 0,75	-	5,0	7	8	-	-	-	-	-
	2	1,45 - 1,75	-	4,7	7	8	-	-	-	-	-
	3	2,0 - 2,75	-	4,5	7	8	1,5 - 2,75	-	3,0	6,0	8
	4	2,5 - 3,75	-	4,2	7	8	2,0 - 3,75	-	2,7	5,8	8
	5	3,0 - 4,75	-	3,8	7	8	3,0 - 4,75	-	2,6	5,7	8
	6	3,5 - 5,75	-	3,6	7	8	3,5 - 5,75	-	2,4	5,5	8
	7	4,0 - 6,75	-	3,5	7	8	4,0 - 6,75	-	2,3	5,4	7,7
	8	5,0 - 7,75 [2]	-	3,0 [1]	6,5	8	6,6 - 7,75	-	2,1	5,4	7,3
	9	-	-	-	-	-	7,8 - 8,75	-	2,0	5,3	7,0
	10	-	-	-	-	-	7,0 - 7,6	-	1,9	5,0	6,7
	11	-	-	-	-	-	8,0 - 8,8	-	1,8	4,9	6,4
	12	-	-	-	-	-	9,0 - 10,0	-	-	4,5	6,0

200 kg

Section		Single-girder crane l_{Kr}	Single-girder crane l_W I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_W I	II-L	II
KBK I	1	0,85 - 0,85	2,7	6,5	8	-	-	-	-
	2	1,8 - 1,85	2,6	6,4	8	-	-	-	-
	3	2,7 - 2,85	2,6	6,2	8	2,1 - 2,85	2,8	6,3	8
	4	-	-	-	-	2,85 - 3,85	2,8	6,3	8
	5	-	-	-	-	3,6 - 4,85	2,6	5,8	8
	6	-	-	-	-	4,3 - 5,2	2,6	5,8	8
	7	-	-	-	-	5,2 - 5,2	2,6	5,8	8
KBK II-L	1	0,75 - 0,75	2,7 [1]	6,1	8	-	-	-	-
	2	1,7 - 1,75	2,6 [1]	6,1	8	-	-	-	-
	3	2,6 - 2,75	2,5 [1]	5,9	8	1,9 - 2,75	2,1	4,9	7,2
	4	3,3 - 3,75	2,5 [1]	5,8	8	2,6 - 3,75	2,0	4,6	6,8
	5	4,1 - 4,75	2,4 [1]	5,7	8	3,3 - 4,75	2,0	4,6	6,8
	6	4,8 - 5,75	2,3 [1]	5,6	8	3,8 - 5,75	1,9	4,3	6,3
	7	5,4 - 6,75	2,3 [1]	5,5	8	4,3 - 6,75	1,9	4,3	6,3
	8	-	-	-	-	6,6 - 7,75	1,9	4,3	6,3
	9	-	-	-	-	7,8 - 8,3	1,9	4,3	6,3
	10	-	-	-	-	7,0 - 7,6	1,9	4,3	6,3
KBK II	2	1,7 - 1,75	2,8 [1]	5,9	8	-	-	-	-
	3	2,5 - 2,75	2,7 [1]	5,6	8	1,8 - 2,75	2,0	4,5	6,7
	4	3,2 - 3,75	2,6 [1]	5,4	8	2,4 - 3,75	1,9	4,4	6,5
	5	3,9 - 4,75	2,5 [1]	5,3	8	3,0 - 4,75	1,8	4,2	6,2
	6	4,5 - 5,75	2,4 [1]	5,2	8	3,5 - 5,75	1,8	4,0	5,8
	7	5,0 - 6,75	2,3 [1]	5,0	7,5	4,0 - 6,75	1,8	3,9	5,7
	8	5,7 - 7,75 [2]	2,0 [1]	4,7	7,0	6,6 - 7,75	1,8	3,9	5,7
	9	-	-	-	-	7,8 - 8,75	1,8	3,9	5,7
	10	-	-	-	-	7,0 - 7,6	1,6 [3]	3,8	5,6
	11	-	-	-	-	8,0 - 8,8	1,6 [3]	3,8	5,6
	12	-	-	-	-	9,0 - 10,0	-	3,7	5,5

250 kg

Section		Single-girder crane l_{Kr}	Single-girder crane l_W I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_W I	II-L	II
KBK I	1	0,85 - 0,85	2,5	6,1	8	-	-	-	-
	2	1,8 - 1,85	2,4	6,0	8	-	-	-	-
	3	2,7 - 2,85	2,4	5,9	8	2,1 - 2,85	2,5	5,7	7,9
	4	-	-	-	-	2,9 - 3,85	2,4	5,6	7,7
	5	-	-	-	-	3,7 - 4,6	2,3	5,5	7,6
	6	-	-	-	-	4,3 - 4,7	2,1	5,3	7,3
	7	-	-	-	-	-	-	-	-
KBK II-L	1	-	-	-	-	-	-	-	-
	2	1,7 - 1,75	2,3 [1]	5,8	8	-	-	-	-
	3	2,6 - 2,75	2,3 [1]	5,8	8	2,0 - 2,75	2,0	4,7	6,9
	4	3,4 - 3,75	2,3 [1]	5,5	8	2,7 - 3,75	1,9	4,5	6,7
	5	4,2 - 4,75	2,2 [1]	5,35	8	3,4 - 4,75	1,85	4,3	6,4
	6	4,8 - 5,75	2,1 [1]	5,2	7,8	3,9 - 5,75	1,8	4,2	6,2
	7	5,4 - 6,1	2,0 [1]	5,0	7,6	4,5 - 6,75	1,75	4,0	6,0
	8	-	-	-	-	6,6 - 7,75	1,7	3,9	5,8
	9	-	-	-	-	7,8 - 8,0	1,7	3,9	5,8
	10	-	-	-	-	7,2 - 7,6	1,7	3,9	5,8
KBK II	2	1,7 - 1,75	2,4 [1]	5,8	8	-	-	-	-
	3	2,5 - 2,75	2,4 [1]	5,6	8	1,85 - 2,75	2,0 [3]	4,4	6,5
	4	3,2 - 3,75	2,3 [1]	5,4	8	2,5 - 3,75	1,9 [3]	4,2	6,2
	5	3,9 - 4,75	2,2 [1]	5,2	8	3,1 - 4,75	1,8 [3]	4,0	5,9
	6	4,5 - 5,75	2,0 [1]	5,0	7,8	3,65 - 5,75	1,7 [3]	3,9	5,7
	7	5,1 - 6,75	2,0 [1]	4,9	7,5	4,1 - 6,75	1,7 [3]	3,7	5,5
	8	6,0 - 7,45 [2]	1,6 [1]	4,0	6,0	6,6 - 7,75	1,7 [3]	3,7	5,3
	9	-	-	-	-	7,8 - 8,75	1,6 [3]	3,7	5,2
	10	-	-	-	-	7,0 - 7,6	1,5 [3]	3,6	5,0
	11	-	-	-	-	8,0 - 8,8	1,5 [3]	3,5	5,0
	12	-	-	-	-	9,0 - 10,0	-	3,5	5,0

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Project drafting data for crane installations must be selected from the table below for KBK single and double-girder cranes. In individual cases, exact static analysis calculations may lead to different results for l_{Kr} and l_w.

Where there are several cranes on the same runway, the end carriages of single-girder cranes must always be designed as double or quadruple trolleys. The spacing of the track supports l_w must then be calculated separately. Intermediate lengths for crane girders are possible. Data calculated on the basis of cranes of standard design for standard components and without special attachments.

Check suspension loads!

Cranes according to DIN 15018, tracks according to DIN 4132: H1, B3 (H2, B3 on request).

1) Two end carriages on each side of crane
2) Double trolley unit
3) Quadruple trolley end carriages on each side of crane
4) Quadruple trolley unit

Crane girder section, crane girder length

125 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_w 100	I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_w 100	I	II-L	II
KBK 100	1	0,85-0,85 2)	2,3 1)	4,3	7	8	-	-	-	-	-
	2	1,8 - 1,85 2)	2,3 1)	4,2	7	8	-	-	-	-	-
	3	2,5 - 2,6 2)	2,2 1)	4,2	7	8	2,1 - 2,85	2,15	3,9	7	8
	4	-	-	-	-	-	2,9 - 3,6	2,1	3,8	7	8
	5	-	-	-	-	-	3,6 - 3,6	2,0	3,7	7	8
KBK I	1	0,8 - 0,85	2,3 1)	4,3	7	8	-	-	-	-	-
	2	1,75 - 1,85	2,2 1)	4,2	7	8	-	-	-	-	-
	3	2,6 - 2,85	2,2 1)	4,1	7	8	2,0 - 2,85	-	3,6	7	8
	4	3,4 - 3,85	2,1 1)	4,0	7	8	2,7 - 3,85	-	3,5	7	8
	5	4,2 - 4,6	2,0 1)	3,9	7	8	3,3 - 4,85	-	3,3	7	8
	6	-	-	-	-	-	4,5 - 5,85	-	3,2	7	8
	7	-	-	-	-	-	5,6 - 6,2	-	3,1	7	8
	8	-	-	-	-	-	5,0 - 5,1	-	3,0	6,7	8
	9	-	-	-	-	-	6,0 - 6,2	-	2,9	6,7	8
KBK II-L	1	0,75 - 0,75	2,0 1)	3,9	7	8	-	-	-	-	-
	2	1,6 - 1,75	2,0 1)	3,9	7	8	-	-	-	-	-
	3	2,4 - 2,75	2,0 1)	3,8	7	8	1,8 - 2,75	-	2,6	6,0	8
	4	3,0 - 3,75	2,0 1)	3,8	7	8	2,4 - 3,75	-	2,5	5,7	8
	5	3,6 - 4,75	2,0 1)	3,7	7	8	3,1 - 4,75	-	2,4	5,5	8
	6	4,1 - 5,75	1,9 1)	3,6	7	8	3,6 - 5,75	-	2,3	5,3	7,8
	7	4,5 - 6,75	1,8 1)	3,5	6,5	8	4,1 - 6,75	-	2,2	5,1	7,6
	8	5,6 - 7,0 2)	-	2,5 1)	6	7,5	6,6 - 7,75	-	2,2	5,1	7,6
	9	-	-	-	-	-	7,8 - 8,75	-	2,1	5,0	7,5
	10	-	-	-	-	-	7,0 - 7,6	-	2,1	5,0	7,5
KBK II	1	0,75 - 0,75	-	4,1	7	8	-	-	-	-	-
	2	1,6- 1,75	-	3,8	7	8	-	-	-	-	-
	3	2,2 - 2,75	-	3,6	7	8	1,6 - 2,75	-	2,5	5,4	8
	4	2,8 - 3,75	-	3,4	7	8	2,2 - 3,75	-	2,4	5,3	8
	5	3,3 - 4,75	-	3,2	7	8	3,0 - 4,75	-	2,4	5,3	7,9
	6	3,7 - 5,75	-	3,0	6,8	8	3,5 - 5,75	-	2,3	5,0	7,4
	7	4,1 - 6,75	-	2,8	6,6	8	4,0 - 6,75	-	2,2	4,8	7,1
	8	5,2 - 7,75 2)	-	2,5 1)	6,0	8	6,6 - 7,75	-	2,0	4,8	6,8
	9	-	-	-	-	-	7,8 - 8,75	-	1,9	4,8	6,5
	10	-	-	-	-	-	7,0 - 7,6	-	1,8	4,5	6,3
	11	-	-	-	-	-	8,0 - 8,8	-	1,7	4,5	6,0
	12	-	-	-	-	-	9,0 - 10,0	-	-	4,4	6,0

160 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_w 100	I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_w 100	I	II-L	II
KBK 100	1	0,85-0,85 2)	1,5 1)	3,2	7	8	-	-	-	-	-
	2	1,8 - 1,85 2)	1,5 1)	3,1	7	8	-	-	-	-	-
	3	-	-	-	-	-	2,25 - 2,85	-	3,4	7	8
	4	-	-	-	-	-	3,25 - 3,3	-	3,3	7	8
	5	-	-	-	-	-	-	-	-	-	-
KBK I	1	0,85 - 0,85	-	3,3	7	8	-	-	-	-	-
	2	1,8 - 1,85	-	3,1	7	8	-	-	-	-	-
	3	2,7 - 2,85	-	3,0	7	8	2,05 - 2,85	-	3,1	6,6	8
	4	3,5 - 3,6	-	3,0	7	8	2,8 - 3,85	-	3,0	6,5	8
	5	-	-	-	-	-	3,5 - 4,85	-	2,9	6,5	8
	6	-	-	-	-	-	4,5 - 5,85	-	2,9	6,5	8
	7	-	-	-	-	-	5,65 - 6,1	-	2,9	6,5	8
	8	-	-	-	-	-	5,0 - 5,1	-	2,6	6,0	8
	9	-	-	-	-	-	6,0 - 6,15	-	2,6	6,0	8
KBK II-L	1	0,75 - 0,75	-	2,8	6,6	8	-	-	-	-	-
	2	1,7 - 1,75	-	2,8	6,6	8	-	-	-	-	-
	3	2,6 - 2,75	-	2,8	6,6	8	1,8 - 2,75	-	2,2	5,2	7,5
	4	3,3 - 3,75	-	2,7	6,5	8	2,5 - 3,75	-	2,1	4,8	7
	5	4,0 - 4,75	-	2,6	6,2	8	3,2 - 4,75	-	2,1	4,8	7
	6	4,6 - 5,75	-	2,5 1)	6,0	8	3,7 - 5,75	-	2,0	4,5	6,6
	7	5,0 - 6,75	-	2,5 1)	6,0	8	4,2 - 6,75	-	2,0	4,5	6,6
	8	6,0 - 6,75 2)	-	2,3 1)	5,6	7,5	6,6 - 7,75	-	2,0	4,5	6,6
	9	-	-	-	-	-	7,8 - 8,75	-	2,0	4,5	6,6
	10	-	-	-	-	-	7,0 - 7,6	-	2,0	4,5	6,6
KBK II	1	0,75 - 0,75	-	3,4	6,75	8	-	-	-	-	-
	2	1,65 - 1,75	-	3,2	6,5	8	-	-	-	-	-
	3	2,45 - 2,75	-	3,0 1)	6,1	8	1,8 - 2,75	-	2,1	4,8	7,2
	4	3,15 - 3,75	-	2,8 1)	5,9	8	2,3 - 3,75	-	2,0	4,6	6,7
	5	3,75 - 4,75	-	2,7 1)	5,75	8	3,0 - 4,75	-	1,9	4,4	6,5
	6	4,35 - 5,75	-	2,6 1)	5,5	8	3,5 - 5,75	-	1,9	4,2	6,2
	7	4,9 - 6,75	-	2,5 1)	5,4	8	4,0 - 6,75	-	1,8	4,1	6,1
	8	5,6 - 7,75 2)	-	2,2 1)	5,2	7,5	6,6 - 7,75	-	1,8	4,1	6,1
	9	-	-	-	-	-	7,8 - 8,75	-	1,8	4,1	6,1
	10	-	-	-	-	-	7,0 - 7,6	-	1,7	4	5,8
	11	-	-	-	-	-	8,0 - 8,8	-	1,7	4	5,8
	12	-	-	-	-	-	9,0 - 10,0	-	-	4	5,8

315 kg

Section		Single-girder crane l_{Kr}	Single-girder crane l_w I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_w I	II-L	II
KBK I	1	0,75-0,85 2)	2,2 1)	5,3	7	-	-	-	-
	2	1,65-1,85 2)	2,0 1)	4,8	7	-	-	-	-
	3	-	-	-	-	2,1 - 2,85	2,1	4,9	7
	4	-	-	-	-	3,0 - 3,85	2,0	4,8	7
	5	-	-	-	-	3,7 - 4,4	2,0	4,8	7
	6	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-
KBK II-L	1	-	-	-	-	-	-	-	-
	2	1,75 - 1,75	1,9 3)	4,8	7,2	-	-	-	-
	3	2,7 - 2,75	1,9 3)	4,7	7,1	2,0 - 2,75	1,7	3,9	5,8
	4	3,6 - 3,75	1,8 3)	4,5	7	2,8 - 3,75	1,7 3)	3,8	5,6
	5	4,4 - 4,75	1,8 3)	4,4	6,7	3,5 - 4,75	1,7 3)	3,6	5,4
	6	5,1 - 5,6	1,8 3)	4,3	6,4	4,0 - 5,75	1,6 3)	3,5	5,2
	7	-	-	-	-	4,6 - 6,75	1,6 3)	3,5	5
	8	-	-	-	-	6,6 - 7,5	1,6 3)	3,5	5
	9	-	-	-	-	7,8 - 7,8	1,6 3)	3,5	5
	10	-	-	-	-	7,2 - 7,6	1,6 3)	3,5	5
KBK II	2	1,75 - 1,75	2,0 3)	4,5	7	-	-	-	-
	3	2,6 - 2,75	1,9 3)	4,4	6,7	1,9 - 2,75	1,7 3)	3,9	5,6
	4	3,4 - 3,75	1,8 3)	4,2	6,6	2,6 - 3,75	1,7 3)	3,6	5,4
	5	4,15 - 4,75	1,7 3)	4,1	6,3	3,2 - 4,75	1,6 3)	3,5	5,1
	6	4,85 - 5,75	1,7 3)	4,0	6,2	3,8 - 5,75	1,6 3)	3,4	5
	7	5,5 - 6,75	1,7 3)	3,9	6	4,3 - 6,75	1,5 3)	3,3	4,8
	8	6,2 - 6,85 2)	1,5 3)	3,7 1)	5,7 1)	6,6 - 7,75	1,5 3)	3,3	4,8
	9	-	-	-	-	7,8 - 8,75	1,5 3)	3,3	4,8
	10	-	-	-	-	7,0 - 7,6	1,5 3)	3,2	4,6
	11	-	-	-	-	8,0 - 8,8	1,5 3)	3,2	4,6
	12	-	-	-	-	-	-	-	-

400 kg

Section		Single-girder crane l_{Kr}	Single-girder crane l_w I	II-L	II	Double-girder crane l_{Kr}	Double-girder crane l_w I	II-L	II
KBK I	1	0,7 - 0,85 4)	1,8 3)	4	6	-	-	-	-
	2	1,6 - 1,85 4)	1,8 3)	4	6	-	-	-	-
	3	-	-	-	-	2,15 - 2,85	1,9 3)	4,3	6,2
	4	-	-	-	-	3,1 - 3,65	1,9 3)	4,3	6,2
	5	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-
KBK II-L	1	-	-	-	-	-	-	-	-
	2	1,75 - 1,75	1,6 3)	4	6,2	-	-	-	-
	3	2,65 - 2,75	1,5 3)	4	6,1	2,0 - 2,75	1,6 3)	3,5	5,1
	4	3,65 - 3,75	1,5 3)	4	6,1	2,8 - 3,75	1,6 3)	3,5	5,1
	5	4,3 - 4,75	1,5 3)	3,9	5,9	3,6 - 4,75	1,6 3)	3,3	4,9
	6	-	-	-	-	4,2 - 5,75	1,5 3)	3,2	4,6
	7	-	-	-	-	4,8 - 6,75	1,5 3)	3,2	4,6
	8	-	-	-	-	6,6 - 7	1,5 3)	3,2	4,6
	9	-	-	-	-	-	-	-	-
	10	-	-	-	-	7,3 - 7,4	1,5 3)	3,2	4,6
KBK II	2	1,75 - 1,75	1,6 3)	3,9	6	-	-	-	-
	3	2,65 - 2,75	1,6 3)	3,8	5,8	1,9 - 2,75	1,6 3)	3,5	5,1
	4	3,45 - 3,75	1,5 3)	3,6	5,5	2,7 - 3,75	1,5 3)	3,3	4,7
	5	4,25 - 4,75	1,5 3)	3,6	5,5	3,3 - 4,75	1,5 3)	3,2	4,5
	6	5,0 - 5,75	1,5 3)	3,5	5,3	3,9 - 5,75	1,5 3)	3,2	4,5
	7	5,7 - 6,75	1,5 3)	3,5	5,3	4,5 - 6,75	1,5 3)	3,2	4,5
	8	6,4 - 6,75 2)	1,3 3)	3,3 1)	5,0 1)	6,6 - 7,75	1,5 3)	3,2	4,5
	9	-	-	-	-	7,8 - 8,75	1,4 3)	3,1	4,5
	10	-	-	-	-	7,0 - 7,6	-	2,9	4,2
	11	-	-	-	-	8,0 - 8,8	-	2,9	4,2
	12	-	-	-	-	-	-	-	-

Selection table for KBK single and double-girder cranes (continued)

Crane girder section, crane girder length

500 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_w I	Single-girder crane l_w II-L	Single-girder crane l_w II	Single-girder crane l_w III	Double-girder crane l_{Kr}	Double-girder crane l_w I	Double-girder crane l_w II-L	Double-girder crane l_w II	Double-girder crane l_w III
KBK I	1	0,7 - 0,85 4)	1,55 3)	3,5	5,4	-	-	-	-	-	-
	2	1,6 - 1,6 4)	1,5 3)	3,5	5,4	-	-	-	-	-	-
	3	-	-	-	-	-	2,2 - 2,85	1,6 3)	3,7	5,2	-
	4	-	-	-	-	-	3,0 - 3,2	1,5 3)	3,6	5,1	-
KBK II-L	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	2,7 - 2,75	1,5 3)	3,4	5,3	8	2,1 - 2,75	1,5 3)	3,2	4,7	7,8
	4	3,6 - 3,7	1,5 3)	3,3	5,2	8	2,9 - 3,75	1,45 3)	3,1	4,6	7,7
	5	-	-	-	-	-	3,7 - 4,75	1,4 3)	3,1	4,5	7,6
	6	-	-	-	-	-	4,4 - 5,75	1,4 3)	3,0	4,4	7,5
	7	-	-	-	-	-	5,1 - 6,5	1,3 3)	2,9	4,3	7,4
KBK II	1	-	-	-	-	-	-	-	-	-	-
	2	1,75 - 1,75	1,5 3)	3,4	5,4	8	-	-	-	-	-
	3	2,65 - 2,75	1,5 3)	3,35	5,3	8	2,0 - 2,75	1,4 3)	3,1	4,6	7,7
	4	3,5 - 3,75	1,45 3)	3,3	5,2	8	2,8 - 3,75	1,4 3)	3,0	4,5	7,6
	5	4,3 - 4,75	1,4 3)	3,25 1)	5,0 1)	8	3,5 - 4,75	1,3 3)	2,9	4,3	7,4
	6	5,1 - 5,75	-	3,2 1)	5,0 1)	8	4,2 - 5,75	-	2,8	4,3	7,4
	7	5,8 - 6,0	-	3,1 1)	5,0 1)	8	4,8 - 6,75	-	2,7	4,2	7,3
	8	-	-	-	-	-	6,6 - 7,75	-	2,7	4,1	7,2
	9	-	-	-	-	-	7,8 - 8,5	-	2,7	4,0	7,0
	10	-	-	-	-	-	7,0 - 7,6	-	2,6	3,9	6,9
	11	-	-	-	-	-	8,0 - 8,5	-	2,6	3,8	6,7
KBK II-T	4	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
	7	5,8 - 6,75 2)	-	3,1 1)	4,7 1)	7,5	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-
KBK III	4	-	-	-	-	-	-	-	-	-	-
	5	4,0 - 4,7	-	-	4,3 1)	7,4	-	-	-	-	-
	6	4,75 - 5,7	-	-	4,2 1)	7,3	-	-	-	-	-
	7	5,4 - 6,7	-	-	4,1 1)	7,2	-	-	-	-	-
	8	6,05 - 7,7	-	-	4,0 1)	7,1	-	-	-	-	-
	9	6,7 - 8,4	-	-	3,9 1)	7,0	6,2 - 8,7	-	-	3,4	5,6
	10	-	-	-	-	-	6,2 - 9,7	-	-	3,4	5,6
	11	-	-	-	-	-	6,2 - 10,7	-	-	3,2	5,5
	12	-	-	-	-	-	7,2 - 11,0	-	-	3,1	5,3
	13	-	-	-	-	-	8,2 - 11,0			3,1	5,2
	14	-	-	-	-	-	9,2 - 11,0	-	-	3,0	5,1

630 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_w I	Single-girder crane l_w II-L	Single-girder crane l_w II	Single-girder crane l_w III	Double-girder crane l_{Kr}	Double-girder crane l_w I	Double-girder crane l_w II-L	Double-girder crane l_w II	Double-girder crane l_w III
KBK I	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-
KBK II-L	1	0,6 - 0,75 2)	-	2,8 1)	4,3 1)	7,2	-	-	-	-	-
	2	1,6 - 1,75 2)	-	2,7 1)	4,2 1)	7	-	-	-	-	-
	3	2,6 - 2,75 2)	-	2,7 1)	4,2 1)	7	2,2 - 2,75	-	2,8	4,1	7,2
	4	3,4 - 3,4 2)	-	2,7 1)	4,2 1)	6,8	3,0 - 3,75	-	2,8	4,0	7,0
	5	-	-	-	-	-	3,8 - 4,75	-	2,7	3,9	6,8
	6	-	-	-	-	-	4,5 - 5,75	-	2,6	3,8	6,6
	7	-	-	-	-	-	5,2 - 5,8	-	2,5	3,7	6,5
KBK II	1	0,6 - 0,75 2)	-	2,8 1)	4,2 1)	7,1	-	-	-	-	-
	2	1,6 - 1,75 2)	-	2,7 1)	4,1 1)	7,0	-	-	-	-	-
	3	2,5 - 2,75 2)	-	2,7 1)	4,1 1)	6,9	2,1 - 2,75	-	2,7	3,9	6,8
	4	3,4 - 3,75 2)	-	2,6 1)	4,0 1)	6,8	2,9 - 3,75	-	2,6	3,8	6,6
	5	4,3 - 4,75 2)	-	2,5 1)	3,9 1)	6,7	3,6 - 4,75	-	2,5	3,6	6,5
	6	5,0 - 5,0 2)	-	2,5 1)	3,9 1)	6,6	4,3 - 5,75	-	2,4	3,6	6,2
	7	-	-	-	-	-	4,9 - 6,75	-	2,4	3,5	6,2
	8	-	-	-	-	-	6,6 - 7,75	-	2,4	3,5	6,2
	9	-	-	-	-	-	7,8 - 8,2	-	2,4	3,5	6,2
	10	-	-	-	-	-	7,0 - 7,6	-	2,3	3,3	5,9
	11	-	-	-	-	-	8,0 - 8,2	-	2,3	3,3	5,9
KBK II-T	4	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-
	6	5,0 - 5,75 2)	-	2,45 1)	3,7 1)	6,5	-	-	-	-	-
	7	5,8 - 6,75 2)	-	2,4 1)	3,6 1)	6,3	-	-	-	-	-
	8	-	-	-	-	-	7,0 - 7,75	-	2,3	3,5	6,0
	9	-	-	-	-	-	8,0 - 8,75	-	2,3	3,5	6,0
KBK III	4	3,45 - 3,7	-	-	3,7 1)	6,4	-	-	-	-	-
	5	4,25 - 4,7	-	-	3,7 1)	6,3	-	-	-	-	-
	6	5,05 - 5,7	-	-	3,5 1)	6,2	-	-	-	-	-
	7	5,8 - 6,7	-	-	3,5 1)	6,1	5,0 - 6,7	-	-	2,6 3)	5,4
	8	6,4 - 7,7	-	-	3,4 1)	6,0	5,6 - 7,7	-	-	2,6 3)	5,4
	9	6,8 - 8,4	-	-	3,3 1)	5,8	6,2 - 8,7	-	-	2,6 3)	5,0
	10	-	-	-	-	-	6,2 - 9,7	-	-	2,6 3)	4,7
	11	-	-	-	-	-	6,6 - 10,7	-	-	2,6 3)	4,6
	12	-	-	-	-	-	7,6 - 10,7	-	-	2,5 3)	4,5
	13	-	-	-	-	-	8,6 - 10,7	-	-	2,5 3)	4,5
	14	-	-	-	-	-	9,6 - 10,7	-	-	2,5 3)	4,5

1250 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_w I	Single-girder crane l_w II-L	Single-girder crane l_w II 6)	Single-girder crane l_w III	Double-girder crane l_{Kr}	Double-girder crane l_w I	Double-girder crane l_w II-L	Double-girder crane l_w II	Double-girder crane l_w III 5)
KBK II	2	-	-	-	-	-	1,1 - 1,75	-	-	2,5 3)	4,5
	3	-	-	-	-	-	2,1 - 2,75	-	-	2,5 3)	4,5
	4	-	-	-	-	-	3,0 - 3,75	-	-	2,4 3)	4,4
	5	-	-	-	-	-	3,8 - 4,75	-	-	2,0 3)	4,3
	6	-	-	-	-	-	4,7 - 5,2	-	-	2,0 3)	4,3
KBK II-T	5	-	-	-	-	-	4,0 - 4,75	-	-	1,2 3)	3,7
	6	-	-	-	-	-	5,0 - 5,75	-	-	1,2 3)	3,7
	7	-	-	-	-	-	6,0 - 6,75	-	-	1,2 3)	3,7
	8	-	-	-	-	-	7,0 - 7,75	-	-	1,2 3)	3,7
	9	-	-	-	-	-	8,0 - 8,6	-	-	1,2 3)	3,7
KBK III	2	-	-	-	-	-	-	-	-	-	-
	3	2,3 - 2,7 2)	-	-	2,3 3)	4,3	-	-	-	-	-
	4	3,2 - 3,7 2)	-	-	2,3 3)	4,3	-	-	-	-	-
	5	4,1 - 4,7 2)	-	-	2,3 3)	4,2	3,8 - 4,7	-	-	0,7 3)	3,7
	6	5,0 - 5,5 2)	-	-	2,3 3)	4,2	4,5 - 5,7	-	-	0,7 3)	3,7
	7	-	-	-	-	-	5,2 - 6,7	-	-	0,7 3)	3,7
	8	-	-	-	-	-	5,9 - 7,7	-	-	0,7 3)	3,6
	9	-	-	-	-	-	6,6 - 8,7	-	-	0,7 3)	3,6
	10	-	-	-	-	-	7,1 - 8,8	-	-	0,7 3)	3,6
	11	-	-	-	-	-	7,7 - 8,8	-	-	0,7 3)	3,6

1600 kg

Section	l_{HT}	Single-girder crane l_{Kr}	Single-girder crane l_w I	Single-girder crane l_w II-L	Single-girder crane l_w II 6)	Single-girder crane l_w III 5)	Double-girder crane l_{Kr}	Double-girder crane l_w I	Double-girder crane l_w II-L	Double-girder crane l_w II	Double-girder crane l_w III 5)
KBK II	2	-	-	-	-	-	1,2 - 1,75	-	-	1,2 3)	3,7
	3	-	-	-	-	-	2,1 - 2,75	-	-	1,1 3)	3,7
	4	-	-	-	-	-	3,0 - 3,75	-	-	1,1 3)	3,7
	5	-	-	-	-	-	3,9 - 4,6	-	-	1,1 3)	3,5
	6	-	-	-	-	-	-	-	-	-	-
KBK II-T	5	-	-	-	-	-	4,0 - 4,75	-	-	0,7 3)	3,5
	6	-	-	-	-	-	5,0 - 5,75	-	-	0,7 3)	3,5
	7	-	-	-	-	-	6,0 - 6,75	-	-	0,7 3)	3,5
	8	-	-	-	-	-	7,0 - 7,5	-	-	0,7 3)	3,3
	9	-	-	-	-	-	-	-	-	-	-
KBK III	2	-	-	-	-	-	-	-	-	-	-
	3	2,3 - 2,7 2)	-	-	1,2 3)	3,8 1)	-	-	-	-	-
	4	3,2 - 3,7 2)	-	-	1,2 3)	3,7 1)	-	-	-	-	-
	5	4,1 - 4,3 2)	-	-	1,2 3)	3,7 1)	3,9 - 4,7	-	-	0,65 3)	3,5
	6	-	-	-	-	-	4,6 - 5,7	-	-	0,65 3)	3,5
	7	-	-	-	-	-	5,4 - 6,7	-	-	0,65 3)	3,4
	8	-	-	-	-	-	6,1 - 7,7	-	-	0,65 3)	3,3
	9	-	-	-	-	-	6,8 - 7,7	-	-	0,65 3)	3,3
	10	-	-	-	-	-	7,3 - 7,7	-	-	0,6 3)	3,3
	11	-	-	-	-	-	-	-	-	-	-

Planning

202976K3.p65/310505

1) Two end carriages on each side of crane
2) Double trolley unit
3) Quadruple trolley end carriages on each side of crane
4) Quadruple trolley unit
5) Suspension fitting, KBK III/M20
6) Crane suspension eye, KBK III (Note: traverse width)

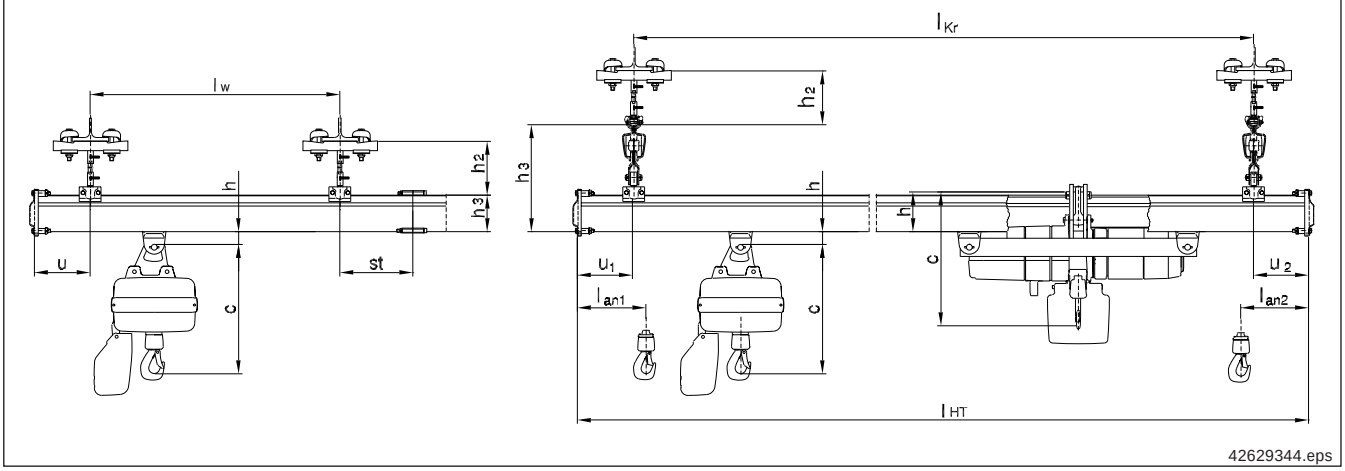
Crane girder section, crane girder length

Section	l_{HT}	800 kg								1000 kg							
		Single-girder crane				Double-girder crane				Single-girder crane				Double-girder crane			
		l_{Kr}	l_w			l_{Kr}	l_w			l_{Kr}	l_w			l_{Kr}	l_w		
			II-L	II	III		II-L	II	III		II-L	II	III		II-L	II	III
KBK I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KBK II-L	1	0,7 - 0,7 2)	2,4 1)	3,6 1)	6,2	-	-	-	-	0,6 - 0,75 2)	2,2 1)	3,3 1)	5,8	-	-	-	-
	2	1,7 - 1,75 2)	2,3 1)	3,4 1)	6,0	-	-	-	-	1,6 - 1,75 2)	2,1 1)	3,2 1)	5,6	-	-	-	-
	3	2,6 - 2,7 2)	2,2 1)	3,4 1)	6,0	2,2 - 2,75	2,4	3,6	6,2	-	-	-	-	2,4 - 2,75	2,2	3,2	5,5
	4	-	-	-	-	3,0 - 3,75	2,3	3,5	6,0	-	-	-	-	3,6 - 3,75	2,2	3,2	5,5
	5	-	-	-	-	3,8 - 4,75	2,3	3,4	5,9	-	-	-	-	3,8 - 4,5	2,0 3)	2,9 3)	5,2
	6	-	-	-	-	4,5 - 5,2	2,3	3,3	5,8	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KBK II	1	0,6 - 0,75 2)	2,3 1)	3,4 1)	6,0	-	-	-	-	0,6 - 0,75 2)	2,0 1)	3,1 1)	5,25	-	-	-	-
	2	1,6 - 1,75 2)	2,2 1)	3,4 1)	6,0	-	-	-	-	1,6 - 1,75 2)	2,0 1)	3,1 1)	5,25	-	-	-	-
	3	2,65-2,75 2)	2,2 1)	3,3 1)	5,8	2,1 - 2,75	2,3	3,4	6,0	2,5 - 2,75 2)	2,0 1)	3,1 1)	5,25	2,3 - 2,75	2,2	3,1	5,4
	4	3,45-3,75 2)	2,2 1)	3,3 1)	5,7	2,9 - 3,75	2,3	3,3	5,8	3,4 - 3,5 2)	2,0 1)	3,1 1)	5,25	3,5 - 3,75	2,2	3,0	5,2
	5	-	-	-	-	3,6 - 4,75	2,2	3,2	5,7	-	-	-	-	3,8 - 4,75	2,0 3)	3,0 3)	5,2
	6	-	-	-	-	4,4 - 5,75	2,1 3)	3,1 3)	5,5	-	-	-	-	4,8 - 5,75	2,0 3)	3,0 3)	5,2
	7	-	-	-	-	5,1 - 6,75	2,1 3)	3,1 3)	5,5	-	-	-	-	5,6 - 6,2	1,9 3)	3,0 3)	5,2
	8	-	-	-	-	6,7 - 7,2	2,1 3)	3,1 3)	5,5	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KBK II-T	4	-	-	-	-	-	-	-	-	3,4 - 3,75 2)	1,8 1)	3,0 1)	5,1	-	-	-	-
	5	4,25-4,75 2)	2,0 1)	3,2 1)	5,6	-	-	-	-	4,4 - 4,75 2)	1,8 1)	3,0 1)	5,1	-	-	-	-
	6	5,0 - 5,75 2)	2,0 1)	3,1 1)	5,5	-	-	-	-	5,5 - 5,75 2)	1,7 3)	3,0 3)	5,1	-	-	-	-
	7	5,8 - 6,75 2)	2,0 1)	3,0 1)	5,4	-	-	-	-	5,9 - 6,5 2)	1,7 3)	2,7 3)	5,0	6,0 - 6,75	-	2,8 3)	4,7
	8	-	-	-	-	7,0 - 7,75	2,0 3)	3,0 3)	5,5	-	-	-	-	7,0 - 7,75	-	2,8 3)	4,7
	9	-	-	-	-	8,0 - 8,75	2,0 3)	3,0 3)	5,5	-	-	-	-	8,0 - 8,75	-	2,7 3)	4,5
KBK III	4	3,6 - 3,7	-	3,0 1)	5,5	-	-	-	-	3,45 - 3,7	-	3,0 3)	5,1	-	-	-	-
	5	4,4 - 4,7	-	3,0 1)	5,4	-	-	-	-	4,3 - 4,7	-	2,9 3)	5,0	-	-	-	-
	6	5,2 - 5,7	-	2,9 1)	5,3	-	-	-	-	5,2 - 5,7	-	2,7 3)	5,0	-	-	-	-
	7	6,0 - 6,7	-	2,9 1)	5,2	5,0 - 6,7	-	2,6 3)	4,6	6,0 - 6,3	-	-	5,0	5,0 - 6,7	-	2,6 3)	4,5 5)
	8	6,65 - 7,4	-	2,9 1)	5,2	5,6 - 7,7	-	2,6 3)	4,6	-	-	-	-	5,6 - 7,7	-	2,5 3)	4,4 5)
	9	-	-	-	-	6,2 - 8,7	-	2,6 3)	4,6	-	-	-	-	6,2 - 8,7	-	2,5 3)	4,3 5)
	10	-	-	-	-	6,5 - 9,7	-	2,5 3)	4,5 5)	-	-	-	-	6,8 - 9,1	-	1,5 3)	4,2 5)
	11	-	-	-	-	7,0 - 10,0	-	2,0 3)	4,4 5)	-	-	-	-	7,4 - 9,1	-	1,5 3)	4,1 5)
	12	-	-	-	-	8,0 - 10,0	-	1,5 3)	4,3 5)	-	-	-	-	8,4 - 9,1	-	1,0 3)	3,8 5)
	13	-	-	-	-	9,0 - 10,0		1,5 3)	4,2 5)	-	-	-	-	8,9 - 9,1	-	0,8 3)	3,8 5)
	14	-	-	-	-	10,0 - 10,0	-	1,5 3)	4,2 5)	-	-	-	-	-	-	-	-

Section	l_{HT}	2000 kg					2500 kg			3200 kg		
		Single-girder crane			Double-girder crane			Single-girder crane			Double-girder crane	
		l_{Kr}	l_w		l_{Kr}	l_w		l_{Kr}	l_w		l_{Kr}	l_w	
			II 6)	III 5)		II	III 5)		II	III 5)		II	III 5)
KBK II	2	-	-	-	1,2 - 1,75	0,65 3)	3,2	-	-	-	-	-	-
	3	-	-	-	2,1 - 2,75	0,65 3)	3,2	-	-	-	-	-	-
	4	-	-	-	3,0 - 3,65	0,65 3)	3,2	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-
KBK II-T	5	-	-	-	4,0 - 4,75	0,65 3)	3,0	-	-	-	-	-	-
	6	-	-	-	5,0 - 5,75	0,65 3)	3,0	-	-	-	-	-	-
	7	-	-	-	6,0 - 6,75	0,65 3)	3,0	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-
KBK III	2	1,3 - 1,7 2)	1,0 3)	3,2 1)	-	-	-	1,2 - 1,7	-	1,4 3)	1,2 - 1,7	-	1,3 3)
	3	2,3 - 2,7 2)	1,0 3)	3,2 1)	-	-	-	2,2 - 2,7	-	1,4 3)	2,1 - 2,7	-	1,3 3)
	4	3,2 - 3,6 2)	1,0 3)	3,2 1)	3,0 - 3,7	-	1,5	3,1 - 3,7	-	1,3 3)	3,1 - 3,7	-	1,3 3)
	5	-	-	-	3,9 - 4,7	-	1,5	3,9 - 4,7	-	1,3 3)	4,0 - 4,2	-	1,3 3)
	6	-	-	-	4,8 - 5,7	-	1,5	4,8 - 5,4	-	1,3 3)	-	-	-
	7	-	-	-	5,8 - 6,6	-	1,5	-	-	-	-	-	-
	8	-	-	-	6,2 - 6,6	-	1,5	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-

3.9 Structural dimensions for monorail tracks and cranes

Suspension monorail | Single-girder crane | Double-girder crane



The lifting height of double-girder cranes is higher than that of single-girder cranes, since the hoist is mounted between the two crane girders.

Structural dimension h_2 mm (suspension from I-beam superstructure with upper suspension bracket)								
KBK	Short suspension fitting		Length of suspension rod for spring clip					
	without height adjustment	with spring clip	80	100	300	600	1000	3000
100	60	100	155	-	375	675	1075	-
I	55	95	150		370	670	1070	
II, II-L	110	140	-	220	420	720	1120	3120
III	-	120		200	400	700	1100	3100
III / M20	-	-		200	400	700	1100	-

l_W, l_{Kr}, l_{HT} see diagram in (section 3.1) and selection tables (section 3.5/3.6)

u, st, l_{an} according to design layout and individual dimensions of components

Structural dimension h_3 mm																									
		Cranes																						Single-track monorail				
KBK runway		100			I				II-L				II					III			KBK				
KBK carne girder		100	I	II-L	100	I	II-L	II	100	I	II-L	II	100	I	II-L	II	III	II-L	II	III	100	I	II-L	II	III
Crane trolleys	single	242	272	337	272	302	367	397	320	350	415	445	350	380	445 2)	475 2)	541 3)	511 3)	541 3)	612 3)	65	100	150	180	246
	double	252	282	347	282	312	377	407	335	365	430	460	365	395	460 2)	490 2)	556	1)							
	quadruple	-			-	375	440	470	-				-				1)	1)							

1) Calculation based on individual components necessary

2) This also applies to rigid crane traverses

3) Rigid crane traverses +20

Structural dimension h mm (to top edge of pin)							
Cranes and monorail tracks							
KBK		100	I	II-L	II	II, 2000 kg	III
Hoist trolleys	single	41	38	35		-	35
	double	51	48	50			118
	quadruple	-	100	-			-
	double-girder crab frame	-100	-105	-150	-190	-180	-215

Dimension c = Hoist headroom dimension

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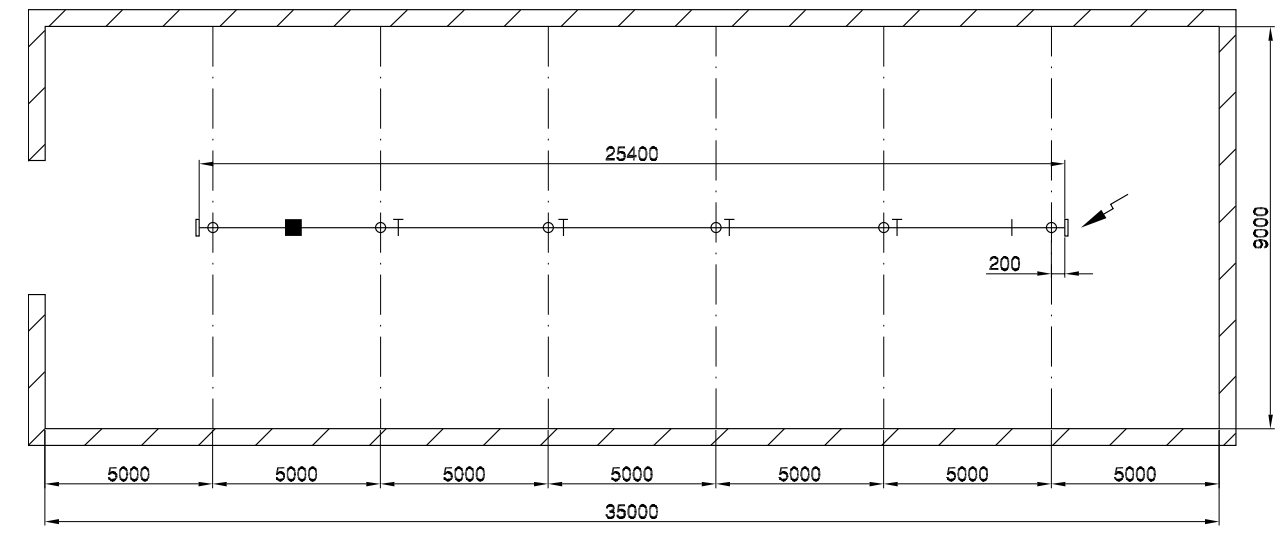
Planning

3.10 Project examples

Suspension monorail



Project

A monorail track, SWL 1000 kg, is to be fitted into the building layout shown above.

The track can be suspended from the IPE 300 superstructure. The beams are spaced 5 m apart and at a height of 4 m from lower edge of beam to floor). Special requirements include a lifting height of 3 m, precise lifting of loads. control pendant suspended from trolley, load to be lifted electrically.

Solution

1.1 Load K on the track girder

Weight on hook including load handling attachment	1000 kg
Weight of hoist DKUN 5-500 V1 2/1 F4	approx. 50 kg
Weight of trolley including DRF 200 (KBK III)	44,2 kg
	K_{Ges} = 1094,2 kg

1.2 Spacing of supports 1_w as per diagram

For the value of K_{Ges} = 1094,2 kg, the diagram shows a spacing between supports of l_w = 5,7 m for the KBK III track section.
Selected: l_w = 5 m = Distance between roof trusses

1.3 Permissible distance st of joint from suspension fitting

st min. = 155 mm; st max. = 0,2 5 m = 1 m; selected: 0,2 m

1.4 Length of track overhang u

For KBK III:

minimum track overhang	=	155 mm
maximum track overhang	=	200 mm
selected u	=	200 mm

1.5 Load G_{AB} on one suspension fitting

$G_{AB} = K_{Ges} + G_B \cdot l_w \cdot 1{,}25$
= 1094,2 kg + 28,4 kg/m · 5 m · 1,25 = 1271,7 kg ≤ 1700 kg

1.6 Suspension

LE girder to floor dimension	4,000 mm
– required hook path	approx. – 3000 mm
– Dimension c for DK 5 V1 – F4	– 465 mm
– Dimension h + h_3 = 35 + 246 =	– 281 mm
	h_2 = 254 mm

Selected: 100 mm suspension rod: h_2 = 200 mm
This results in a hook path of 3054 mm; a chain hoist with a hook path of 3 m must be ordered.

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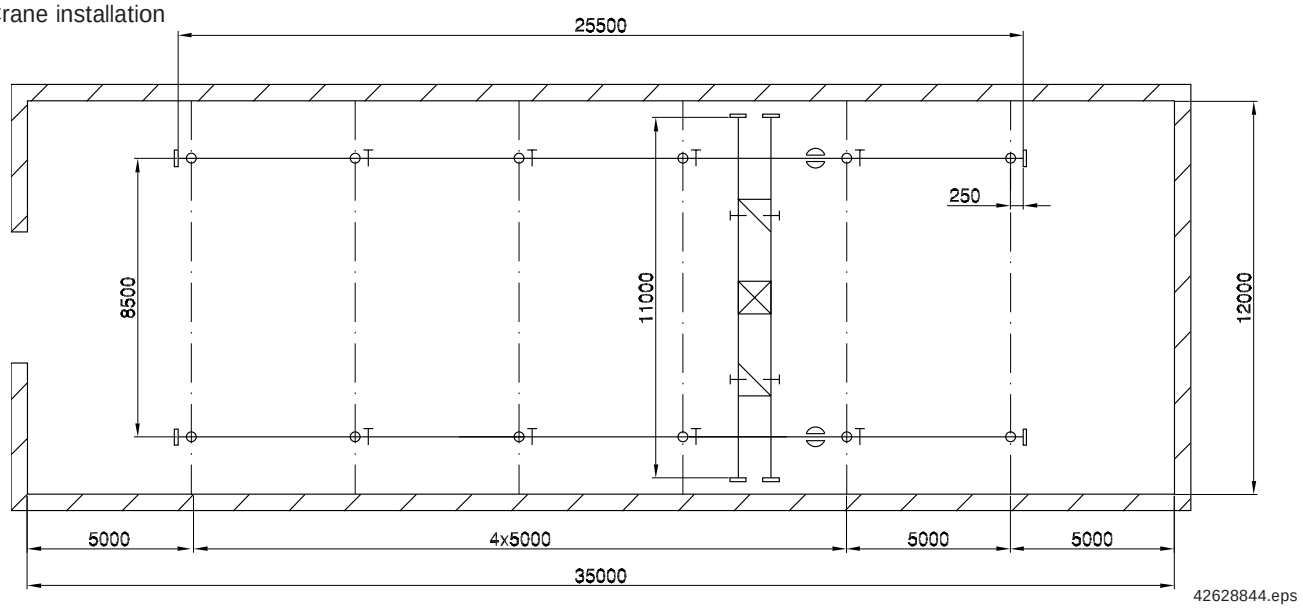
Crane installation



Project

A crane installation for an SWL of 250 kg is to be fitted inside a building that utilises the entire floor area as effectively as possible.
The other conditions are practically the same as those in the monorail track example.

Solution

Crane according to the selection table for KBK single and double-girder cranes. Electric travel drives are required for the crane girder. Push travel trolley. KBK II double-girder crane girder length 11 m.

Span l_{Kr} = 8 – 8,8 m, selected: 8,5 m
Distance between supports l_w = Distance between roof trusses = 5 m
Load on suspension fitting $G_{AB} = K_{Ges}+G_B \cdot l_w \cdot 1{,}25$; where $K_{Ges} = G_H+G_3+0{,}8\,(G_1+G_2)$

G_H =	SWL	250 kg
G_1 =	2 x straight sections of 7 m	238 kg
	4 x straight sections of 2 m	136 kg
	2 x internal buffer stops	0,4 kg
	4 x end caps with buffers	2,4 kg
	2 x bracing frames	22 kg
	4 x joint bolt sets	1,6 kg
		400,4 kg
G_3 =	1 x DKUN1-125 KV1 2/1 F4 hoist	17 kg
	1 x crab frame	19,6 kg
	4 x trolleys	8 kg
		44,6 kg
G_2 =	2 x trolley combinations	21,4 kg
	2 x friction wheel travel drives	57 kg
	4 x crane girder suspension fittings	4,8 kg
	Electrical equipment	approx. 10 kg
		93,2 kg

K_{Ges} = 250 kg + 44,6 kg + 0,8 (400,4 kg + 93,2 kg) = 689,48 kg

Thus

G_{AB} 689,48 kg + 17 kg/m · 5 m · 1,25 = 795,73 kg ≤ 1700 kg

Available hook path

LE girder to floor dimension	4,000 mm
Dimension c for DKUN1-125 KV1 2/1 F4	– 410 mm
Dimension h	+ 190 mm
Dimension h_3	– 475 mm
Dimension h_2 with 100 mm suspension rod	– 220 mm
	3,085 mm

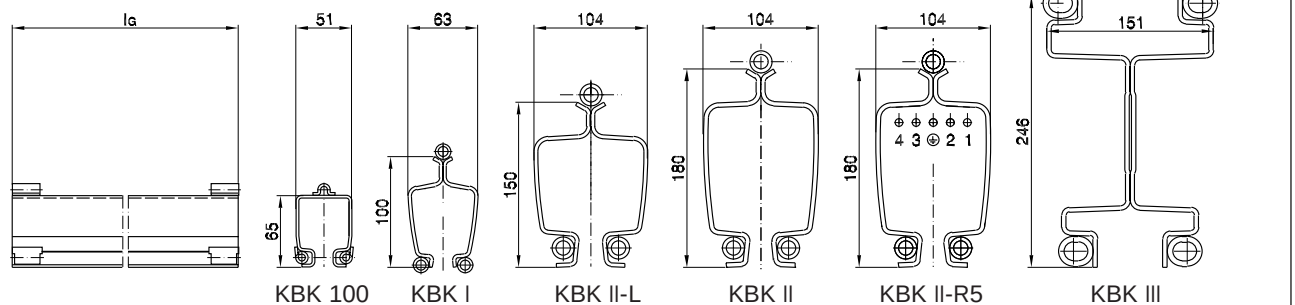
The chain hoist can be ordered with a hook path of 3 m.

4 Basic components for monorail track, crane runway, crane girder

4.1 Crane and track elements

(item 1)

4.1.1 Straight sections



Length l_G	KBK 100		KBK I		KBK II-L		KBK II		KBK II-R		KBK III	
	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.
1000 mm	4,1	984 701 44	6,4	980 224 44	13,2	984 201 44	17	982 224 44	18,2	873 551 44	28,4	850 211 44
2000 mm	8,2	984 702 44	12,8	980 226 44	26,4	984 202 44	34	982 226 44	36,4	873 552 44	54,1	850 212 44
3000 mm	12,3	984 703 44	19,2	980 228 44	39,6	984 203 44	51	982 228 44	54,6	873 553 44	79,8	850 213 44
4000 mm	16,4	984 704 44	25,6	980 230 44	52,8	984 204 44	68	982 230 44	72,8	873 554 44	105,5	850 214 44
5000 mm	20,5	984 705 44	32	980 232 44	66	984 205 44	85	982 232 44	91	873 555 44	131,2	850 215 44
6000 mm	24,6	984 706 44	37,8	980 286 44	79,2	984 206 44	102	982 234 44	109,2	873 556 44	156,9	850 216 44
7000 mm	-		-		92,4	984 207 44	119	982 236 44	127,4	873 557 44	182,6	850 217 44
8000 mm	-		-		105,6	984 322 44	132	982 235 44	145,6	873 558 44	208,3	850 218 44

l_G special length; KBK 100 min. 120 mm; KBK I min. 150 mm; KBK II-L/II/II-R min. 300 mm; KBK III min. 400 mm. Special lengths up to max. standard length possible.
KBK I special length 20 ft. (6096 mm), Part. no. 980 287 44.

The ends of KBK straight track sections, special cold-rolled profiles (to DIN 59413) are fitted with three or, in the case of KBK III, four tube sections for bolting the individual track sections together or for fitting the end cap with buffer.

KBK II-R straight track sections are fitted with five internal busbars (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.

KBK II-R straight sections without protective earth conductor on application.

KBK III can be fitted with max. 5 DEL busbars on each side.

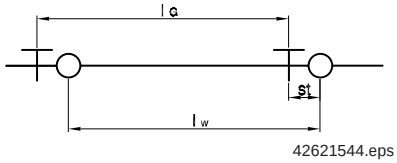
Type of enclosure

IP 23 to DIN 40050. In the KBK II-R model, the centrally arranged, green-yellow busbar is the protective earth conductor. In the KBK III version, the protective earth conductor is always on one and the same side. Its position in monorail track installations must be accurately planned throughout the track system.

Designation of busbars

1 = L 1 3 = L 3 4 = control
2 = L 2 ⏚ = PE 5 - 7 (9) = KBK III control cable

Suspension fittings and joints



For installations including isolating sections or power pick-up guides, the busbar arrangement must be shown in the drawing.

Finish: standard version powder-coated, red (RAL 2002)

Special designs, e.g. for outdoor operation, on request.

For distance between supports l_W and for the distance st of joint from suspension fitting, see section 3.5.

Use of KBK II-L

For KBK II-L monorail tracks, the curved sections, track switches, turntables, drop sections and latching devices are of the KBK II type, see adapter joint bolt set in section 4.2.

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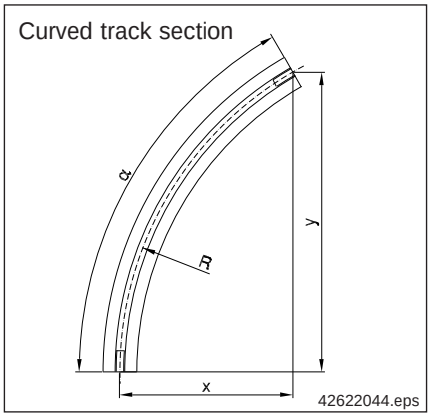
4.1.2 Curved track sections (item 4)



Curved track sections are built up in the same manner as straight track sections. KBK II curved track sectionsare used for KBK II-L installations. In such cases, the adapter joint bolt set is required, see section 4.2.

Special angles: Intermediate sizes available on application.

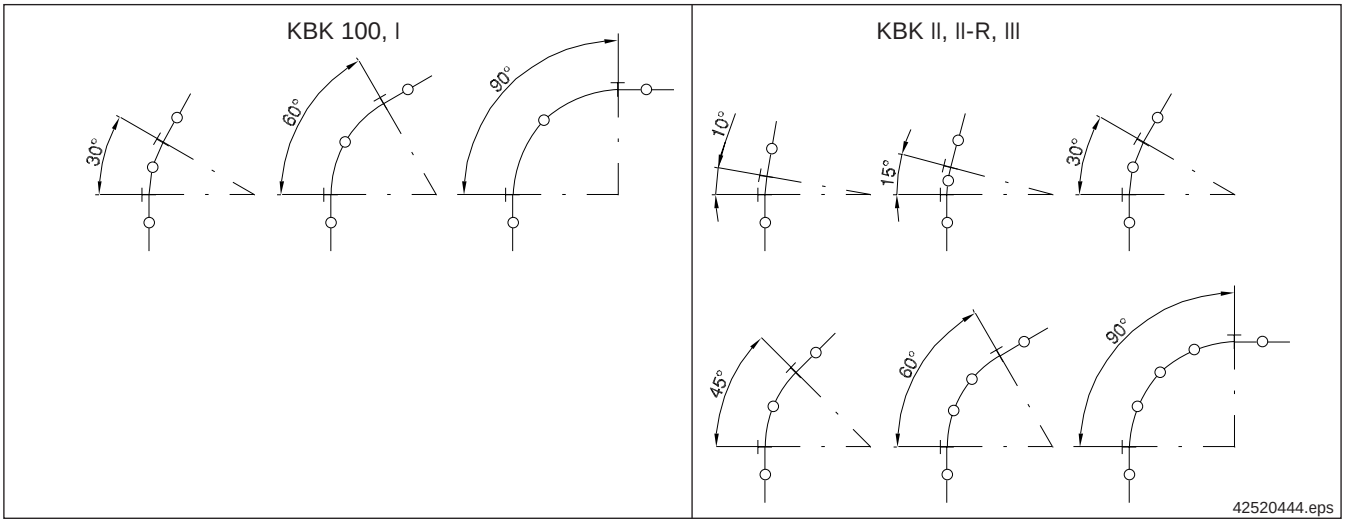
Special radii (greater than the standard radius) are obtained by approximation using curved and straight track sections (polygon formation).

		Angle	Dimensions in mm		Weight	Part no.
		α	x	y	approx. kg	
KBK 100	R = 650	30°	85	325	1,4	984 671 44
		60°	325	565	2,8	984 672 44
		90°	650	650	4,2	984 673 44
KBK I	R = 750	30°	100	375	2,5	980 233 44
		60°	375	650	5	980 235 44
		90°	750	750	7,5	980 237 44
KBK I	R = 1000	30°	135	500	3,5	980 391 44
		60°	500	865	6,7	980 392 44
		90°	1000	1000	10	980 393 44
KBK II	R = 1500	10°	25	260	4,9	982 380 44
		15°	50	390	7,1	982 384 44
		30°	200	750	13,7	982 388 44
		45°	440	1060	20,3	982 392 44
		60°	750	1300	26,9	982 396 44
		90°	1500	1500	41	982 400 44
KBK II-R	R = 1500	10°	25	260	5,2	873 580 44
		15°	50	390	7,6	873 584 44
		30°	200	750	14,6	873 588 44
		45°	440	1060	21,7	873 592 44
		60°	750	1300	28,8	873 596 44
		90°	1500	1500	43,5	873 578 44
KBK III	R = 1500	30°	200	750	21,5	850 388 44
		45°	440	1060	31,5	850 392 44
		60°	750	1300	41,5	850 396 44

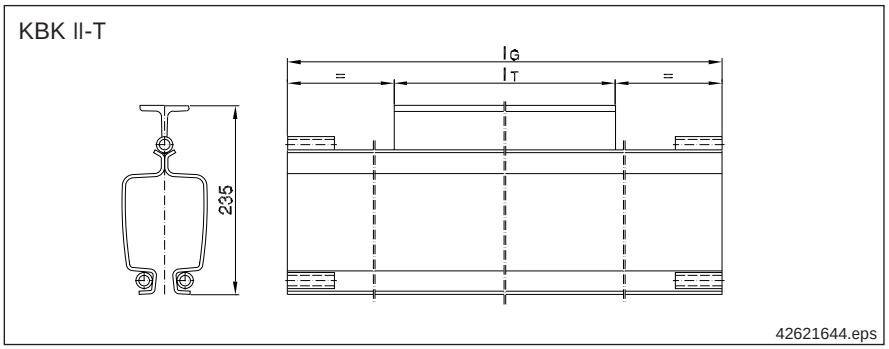
Finish: standard version powder-coated, red (RAL 2002)

How to support curved track sections

Curved track sections must be supported in the centre by one suspension fitting; one further suspension fitting must be arranged close to each joint.



4.2 KBK II-T crane girder



KBK II-T profile sections are used for higher load capacities and larger spans for cranes (not tracks). For selection of cranes, see the crane selection table for KBK single and double-girder cranes in section 3.8. For double-girder cranes constructed from assembled girders, see section 3.5. KBK II-T straight track sections can be combined with other KBK II components. KBK II-T in special lengths and with enclosed busbars (KBK II-T-R) on application.

Finish: red (RAL 2002)

Length l_G mm	Length l_T mm	Weight approx. kg	Part no.
4000	2000	81	984 221 44
5000	3000	104	984 222 44
6000	4500	131	984 223 44
6000 1)	5400	136	984 224 44
7000	5000	151	984 225 44
7000 1)	6000	157	984 226 44

1) Middle straight section l_{G2} according to table for double-girder cranes constructed from assembled girders.

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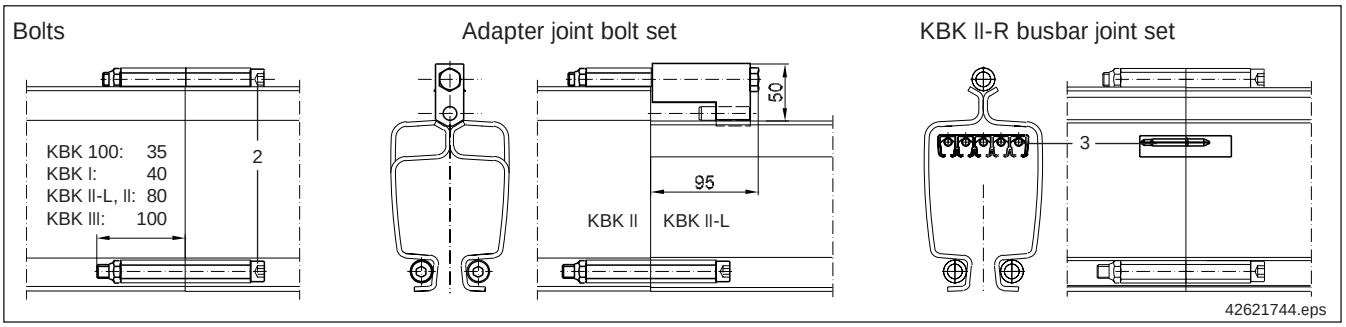
4.3 Bolts

Joint bolt set (item 2)
Busbar connection (Part no. 3)



Item no.		KBK 100		KBK I		KBK II-L, II		KBK II-R		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.
2	Joint bolt set cpl.	0,05	984 558 44	0,1	980 273 44	0,44	982 273 44	0,44	982 273 44	1,3	850 258 44
	Adapter joint bolt set cpl.	-		-		1,06	984 258 44	-		-	
3	Busbar joint set cpl.	-		-		-		-	873 649 44	-	

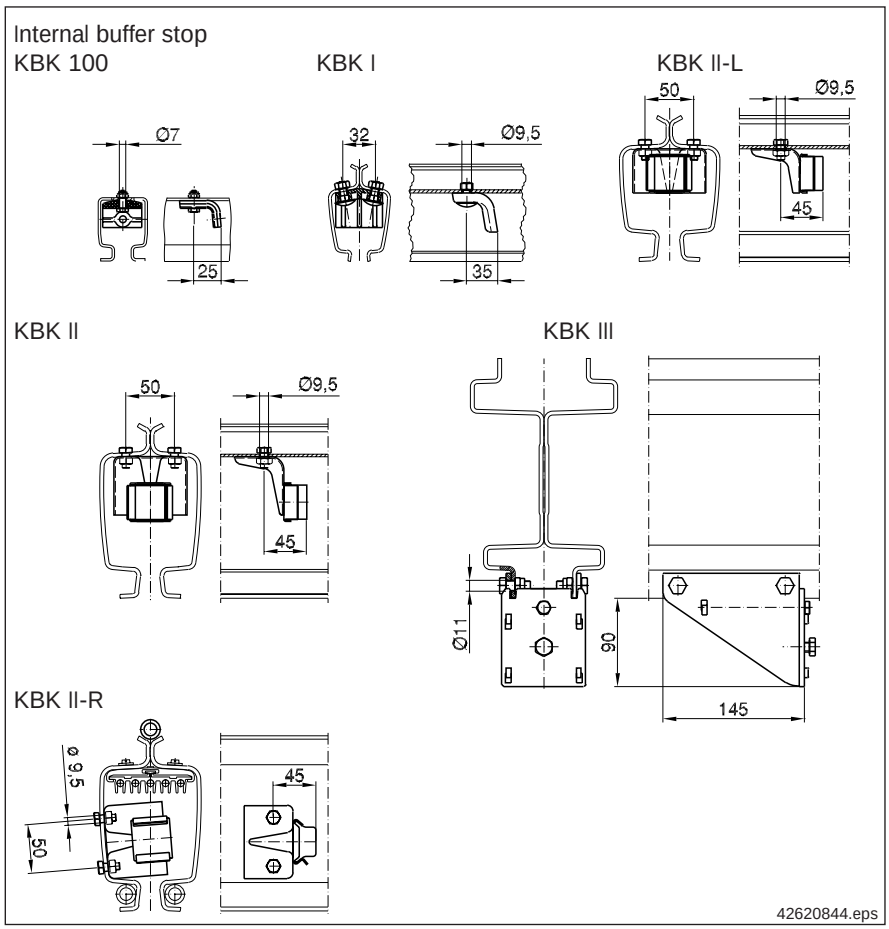
The joint bolt set for one track joint consists of three or (in the case of KBK III) four high-tensile socket head bolts with self-locking nuts. The connection is a positive and friction connection. An adapter joint bolt set is used for connecting KBK II-L straight sections with KBK II track sections.

Finish: joint bolt set zinc-galvanized connection, adapter red (RAL 2002)

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

4.4 Internal buffer stop

(item 6)



Item no.		KBK 100		KBK I		KBK II-L		KBK II		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.
6	Internal buffer stop	0,04	984 545 44	0,05	980 130 44	0,2	984 355 44	0,2	982 120 44	1,3	850 360 44

The internal buffer stop is fitted as a means of protection for accumulated cable sliders, and in the case of KBK II-L/II for cable trolleys or for limiting crane or hoist trolley travel. Drill holes in the top of the track section to secure the internal buffer stop.

The KBK III internal buffer stop is fitted in the lower portion of the section.

If an internal buffer stop (982 120 44) is required in the KBK II-R section, this is fitted inside on the lateral wall of the section.

A buffer is fitted in both rails of double rail systems and double-girder cranes.

Finish:

KBK 100, KBK I: plastic, black

KBK II-L, KBK II: steel, zinc-galvanized

KBK III steel, without buffer element (see section 14)

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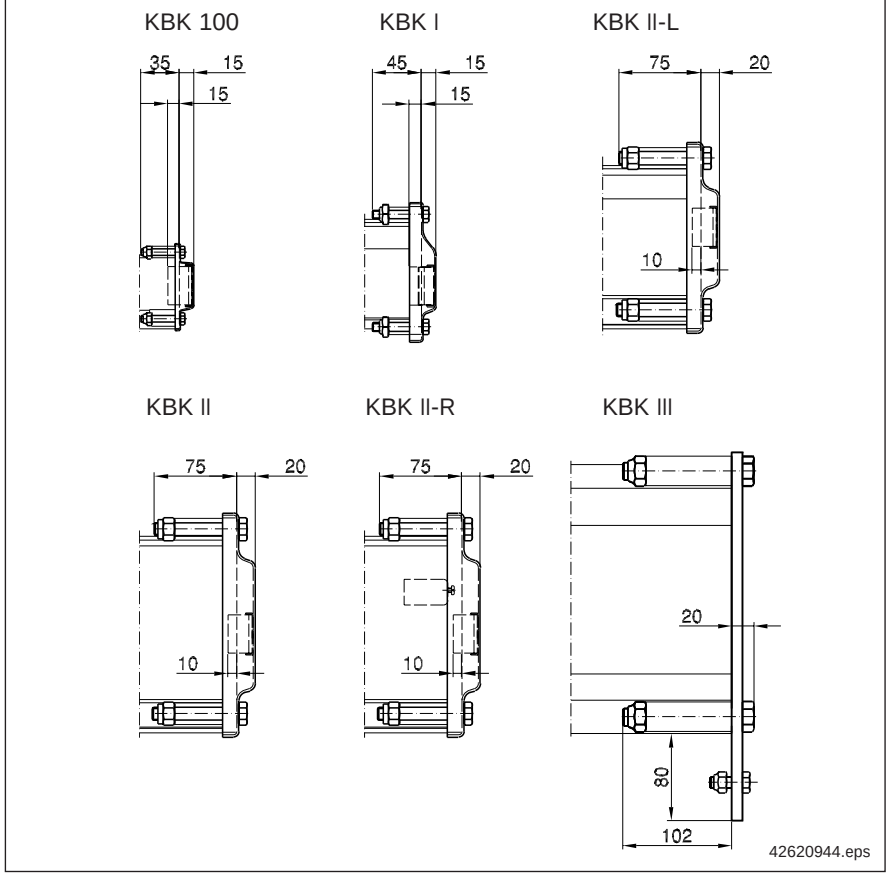
4.5 End cap with buffer

(item 7)

End cap with buffer



Item no.		KBK 100		KBK I		KBK II-L		KBK II		KBK II-R		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.
7	End cap with buffer	0,1	984 540 44	0,1	980 126 44	0,5	984 126 44	0,6	982 126 44	0,7	873 611 44	4,6	850 126 44

A cap with a buffer is fitted as a termination for tracks or crane girders. The KBK II-R end cap with buffer is fitted with an additional end cap for the busbars.

End caps must not be approached in normal operation.

Finish:

KBK 100, I, II-L, II, steel, galvanized

KBK III steel, red (RAL 2002),

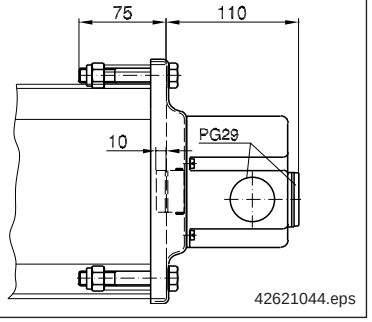
zinc-galvanized without buffer elements (see section 14)

4.6 KBK II-R components

Item no.	Designation KBK II-R components	KBK II-R	
		Weight approx. kg	Part no.
8	Power feed end caps	0,8	873 605 44
9	Centre power feed section	20,1	873 615 44
10	Power pick-up guide	0,1	873 650 44

Power feed end cap (item 8)

End power feed



The end power feed cap is used for power supply to the end of a KBK II-R section. It consists of a cap with rubber pad and a terminal box with a Pg 29 twist-type cable entry gland (max. connecting cable conductor cross section 10 mm², flexible). The power feed end cap is supplied preassembled with attached plug connectors and jumper wires. Power feed end caps without protective earth conductor available on application.

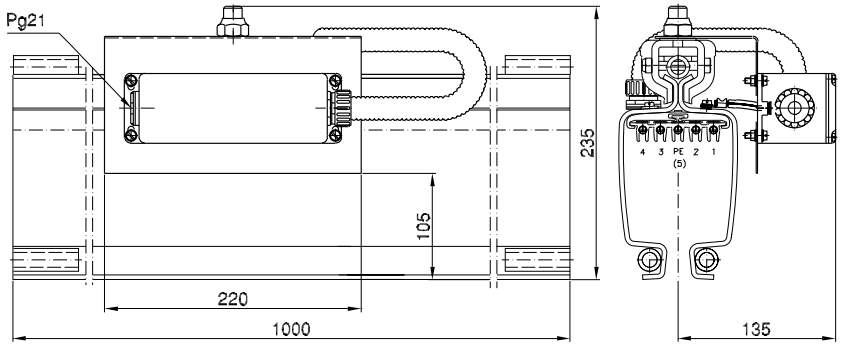
Finish: cap zinc-galvanized, terminal box, red plastic

Runway powerfeed (item 9)

The KBK II-R centre power feed section is straight section, 1000 mm in length, fitted with four or five busbars and a ready-wired terminal box with a Pg21 twist-type cable entry gland (max. connecting cable conductor cross section 10 mm²). This component is used for feeding power to closed-circuit tracks or as an additional feed point in the case of long tracks for avoiding an excessive voltage drop. The terminal box can be easily mounted on either side, as required. Track switches and turntables may also be used as power feed points. Curved track sections fitted for centre power feed, and straight centre power feed sections of up to max. 7 m length available on application.

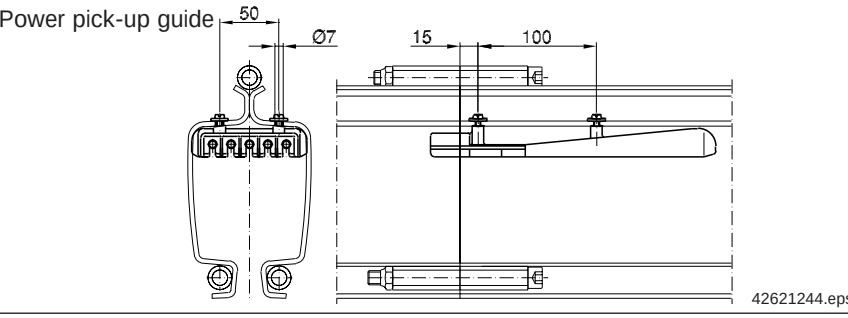
Finish: red (RAL 2002)

Runway powerfeed



Power pick-up guide (item 10)

Power pick-up guide



Where, with push travel trolleys, electrification is required only for the operation of electric hoists in certain parts of the KBK installation, power pick-up guides are fitted to the appropriate track sections for easy passage of collector trolleys from KBK II to KBK II-R (or vice versa). Power pick-up guides can only be fitted to straight track sections. KBK II or KBK II-R straight sections with ready-mounted power pick-up guide and busbars are available on application.

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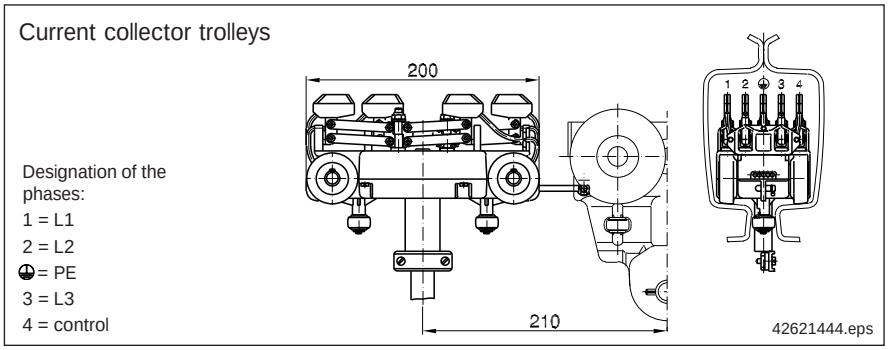
Current collector trolleys (item 12)



Item no.	Designations KBK II-R component		KBK II-R	
			Weight approx. kg	Part no.
12	Collector trolley	4-poles	1,5	873 684 44
		5-poles		873 685 44

For safe current collection, the 4 or 5-pole KBK II-R collector trolley is fitted. For each busbar, two sliding carbon contacts are mounted on individually spring-loaded double pantographs. The cable supplied for connecting up is 2 m long.
Maximum load: 15 A at 100 % CDF.

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

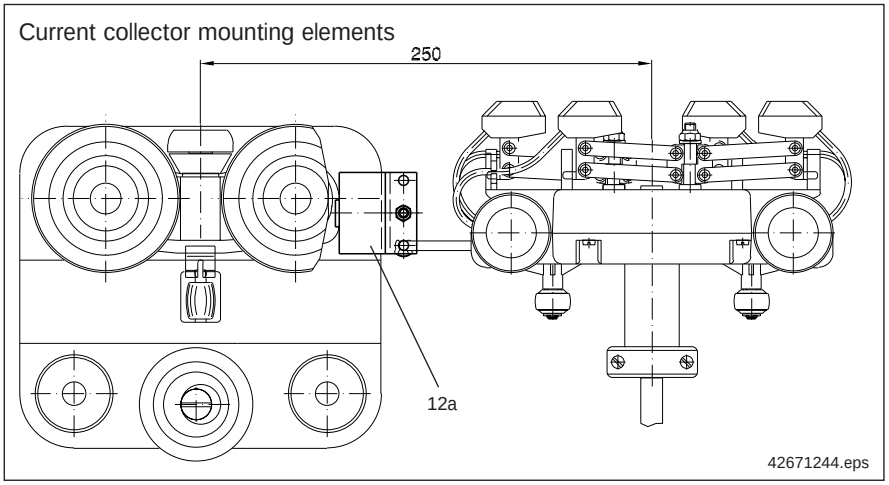
Important: The 4-pole current collector trolley may only be used in 4-pole (old) installations.

Please note

The collector trolley is always arranged to run between two KBK II trolleys to protect it against collisions.

Current collector trolley without protective earth conductor available on application.

KBK II ergo current collector mounting elements (item 12a)



Current collector mounting elements are used to connect the current collector trolley to KBK II ergo trolleys, see KBK ergo document 203 309 44.

Finish: galvanized

Item no.	Designation	Weight approx. kg	Part no.
12a	Current collector mounting element	0,1	851 125 44

4.7 Maintenance sections

General

A collector trolley maintenance section facilitates the fitting, removal and maintenance of trolleys and collector trolleys; it should be incorporated in monorail tracks of considerable length or of closed-circuit layout, and in crane runways for more than two electrically powered cranes.

Monorails with several travelling hoists should be provided with a maintenance branch track, incorporating a maintenance section, connected to the main track via a track switch.

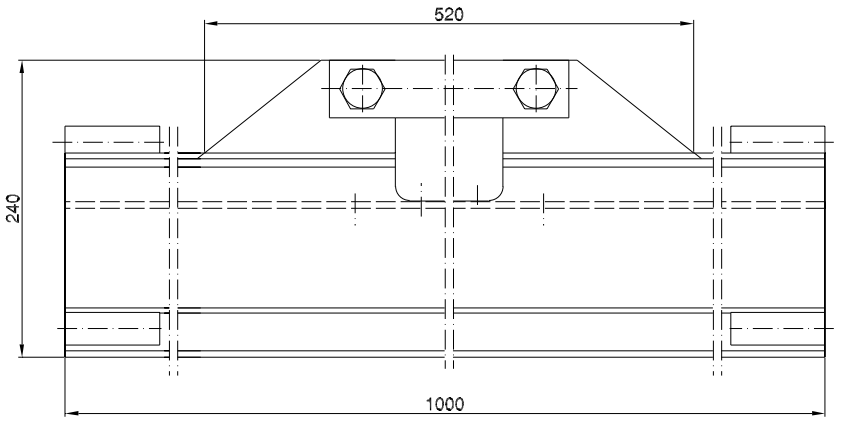
Collector trolley maintenance section (item 11)

This straight track section of 1000 mm in length fitted with five internal busbars features a stiffener bar and cover that can be removed to provide access to trolleys through an opening in the track. This enables collector trolleys to be replaced.

Straight sections up to max. 7 m long available on application.

Finish: red (RAL 2002)

Maintenance section



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Item no.	Designation KBK II-R components	KBK II-R	
		Weight approx.kg	Part no.
11	Collector trolley maintenance section	19,1	873 665 44

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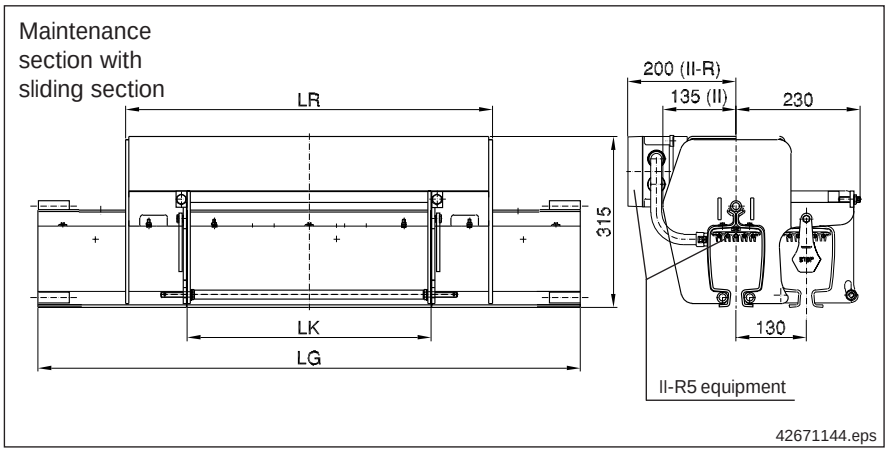
Maintenance section with sliding section

(item 11)

Maintenance sections are used for fitting and removing travel units. The sliding section releases rail ends on both sides which can be used as erection openings. **Remove the load and disconnect installations featuring KBK II-R from the power supply.** Maintenance sections can bear loads when closed.



	Dimensions in mm				Weight [kg]	Part no.
	L_G	LK	LR	Max. crab length		
KBK II	1000	450	676	420	48	on request
	2000	800	1026	770	76	
KBK II-R	1000	450	676	420	51	
	2000	800	1026	770	80	

Special lengths on request; sliding section on one side at rail end; L_G up to 8000 mm

Suitable for: KBK II; II-L with II-R adapter

Fitting and suspension:
Maintenance sections are fitted in the same way as normal track sections. Suspensions can be fitted on either side of the sliding section – suspension dimension h_2 min. 140 mm

When short, adjustable suspensions are used, the upper structure must face the rail.

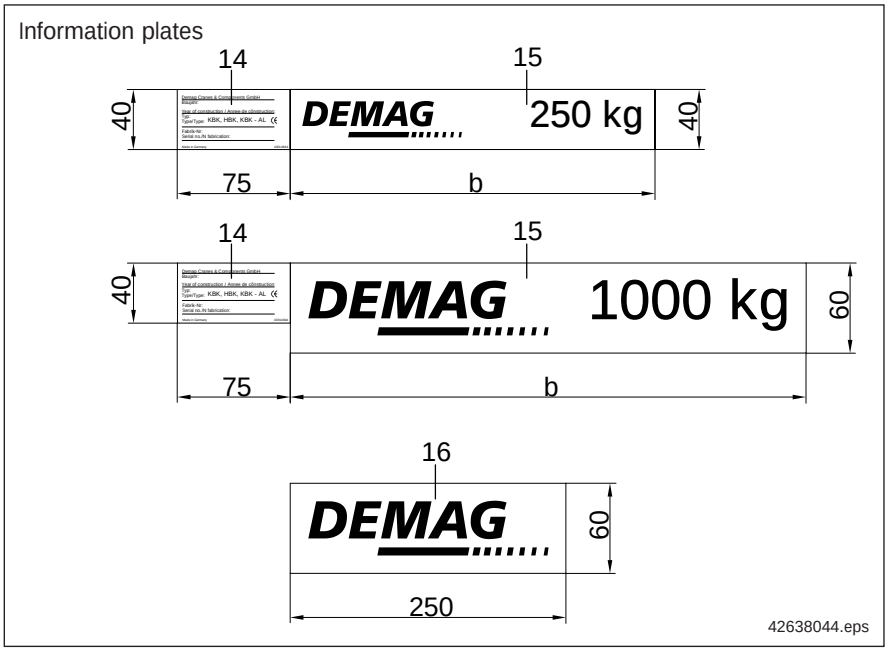
Fittings:
KBK II without conductors

KBK II-R with conductors and terminal box – can be used for power feed

Finish: red (RAL 2002)

4.8 Information plates

Manufacturer's plate (item 14)
Capacity plate (item 15)
Demag name plate (item 16)



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

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

In the case of section sizes of KBK II and higher, the use of 60 mm high capacity plates is recommended.

Finish:

Manufacturer's plate of self-adhesive aluminium foil

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

Item no.		SWL	40 mm high version		40 mm high version	
		in kg	b in mm	Part no.	b in mm	Part no.
14	Manufacturer's plate	-	75	980 149 44	75	980 149 44
15	Capacity plate	50	211	980 150 44	-	-
		80	211	980 139 44	-	-
		100	227	980 146 44	-	-
		125	227	980 140 44	-	-
		160	227	980 750 44	-	-
		200	227	980 751 44	-	-
		250	227	980 141 44	344	850 286 44
		315	227	980 752 44	-	-
		400	227	980 753 44	-	-
		500	227	980 142 44	344	850 287 44
		630	227	980 754 44	344	850 288 44
		800	227	980 755 44	344	850 289 44
		1000	243	980 143 44	368	850 290 44
		1250	-	-	368	850 291 44
		1500	-	-	368	-
		1600	-	-	368	850 292 44
		2000	-	-	368	850 293 44
		2500	-	-	368	850 294 44
		3200	-	-	-	on request
16	Demag name plate	-	-	-	250	850 150 44

Intermediate values (load capacity) available on request

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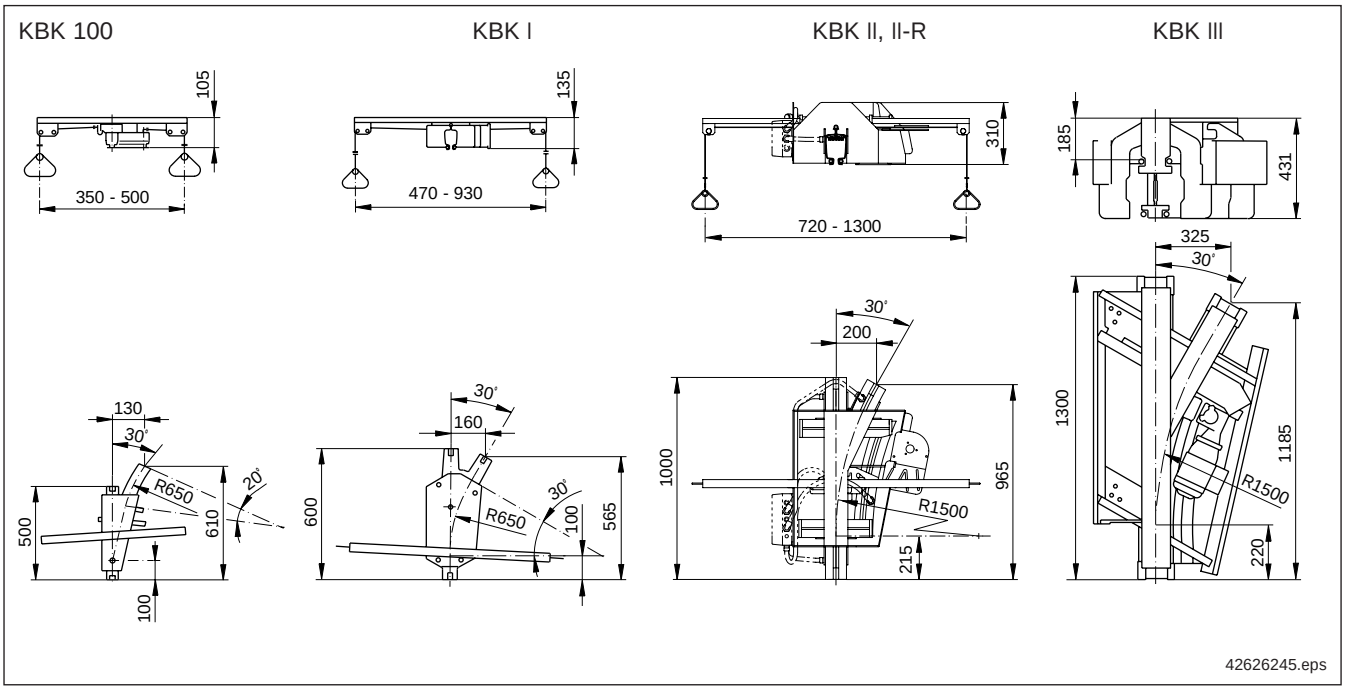
5 Assemblies for suspension monorails

5.1 Track switch

(item 20)

5.1.1 Track switches, dimensions and remarks



Item no.			KBK 100		KBK I		KBK II		KBK II-R		KBK III	
			Turning switch				Sliding switch					
			Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.
20	Track switch, RH (ill.)	manually operated	15	984 620 44	33	980 480 44	97	984 470 44	103	873 952 44	270	850 185 44
	Track switch, LH			984 630 44		980 490 44		984 475 44		873 953 44		850 180 44
	Track switch, RH (ill.)	Electrically operated	-		-		100	984 460 44	106	873 950 44	280	850 105 44
	Track switch, LH	w/o control elements						984 465 44		873 951 44		850 100 44

All track switches are mechanically safeguarded against incorrect operation and to secure the load.

Control elements and control cabling must be ordered separately (see section 5.1.4).

KBK II track switches are used for KBK II-L installations. In such cases, adapter joint bolt sets are required.

Assembling track switch to track switch: Special joint bolt set and KBK III special suspension bracket available on application.

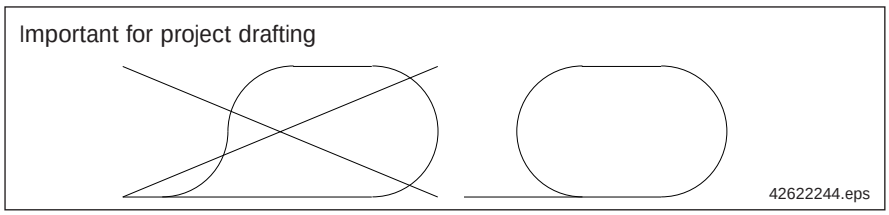
In case of several loads in one installation, pay attention to the load capacity of the switch blade.

Finish: red (RAL 2002)

Maximum load on track switches:

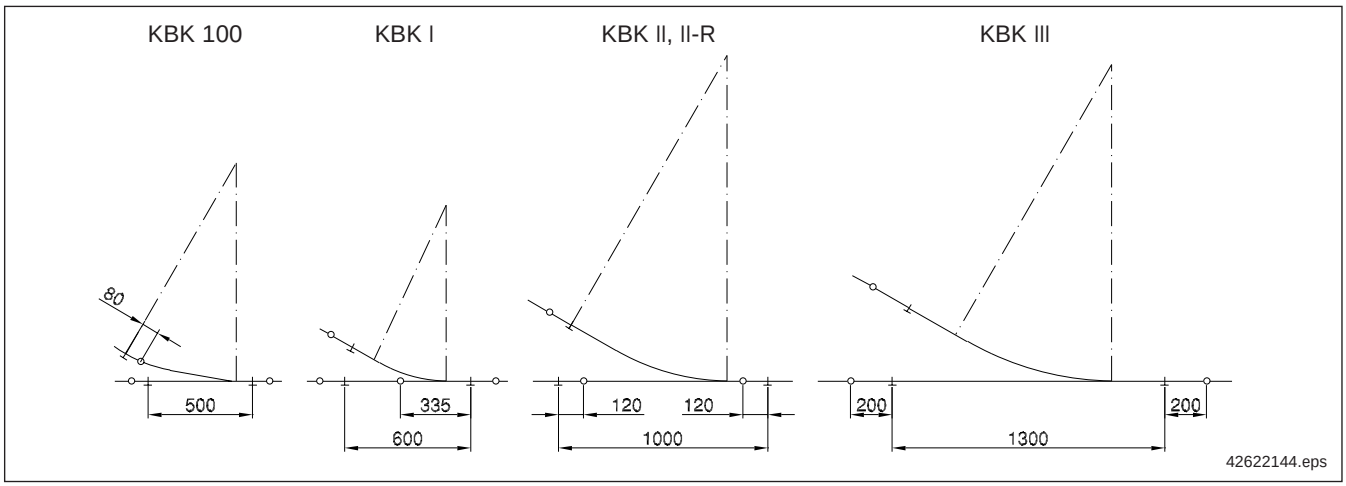
Track switch	Max. load [kg]	Distributed to 2 travel units with a min. distance of [mm]
KBK 100	200	210
KBK I	400	210
KBK II	1200	250
KBK III	1300	800

Important for project drafting



When drafting projects for KBK II-R and KBK III DEL systems, the switches must be incorporated in the track installations in such a way that cross phasing of collector trolleys is not possible (continuity of L1, L2, L3 and control conductors).

Track switch suspension



The KBK I track switch is suspended by means of the attached ball head rod with spring clip. For KBK 100, KBK II, II-R and KBK III track switches, suspension fittings are required as for track sections. The suspension rod lengths necessary for track switch suspension are identical to those for the other track sections.

It is not possible to use short suspension fittings.

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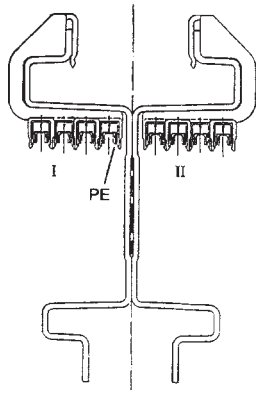
5.1.2 Integrated busbar line KBK II-R, KBK III-DEL

KBK II-R and KBK III-DEL track switches can be used to supply outgoing tracks with power.
They are fitted with a terminal box to provide the operating voltage.
Operating voltage: 220 - 550 V, 50 Hz
Track switches are checked and supplied ready for operation.

KBK III-DEL track switches can be fitted with 2x4 conductors maximum.
Pay attention to and specify the position of the protective earth conductor.

KBK III power supply



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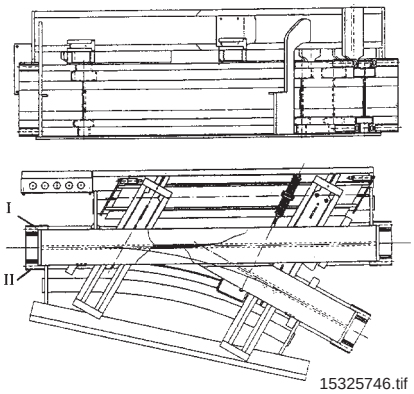
KBK III, right track switch



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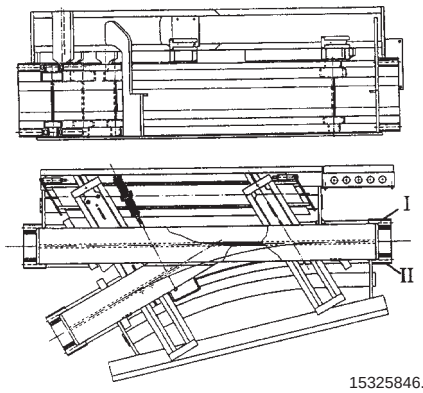
KBK III, left track switch



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4 or 8 conductors
Conductor cross-section 25 mm²
Position of PE rail in I or II

Designation	pol.	Position	Part no.
DEL equipment Right track switch	4	I	878 700 44
		II	878 705 44
	8	I	878 710 44
		II	878 715 44
DEL equipment Left track switch	4	I	878 720 44
		II	878 725 44
	8	I	878 730 44
		II	878 735 44

5.1.3 KBK II, II-R, III drive

Equipment included in electrically actuated track switches
Geared motor, end position cut-off by limit switches
Switching time: approx. 3 sec, CDF = 50%

Drive:	Worm geared motor	
	Part no.:	851 208 44
	Voltage:	380 -415 V, 50 Hz
	Drive output:	0.12 kW
	Type of enclosure:	IP 55
	Insulation class:	ISO F
	Rated motor current:	0,51 A
	cos γ:	0,72

Filled with oil and lubricated for life

Control switch connected according to wiring diagram

Alternative voltage and pneumatic operation available on application.

5.1.4 KBK II, II-R, III controls

Basic control types

Track switch	Design	Control	Remarks
KBK II KBK II-R5 KBK III KBK III-DEL	Moved by selector and push button switch without electric track switch monitoring device (two-handed actuation) with automatic retention	Contactor control	Should preferably be used for push travel trolleys.
	Moved by selector and push button switch with electric track switch monitoring device with automatic retention		Only possible for electric travel trolleys and with at least 5-pole conductor line along the entire track length. Special controls are required when track switches are arranged close together.

Without electric monitoring device

Control switch can only be actuated using two hands:

To change the track switch position a switch must be turned to the right or left and then the push button must be pressed. Track switch operation is then automatic it is switched off in the end position.

A track switch without a electric track switch monitoring device is not protected against incorrect operation. Incorrect operation may cause damage to the track switch and trolley.

With electric track switch monitoring device

Single-hand actuation of control switch:

To change the track switch position a switch must be turned to the right or left. The monitoring device prevents track switch operation whilst a monorail hoist or trolley is located within the track switch zone (prerequisite: trolley electrically driven, 5-pole conductor line, contactor control).

Isolating sections must be provided in a control conductor of the outgoing track section for electrical protection of the track switch.

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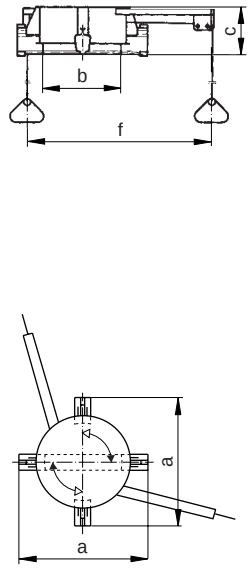
5.2 Turntable

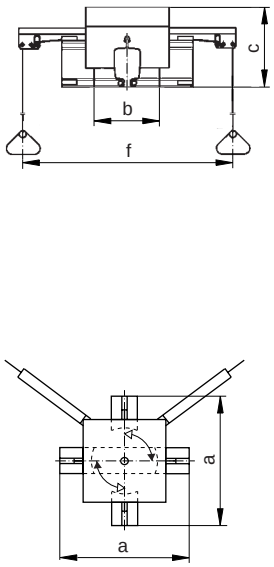
(item 21)

5.2.1 Turntables, dimensions and remarks

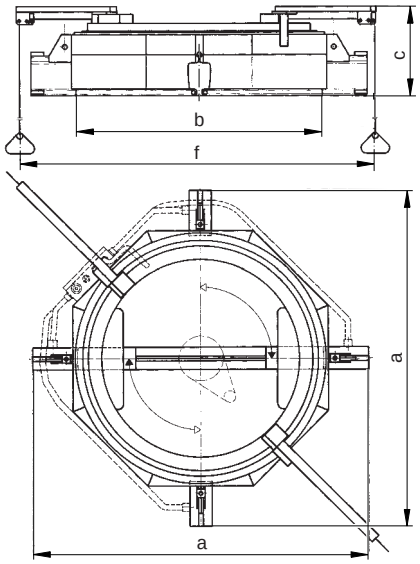
KBK 100, I



KBK II 600 kg



KBK II, II-R 1200 kg (KBK III)



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	For max. trolley lengths in mm	Max. load in kg	a in mm	b in mm	c in mm	f (adjustable) in mm	Operation	Weight approx. kg	Part no.	Suspension as per ill. (next page)
KBK 100	140	100	350	180	125	300 - 680	manual	15	on application	1
KBK I	140	300	500	300	225	400 - 1100	manual	21	on application	1
	350	400	750	500	175	600 - 1300	manual	26	on application	1
	890	600	1500	1000	340	-	electrical	125	on application	2
KBK II	170	600	500	250	310	600 - 1050	manual	45	982 650 44	3
	890	1200	1500	1100	405	1300 - 2200	manual	275	982 902 44	4
	890	1200	1500	1100	420	-	electrical	300	982 901 44	4
KBK II-R	890	1200	1500	1100	405	1300 - 2200	manual	280	873 740 44	4
	890	1200	1500	1100	420	-	electrical	305	873 735 44	4
	1300	1200	2000	1500	445	-	electrical	370	on application	5
KBK III	750	1200	1500	1100	485	-	electrical	450	on application	4
	1550	2600	2500	1800	545	-	electrical	1200	on application	6

The turntable comprises a short track section which rotates 90°. Integrated mechanical safety stops prevent trolleys from entering and leaving the turntable unintentionally during turning operations.

Any unused branches and dead ends must be closed by fitting end cap with buffer (see section 4.5). Operation is effected either manually by adjustable pull cords, or electrically. In the case of electric operation, the slewing time is approx. 8 seconds, up to 15 seconds for the largest types, 20 % CDF, standard version 400 V, 50 Hz.

Other voltages and frequencies available on application.

Control elements and control cable must be ordered separately.

KBK II turntables are used for KBK II-L installations. In such cases, adapter joint bolt sets are required (see section 4.2).

KBK II-R turntables are fitted with five busbars and can be used as power feed points for the adjoining track sections.

The turntable is completely wired and fitted with a terminal box for connection to the power supply.

KBK III turntables can be fitted with up to 2 x 4 DEL busbars.
The length of the trolley travel gear combination must be determined before selecting a turntable.

Finish:

Red (RAL 2002), internal part with yellow markings (RAL 1007)

Important for project drafting

When drafting projects for KBK II-R and KBK III DEL systems, the turntables must be incorporated in the track installations in such a way that cross phasing of collector trolleys is not possible when the turntable is rotated (continuity of L1, L2 and L3 conductors).

Turntable suspension

Turntables must be fitted in such a way that conductor cross phasing is not possible when they are rotated.

The same suspension rods as those used for the other track sections are required for turntable suspension. Reduce suspension rod length by 20 mm for KBK II/II-R turntables, according to Fig. 4.

It is not possible to use short suspension fittings.

Fig. 1

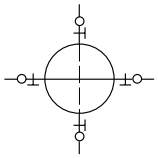


Fig. 2

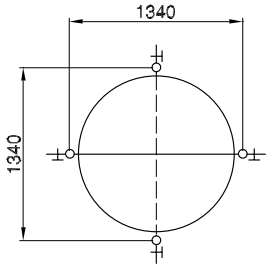


Fig. 3

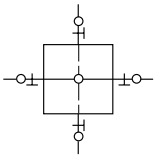


Fig. 4

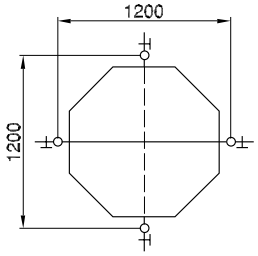


Fig. 5

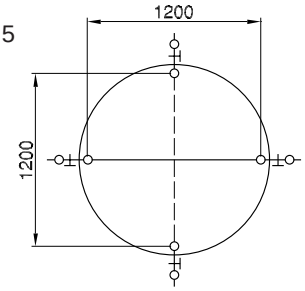
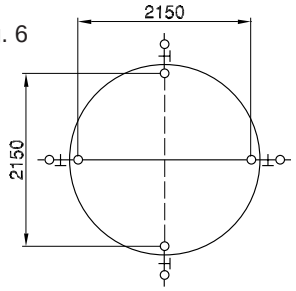


Fig. 6



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(Fig. 1) Suspension at the adjoining track sections close to the bolted joints.

(Fig. 2) Suspension of the incoming and outgoing tracks of the turntable as for track sections.

(Fig. 3) Suspension from the ready-fitted ball-head suspension rod and from the adjoining tracks close to the bolted joints.

(Fig. 4) Suspension from the ready-fitted hinge blocks (item 49)

(Fig. 5) Suspension from the ready-fitted floor fixture plate (item 35) and from the adjoining tracks close to the bolted joints.

(Fig. 6) Suspension from the ready-fitted suspension clamp fittings and at the adjoining track sections close to the bolted joints.

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5.2.2 Electrical equipment, KBK II, II-R, III turntables

Operating voltage 230-550 V, 50 Hz (standard voltage: 400 V)
Control voltage 42-230 V

Equipment included for electrically operated turntables
Drive: Geared motor with slipping clutch

Basic control types

Control		Push button station	Wiring diagram		Remarks
By pendant suspended from turntable contactor box	without electric turntable monitoring device	Special design DST 3	Direct control	553 989 44 1)	Should preferably be used for push travel trolley
			Contactor control	209 600 46	
or by a fixed control station	with electric turntable monitoring device		Contactor control	20960146	Only possible for electic travel trolley and with power supply via 5-pole busbar (KBK II-R5, KBK III-DEL5)

1) without contactor box

Without electric track switch monitoring device

The turntable is operated electrically. To prevent operating errors, the turntable control panel is operated with both hands:

To operate the turntable, a rotary switch must be turned and at the same time either the “Straight” or “Across” pushbutton must be pressed. Where direct on-line control is provided, the pushbutton must be pressed until the rotary component of the turntable has reached its end position. In the case of contactor control, the drive motor is switched off when the end position has been reached and the conductors in the turntable rail are disconnected from the supply when the turntable is turning

Attention

The turntable is not protected against incorrect operation. Damage may be caused to the turntable, travel gear and current collector as a result of incorrect operation. For prevention of incorrect operation: see “With electric track switch monitoring device”. The load is protected from dropping.

With electric track switch monitoring device

The electrical monitoring device enables turntableoperation only if the hoist trolley is either at the centre of the inner section of the turntable, or is completely outside the turntable.

Attention

Special measures have to be incorporated into the tracksections (anti-collision block sections) for electric turntable monitoring; the turntable must be ordered with limit switches for the end positions.
In addition, the following contactor control can be provided. This is used to check the trolley is centred. The conductors in the moving section are disconnected while the turntable is moving.
In addition, the following contactor control systems can be provided (control adapted to meet application requirements on request):

a) Initiation of rotation from the trolley on the track
b) Stoppage of trolley travel on block section tracks unless the turntable has been set correctly for clear passage (see also track switch control details).

The prerequisites for the above are that the trolley is always electrically driven, that the power supply is via 5-pole busbar, and contactor control.
The contactor boxes and control pendants with control cable (please specify length required) are supplied separately. Power supply cabling to contactor box and to turntable available on application, or supplied by the customer.

Work to be carried out by the customer:
Mounting of contactor box, installation and connection of power supply line to contactor box; laying of cabling from contactor box to control station (if not of pendant type) and to the terminal box on turntable. The power supply line to the turntable is not necessary if the complete KBK II-R installation is fed from another pointfrom another point. Protection against short-circuiting must be provided in accordance with DIN VDE or relevant national regulations.

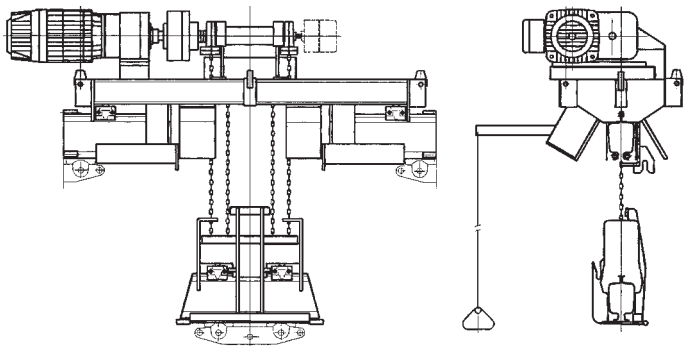
Example for ordering
1 x turntable, part no. 982 901 44,
control from a fixed station with 4,8 m control cable,
Wiring diagram 553 989 44, operating voltage: 400 V, 50 Hz

5.3 Drop station

(item 22)

Drop sections are used where a large number of trolley units without their own hoists have to travel to a small number of load depositing or pick-up points in monorail installations. The trolley on the drop section is fixed in a position at the centre of the drop section track. The drop section comprises a short track which can be lowered to a predetermined height. Locking of the adjacent open track ends is automatic. When the drop section is locked in its top position, a trolley held in this section can be released for continued travel by pulling a cord.

Drop station



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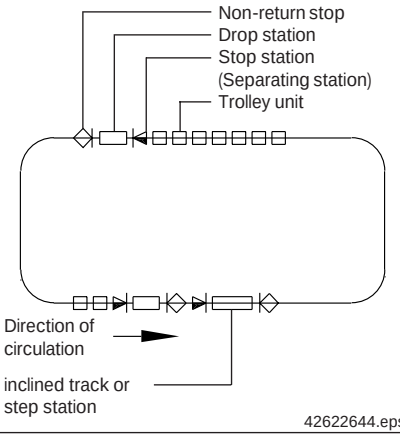
Track diagram



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Drop sections are selected on the basis of the SWL data and the trolley unit and/or load dimensions. A careful check should be made to ensure that all the trolley unit / load dimensions are identical and that the loads are uniformly spaced.

Control is effected by means of direct on-line control.
For further information on KBK 100, I, II drop sections, see technical data sheet 202 772 44.

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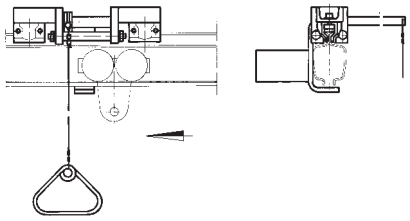
5.4 Stop station and separating station

Stop stations must be incorporated in tracks where intermittent trolley travel is required, and separating stations where trolleys are accumulated. When actuated, the separating station releases one trolley at a time and retains the following trolleys. The trolleys are prevented from running backwards by non-return stops. A slope of 2-3 % should be provided for empty trolleys, and 1,5-2 % for loaded trolleys when required to run from standstill. Intermediate stop stations are recommended for descending tracks longer than 10 m. Max. load/trolley in inclined section approx. 200 kg.

Stop station



Direction of travel

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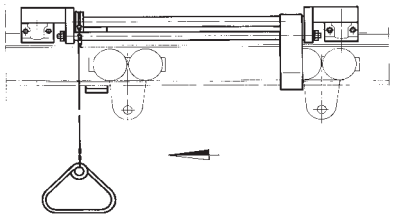
Separating station



Direction of travel

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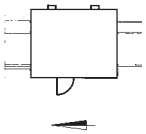
Non-return stop



Direction of travel

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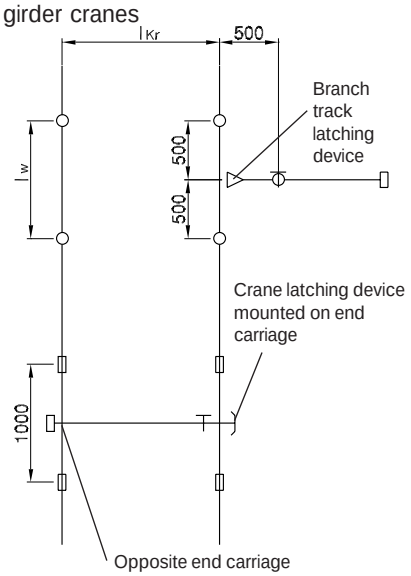
5.5 Latching devices for single-girder cranes

Monorail track/KBK II crane on KBK II crane runway

Monorail track / KBK III crane on KBK III crane runway

Latching devices for single-girder cranes



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The KBK latching system enables the trolley to transfer from the crane girder to connecting tracks. This makes it possible to build extensive handling systems comprising cranes and tracks with switches and turntables for serving large production areas without the need for transferring the load.

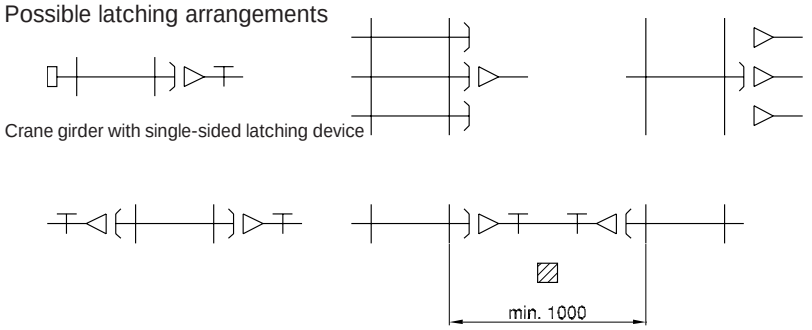
Components

- Crane latching device on end carriage
- Track latching device
- Opposite end carriage

} See next page for latching device selection table

- Control system
- End carriage track
- Trolley units, drives
- Hoist trolley
- Electrical equipment

Possible latching arrangements



Crane girder with latching device on both sides for opposite or offset branch tracks

Transfer section with two latching devices for connecting two crane girders on different crane runways (direct latching of crane girders to each other is not possible)

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Crane span dimensions

Distance between track suspension points

(guide values)

SWL	KBK II		KBK III	
in kg	l_{Kr} in m	l_w in m	l_{Kr} in m	l_w in m
250	7,0	7,0	8,0	7,0
315	7,0	7,0	8,0	7,0
400	6,0	6,0	8,0	7,0
500	5,7	6,0	8,0	7,0
630	4,0	4,0	7,0	6,0
800	3,5	3,5	6,5	6,0
1000	3,0	3,0	5,6	5,4
1250	2,5	1,5	4,5	4,5
1600	2,5	1,0	4,0	4,0
2000	2,5	1,0	3,4	3,5

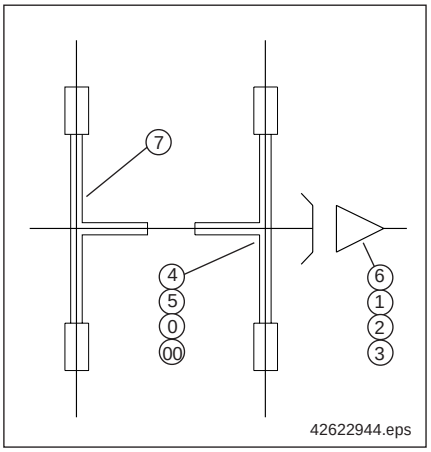
Latching device selection table		Latching device with actuation on crane girder			Track connection latching device			KBK II		KBK II-R5		KBK III	
		manually operated		electrically operated	manually operated		electrically operated	Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.
(0) Main crane latching device with manual actuation 2)		O	-	-	-	-	-	91	984 007 44	91,5	873 747 44	-	-
(00) Main crane latching device with manual actuation and limit switch attachment 2)		-	O	-	-	-	-	92	984 008 44	92,5	873 748 44		
(1) Main track latching device with manual actuation		-	-	-	O	-	-	68	984 002 44	68,5	873 742 44		
(2) Main track latching device with manual actuation and limit switch attachment4)		-	-	-	-	O	-	75	984 006 44	75,5	873 746 44		
(3) Main track latching device with electric actuation and limit switch attachment4)		-	-	-	-	-	O	74	984 001 44	74,5	873 741 44		on application
(4) Crane conn. latching device		-	-	-	O	O	O	56	984 004 44	56,7	873 744 44		
(5) Main latching device, crane, with electric actuation and limit switch attachment1) 2)		-	-	O	-	-	-	97	984 003 44	97,5	873 743 44	-	as per drawing
(6) Track conn. latching device		O	O	O	-	-	-	52	984 005 44	52,5	873 745 44		
(7) End carriage 2)		O	O	O	O	O	O	38	984 012 44	38	984 012 44		
(8) Latching device control, crane and hoist unit 3)		-	O	O	-	O	O	on application					
Long travel	h = push	h	-	❑	h	-	❑	❑ = optionally h or e					
	e = 5/20m/min	-	e	❑	-	e	❑						
Cross travel		manual or electrical (5/20 m/min)											

1) On the opposite side of the crane to the latching device; not applicable in systems with crane latching devices on both sides.

2) In the case of latching cranes running on three tracks, additional end carriages are necessary for the centre runway. When double trolley units are used, crane traverses D, part no. 984 380 44 must also be ordered. The crane latching device is fitted with suspension plates D, part no. 984 022 44.

3) Additional control details necessary (e.g. type and design: control from hoist trolley, from crane or stationary). Control system for latching device, crane and hoist trolley on application.

4) Avoid if possible – increased equipment cost for data exchange.



Cranes with latching devices have end carriages which are rigidly connected to the bridge girder.

Electric travel latching cranes approach the latching position at a creep speed not exceeding 5 m/min.

Push-travel latching cranes must approach at a correspondingly lower speed.

For further information and technical details, see publication 202 731 44.

KBK II double-girder crane latching device on request

6 Track suspension

6.1 Remarks and overview

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

KBK suspensions are generally designed to permit pendulation.

Supporting structure

Verification of superstructure/support structure suitability is the responsibility of the owner.

Short suspension fitting

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

Sloping steel sections

Suspension from inclined steelwork is also possible.

KBK II-L monorail tracks

When determining the suspension rod length for KBK II-L installations fitted with KBK II curved track sections, track switches, turntables, drop sections and latching devices, the length difference of 30 mm resulting from the different track section heights must be considered.

Stiffeners

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

Stiffeners are also necessary for gravity tracks ahead of curves, for stop stations and drop sections, on tracks connected to switches and turntables, and specially if drives are used.

It is recommended that for monorails and crane tracks, transverse stiffeners be provided approx. every 15 m for KBK 100, I and approx. Every 20 m for KBK II-L, II, III. One stiffener is usually sufficient in the longitudinal direction. All crane runway sections are provided with stiffeners.

Transverse and longitudinal stiffeners are V-type. In individual cases (see Stiffeners section), single lateral stiffeners are sufficient to restrict undesirable track swing. Pairs of stiffeners have to be fitted on one side to avoid pressure in the sloping stiffener.

V-type suspensions

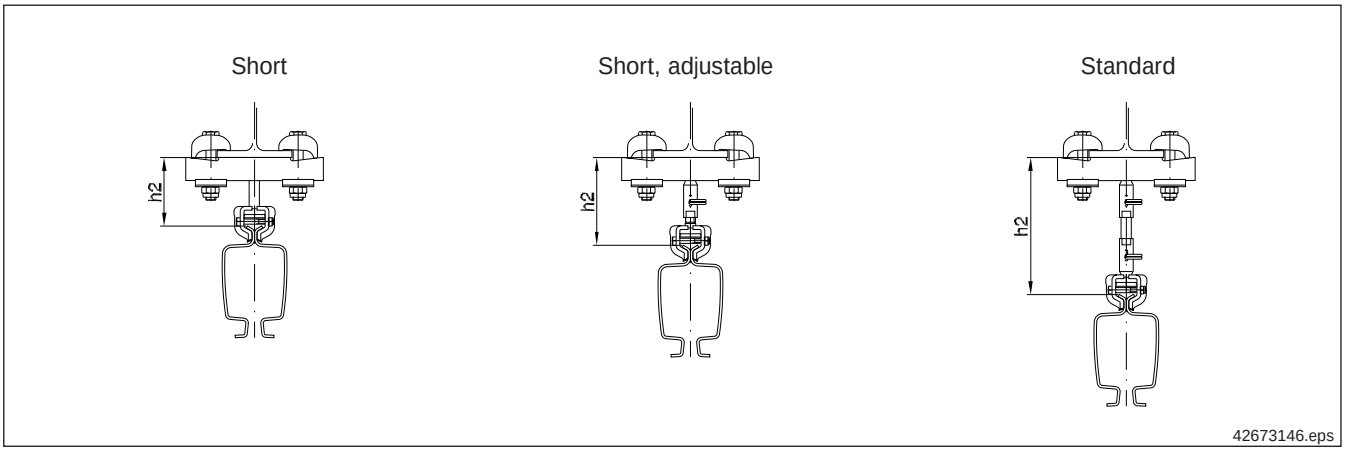
V-type suspension fittings may also replace missing suspension points in vertical suspension arrangements. Max. vertical dimension as for vertical suspension arrangements.

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

	Thread	Capacity [1]	Suspension dimension h_2			h_1
			Rigid short suspension	Adjustable short suspension	Suspension with threaded rod	Max. threaded rod length
		[kg]	[mm]	[mm]	80/100 mm	[m]
KBK 100	M10	400	60	100 ± 4	155 ± 9	1
KBK I	M10	750	55	95 ± 4	150 ± 9	2
KBK II/M10	M10	750	-	105 ± 4	165 ± 9	2
KBK II-L	M16 x 1,5	1400	110	140 ± 7	220 ± 14	3
KBK II	M16 x 1,5	1700	110	140 ± 7	220 ± 14	3
KBK III	M16 x 1,5	1700	-	120 ± 7	200 ± 14	3
KBK III/M20	M20 x 1,5	2600	-	-	200 ± 14	1

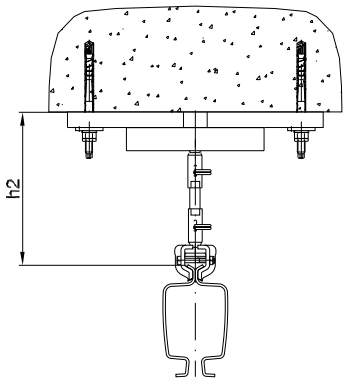
1) Static or alternating load

Examples

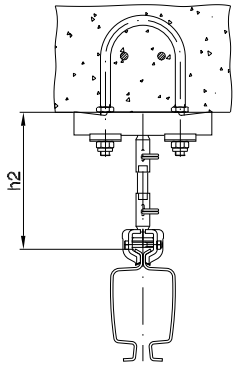


Examples

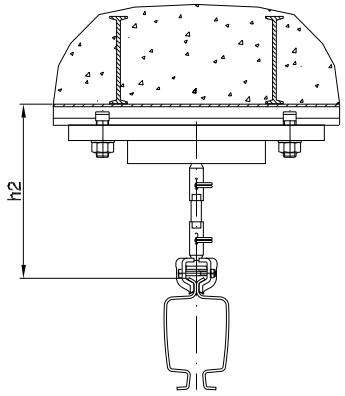
on anchor bolts



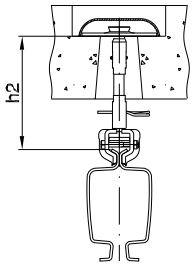
from U-bolt



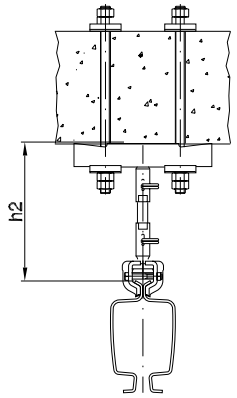
from brackets



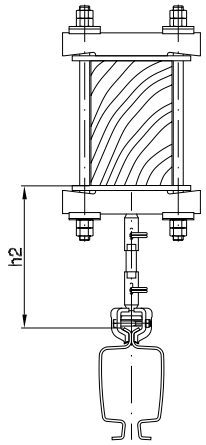
with floor plate



drilled



on wood



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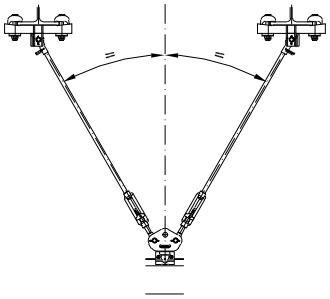
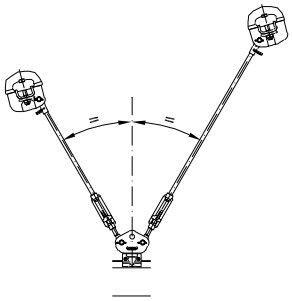
V-type suspension fitting

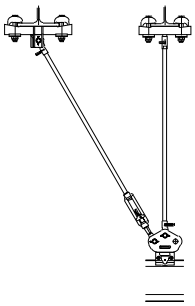


Sloping V-type suspension fitting

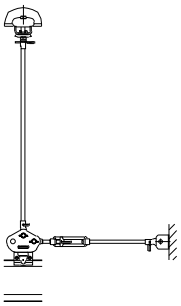


Sloping suspension

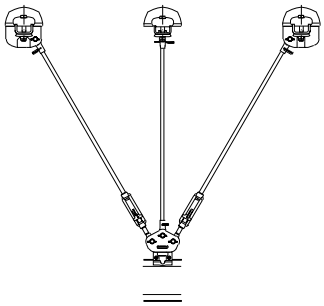
Lateral stiffener



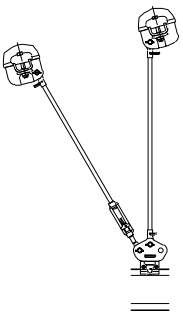
Lateral stiffener



V-type stiffener



Sloping stiffener



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6.2 Vertical suspension on I-beams

6.2.1 I-beam assignment

Upper suspension bracket A and upper suspension bracket B for KBK III/M20 can be used on roof structures and steel profile sections, upper suspension bracket B (ends project beyond bearing surface) is only suitable for steel profile sections.

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

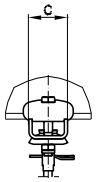
Section category		Suitable for		
		I	IPE	HE-B (IPB)
KBK 100, I, KBK II/M10	Upper suspension bracket A	140 - 260	120 - 270	100 - 140
	Upper suspension bracket B	-	220 - 450	120 - 200
KBK II-L, II, KBK III	Upper suspension bracket A	140 - 320	140 - 270	100 - 120
	Upper suspension bracket B	220 - 450	180 - 500	100 - 200
KBK III/M20	Upper suspension bracket B	220 - 450	180 - 500	100 - 200

Upper suspension bracket S and upper suspension clamp S for steel sections with larger flange width for various flange thicknesses, see technical data sheet 203 072 44.

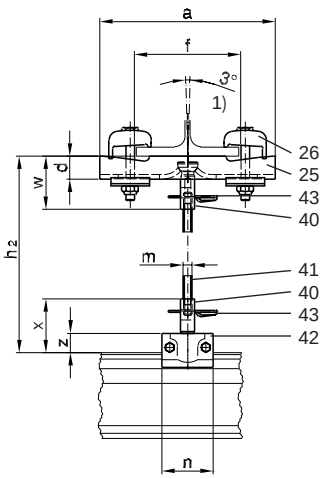
Important: Higher flange bending stresses may occur, for example, when using HE-A beams.

6.2.2 Suspension with ball head suspension rod

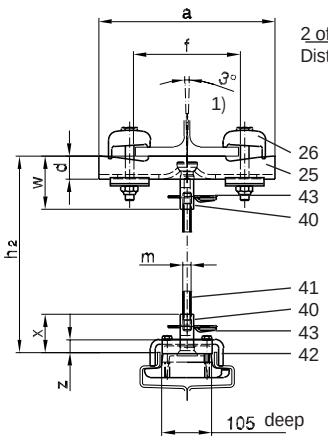
Dimension C



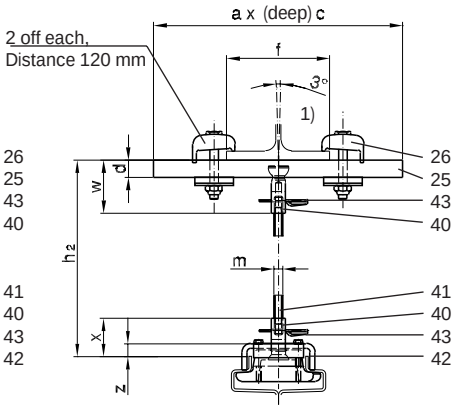
KBK 100, I, II-L, II



KBK III



KBK III/M20, 2600 kg:



	h_2	m	n	w	x	z
KBK 100	75 + h1 ±9	M10	60	60	65	25
KBK I	70 + h1 ±9	M10	60	60	60	20
KBK II-L	120 + h1 ±14	M16 x 1,5	80	95	90	30
KBK II	120 + h1 ±14	M16 x 1,5	80	95	90	30
KBK III	100 + h1 ±14	M16 x 1,5	105	95	70	25
KBK III/M20	100 + h1 ±14	M20 x 1,5	105	90	75	25

1) Max. girder gradient ± 1,5°

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Section category		Dimensions in mm			
		a	f	c	d
KBK 100, I, KBK II/M10	Upper suspension bracket A	205	66 - 142	70	27
	Upper suspension bracket B	270	110 - 210		23
KBK II-L, II, KBK III	Upper suspension bracket A	221	71 - 139	72	37
	Upper suspension bracket B	290	100 - 208	76	36
KBK III/M20	Upper suspension bracket B	290	96 - 208	230	20

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Item no.	Suspension fitting, vertical	Weight kg/ piece	Part no.	KBK 100 Qty./ susp.	KBK I Qty./ susp.	Weight kg/ piece	Part no.	KBK II-L, KBK II Qty./ susp.	KBK III Qty./ susp.	Weight kg/ piece	Part no.	KBK III/ M20 Qty./ susp.
25	Upper suspension bracket A	0,65	980 302 44	1	1	1,20	982 302 44	1	1	-	-	
	Upper suspension bracket B	0,85	980 304 44			2,40	982 304 44			12,9	850 304 44	1
26	Upper suspension clamp	0,45	980 326 44	2	2	1,00	982 326 44	2	2		4 pieces	
40	Ball head suspension rod	0,08	980 333 44	2	2	0,15	982 333 44	2	2	0,33	850 343 44	2
41	Suspension rod h1 = 80 mm	0,07	980 346 44	1	1			1	1			
	Suspension rod h1 = 100 mm					0,22	982 446 44			0,21	850 346 44	1
	Suspension rod h1 = 300 mm	0,18	980 347 44			0,53	982 447 44			0,63	850 347 44	
	Suspension rod h1 = 600 mm	0,33	980 348 44			1,01	982 448 44			1,25	850 348 44	
	Suspension rod h1 = 1000 mm	0,53	980 349 44			1,64	982 449 44			2,08	850 349 44	
	Suspension rod h1 = 3000 mm			-	-	4,80	982 445 44			-	-	-
42	Track suspension clamp	0,30	984 550 44	1		0,80	982 260 44	1		-	-	-
	Track suspension clamp	0,20	980 260 44		1	2,85	850 260 44		1	-	-	-
	Track suspension clamp (2600)									2,9	850 280 44	1
43	Spring clip	0,01	342 200 99	2	2	0,02	342 201 99	2	2	0,04	342 202 99	2
50	Suspension rod coupling	0,10	980 277 44			0,17	982 277 44					

Finish: galvanized

Complete suspensions (cpl. pre-assembled)

Part no.	Upper suspension bracket type	Suspension with threaded rod				
		80	100	300	600	1000
KBK 100	A	517 686 46	-	517 688 46	517 690 46	517 692 46
	B	517 687 46	-	517 689 46	517 691 46	517 693 46
KBK I	A	980 497 44[1)]	-	980 498 44[1)]	517 698 46	517 700 46
	B	517 696 46	-	517 697 46	517 699 46	517 701 46
KBK II-L/II	A	-	851 147 44[1)]	851 148 44[1)]	517 704 46	517 706 46
	B	-	851 149 44[1)]	851 151 44[1)]	517 705 46	517 707 46
KBK III	A	-	517 710 46	517 712 46	517 714 46	517 716 46
	B	-	517 711 46	517 713 46	517 715 46	517 717 46
KBK III/M20	B	-	517 719 46	517 721 46	517 723 46	517 725 46

1) Series, delivery ex stock

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.

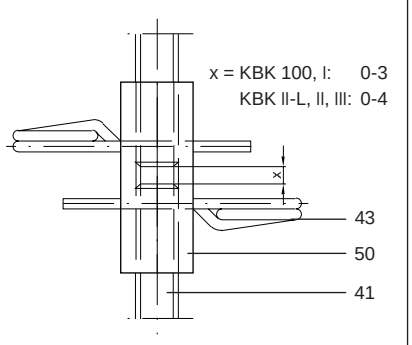
Drilling jig

A drilling jig for M10/M16 x 1,5/M20 x 1,5 threaded rods is available, part no. 982 017 44.

Diameter of the transverse hole / distance from end
KBK 100, I: 3,2 mm/5 mm; KBK II-L, II, III: 4,0 mm/6 mm; KBK III/M20: 5mm / 6 mm

6.2.3 Coupling for suspension rod (item 50)

Coupling for threaded rod



Use coupling for connecting several threaded rods (not for KBK III/M20).

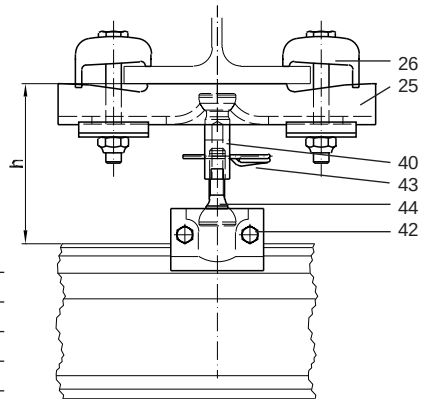
6.2.4 Short suspension arrangement with height adjustment

A particularly low suspension headroom can be achieved using the ball head bolt/ball head suspension rod connection arrangement with spring clip. Slotted holes facilitate height adjustment. Not for KBK III/M20.

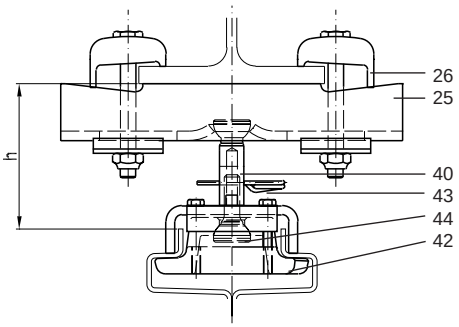
Finish: galvanized

Short suspension fitting

KBK 100, I, II-L, II



KBK III (up to 1700 kg)



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	h
KBK 100	100 ± 4
KBK I	95 ± 4
KBK II-L / KBK II	140 ± 7
KBK III	120 ± 7

Item no.		Weight kg / piece	Part no.	KBK 100 Qty. / susp.	KBK I Qty. / susp.	Weight kg / piece	Part no.	KBK II-L / KBK II Qty. / susp.	KBK III Qty. / susp.
25	Upper suspension bracket A	0,65	980 302 44	1	1	1,20	982 302 44	1	1
	Upper suspension bracket B	0,85	980 304 44			2,40	982 304 44		
26	Upper suspension clamp	0,45	980 326 44	2	2	1,00	982 326 44	2	2
40	Ball head suspension rod	0,08	980 333 44	1	1	0,15	982 333 44	1	1
42	Track suspension clamp	0,30	984 550 44	1	-	0,80	982 260 44	1	-
	Track suspension clamp	0,20	980 260 44	-	1	2,85	850 260 44	-	1
	Track suspension clamp (2600)	-	-	-	-	6,40	850 280 44	-	-
43	Spring clip	0,01	342 200 99	1	1	0,02	342 201 99	1	1
44	Ball head bolt	0,06	980 283 44	1	1	0,14	982 283 44	1	1
49	Hinged end piece	-	-	-	-	0,30	984 083 44	-	-

Suspension fitting

Complete suspensions (cpl. pre-assembled)

Part no.	Upper suspension bracket type	Short suspension
KBK 100	A	517 684 46
	B	517 685 46
KBK I	A	517 694 46
	B	517 695 46
KBK II-L/II	A	517 702 46
	B	517 703 46
KBK III	A	517 708 46
	B	517 709 46

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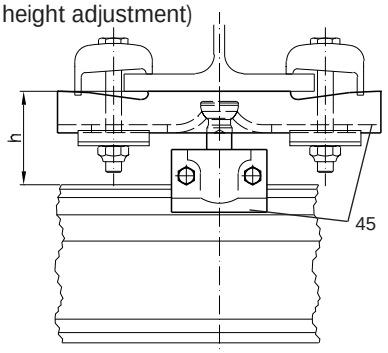
6.2.5 Short suspension arrangement without height compensation (item 45)

Short suspension arrangement (without height adjustment)



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	h
KBK 100	60
KBK I	60
KBK II-L	110
KBK II	110

Particularly low suspension heights are achieved by using short suspension arrangements. The height of the track cannot be compensated, which means the superstructure must be perfectly level.

The minimum flange width when using short suspension fittings is 75 mm.

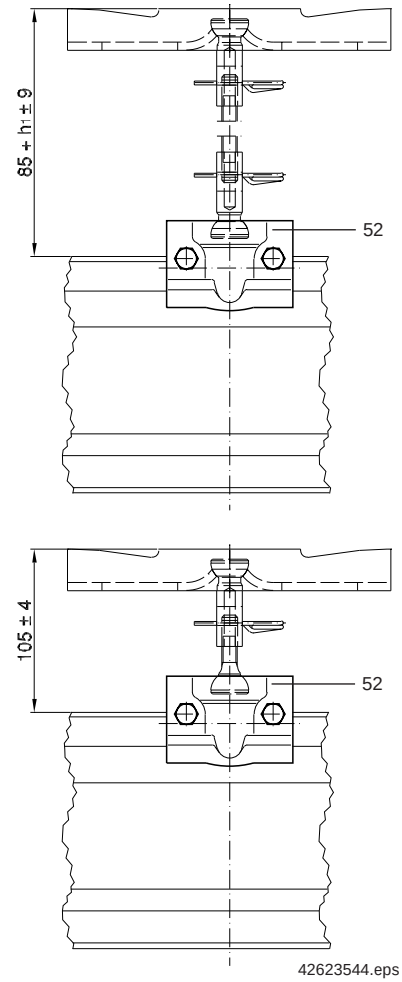
The short suspension fitting cannot be used for track switches, turntables and drop sections. The upper suspension bracket and track suspension clamp are permanently connected to each other before leaving the factory.

Finish: galvanized

Item no.		KBK 100		KBK I		KBK II-L, II	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight approx. kg	Part no.
45	Short susp. fitting w. upper susp. bracket A	1,1	on application	1,0	980 370 44	2,2	982 370 44
	Short susp. fitting w. upper susp. bracket B	1,3	on application	1,2	980 371 44	2,4	982 371 44

6.2.6 KBK II/M 10 suspension clamp (item 52)

KBK II/M10 suspension fitting



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In addition to the standard KBK II track suspension fittings with a load capacity of 1700 kg, KBK II/M 10 track suspension fittings are also available for installations for low loads. These suspension arrangements consists of KBK I components and a special KBK II track suspension clamp for accommodating KBK I ball head suspension rods.

Maximum permissible load per KBK II/M 10 suspension: 750 kg

Finish: zinc-galvanised, yellow ball socket

Item no.		KBK II-L, II	
		Weight approx. kg	Part no.
52	KBK II/M10 track suspension clamp	0,8	980 250 44

Possible applications

KBK crane and track installations with suspension loads less than 750 kg according to special calculation and verification with the formulae from section 3.

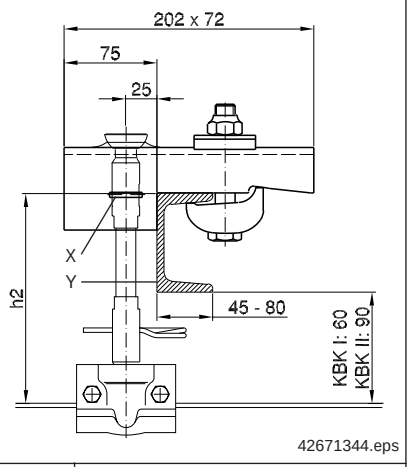
Overloading of the crane suspension must be avoided; particular attention must be paid to any changes in the installation.

The KBK II track suspension clamp (982 260 44) must not be combined with KBK I suspension elements.

The use of KBK II/M10 suspensions must be clearly indicated in drawings and in the test and inspection booklet.

6.3 Vertical suspension on U section

KBK II/M10 suspension fitting



	h_2	
KBK I	20 + h1 ± 9	> track section height + 60
KBK II	50 + h1 ± 14	> track section height + 90

Upper U-type suspensions can be used on U-steel profile sections (DIN 1024).
The max. suspension load must be observed as specified in the table:

Profile	Weight in kg	Part no.	Max. suspension load G_{AB} in kg	Girder section
KBK I	2	980 377 44	750	U 80 - U 220
KBK II	2	984 377 44	750	U 80 - U 100
			1000	U 120 - U 140
			1250	U 160
			1400	U 180
			1500	U 200 - U 220

The connection between the upper ball head suspension rod and threaded rod is secured with the enclosed split sleeve (see “X”)

Edge “Y” must be in close contact with the profile section. The ball head suspension rods, the threaded rods, the spring clip and the suspension clamp must be ordered separately.

Finish: galvanized

The loads specified for individual profile sections must not be exceeded. Verification of the U profile section is the responsibility of the owner.

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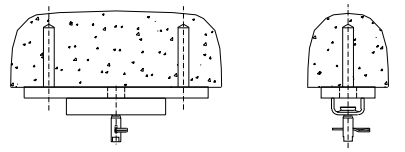
6.4 Ceiling attachment

6.4.1 Suspension with anchor bolt connection

KBK installations may be attached to concrete superstructures with anchor bolts. Anchor bolts must be used that are approved for use with dynamic loads. Erection must be carried out by trained personnel and an erection report must be compiled. Please observe technical data sheet 203 276 44.

Anchor bolt connection



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6.4.2 U-bolt with upper suspension bracket A

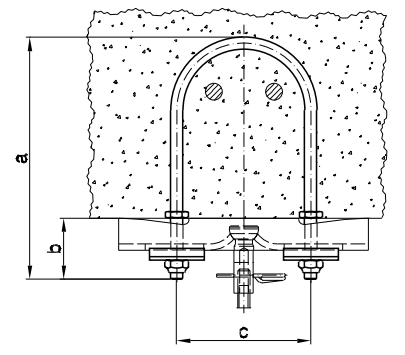
For new buildings, it is possible to cast U-bolts in reinforced ceilings at the KBK track suspension points while the building is still undergoing construction. This must be discussed with the structural engineer. U-bolts are used to secure upper suspension bracket A.

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

Two U-bolts should be arranged at a distance of 120 mm for securing KBK III/M20 suspensions.

Finish: galvanized

U-bolt (item 27)



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	a	b	c
KBK 100	200	50	110
KBK I	200	50	110
KBK II-L	225	70	120
KBK II	225	70	120
KBK III	225	70	120

Item no.		Qty. / susp.	KBK 100, I		KBK II-L, II, III	
			Weight approx.kg	Part no.	Weight approx.kg	Part no.
27	U-bolt (complete)	1	0,15	980 330 44	0,8	982 330 44

6.4.3 U-bolt from ceiling section rails with upper suspension bracket A

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

A-type upper suspension brackets are secured to section rails cast in concrete using a packing plate and 2 special bolts with nuts and tab washers. The M 10 for KBK 100, I and M 16 for KBK II-L, II, and III special bolts 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 suspension fitting must be regarded as a concentrated load on the securing section rail (low load bearing capacity).

Finish: galvanized

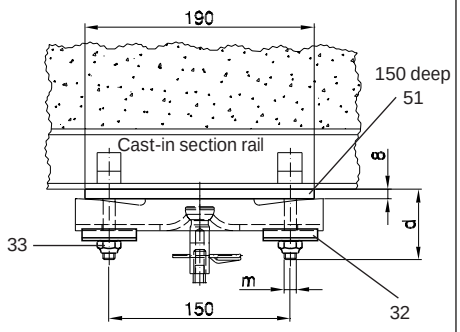
Upper suspension bracket H with bore hole spacing ≥ 250 mm count as dual load suspensions.
See technical data sheet 203 072 44.

	d	m [1]
KBK 100	70	M10
KBK I	70	M10
KBK II-L	80	M16
KBK II	80	M16
KBK III	80	M16

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

For tightening torque M see data referring to cast-in section rail

Tab washer (item 32), lock nut (item 33), packing plate (item 51)



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Item no.		Qty. / susp.	KBK 100, I		KBK II-L, II, III	
			Weight approx.kg	Part no.	Weight approx.kg	Part no.
32	Packing plate	2	0,1	980 429 44	0,21	984 329 44 [2]
33	Lock nut	2	-	334 610 44	-	334 614 44 [2]
51	Packing plate for upper suspension bracket	1	1,6	984 088 44	1,6	984 088 44 [2]

2) KBK III (M16) suspension fitting only for KBK III

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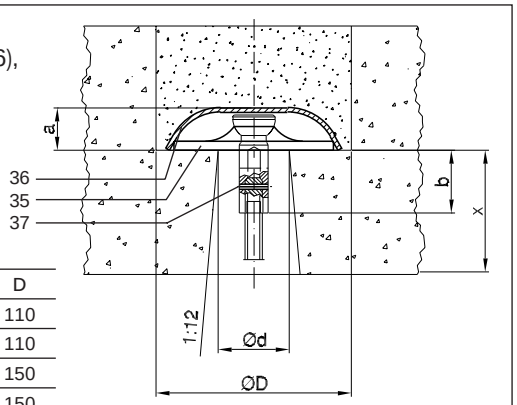
6.4.4 Suspension with floor fixture plate and cover

Floor fixture plate (item 35),
cover for floor fixture plate (item 36),
split sleeve (item 37)



	a	b	d	D
KBK 100	25	35	40	110
KBK I	25	35	40	110
KBK II-L	28	60	60	150
KBK II	28	60	60	150
KBK III	28	60	60	150

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

Finish: galvanized

Item no.		KBK 100, I		KBK II-L, II, III 1)	
		Weight approx.kg	Part no.	Weight approx.kg	Part no.
35	Floor fixture plate	0,2	980 336 44	0,4	982 336 44
36	Cover for floor fixture plate	0,2	980 338 44	0,2	982 338 44
37	Split sleeve 3 x 18	-	345 095 99	-	-
	Split sleeve 4 x 26	-	-	-	345 008 99

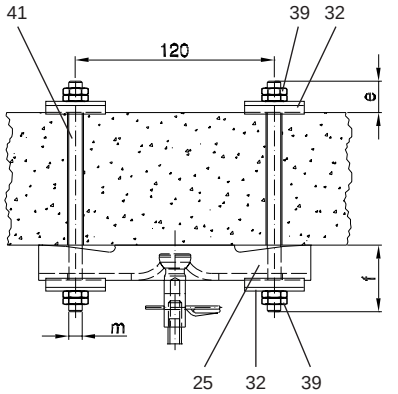
1) KBK III (M16) suspension fitting only

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

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

Suspension rod spacing (M16 x 1,5) for KBK III/M20: 120 x 120 mm
Tab washers (item 32) are not required for KBK III/M20. Order upper suspension bracket B without upper suspension clamps, but with two filler plates 850 305 44.

Nut for suspension rod (item 39)



	e	f	m
KBK 100	35	60	M10
KBK I	35	60	M10
KBK II-L	50	85	M16 x 1,5
KBK II	50	85	M16 x 1,5
KBK III	50	85	M16 x 1,5

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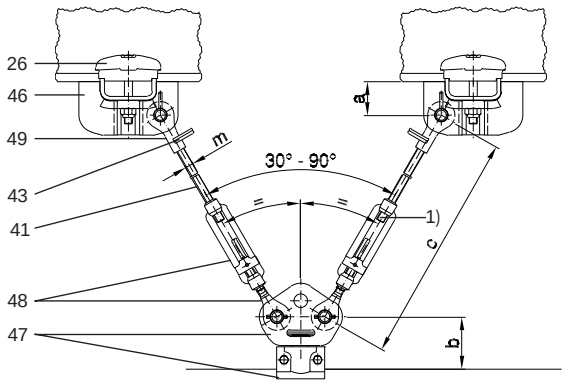
Item no.		KBK 100, I	KBK II-L, II, III
		Part no.	Part no.
39	Nut for suspension rod	150 509 99	150 678 99

6.5 V-type suspension fitting

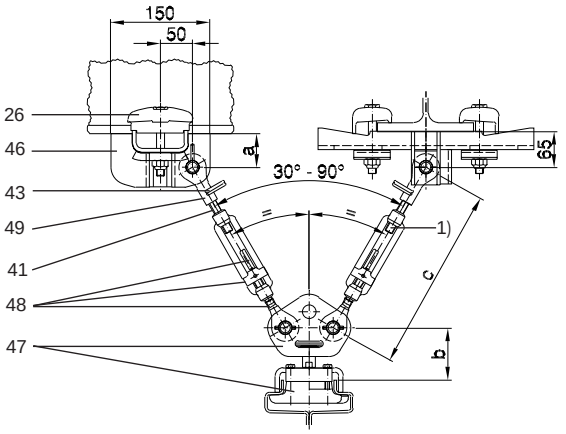
V-type suspensions are fitted as shown in the diagrams. V-type hinged suspension bracket (item 47) and V-type upper suspension bracket (item 46) are connected to each other by suspension rod strainer (item 48), suspension rod (item 41) and hinged end piece (item 49). Each bolted connection with a hinged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

Finish: galvanized

KBK 100, I, II-L, II V-type suspension fitting
(see sections 6.1 and 6.8 for load capacity)



KBK III (up to 1700 kg load capacity)



	a	b	c	m
KBK 100	40	65	h_1 + 155 ± 30	M10
KBK I	40	60	h_1 + 155 ± 30	M10
KBK II-L	55	75	h_1 + 220 ± 40	M16 x 1,5
KBK II	55	75	h_1 + 220 ± 40	M16 x 1,5
KBK III	55	85	h_1 + 220 ± 40	M16 x 1,5

h1 = suspension rod length
1) no spring clip here

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

Item no.	V-type suspension, parallel or perpendicular	Weight kg/piece	Part no.	KBK 100 Qty./ susp.	KBK I Qty./ susp.	Weight kg/piece	Part no.	KBK II-L, KBK II Qty./ susp.	KBK III (1700kg) Qty./ susp.
25	Upper suspension bracket A	0,65	980 302 44			1,20	982 302 44		
	Upper suspension bracket B	0,85	980 304 44			2,40	982 304 44		
26	Upper suspension clamp	0,45	980 326 44	4	4	1,00	982 326 44	4	4
40	Ball head suspension rod	0,08	980 333 44			0,15	982 333 44		
41	Suspension rod h1 = 80 mm	0,07	980 346 44						
	Suspension rod h1 = 100 mm					0,22	982 446 44		
	Suspension rod h1 = 300 mm	0,18	980 347 44	2	2	0,53	982 447 44	2	2
	Suspension rod h1 = 600 mm	0,33	980 348 44			1,01	982 448 44		
	Suspension rod h1 = 1000 mm	0,53	980 349 44			1,64	982 449 44		
	Suspension rod h1 = 3000 mm			-	-	4,80	982 445 44		-
43	Spring clip	0,01	342 200 99	2	2	0,02	342 201 99	2	2
46	V-type upper suspension bracket B	1,39	980 360 44	2	2	3,20	984 075 44	2	2
47	V-type hinged suspension bracket	1,10	984 549 44	1		2,20	984 080 44	1	
	V-type hinged suspension bracket	1,00	980 395 44		1	4,70	850 080 44		1
	Bolts for third hinged end piece	0,07	335 560 99			0,14	335 562 99		
	Split sleeve	-	345 008 99			-	345 033 99		
48	Suspension rod strainer	0,29	980 310 44	2	2	0,85	984 085 44	2	2
49	Hinged end piece	0,10	980 315 44	2	2	0,30	984 083 44	2	2
50	Suspension rod coupling	0,10	980 277 44			0,17	982 277 44		
51	Packing plate for upper suspension bracket	1,79	984 088 44			1,79	984 088 44		
	Wall fixture	0,20	980 272 44			0,46	850 399 44 1)		

1) See KBK III hinged block, section 13.3

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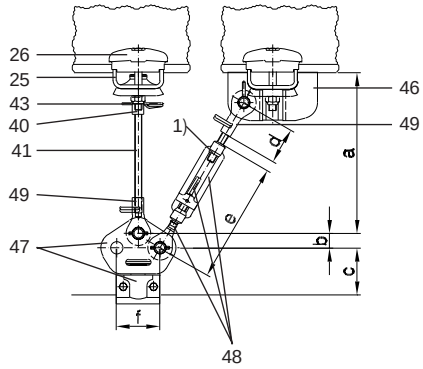
6.6 Stiffener

	a	b	c	d	e	f
KBK 100	h_1+65±4	20	65	50	165±15	60
KBK I	h_1+65±4	20	60	50	165±15	60
KBK II-L	h_1+100±7	25	75	65	235±20	90
KBK II	h_1+100±7	25	75	65	235±20	90
KBK III	h_1+100±7	25	85	65	235±20	90

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

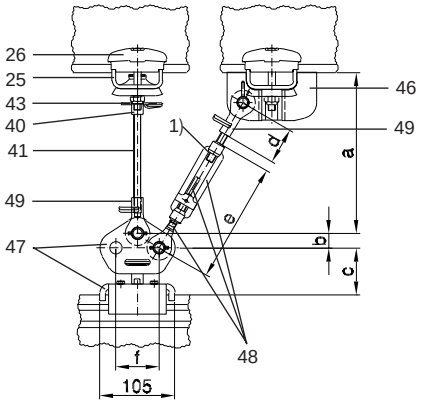
Finish: galvanized

Stiffener
KBK 100, I, II-L, II

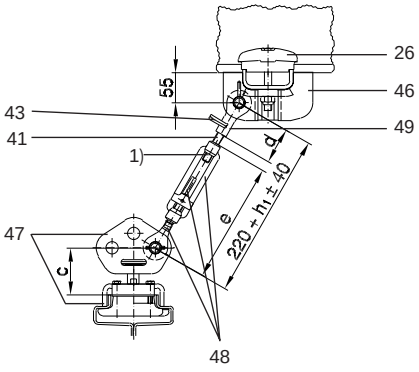


1) no spring clip here

KBK III (up to 1700 kg)



KBK III sloping stiffener, in combination with KBK III/M 20



Stiffener on one side only, not a load-bearing suspension

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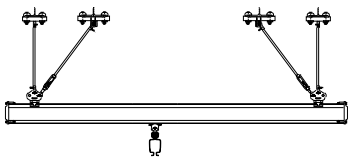
item no.	Lateral stiffeners,transverse or longitudinal	Weight kg/piece	Part no.	KBK 100 Qty./ susp.	KBK I Qty./ susp.	Weight kg/piece	Part no.	KBK II-L, KBK II Qty./ susp.	KBK III Qty./ susp.	KBK III sloping Qty./ susp.
25	Upper suspension bracket A	0,65	980 302 44	1	1	1,20	982 302 44	1	1	
	Upper suspension bracket B	0,85	980 304 44			2,40	982 304 44			
26	Upper suspension clamp	0,45	980 326 44	4	4	1,00	982 326 44	4	4	2
40	Ball head suspension rod	0,08	980 333 44	1	1	0,15	982 333 44	1	1	
41	Suspension rod h1 = 80 mm	0,07	980 346 44	1+1	1+1			1+1	1+1	1
	Suspension rod h1 = 100 mm					0,22	982 446 44			
	Suspension rod h1 = 300 mm	0,18	980 347 44			0,53	982 447 44			
	Suspension rod h1 = 600 mm	0,33	980 348 44			1,01	982 448 44			
	Suspension rod h1 = 1000 mm	0,53	980 349 44			1,64	982 449 44			
	Suspension rod h1 = 3000 mm			-	-	4,80	982 445 44			-
43	Spring clip	0,01	342 200 99	2	2	0,02	342 201 99	3	3	1
46	V-type upper suspension bracket B	1,39	980 360 44	1	1	3,20	984 075 44	1	1	1
47	V-type hinged suspension bracket	1,10	984 549 44	1		2,20	984 080 44	1		
	V-type hinged suspension bracket	1,00	980 395 44		1	4,70	850 080 44		1	1
	Bolts for third hinged end piece	0,07	335 560 99			0,14	335 562 99			
	Split sleeve	-	345 008 99			-	345 033 99			
47a	Filler plates for sloping surface	-	-	-	-	0,6	516 833 46 [2]			1
48	Suspension rod strainer	0,29	980 310 44	1	1	0,85	984 085 44	1	1	1
49	Hinged end piece	0,10	980 315 44	2	2	0,30	984 083 44	2	2	1
	Wall fixture	0,20	980 272 44			0,46	850 399 44 [1]			

1) See KBK III hinged block, section 13.1

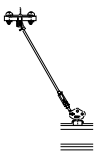
2) Special production

Crane runway stiffener, perpendicular direction

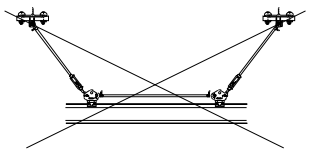
Track stiffener, longitudinal direction



KBK III/M20 only



Not permissible for all profile sections



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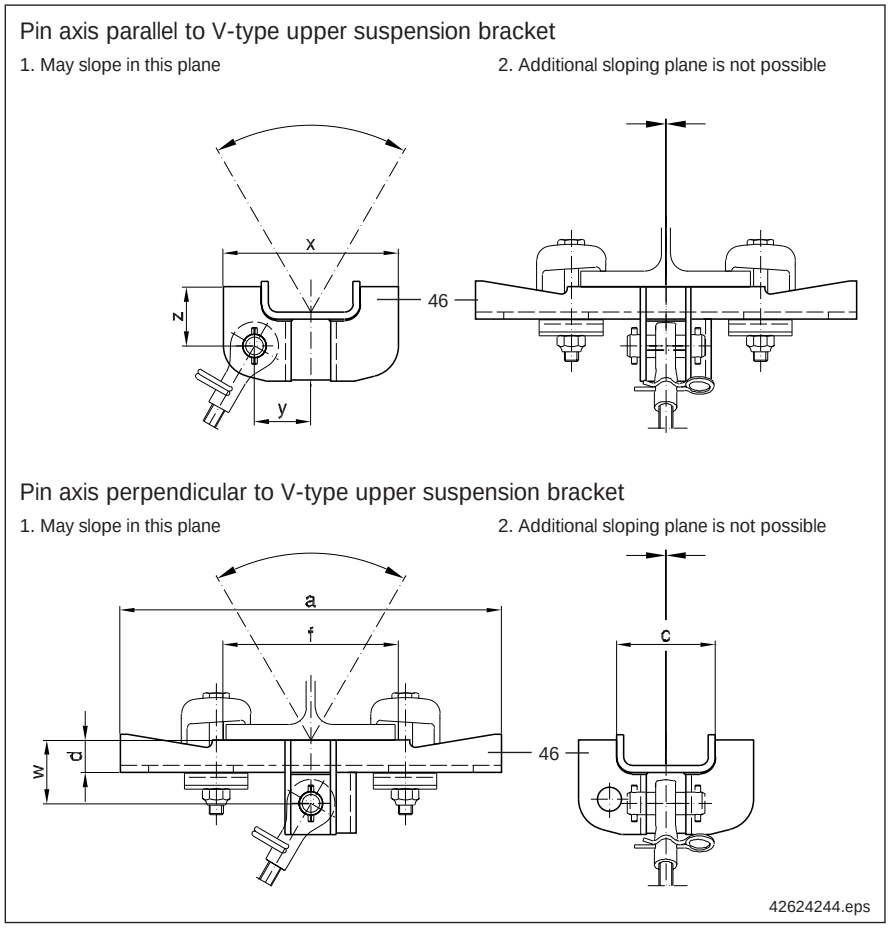
6.7 Components for V-type suspension / stiffener arrangement

6.7.1 V-type upper suspension bracket (item 46)



	w	x	y	z
KBK 100	45	125	40	40
KBK I	45	125	40	40
KBK II-L	65	150	50	55
KBK II	65	150	50	55
KBK III	65	150	50	55

The V-type upper suspension bracket has a pin with split sleeves (no hinged end piece).

Possible arrangements

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

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

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

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

Please note

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

Finish: galvanized

Clamp section with V-type upper suspension bracket B for steel sections with larger flange width for various flange thicknesses, see technical data sheet 203 072 44.

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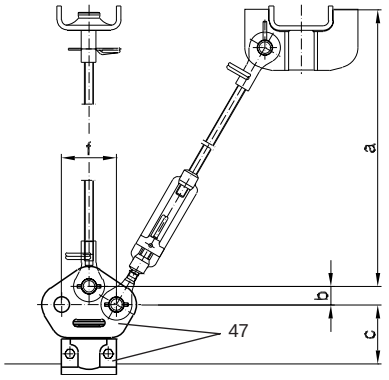
6.7.2 V-type hinged suspension bracket (item 47)

	a	b	c	f
KBK 100	h_1 + 65 ± 4	20	65	60
KBK I	h_1 + 65 ± 4	20	60	60
KBK II-L	h_1 + 100 ± 7	25	75	90
KBK II	h_1 + 100 ± 7	25	75	90
KBK III	h_1 + 100 ± 7	25	85	90

h_1 = threaded rod length



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

Possible arrangements

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

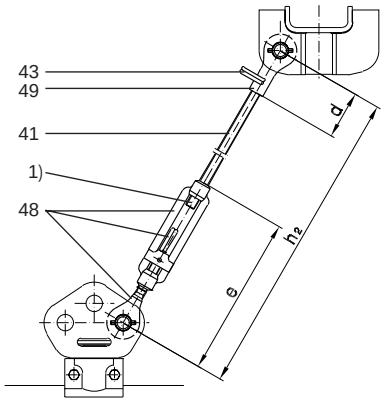
Please note

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

6.7.3 Spring clip (item 43) Suspension rod strainer (item 48) Hinged block (item 49)

	d	e	h_2
KBK 100	60	165 ± 15	h_1 + 155 ± 30
KBK I	60	165 ± 15	h_1 + 155 ± 30
KBK II-L	65	235 ± 20	h_1 + 220 ± 40
KBK II	65	235 ± 20	h_1 + 220 ± 40
KBK III	65	235 ± 20	h_1 + 220 ± 40

h_1 = threaded rod length



1) no spring clip here

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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.

Possible arrangements

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

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

KBK 100, I: 20 mm KBK II-L, II, III: 25 mm

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

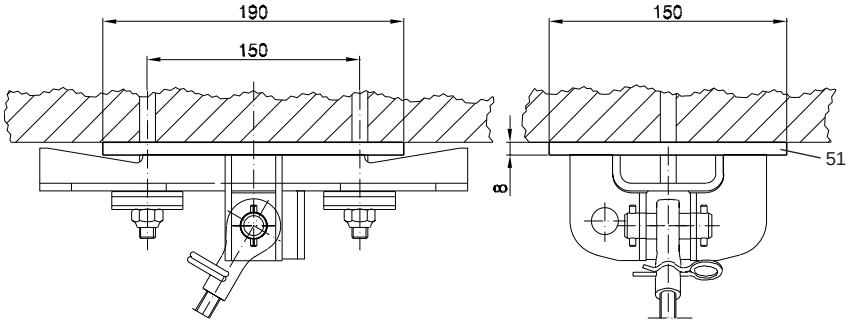
KBK 100, I: 45 mm KBK II-L, II, III: 60 mm at full ± adjustment.

Please note

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

6.7.4 Packing plate for upper suspension bracket (item 51)

Packing plate for upper suspension bracket



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

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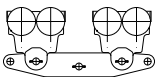
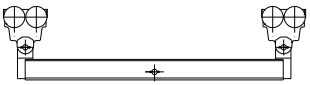
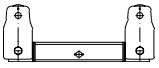
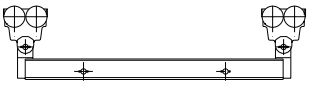
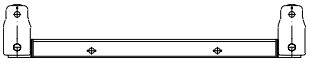
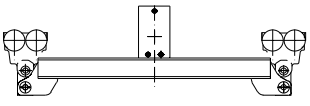
7 Trolleys and trolley combinations

7.1 Possible applications

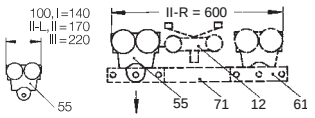
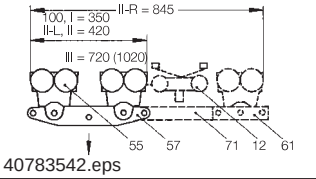
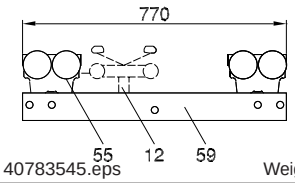
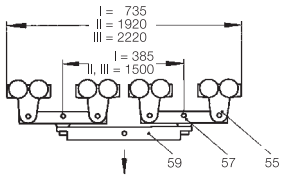
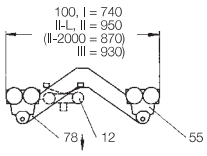
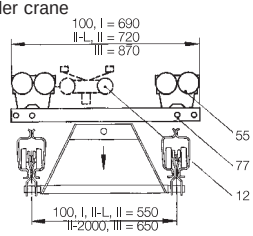
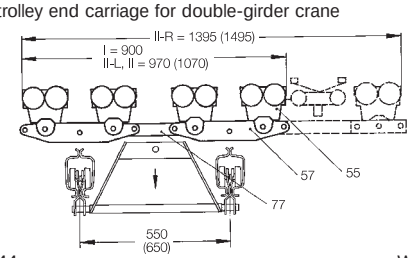
X Possible
O Possible in special cases
- Not possible

Item	Designation	Fig.	Connected by	Profile	Suitable for monorail		Crane trolley		
					straight track	with curves	Single-girder crane		Double-girder crane
							push travel	electric travel	
55	Single trolley	 42673241.eps	1 pin	100, I, II-L, II, III	X	X	X	-	X
64	Light-duty trolley, steel			100, I, II-L, II	X	X	-	-	-
65	Light-duty trolley, plastic			100, I, II-L, II	X	X	-	-	-
57	Double trolley with articulated frame	 42673242.eps		100, I, II-L, II, III	X	X	X	-	X
68	Load bar for curve	 42673243.eps	1 pin	I	X	X	X	-	o
69	Load bar for curve, type C			I, II-L, II	X	X	X	-	o
59	Type A load bars	 42673244.eps	1 pin	I, II-L, II	X	-	X	-	o
59	Load bar 600			II	X	-	X	-	o
59	KBK III load bar			III	X	-	X	-	o
56	Load bar with single-axle trolleys	 42673245.eps		III	X	-	X	-	o
58	Load bar with a single-axle trolley			III	X	-	X	-	o
66	Type B load bars	 42673246.eps	2 pins	I, II-L, II	X	-	-	X	X
66	KBK III load bar			III	X	-	-	X	X
63	Load bar with single-axle trolleys	 42673247.eps		III	X	-	-	X	X
60 62	Rigid crane traverse	 42673248.eps	rigid	II-L, II, III	-	-	X	X	X
	Raised crane traverse	 42673249.eps		II-L, II, III	-	-	X	X	X

7.2 Trolley combinations

The following criteria must be considered when selecting a trolley or a combination of trolleys:

1. Load on the trolley or combination of trolleys
2. Type of load attached (e.g. single or double-girder crane or crab frame)
3. Push or electric travel
4. Type of power supply system
5. When fitting attachments to the trolley, care must be taken to ensure that full system flexibility is maintained. The load handling attachment and load must be flexibly suspended from the trolleys.
6. In the event of a number of trolleys or cranes running on the same track, buffers must be provided (see section 14).

Combination of trolleys	KBK 100			KBK I			KBK II-L, II			KBK II-R			KBK III		
	Qty.	Item	Part no.	Qty.	Item	Part no.	Qty.	Item	Part no.	Qty.	Item	Part no.	Qty.	Item	Part no.
Trolley	1	55	984 534 44	1	55	980 610 44	1	55	982 110 44	2	55	982 110 44	1	55	850 110 44
										2	61	982 505 44			
										1	71	982 345 44			
										1	12	873 68 . 44			
															
40474645.eps															
40783544.eps Weight	1,0 kg			1,0 kg			2,0 kg			8,0 kg			12,0 kg		
Double trolley	2	55	984 534 44	2	55	980 610 44	2	55	982 110 44	3	55	982 110 44	2	55	850 110 44
	1	57	980 305 44	1	57	980 305 44	1	57	982 305 44	1	57	982 305 44	1	57	as per drwg.
										1	61	982 505 44			
										1	71	982 345 44			
										1	12	873 68 . 44			
															
40783542.eps															
							2	55	982 110 44	2	55	982 110 44			
							1	59	984 305 44	1	59	984 305 44			
										1	12	873 68. 44			
40783545.eps Weight	3,0 kg			3,0 kg			6,0 kg			11,2 kg			42,0 kg		
Quadruple trolley				4	55	980 610 44	4	55	982 110 44	5	55	982 110 44	4	55	850 110 44
				2	57	980 305 44	2	57	982 305 44	2	57	982 305 44	2	57	as per drwg.
				1	59	980 115 44	1	59	as per drwg. (1,5 m)	1	61	982 505 44	1	59	as per drwg. (1,5 m)
										1	71	982 345 44			
										1	12	873 68 . 44			
										1	59	as per drwg. (1,5 m)			
40783543.eps Weight				8,4 kg			approx. 49,0 kg			approx. 52,0 kg			approx. 125,0 kg		
Crab	4	55	984 534 44	4	55	980 610 44	4	55	982 110 44	4	55	982 110 44	1	78	850 440 44
	1	78	980 600 44	1	78	980 600 44	1	78	984 310 44	1	78	984 310 44			
									(984 330 44)			(984 330 44)	1	78	as per drwg.
							for II-L:			1	12	873 68 . 44	4	55	850 110 44
							1	78	855 110 44						
							KBK II:		27,6 kg						
							KBK II-L:		27,0 kg	29,1 kg					
40783644.eps Weight	17,0 kg			17,0 kg			(KBK II-2000: 52,0 kg)			KBK II -2000: 53,5 kg			74,0 kg		
Single trolley end carriage for double-girder crane	2	55	984 534 44	2	55	980 610 44	2	55	982 110 44	2	55	982 110 44	2	55	850 110 44
	1	77	980 595 44	1	77	980 595 44	1	77	982 595 44	1	77	982 595 44	1	77	850 332 44
										1	12	873 68 . 44			
															
41026844.eps Weight	3,5 kg			3,5 kg			7,8 kg			9,3 kg			26,9 kg		
Double trolley end carriage for double-girder crane				4	55	980 610 44	4	55	982 110 44	5	55	982 110 44	on application		
				2	57	980 305 44	2	57	982 305 44	2	57	982 305 44			
				1	77	980 590 44	1	77	982 591 44	1	61	982 505 44			
									(982 440 44)	1	71	982 345 44			
										1	77	982 591 44			
										(982 440 44)					
										1	12	873 68. 44			
40474644.eps Weight				7 kg			13 kg (13,2 kg)			18,2 kg (18,4 kg)					

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Separate calculations based on the individual components must be carried out for trolley combinations with load bars.

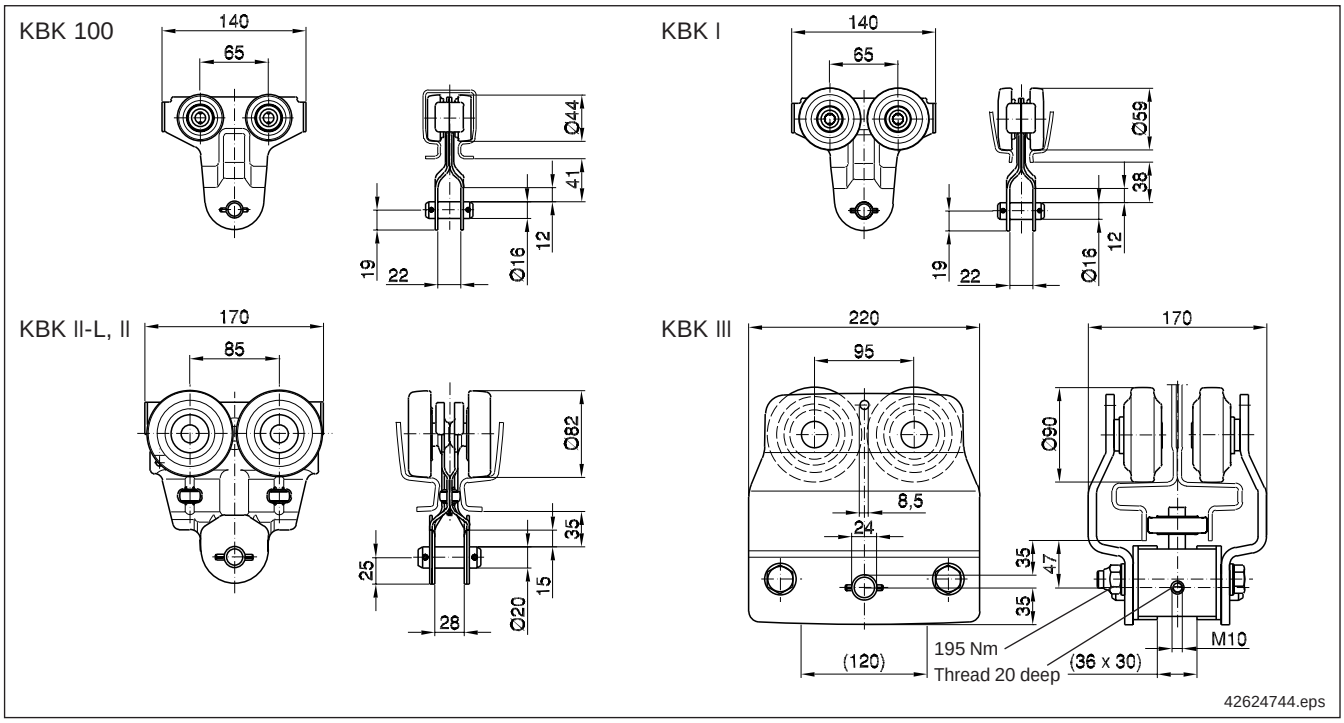
See the following pages for details.

1) Weight indicated does not include friction wheel travel drive

Combination of trolleys		KBK II-L, II			KBK II-R			KBK III		
		Qty.	Item	Part no.	Qty.	Item	Part no.	Qty.	Item	Part no.
Trolley with drive		1	55	982 110 44	1	55	982 110 44	1	55	850 110 44
		1	61	982 505 44	1	61	982 505 44	1	71	850 340 44
		1	69	982 480 44	1	69	982 490 44	1	69	850 171 44
		1	70	DRF drive	1	70	DRF drive	1	70	DRF drive
					1	12	873 68 . 44			
41026944.eps	Weight 1)			5,7 kg			7,6 kg			23,0 kg
Double trolley with drive		2	55	982 110 44	2	55	982 110 44	2	55	850 110 44
		1	57	982 305 44	1	57	982 305 44	1	57	n. Zeichnung
		1	69	982 480 44	1	69	982 490 44	1	71	850 340 44
		1	70	DRF drive	1	70	DRF drive	1	69	850 171 44
					1	12	873 68 . 44	1	70	DRF drive
40275244.eps	Weight 1)			8,9 kg			12,8 kg			53,0 kg
Quadruple trolley with drive		4	55	982 110 44	4	55	982 110 44	4	55	850 110 44
		2	57	982 305 44	2	57	982 305 44	2	57	as per drwg.
		1	59	as per drwg. (1,5m)	1	12	873 68. 44	1	59	as per drwg. (1,5m)
		1	69	982 480 44	1	59	as per drwg. (1,5m)	1	71	850 340 44
		1	70	DRF drive	1	69	982 490 44	1	69	850 171 44
					1	70	DRF drive	1	70	DRF drive
	Weight 1)			approx. 51,9 kg			approx. 53,2 kg			approx. 136,0 kg
Trolley with drive for double-girder crane		4	55	982 110 44	4	55	982 110 44	1	78	850 440 44
		1	69	982 480 44	1	69	982 480 44	1	69	850 171 44
		1	70	DRF drive	1	70	DRF drive	1	70	DRF drive
		1	78	984 310 44	1	78	984 310 44	1	71	850 330 44
				(984 330 44)			(984 330 44)			
		1	71	984 307 44	1	12	873 68. 44			
				for II-L:	1	71	984 307 44			
		1	78	855 110 44						
		KBK II: 30,8 kg								
		KBK II-L: 30,2 kg			KBK II: 32,3 kg					
40275345.eps	Weight 1)	(KBK II-2000: 55,2 kg			KBK II-2000: 56,7 kg					82,2 kg
Double trolley with drive for double-girder crane		2	55	982 110 44	2	55	982 110 44	2	55	850 110 44
		1	69	982 480 44	1	69	982 480 44	1	77	850 332 44
		1	70	DRF drive	1	70	DRF drive	1	69	850 171 44
		1	77	982 595 44	1	77	982 595 44	1	70	DRF drive
					1	12	873 68. 44	1	71	850 330 44
40474744.eps	Weight 1)			10,7 kg			12,2 kg			38,1 kg
Double trolley end carriage with drive unit for double-girder crane		4	55	982 110 44	4	55	982 110 44			on application
		2	57	982 305 44	2	57	982 305 44			
		1	69	982 480 44	1	69	982 490 44			
		1	70	DRF drive	1	70	DRF drive			
		1	77	982 591 44	1	77	982 591 44			
				(982 440 44)			(982 440 44)			
					1	12	873 68. 44			
40474745.eps	Weight 1)			15,9 kg (16,1 kg)			17,8 kg (18,0 kg)			

7.3 Single trolleys

7.3.1 Load trolleys (item 55)



Trolley / suitable for	KBK 100			KBK I			KBK II-L, II			KBK III		
	Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.	Max. load. kg	Weight approx. kg	Part no.	Max. load. kg	Weight approx. kg	Part no.
DC 1, DCM 1 DKUN 1, DKM 1	100	1	984 530 44	—			—			—		
DC 1 - DC 2, DCM 1 - DCM 2 DKUN 1, DKUN 2, DKM	—			300	1	980 610 44	—			—		
DC 1 - DC 5, DCM 1 - DCM 5 DKUN 1, DKUN 2, DKUN 5, DKM	—			—			600	2	982 110 44	—		
DC 2 - DC 10, DCM 2 - DCM 5 DKUN 2, DKUN 5, DKUN 10, DKM 2	—			—			—			1300	12	850 110 44

DC and DKUN hoists with short suspension eye can be used on the single trolley for KBK 100, I, II-L, II.

The load handling attachment and load must be flexibly suspended.

Quiet-running KBK trolleys are fitted with 4 plastic travel wheels mounted in permanently lubricated anti-friction bearings. KBK II-L, KBK II and KBK III trolleys have two additional horizontal guide rollers. The trolley side cheeks project beyond the travel wheels as a protection against collision damage.

Connection possibility for coupling bars, etc.

KBK II: link (item 61); KBK III: M 10 at both ends

The traction resistance of a loaded trolley is approx. 1–2 % of the attached load. Approx. 0,5 % with constant displacement.

Finish: KBK 100, I, II-L, II: black (RAL 9005); KBK III: red (RAL 2002)

The permissible load on the trolley is reduced for:

Ambient temperature °C	–20	–15	–10 to +40	+50	+60	+70
% of load	50	80	100	90	75	50

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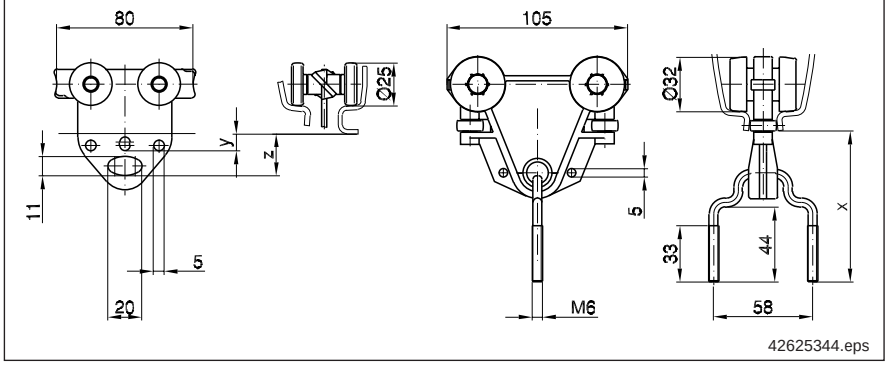
7.3.2 Special trolleys for small loads

Light-duty trolley (steel) KBK 100, I (item 64)

Light-duty trolley (plastic) KBK 100, I, II-L, II (item 65)



	x	y	z
KBK 100	85	10	25
KBK I	90	15	30
KBK II-L, II	70	-	-

Steel version

The light-duty trolley is intended for carrying light-weight mobile tools or other small loads. The steel wheels are mounted on anti-friction bearings.

Finish: galvanized

Plastic version

The axles of the plastic travel wheels are mounted on anti-friction bearings. The trolleys have two special horizontal guide rollers. The stirrup for securing the load is fitted to a plastic ball-and-socket joint. The plastic side cheek projects beyond the wheels in the direction of travel as a buffer for protection in the event of a collision.

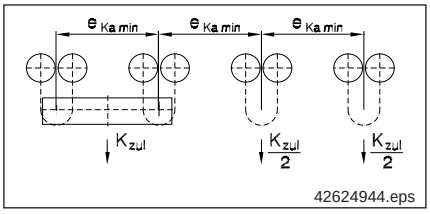
Finish: black, stirrup galvanised

Item	Designation	KBK 100, I			KBK II-L, II		
		Max. load kg	Weight kg	Part no.	Max. load kg	Weight kg	Part no.
64	Light-duty trolley (steel)	40	0,2	984 607 44	40	0,5	855 085 44
65	Light-duty trolley (plastic)	25	0,2	980 461 44	25	0,2	982 471 44

7.3.3 Minimum trolley spacing

The minimum permissible spacing dimensions between single or multiple trolleys at maximum load are governed by the trolley centre distances of the load bars.

Pay attention to permissible distances between suspensions and loads.

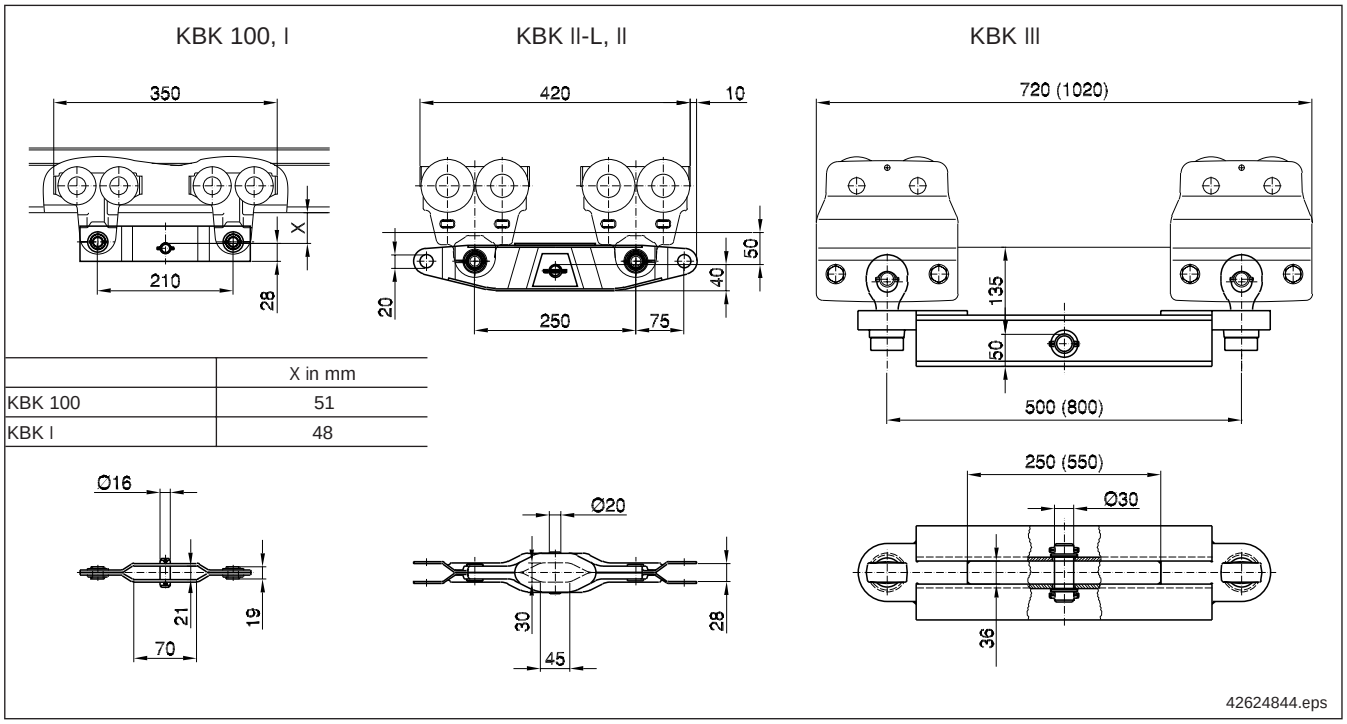


	Minimum spacing dimension mm	Max. load on single trolley kg
KBK 100	210	100
KBK I	200	200
	400	300
KBK II-L, II	250	600
KBK III	500 (800) 1)	1200

1) For travel through switches

7.4 Load bar

(item 57)



	X in mm
KBK 100	51
KBK I	48

Trolley / suitable for	KBK 100			KBK I			KBK II-L, II			KBK III		
	Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.
DC 1 - DC 2, DCM 1 - DCM 2 DKUN 1, DKUN 2, DKM	200	1	980 305 44	—			—			—		
DC 1 - DC 5, DCM 1 - DCM 5 DKUN 1, DKUN 2, DKUN 5, DKM	—			400	1	980 305 44	—			—		
DC 1 - DC 10, DCM 1 - DCM 5 DKUN 1, DKUN 2, DKUN 5, DKUN 10 1), DKM	—			—			1200	2	982 305 44	—		
DC 2 - DC 20, DCM 2 - DCM 5 DKUN 2, DKUN 5, DKUN 10, DKM 2	—			—			—			2600	18	as per drwg.
Double trolley end carriage, completed (load bar+ 2 trolleys)	200	3	on application	400	3	980 322 44	1200	6	851 132 44	2600	42	on application

1) DKUN 10 cannot be used with a suspension ring.

The double trolley for travel on straight tracks and on curves is obtained by joining two trolleys using the load bar. Holes drilled into the ends of the KBK II-L, II load bar are provided for fitting spacer bars and link bars (see section 12), they are not designed for connecting loads. Trolleys are connected by means of the M10 threaded hole for KBK III.

Use DC and DK hoists with the long suspension eye.

Finish:

KBK 100, I, II-L, II: black (RAL 9005); KBK III: red (RAL 2002)

The KBK III load bar is normally 500 mm long; however, they must be at least 800 mm long for applications involving track switches.

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7.5 Load bars for curved travel

Monorail trolleys, and single and double-girder cranes can be fitted with load bars for load distribution. This enables larger distances between suspension fittings to be achieved, or heavier loads to be transported for a given suspension fitting interval.

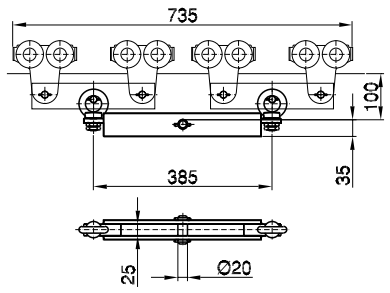
Load bar length e_{Ka} for the travelling hoist or e_{KT} for the crane trolley and the distances between suspension fittings must be specified as described in section 3.

The dead weight of the spacer bar must be included in load K when selecting the monorail or crane runway. The number of trolleys (single, double or quadruple trolleys) must be determined according to load K.

When special trolley load bars are provided for trolleys running on curved tracks, the maximum possible distance between the trolleys (e_{Ka}) is the length of the radius of the curve.

7.5.1 KBK I load bar

KBK I load bar (item 59)



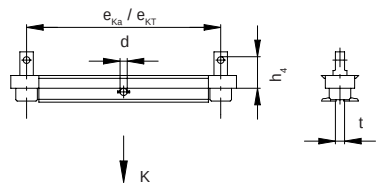
42625044.eps

Item	Designation	Max. load kg	Weight approx. kg	Part no.	Finish	Ordered complete with trolleys	Weight approx. kg
59	KBK I load bar, for curves 1)	600	3,2	980 115 44	black (RAL 9005)	—	—

1) not for DK 10, DC 10.

7.5.2 Load bar type C

Articulated load bar for monorail unit



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Track section	Max. load K in kg	e_{Ka}, e_{KT} min - max in mm	h_4 in mm	d in mm	t in mm	Weight approx. kg
KBK I	400	210 - 1000	70	20	25	8,8 / m + 3,2
	600	400 - 1000 3)				
KBK II-L KBK II	1400	650 - 1500	95		25 1)	17,3 / m + 5,5
	1500	650 - 1400	85	30 2)	30	
	1700	650 - 1200				
	2100	650 - 1000				
	2200	650 - 1500	105			21,2 / m + 5,5

DC and DK hoists with long suspension eye,
1) not for DK 10
2) not for KBK II, KBK I crane suspensions
3) $e_{Ka} \leq 600$: 2x double trolley with articulated frame required

Finish: red (RAL 2002)

Data required for ordering

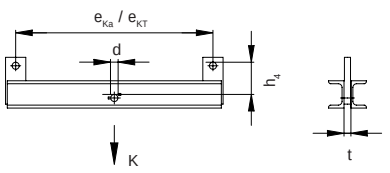
Load bar type; track section profiles; e_{Ka} / e_{KT}, h_4, d and l_{Ka} in mm.

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

7.6.1 Load bar type A

see also section 7.5

Load bar for monorail trolley (straight track) and crane trolleys (EHK)



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Track section	Max. load K in kg	e_{Ka}, e_{KT} min - max in mm	h_4 in mm	d in mm	t in mm	Weight approx. kg
KBK I	800	400 - 2000 3)	85	20	25	17,3 / m + 2,8
KBK II-L KBK II	700	450 - 2800	95			17,3 / m + 4,5
	850	450 - 2500				
	1000	450 - 2200				
	1200	450 - 1750				
	1400	650 - 1500	85	30 2)	30	
	1600	650 - 1300				
	1800	650 - 1150				
	2100	650 - 1000				
	1100	450 - 3000	115	20	25 1)	21,2 / m + 5,0
	1300	450 - 2500				
	1500	650 - 2200	105	30 2)	30	
	1600	650 - 2000				
	1800	650 - 1800				
	2100	650 - 1600				
	2100	650 - 3000	145			32,0 / m + 5,5

DC and DK hoists with long suspension eye,

1) not for DK 10

2) not for KBK II, KBK I crane suspensions

3) $e_{Ka} \leq 600$: 2x double trolley with articulated frame required

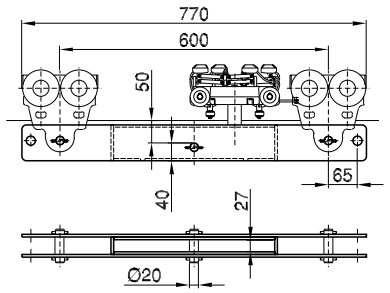
Finish: red (RAL 2002)

Data required for ordering

Load bar type; track section profiles; e_{Ka} / e_{KT}, h_4, d and l_{Ka} in mm.

7.6.2 KBK II load bar, size 600

Load bar 600 (item 59)



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

The KBK II-R current collector trolley is protected against collision between the trolleys.

Item	Designation	Max. load kg	Weight approx. kg	Part no.	Finish	Ordered complete with trolleys	Weight approx. kg
59	Load bar 600, KBK II	1200	8	984 305 44	black (RAL 9005)	851 131 44	12

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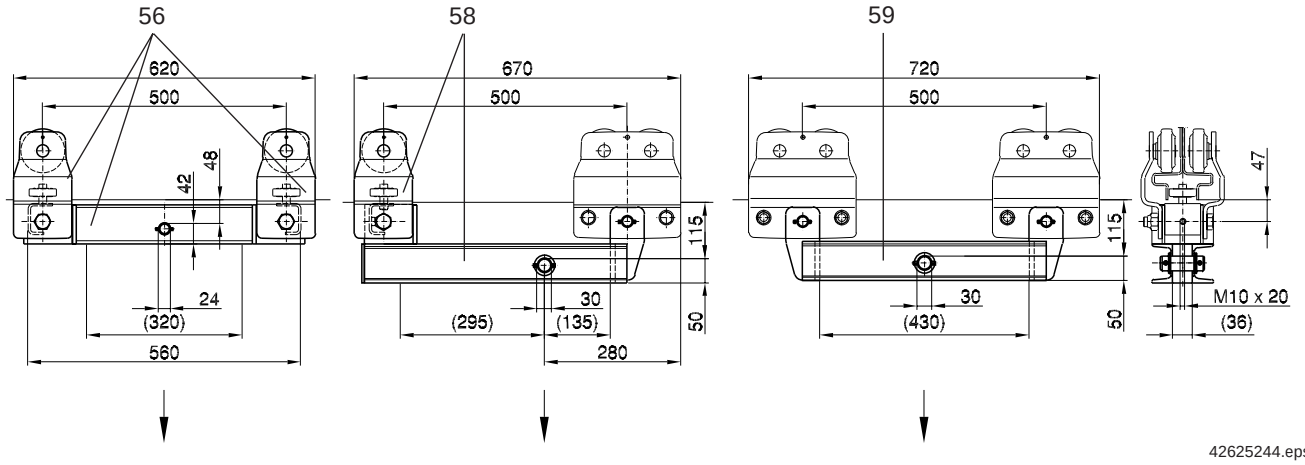
7.6.3 KBK III load bar

KBK III load bars (not for curved track) (items 56, 58, 59)



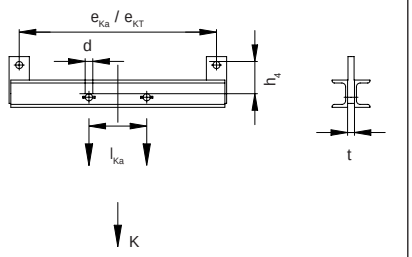
The rubber buffer must be fitted with 20 mm filler plates or a cellular foam buffer must be used on the single-axle trolley.

Item	Designation	Max. load kg	Weight approx. kg	Part no.	Finish	Ordered complete with trolleys	Weight approx. kg
56	Single-axle trolley with load bar not for curve travel, KBK III	1300	22	Standard drawing	red (RAL 2002)	on application	22
58	Load bar with single-axle trolley not for curve travel, KBK III	1900	22				34
59	Load bar, not for curve travel, KBK III	2600	17				41

7.7 Load bars for travel on straight tracks for trolleys and cranes with two pins

7.7.1 Load bar type B

Load bar for crane trolleys (ZHK) and for monorail trolley (2 loads symmetrically arranged to the centre)



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Track section	Max. load K in kg	e_{Ka} e_{KT} min - max in mm	h_4 in mm	d in mm	t in mm	Weight approx. kg
KBK I	800	400 - 2000 2)	85	20	25	17,3 / m + 2,8
KBK II-L KBK II	800	1000 - 2800	95		25 1)	17,3 / m + 4,5
	1000	1000 - 2500				
	1200	1000 - 2250				
	1400	1000 - 2000				
	1700	1000 - 1750				
	2200	1000 - 1500				
	900	1000 - 3400	115			21,2 / m + 5,0
	1300	1000 - 3000				
	1500	1000 - 2700				
	1700	1000 - 2400				
	2200	1000 - 3000	155			32,0 / m + 5,5

DC and DK hoists with long suspension eye,
1) not for DK 10
2) $e_{Ka} \leq 600$: 2x double trolley with articulated frame required

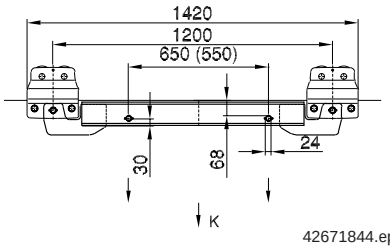
Finish: red (RAL 2002)

Data required for ordering

Load bar type; track section profiles; e_{Ka} / e_{KT}, h_4, d and l_{Ka} in mm.

7.7.2 KBK III load bar

Traverse for KBK III double-girder crane (item 66)



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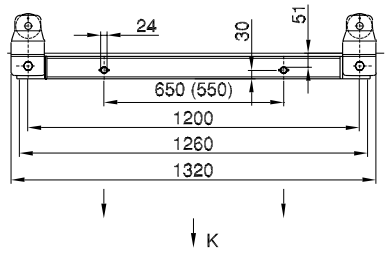
Traverse with single-axle trolleys for KBK III double-girder crane (item 63)



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Item	Designation	Max. load K in kg	Finish	Weight approx. kg	Part no.
66	Double-girder crane traverse for trolleys for KBK II, KBK III crane girders	2600 (2x1300)	red (RAL 2002)	35	Standard drawing
63	Double-girder crane traverse with single-axle trolleys for KBK II, KBK III crane girders	1300 (2x650)	red (RAL 2002)	37	Standard drawing

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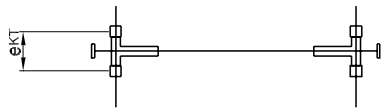
Trolleys

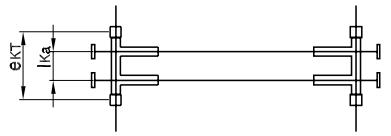
7.8 Crane traverses with rigid crane girder connection

7.8.1 Crane end carriage, rigid (standard height)

Single-girder crane



Double-girder crane



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Rigid crane trolleys facilitate the construction of parallel-running single and double-girder cranes. Rigid single-girder cranes can be fitted with electric travel drives (crane girder lengths: KBK II max. 6 m, KBK III max. 9 m), as well as rigid double-girder cranes. Two crane traverses are needed for each crane to make up the crane trolleys; trolleys and load bars must be ordered separately. Crane girder suspensions, spacer bars and bracing frames for double-girder cranes are no longer available.

Finish: red (RAL 2002)

Cranes should be designed according to the selection table. Not suitable for KBK II-T. Shorter suspension plates D can be employed when double trolleys are used. The RF friction wheel travel drive link, link bars, spacer bars or buffer attachments can be fitted using the single-trolley bracket, part no. 98250544, or using the load bar.

The rubber buffer must be fitted with 20 mm filler plates or a cellular foam buffer must be used on single-axle trolley traverses.

Important: Joint distance dimension (st) on the crane must be 150–550 mm or more than 850 mm. Length of stiffener on the crane: 750 mm.

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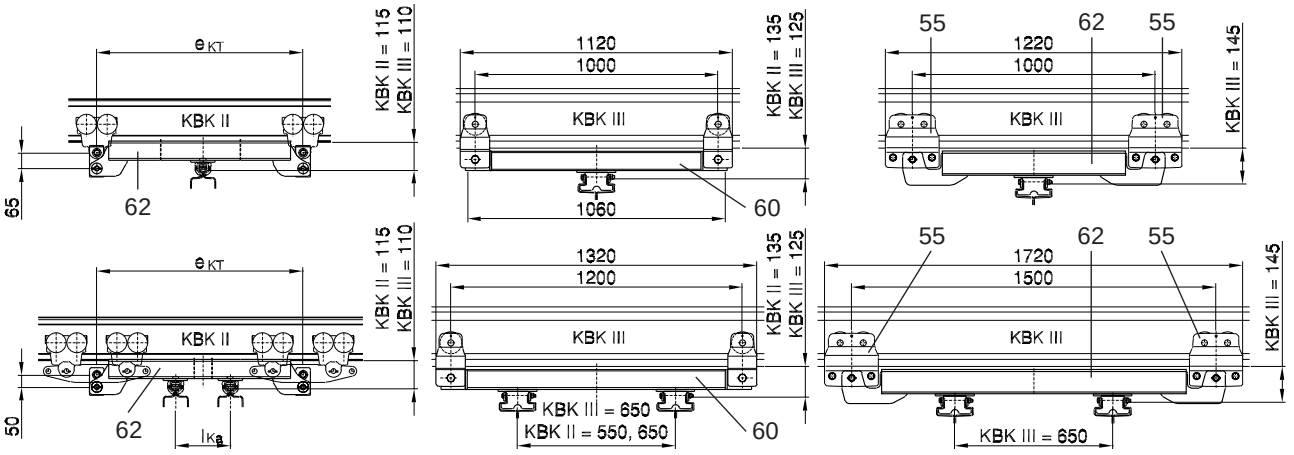
KBK II on KBK II
(KBK III on KBK II not illustrated)

KBK III on KBK III (up to 1300 kg)
(KBK II on KBK III not illustrated)

KBK III on KBK III (up to 2600 kg)



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Item	Rigid crane traverses			SWL 1) (max.) kg	Weight kg	Part no.
	A) KBK II crane on KBK II track (115 mm headroom as with crane girder suspension)					
62	Single-girder crane traverse, rigid	e_{KT} = 1000 mm,	E	1000	38	984 012 44
		e_{KT} = 1000 mm,	D	1000	38	984 380 44
		e_{KT} = 1100 – 2000 mm,	E	1000	38-48	
		e_{KT} = 1100 – 2000 mm,	D	1000	38-48	
62	Double-girder crane traverse, rigid	e_{KT} = 1200 – 2000 mm,	E, l_{Ka} = 550 mm	1000	56-64	
		e_{KT} = 1200 – 2000 mm,	D, l_{Ka} = 550 mm	1000	56-64	
		e_{KT} = 1300 – 2000 mm,	D, l_{Ka} = 650 mm	1000	58-64	
		e_{KT} = 1300 mm,	D, l_{Ka} = 650 mm	2000	58	
	B) KBK III crane on KBK III track					
60	Single-girder crane traverse, rigid, with single-axle trolley	e_{KT} = 1000 mm		1000	46	
62	Single-girder crane traverse, rigid w/o trolley	e_{KT} = 1000 mm		2000	47	
60	Double-girder crane traverse, rigid, with single-axle trolley	e_{KT} = 1200 mm, l_{Ka} = 650 mm		1000	66	As per standard drawing
62	Double-girder crane traverse, rigid w/o trolley	e_{KT} = 1500 mm, l_{Ka} = 650 mm		2000	74	
	C) KBK II crane on KBK III track: (not illustrated)					
60	Single-girder crane traverse, rigid, with single-axle trolley	e_{KT} = 1000 mm		1000	37	
60	Double-girder crane traverse, rigid, with single-axle trolley	e_{KT} = 1200 mm, l_{Ka} = 550 or 650 mm		1000	47	
	Double-girder crane traverse, rigid w/o trolley	e_{KT} = 1500 mm, l_{Ka} = 550 or 650 mm		2000	74	
	D) KBK III crane on KBK II track: (not illustrated)					
62	Single-girder crane traverse, rigid	e_{KT} = 1000 – 2000 mm,	E	500	40-50	
		e_{KT} = 1000 – 2000 mm,	D	1000	40-50	
62	Double-girder crane traverse, rigid	e_{KT} = 1200 – 2000 mm,	E, l_{Ka} = 650 mm	500	52-60	
		e_{KT} = 1200 – 2000 mm,	D, l_{Ka} = 650 mm	1000	52-60	

1) Check trolley loads.

e_{KT} standard lengths: 1000 – 1200 – 1600 – 2000 mm.

7.8.2 Crane end carriage, rigid, raised

KBK cranes with raised girders of single or double-girder design may be used where height is very limited, e.g. in low rooms.

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

The track and crane girder profile sections are the same for KBK II (not KBK II-T) or KBK III.

If KBK II-R used for the crane girders, the KBK II-R sections must be ordered with a power feed arrangement and conductors shortened by 20 mm at each end as well as the protective caps for conductors (order no. 979 516 44).

The crane end buffers are already integrated into the crane traverses for KBK II-L/II cranes.

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

The crane end buffers must be fitted to the crane traverses for KBK III cranes.

Cranes fitted with raised crane traverses are rigid, which means that KBK III single-girder cranes and KBK II and KBK III double-girder cranes may also be fitted with electric travel drives.

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

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

There must be no track joints in the crane girder.

Finish: Crane traverses RAL 2002 (red)

Example for ordering

2 off raised crane traverse for ZHK-KBK II

Lower edge of crane = lower edge of runway

Max. crane girder length selection table

SWL (kg)	KBK II-L				KBK II				KBK III			
	Single-girder crane 1)		Double girder crane		Single-girder crane 1)		Double girder crane 3)		Single-girder crane		Double girder crane	
	l_{HT} (m)	l_{Kr} (m)	l_{HT} (m)	l_{Kr} (m)	l_{HT} (m)	l_{Kr} (m)	l_{HT} (m)	l_{Kr} (m)	l_{HT} (m)	l_{Kr} (m)	l_{HT} (m)	l_{Kr} (m)
160	5,00	5,22	6,00	6,22	6,00	6,22	7,00	7,22	8,00	8,30	8,00	8,30
200	5,00	5,22	6,00	6,22	6,00	6,22	7,00	7,22	8,00	8,30	8,00	8,30
250	5,00	5,22	6,00	6,22	6,00	6,22	7,00	7,22	8,00	8,30	8,00	8,30
315	4,00	4,22	6,00	6,22	6,00	6,22	7,00	7,22	8,00	8,30	8,00	8,30
400	3,00	3,22	6,00	6,22	6,00	6,22	7,00	7,22	8,00	8,30	8,00	8,30
500	3,00	3,22	5,00	5,22	5,50	5,72	7,00	7,22	8,00	8,30	8,00	8,30
630			5,00	5,22	4,5 2)	4,72	7,00	7,22	8,00	8,30	8,00	8,30
800			4,00	4,22			6,50	6,72	6,50	6,80	8,00	8,30
1000		-	4,00	4,22			5,50	5,72	5,50	5,80	8,00	8,30
1250						-					8,00	8,30
1600			-				-		-		7,00	7,30
2000											6,00	6,30
e_{KT} (mm)	1000		1000		1000		1000		1000		1500	
l_{Ka} (mm)	-		550		-		550		-		650	
Weight (kg) 4)	32		38		32		38		52		77	

1) only for push travel

2) double trolley required for crab

3) also for quadruple trolley on request

4) with trolley; exception: KBK III - EHK with single-axle trolleys

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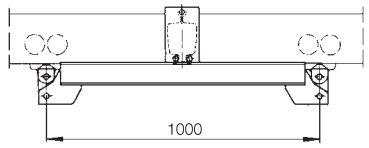
Crane end carriage, raised, single-girder crane (EHK)

KBK II-L / II



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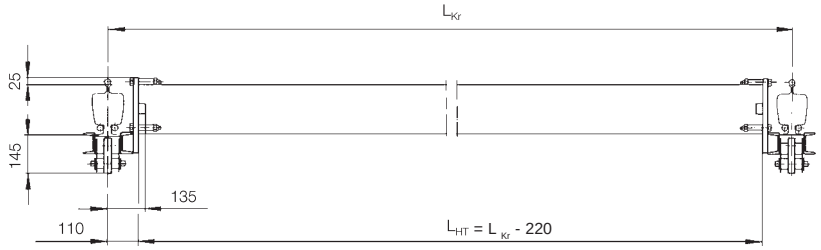

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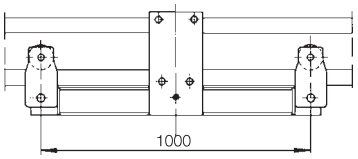
KBK III



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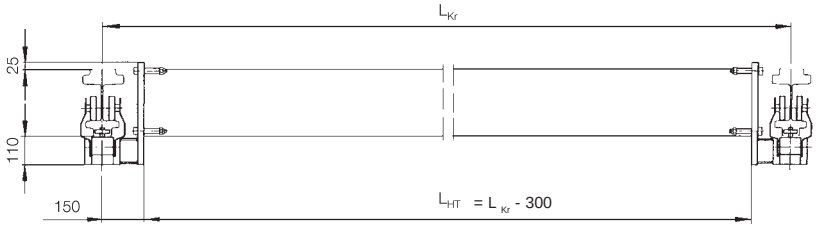

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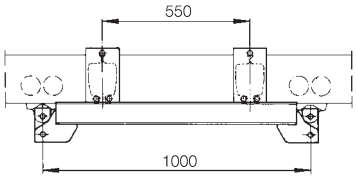
Crane end carriage, raised, double-girder suspension crane (ZHK)

KBK II-L / II



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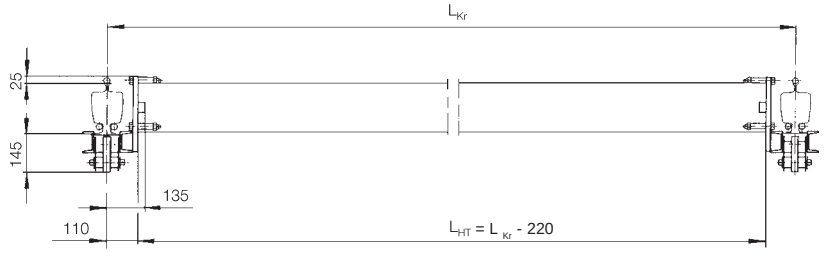

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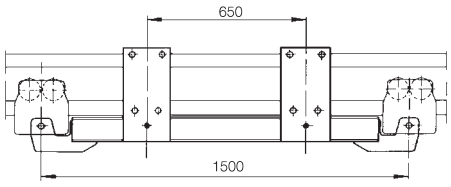
KBK III



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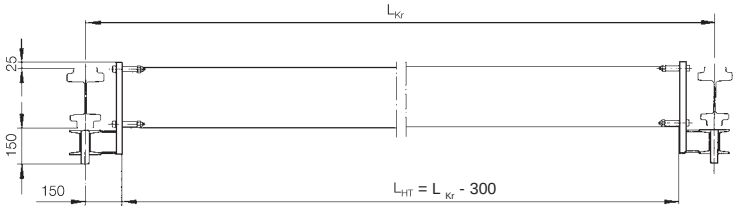

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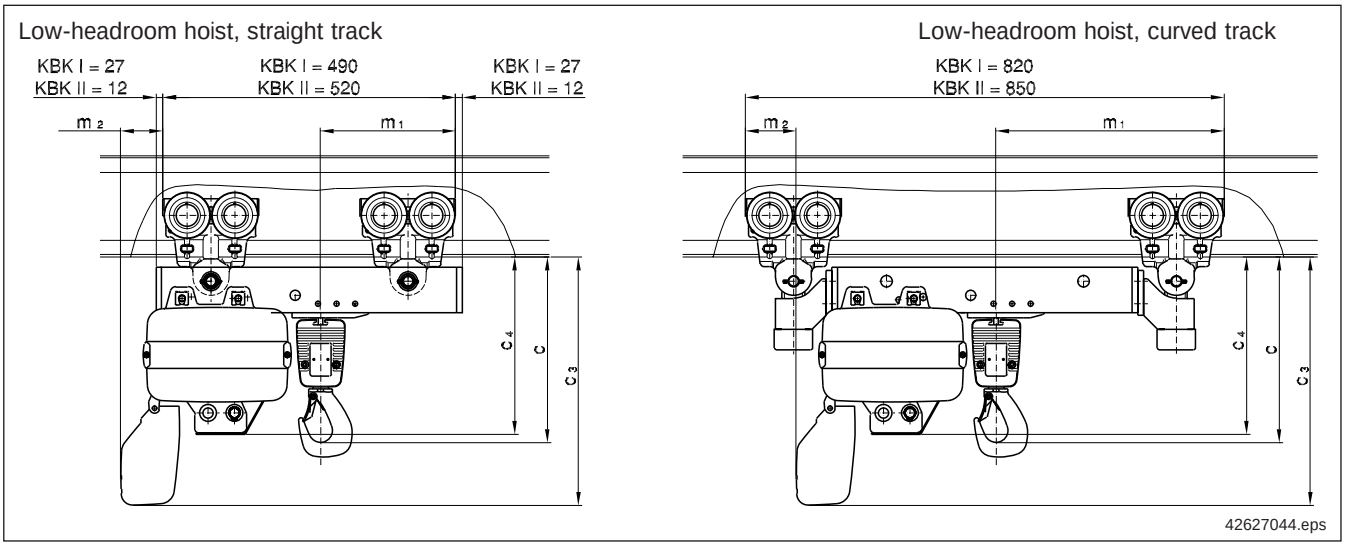
8 Monorail trolley for special hoists

8.1 Low-headroom frame for KBK I and KBK II monorail hoists for straight and curved track

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

For further details, see technical data sheet: order no. 202 906 44 for DKUN 2 and 5 (see diagram for arrangement).



8.2 Load bar for DS-1 rope winch and D-SH SpeedHoist

The load bar is used for fitting DS-1 rope winch and D-SH SpeedHoist lifting appliances

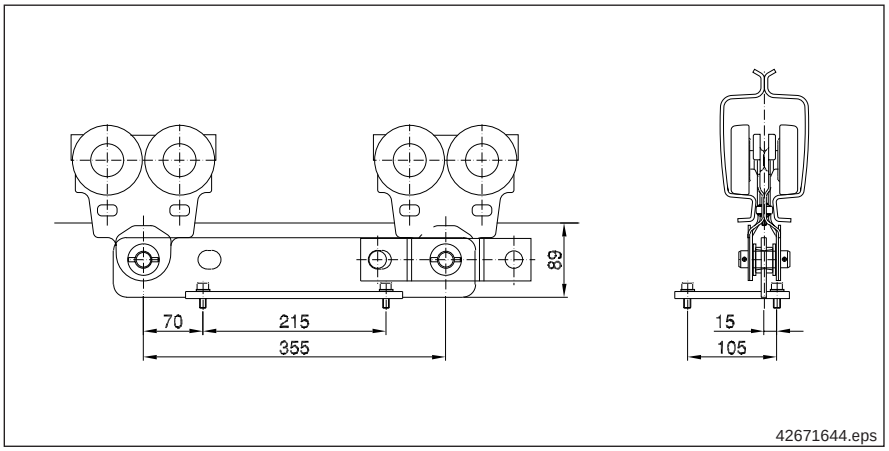
The single-trolley link can be fitted.

The load bar is suitable for trolleys: KBK 100, KBK I, KBK II

Straight travel (curved travel possible for KBK II)

Item	Designation	Weight approx. kg	Part no.
	Load bar for DS-1 rope winch and D-SH SpeedHoist	2,2	851 195 44

Finish: Load bar RAL 9005 (black)



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8.3 Load bar for D-BP 55 / 110 rope balancer

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

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

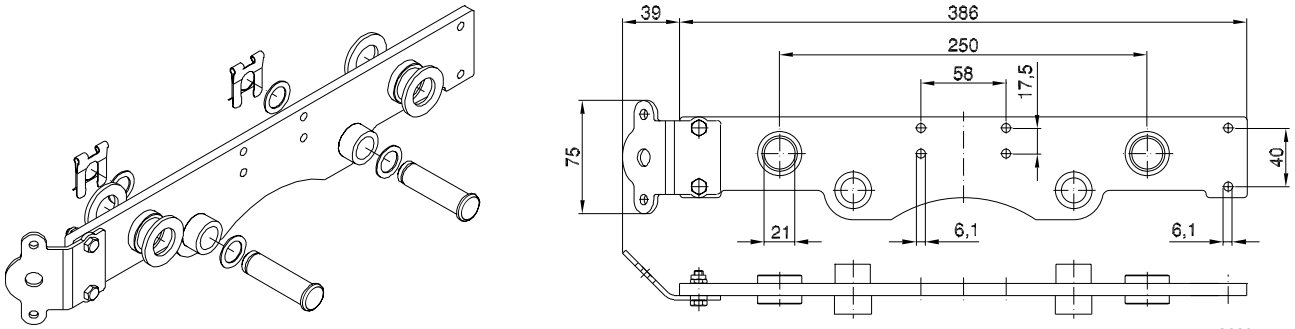
The load bar is suitable for trolleys: KBK 100, KBK I, KBK II

Straight travel (curved travel possible for KBK II)

Item	Designation	Weight approx. kg	SWL	Part no.
	Load bar for D-BP 55/110 rope balancer	1,85	230 kg	984 685 44

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

The washers are only required for KBK II.



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

D-BP 55 : K = 80 kg

D-BP 110 : K = 160 kg

Up/down control

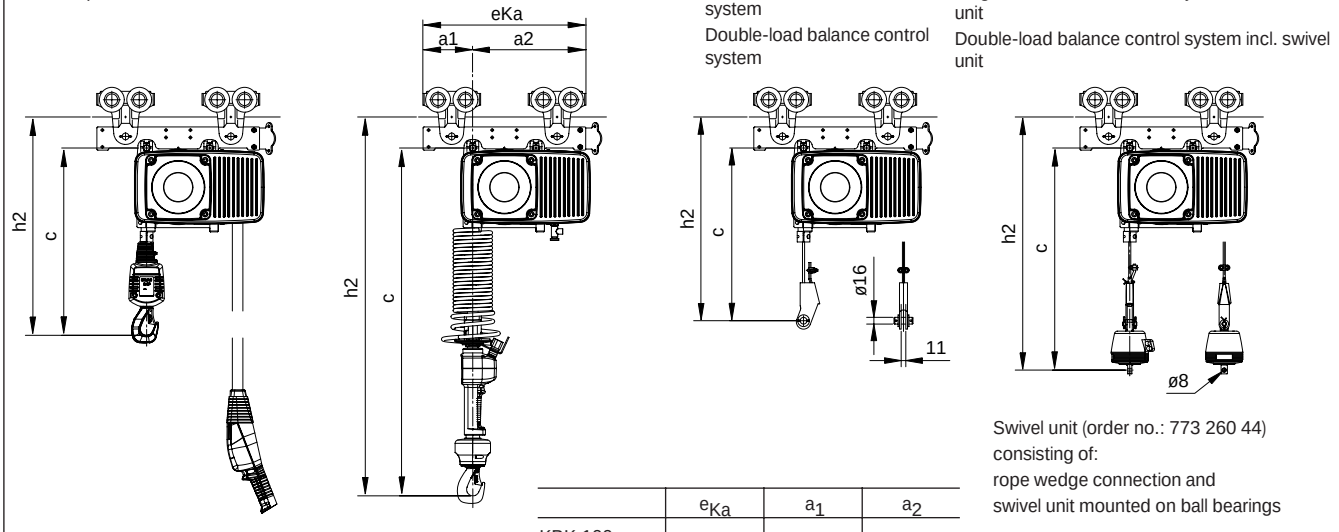
Manual force control

Single-load balance control system

Double-load balance control system

Single-load balance control system incl. swivel unit

Double-load balance control system incl. swivel unit



	e_{Ka}	a_1	a_2
KBK 100 KBK I	390	120	270
KBK II	420	135	285

Swivel unit (order no.: 773 260 44) consisting of:
rope wedge connection and
swivel unit mounted on ball bearings

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Installation dimensions

Profile section:
KBK 100, KBK I, (KBK II = -3 mm)

	Up/down control c / h2	Manual force control c / h2	Single (double) load balance control system c / h2	Single (double) load balance control system incl. swivel c / h2
D-BP 55	445 / 520	825 / 900	410 / 485	525 / 600
D-BP 110	465 / 540	845 / 920	430 / 505	545 / 620

9 Crab

9.1 Crab frame
(item 78)

KBK 100, I, II-L, II crab frames fitted with four trolleys and the hoist form a double-rail crab for double-girder cranes.

The KBK III crab frame is supplied from the factory with single-axle trolleys ready fitted.

Special crab frames to reduce dimension H (raised crab frames) are available on request.

Passing beneath bracing frames, spacer bars or crane traverses is only possible with the normal crab frame. The KBK II crab frame can also be used for KBK II-L (unable to underpass the crane runway).

Underpassing is not possible with KBK 100 as standard. Special equipment on application.

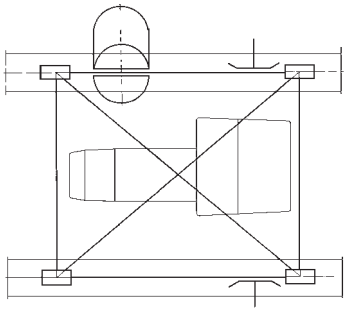
Electric travel drives and current collectors (KBK II-R, DEL) can be fitted both inside and outside the crab frame.

RF trolley coupling within the crab frame is possible as follows:

- With KBK DC 10-20, KBK II, using the 120 trolley coupling, part no. 984 307 44 (the link bar on the trolley for RF-KBK II is not required)
- With KBK II-2000, always (either inside or outside the crab frame) using the 120 trolley coupling which is included in the ident. no. of the crab frame.
- With KBK III, using the short link bar, part no. 850 330 44.

The motor of the RF trolley points outwards (see diagram), while the hoist motor points towards the RF trolley.

RF trolley in crab frame



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	Finish	Max. load kg	Weight approx. kg	Part no.
KBK 100 crab frame [3]	black	200	13,0	980 600 44
KBK I crab frame		600	13,0	980 600 44
KBK II-L crab frame		1200	19,0	855 110 44
KBK II crab frame	red	1200	19,6	984 310 44
KBK II-2000 crab frame		2100	44,0	984 330 44 [2]
DC 10-20 KBK II / III crab frame		2600 [4]	25	851 275 44
Crab frame with KBK III single-axle trolleys		2200 (2600 [1])	74	850 440 44
KBK III-3200 crab frame (w/o trolleys)		3300	74	on application

1) Group of Mechanisms 1 Cm
2) 120 trolley coupling included
3) The standard crab frame does not underpass the crane runway, pay attention to approach dimensions.
4) Pay attention to the maximum permissible trolley loads for KBK II.

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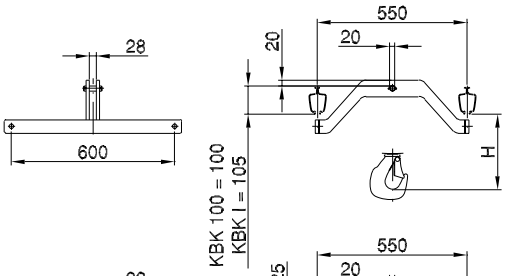
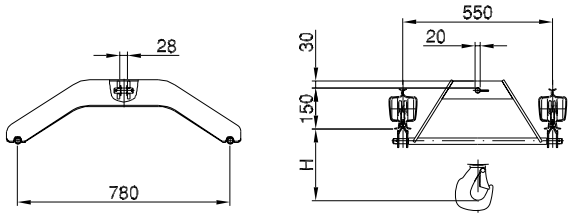
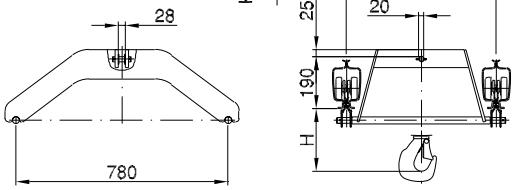
KBK 100, I



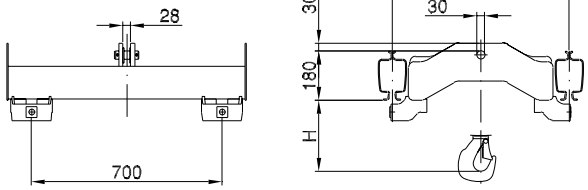
KBK II-L



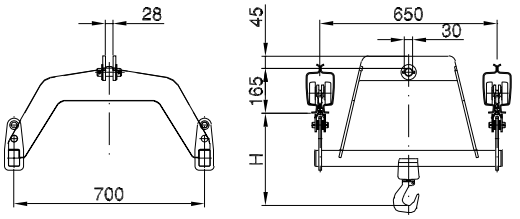
KBK II



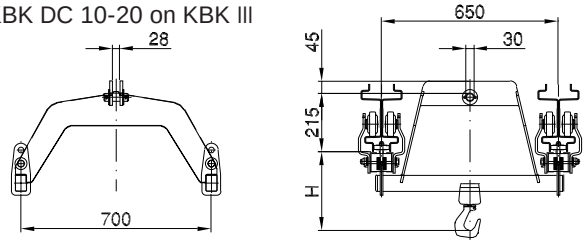
KBK II-2000



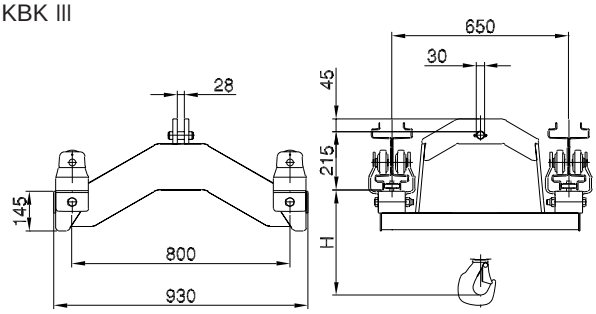
KBK DC 10-20 on KBK II



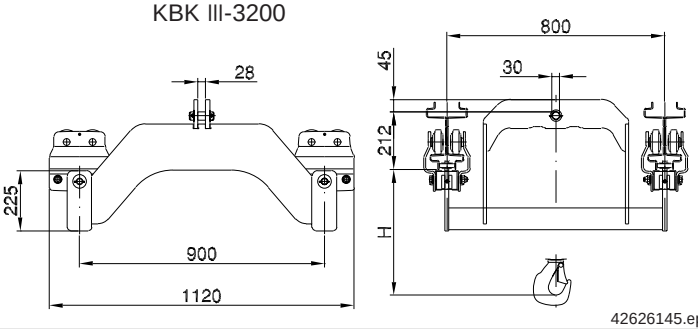
KBK DC 10-20 on KBK III



KBK III



KBK III-3200



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Dimension H	DKM 1 [1] DKM 2 (+10)	DKUN 1 [1] 1/1	DKUN 1 [1] 2/1	DKUN 2 1/1	DKUN 2 2/1	DKUN 5 1/1	DKUN 5 2/1	DKUN 10 1/1	DKUN 10 2/1	DKUN 16 1/1	DKUN 16 2/1
KBK 100	630	255	-	-	-	-	-				
KBK I	625	250	310	250	310	290	360	-	-	-	-
KBK II-L	580	205	265 [2]	205	265	245	315				
KBK II	540	165	225 [2]	165	225	205	275				
KBK II-2000	-	-	-	175	235	215	285	310	410		
KBK III				140	200	180	250	275	375	350	
KBK III-3200				-	-	-	-	278	378	353	453

Dimension H	DCM 1	DCM 2	DCM 5	DC 1	DC 2	DC 5	DC 10	DC 20
KBK 100	573	-	-	243	-	-	-	-
KBK I	568	568	613	238	238	283		
KBK II-L	523	523	568	193	193	238	343	
KBK II	483	483	528	153	153	198	303	
KBK II-2000	-	-	538	-	-	208	313	400
KBK DC 10-20 on KBK II			553			223	328	415
KBK DC 10-20 on KBK III			503			173	278	365
KBK III			-			-	278	365
KBK III-3200							281	368

1) When used with DKUN 1, the hoist must be ordered with the long suspension eye, part no. 834 702 44.
2) DKM hoists must be ordered with a long suspension eye.

All hoists must be used with the long suspension eye.

9.2 Extending frames

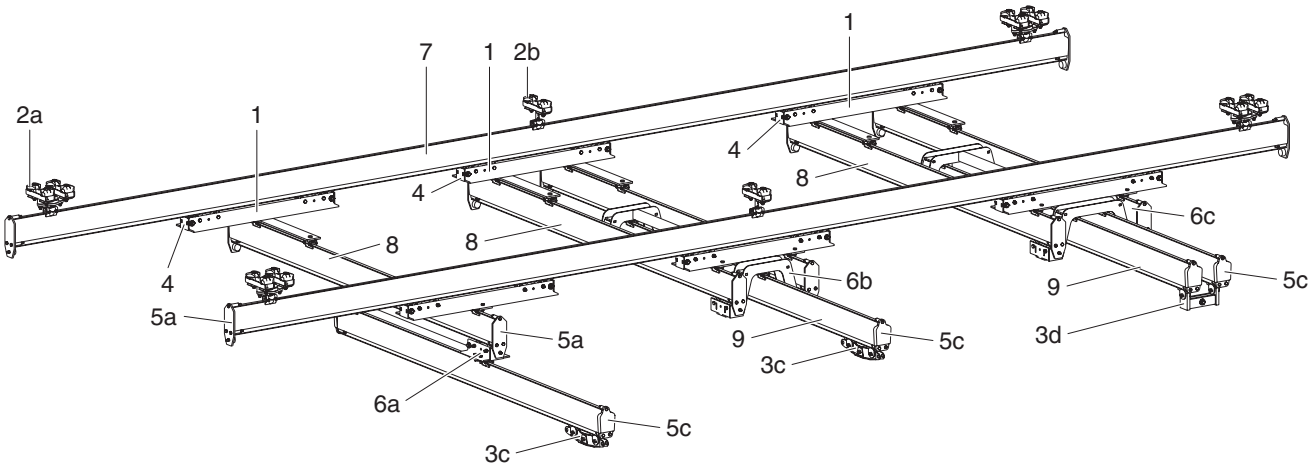
Extending frames are used for transferring loads between adjacent crane areas, for depositing loads between building columns and for extending the crane operating range. These cranes consist of a crane bridge on which runs a sliding crab frame to which a single-girder or double-girder lateral travel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

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

KBK ergo components should preferably be used, see document 203 309 44.

Example:

Extending cranes and crabs



KBK ergo cranes

1. KBK ergo crane end carriages
2. Suspension
a) KBK ergo
b) KBK classic
3. Crab
a) KBK ergo crab frame
b) KBK classic crab frame
c) KBK classic single or double trolleys
d) Crab end carriage for extending crane B2/2
4. Buffer plate
5. End cap
a) KBK ergo with rubber or cellular foam 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 I, II-L, II crane runways
8. KBK I, II-L, II, II-T crane girders
9. KBK I, II-L, II extending rails
10. Drives
a) electric
b) pneumatic
11. Power supply
a) electric
b) Pneumatic

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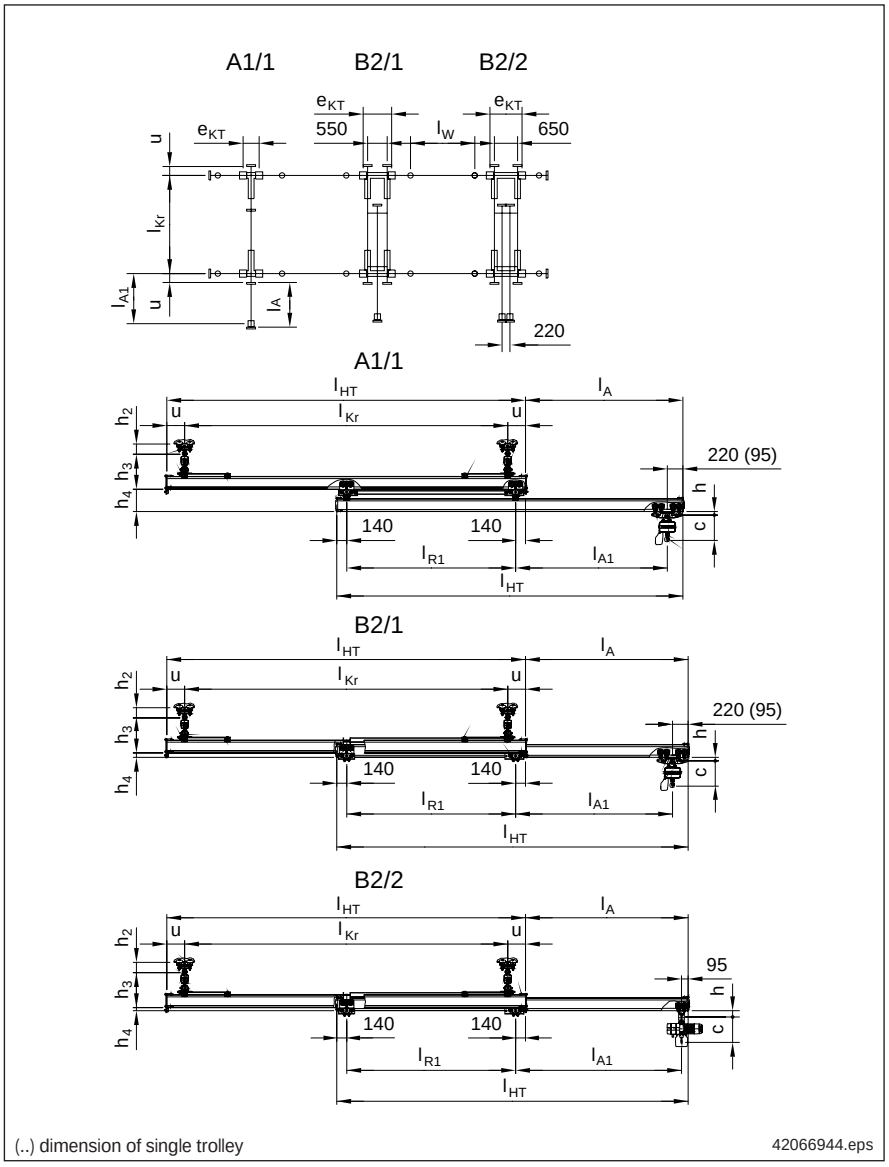

(..) dimension of single trolley

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Greater extension lengths l_A with smaller base l_{R1} are possible using cranes built with KBK ergo components than with KBK classic components.

The crane selection tables in document 203 309 44 show the maximum possible overhang l_{A1}.

Due to unfavourable headroom dimension, model A (extending rail underneath crane girder) is not available for double-girder cranes. In model B, the extending rails are routed between the crane girder rails.

Crane types:

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

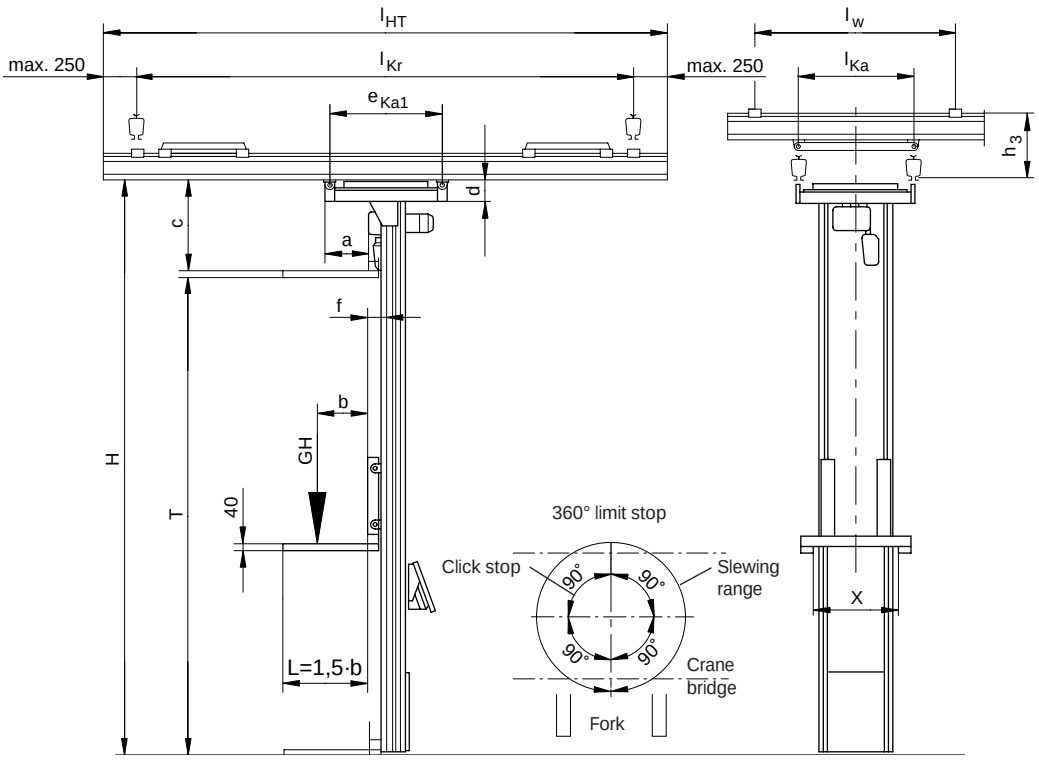
Crane runways:	KBK II-L, II
Crane Girders:	KBK II-L, KBK II, KBK II-T
Extending rails:	KBK II-L, KBK II

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

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

9.3 Stacker crabs

Stacker crab for KBK I, II double-girder crane (item 96)



The overhang for flat cable supply lines can be extended by the length of the accumulated cable trolleys.
The load must be picked up in alignment with the stacker mast centre.

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Stacker cranes, double-girder cranes fitted with stacker crabs, can be used wherever loads weighing up to 500 kg (unit loads, small loads in containers or on pallets, etc.) are transported, sorted, stored and picked. The stacker crab is easily moved by hand and turned, the lifting motion is electrically powered. Electric travel motions are not included in the design. Select the cranes and tracks for the three stacker crab sizes from the stacker crab selection table. The values in the crane selection table do not apply, as the deflection is too high.

KBK II-T and KBK III cranes are not included in the design due to high inertia. A double-girder crane with two diagonal braces is used for the crane bridge. The standard design features direct control for the stacker crab hoist mechanism, power is supplied by means of a trailing cable or conductor line system. The cable sag for trailing cable arrangements must be such that the load cannot snag.

Stacker crab component parts

Stacker mast with

- DKUN 1 or DKUN 2 or 5 electric chain hoist, with chain collector box, double-fall design
- Handle with integrated DST control unit
- Lifting carriage with 2 fork blades (standard design)

Other lifting carriage designs on request.

Additional sub-assemblies

- Contactor control (if required) integrated into additional fitting on the stacker mast (not in the electric chain hoist), circuit diagrams: with DKUN 1 518 063 46; with DKUN 2-5 519 627 46
- Set-down cut-off (reduced lifting height)
- Lifting carriage height display, mechanical by means of tape with marking

The crab trolleys, spacers and diagonal braces belong to the crane and must be ordered separately (pay attention to crab span dimension l_{Ka}).

Finish: Stacker mast red (RAL 2002); lifting carriage yellow (RAL 1007)

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Stacker crab selection table					Crane data for the stacker crab					
Payload G_H up to ... kg	Load centre distance b (max.) mm	Size	Unit height H (max.) mm	Fork lifting height T (max.) mm	KBK crane girder profile	Crane girder length l_{HT} mm	Crane span dimension l_{Kr} (max.) mm	Crane runway suspension distance l_w mm		
								KBK I	KBK II-L	KBK II
50	550	1	3540	3000	I	4000	3500	3000	6000	7000
			3590	3000	II-L	5000	4500	2500	5500	7000
					II	6000	5500	2000	4000	7000
	1000	2	4110	3420	II-L	5000	4500	—	4000	6500
					II	6000	5500		4000	6000
	1200	3	5110	4420	II-L	5000	4500		3500	5500
					II	6000	5500		3000	5000
80	400	1	3540	3000	I	3500	3000	3000	6000	7000
			3590	3000	II-L	5000	4500	2000	5000	7000
					II	6000	5500	2000	4000	7000
	900	2	4110	3420	II-L	5000	4500	—	4000	6000
					II	6000	5500		3500	6000
	1200	3	5110	4420	II-L	5000	4500		3000	5000
					II	6000	5500		3000	5000
100	350	1	3540	3000	I	3500	3000	2500	5500	7000
			3590	3000	II-L	5000	4500	2000 1)	4500	7000
					II	6000	5500	1500 1)	4000	7000
	800	2	4110	3420	II-L	5000	4500	—	3500	6000
					II	6000	5500		3500	5500
	1000	3	5110	4420	II-L	5000	4500		3000	5000
					II	6000	5500		3000	4500
125	300	1	3540	3000	I	3000	2500	2000	5500	7000
			3590	3000	II-L	4500	4000	1500 1)	4500	7000
					II	6000	5500	1500 1)	4000	7000
	700	2	4110	3420	II-L	5000	4500	—	3500	5500
					II	6000	5500		3500	5500
	900	3	5110	4420	II-L	5000	4500		3000	4500
					II	6000	5500		3000	4500
160	550	2	4110	3420	II-L	5000	4500		3000	5000
					II	6000	5500		3000	5000
	800	3	5110	4420	II-L	5000	4500		2500	4000
					II	6000	5500		2500	4000
200	480	2	4110	3420	II-L	5000	4500		2500	4500
					II	6000	5500		2500	4500
	650	3	5110	4420	II-L	5000	4500		2000	4000
					II	6000	5500		2000	4000
250	400	2	4110	3420	II-L	5000	4500		2500	4500
					II	6000	5500	—	2500	4000
	600	3	5110	4420	II-L	5000	4500		2000	4000
					II	6000	5500		2000	3500
315	370	2	4110	3420	II-L	4500	4000		2000	4000
					II	5000	4500		2000	3500
	600	3	5110	4150	II-L	4500	4000		1500	4000
					II	5500	5000		1500	3500
400	350	2	4110	3420	II-L	4500	4000		1500 1)	4000 1)
					II	5000	4500		1500 1)	3500 1)
	600	3	5110	4150	II-L	4000	3500		1500 1)	3500 1)
					II	5000	4500		1500 1)	3000 1)
500	300	2	4110	3420	II-L	3500	3000			3500 1)
					II	4500	4000		—	3500 1)
	600	3	5110	4150	II	4500	4000			3000 1)

1) 2 x double trolley at each end of the crane for $l_{HT} > l_{KR} + 240$ mm. Dimension h_3 increases by + 15 mm.
KBK II-T and KBK III crane girders should be avoided due to their heavy weight.

Stacker crab dimensions

Size	Crab span dimension l_{Ka} and dim. e_{Ka1} mm	Dimensions in mm					Electric chain hoist		Main lifting speed	Creep lifting speed	Weight at max. H
		X (max.)	a	c	d	f 3)	Range	For payload up to kg	max. approx. m/min		approx. kg
1	550	1000	215 (230) 2)	500	ca. 230	135	DKUN 1 4)	125	4,0	1,0	160
2	800	1000	350	650 2)	160	135	DKUN 1 5)	125	4,0	1,0	300
							DKUN 2-250	400	7,0	1,7	
							DKUN 5-500	500	6,3	1,5	
3	1000	1000	500	650	80	85	DKUN 1 5)	125	4,0	1,0	400
							DKUN 2-250	250	7,0	1,7	
				920			DKUN 2-250	400	7,0	1,7	
							DKUN 5-500	500	6,3	1,5	

2) (...) For II-L, II crane girder profile section. Only 2-fall electric chain hoists are used in order to minimize vibration.
3) Dimension f for pivot centre.
4) Short suspension eye.
5) Long suspension eye.

Example for ordering

1 off stacker crab for KBK II crane girder section,
payload G_H = 125 kg, size 2; Load centre distance b = 700 mm
Unit height H = 3800 mm, Fork lifting height T = 3110 mm
Dim. between fork prongs X = 600 mm; Fork length L = 1050 mm
400 V, 50 Hz, direct control.

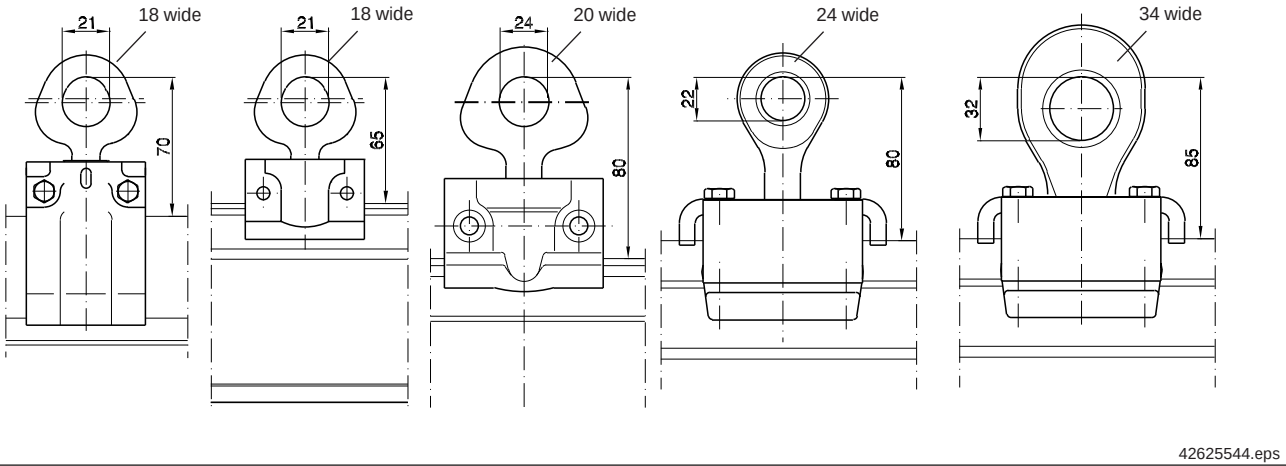
To be ordered with the crane:
2 off diagonal brace for l_{Ka} = 800 mm; 2 off spacer for l_{Ka} = 800 mm.

10 Components for building cranes

10.1 Crane suspension eye

(item 75)

10.1.1 Crane suspension eye H1, B3



Item no.	Designation	KBK 100			KBK I			KBK II-L, II, II-T			KBK III		
		Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.
75	Crane suspension eye	400	0,8	984 535 44	600	0,7	980 350 44	1400	1,2	982 350 44	1300 1)	3,3	984 350 44
											2600	4,6	850 350 44

1) on KBK II runway

The crane suspension eye connects crane girders with single or multiple trolleys running on track sections. Due to the ball-and-socket type mounting of the suspension eye, KBK single-girder cranes can take a diagonal position. This makes it possible for them to travel on curved or converging runways. The suspension eye and track suspension clamp are permanently connected to each other before leaving the factory. The unit should not be used as a swivel joint.

Finish: galvanized

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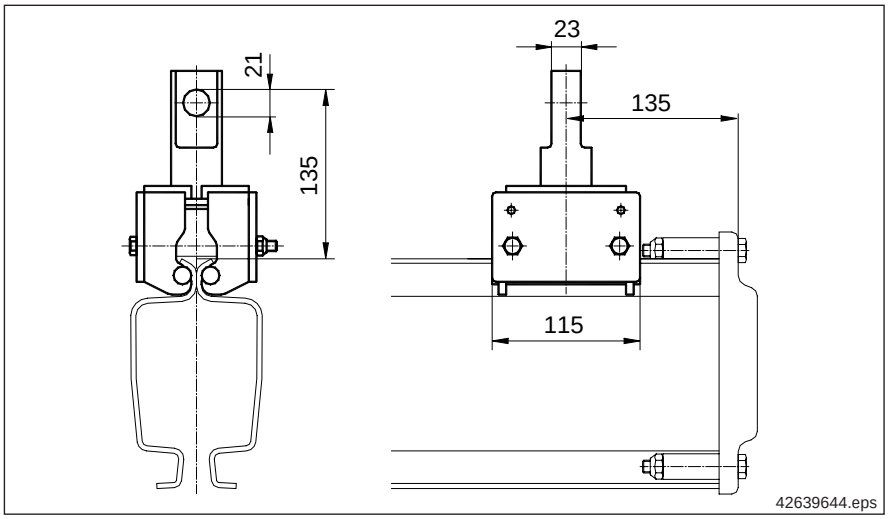
10.1.2 HD crane suspension eye KBK II

HD crane suspensions are used wherever higher loads are to be expected due to special operation with a high number of cycles and heavy duty.

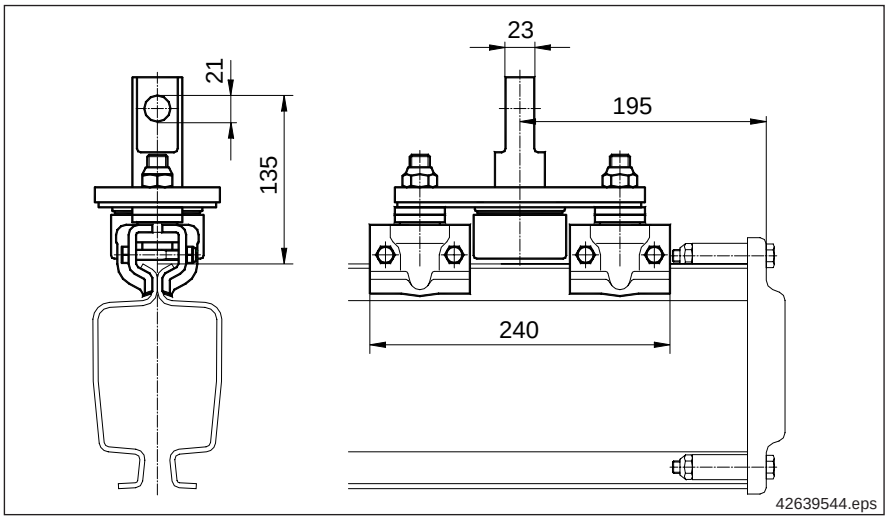
Two variants are available.

For selection purposes, the minimum overhang that can be achieved must be observed.

Type 1
min. overhang 135



Type 2
min. overhang 195



Designation	Min. overhang [mm]	Load [kg]	Weight [kg]	Part no.
HD crane suspension	135	1400	4,10	Standard drawing 1)
	195	1400	4,32	

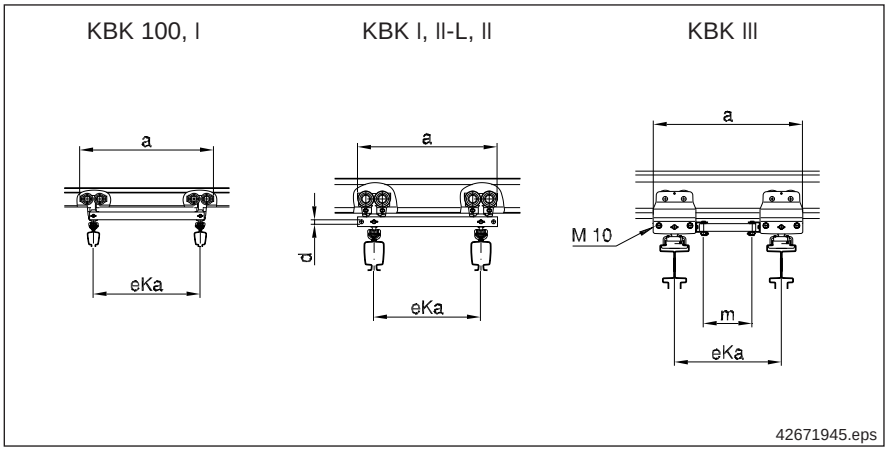
1) Solutions for other profile section sizes on request.

Design

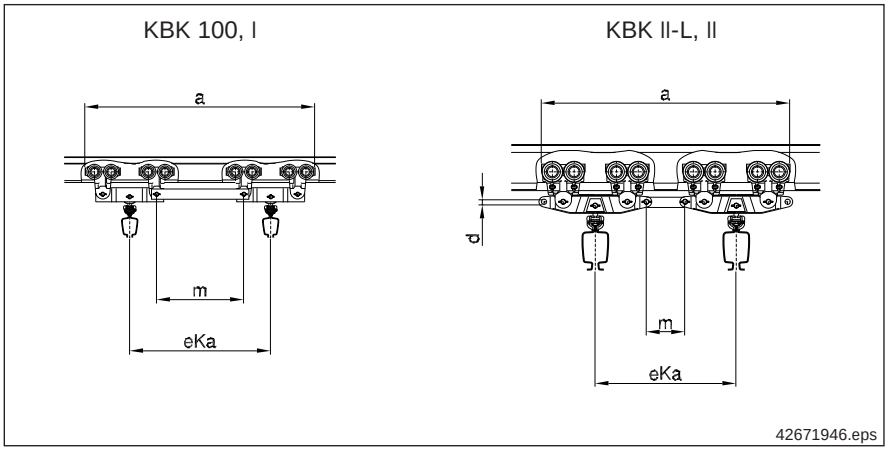
Finish: White aluminium (RAL 9006)

10.2 Spacer bars for crane trolleys

(item 77)



	e_{Ka}	a	d	m
KBK 100	550	690	-	-
KBK I	550	690	-	-
	550	690	20,5	-
KBK II-L / II	550	720	20,5	-
KBK III	550	770	M 10	250
	650	870	M 10	350



	e_{Ka}	a	d	m
KBK 100	550	900	-	340
KBK I	550	900	-	340
KBK II-L / II	550	970	20,5	150
	650	1070	20,5	250

Item no.	Spacer bars for crane trolleys	$e_{K\ a}$	Connection possible	KBK 100, I		KBK II-L, II		KBK III	
				Weight kg	Part no.	Weight kg	Part no.	Weight kg	Part no.
77	for single trolley	550	no	1,5	980 595 44				
			yes [1]		855 068 44	3,8	982 595 44		
			yes [2]					2,4	850 331 44
		650	yes [2]					2,9	850 332 44
	for double trolley	550	no	1	980 590 44				
			yes [3]			1	982 591 44		
		650	yes [3]			1,2	982 440 44		

1) to spacer bar
2) to trolley
3) to articulated frame

Finish: black (RAL 9005)

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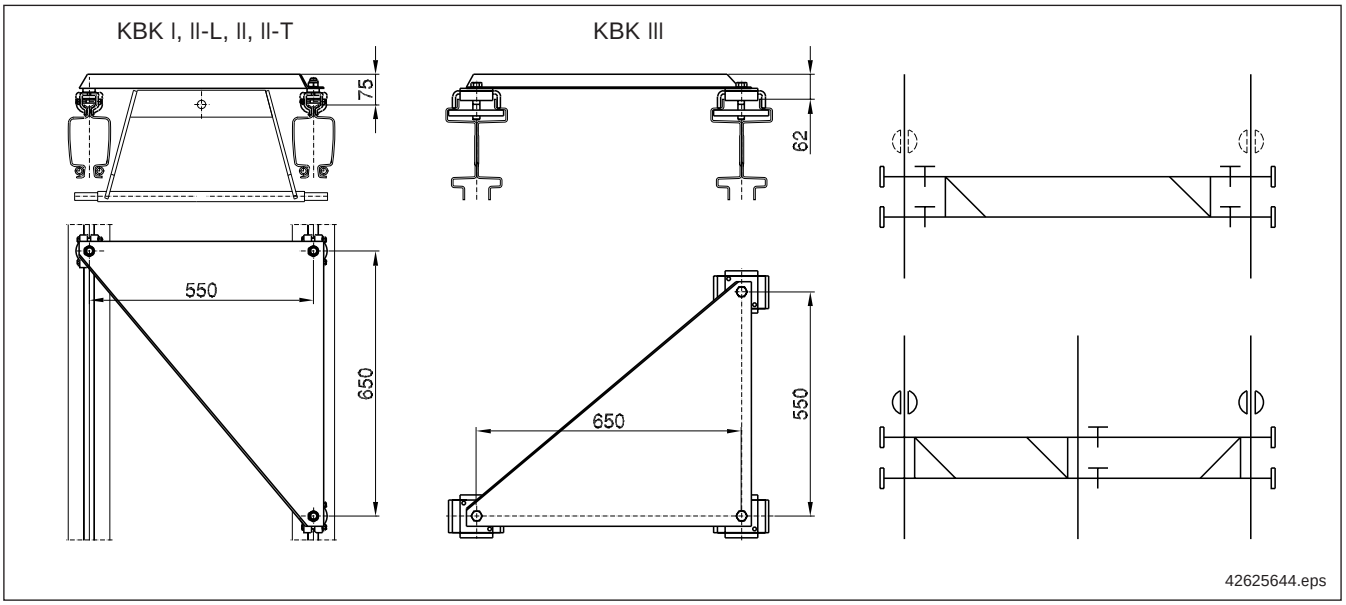
10.3 Bracing frame

(item 79)



Bracing frames must be fitted to the ends of the crane girders of flexibly connected double-girder cranes in order to reduce their tendency to skew. Bracing frames should be fitted at the ends and near the centre of the crane girders on double-girder cranes travelling on three tracks. If it is not possible to fit the bracing frames near the reinforcement on the KBK II section of reinforced section cranes (KBK II-T), the bracing frames are fitted direct to the T section without the attachment brackets. Holes must be drilled for assembly. Bracing frames are suitable for trolley track gauges of 550 mm and 650 mm.

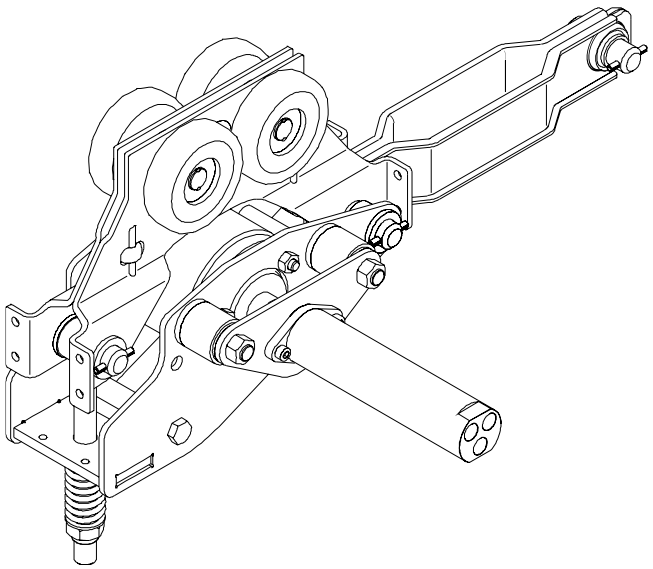
KBK 100 bracing frames and special widths available on application.

Finish: red (RAL 2002)

Item no.	Designation	KBK I, II-L, II, II-T		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.
79	Bracing frame	11	982 435 44	16	850 435 44

11 Travel drives for crabs and cranes

RF 100 travel drive
Pneumatically driven
KBK II-L, KBK II



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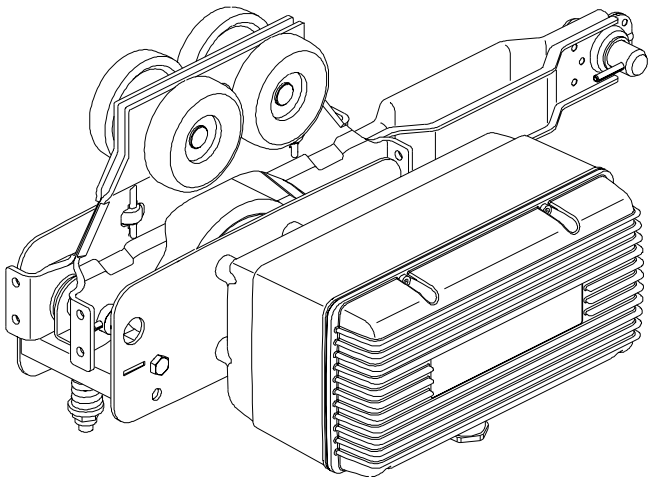
RF 125 travel drive
Electrically driven
KBK II-L, KBK II



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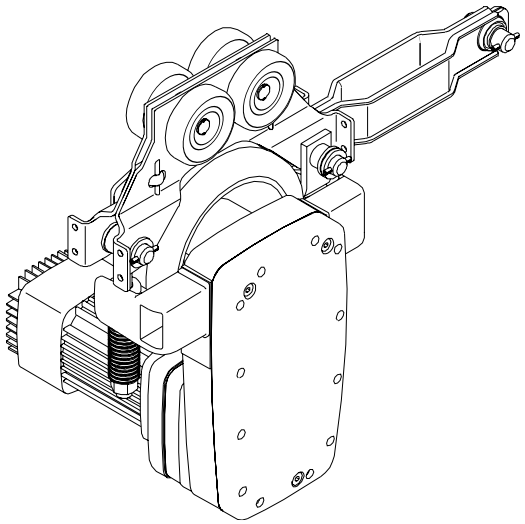
DRF 200 travel drive
Electrically driven
KBK II-L, KBK II, KBK III



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11.1 Friction wheel travel drive RF 100 PN

(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 power of the pneumatic travel motor is transmitted to the bottom flange of KBK II (II-L) rails by means of a friction wheel.

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

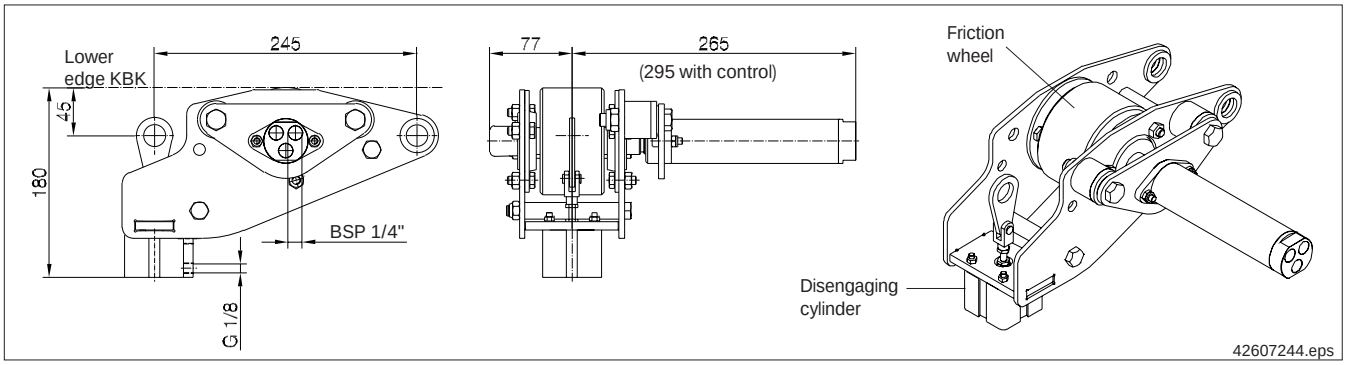
RF 100 PN travel drive with Disengaging cylinder Part no. 851 078 44
Pressure spring Part no. 851 079 44 N

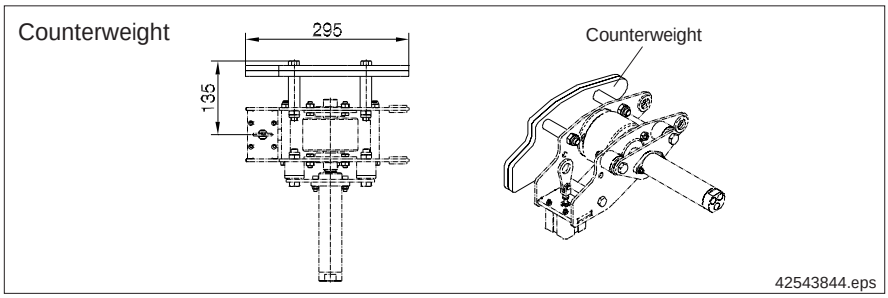
Technical data

Reversible oil-free air motor							
Travel speed	Output	Operating pressure	Recommended operating pressure	Air demand at 4 bar	Weight	CDF	Max. transportable load
m/min	W	bar	bar	l/s	kg	%	kg
approx. 10 - 30	80	3 - 6	approx. 4	4,5	7,2	50	500

11.1.1 Travel drive with disengaging cylinder

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





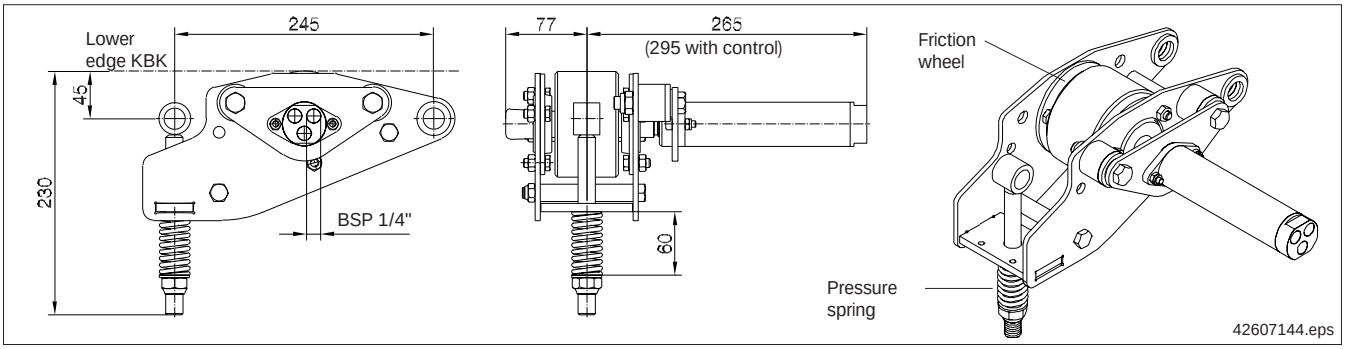
The RF travel drive with disengaging cylinder requires a counterwight, if an articulated link bar is used.

Part no.	Weight [kg]
851 205 44	4,5

Finish: RAL 9005 (black)

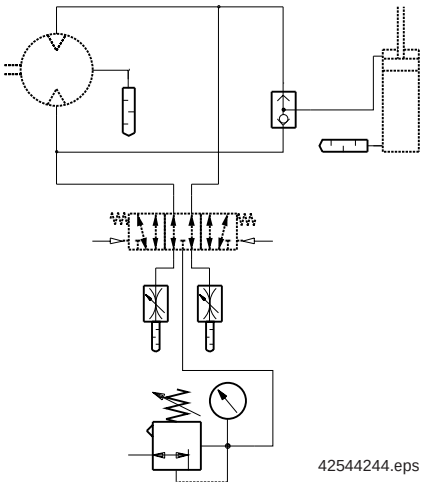
11.1.2 Travel drive with pressure spring

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



11.1.3 RF 100 PN controls

RF pneumatic equipment base block



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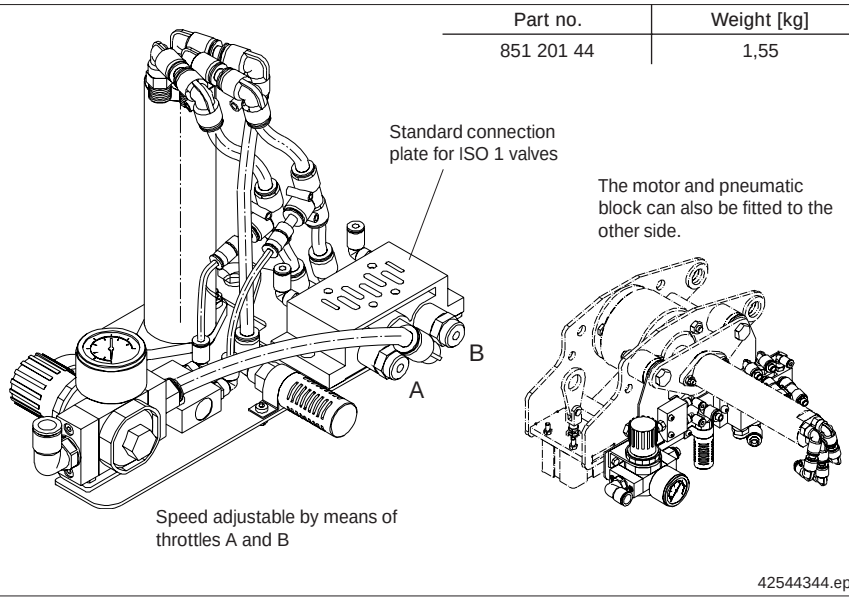
Part no.	Weight [kg]
851 201 44	1,55



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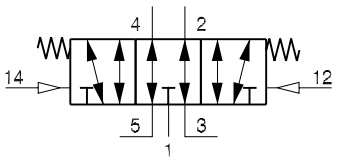
The pneumatic elements are fitted and connected to the hoses on the same mounting panel.

Pneumatic control



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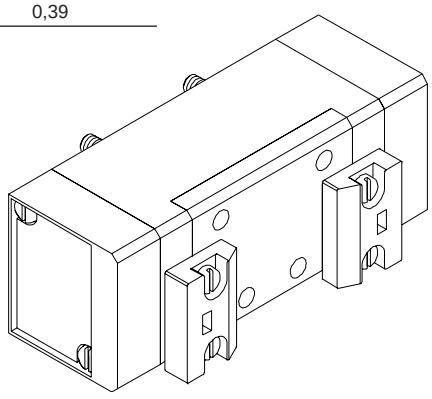
Part no.	Weight [kg]
343 791 44	0,39

Pneumatic valve



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

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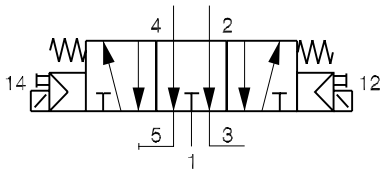
Electrical control



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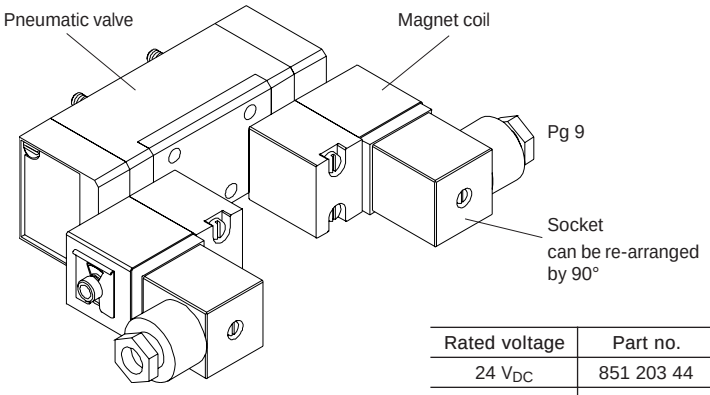

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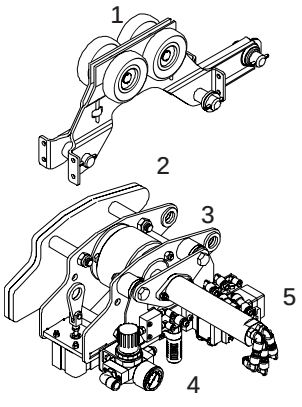
Rated voltage	Part no.	Weight [kg]
24 V_{DC}	851 203 44	0,62
230 V_{AC}	851 204 44	0,62

The unit consists of:
- valve
- magnet coil for 24 V_{DC} or 230 V_{AC}
- standard socket

KBK classic

RF 100 PN travel drive with disengaging cylinder, suitable for fitting to crane end carriage with RF pneumatic base block as well as pneumatic valve with 5/3-way function.



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Item no.	Designation	Part no.
1	Trolley with with 270 link bar	982 490 44
2	Counterweight	851 205 44
3	RF 100 PN	851 078 44
4	Basic block	851 201 44
5	Pneumatic valve	343 791 44

11.2 RF 125 friction wheel travel drive (item 70)

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

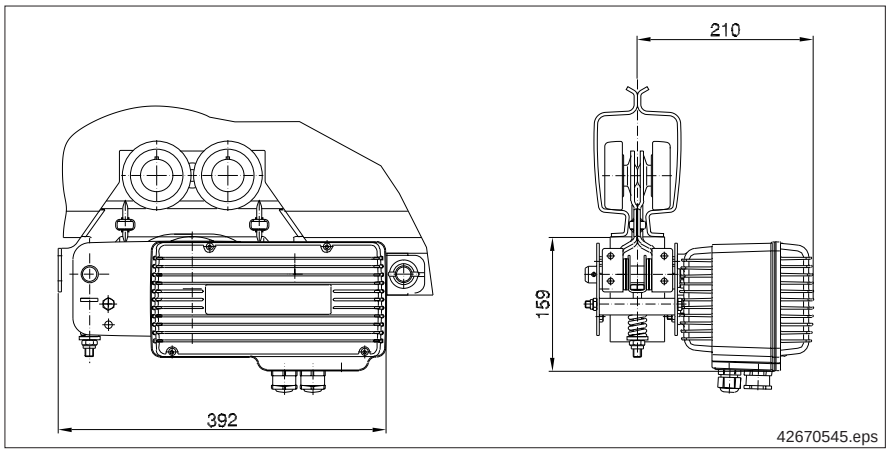
11.2.1 Drive data

The power of the electric travel motor is transmitted to the bottom flange of KBK II (II-L) rails by means of a friction wheel. The friction wheel is pressed against the bottom flange of the rail by means of a pressure spring.

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

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

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



Technical data

DC motor with worm gearbox						
Travel speed [m/min]	Output [W]	CDF [%]	Motor [V; Hz]	Weight [kg]	Max. transportable hoist load incl. dead load [kg]	Part no.
7/27 1)	50/200	20/40	220-480; 50/60 3 ~	5	2200	716 590 45

1) Can be modified to max. 8/33 m/min by programming parameters.

Finish: blue (RAL 5009)

11.2.2 Control system

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

The control system includes the following features as standard:

- plug connections for all inputs and outputs;
- line voltage relayed to the chain hoist;
- limit switch inputs;
- fast-to-slow limit switch inputs;
- 7-segment display for operating status, error messages, parameter programming;
- parameters for speed, acceleration, etc.;
- temperature monitoring and cut-off in the event of overtemperature;
- signal transmission with tri-state signals (half-wave evaluation).

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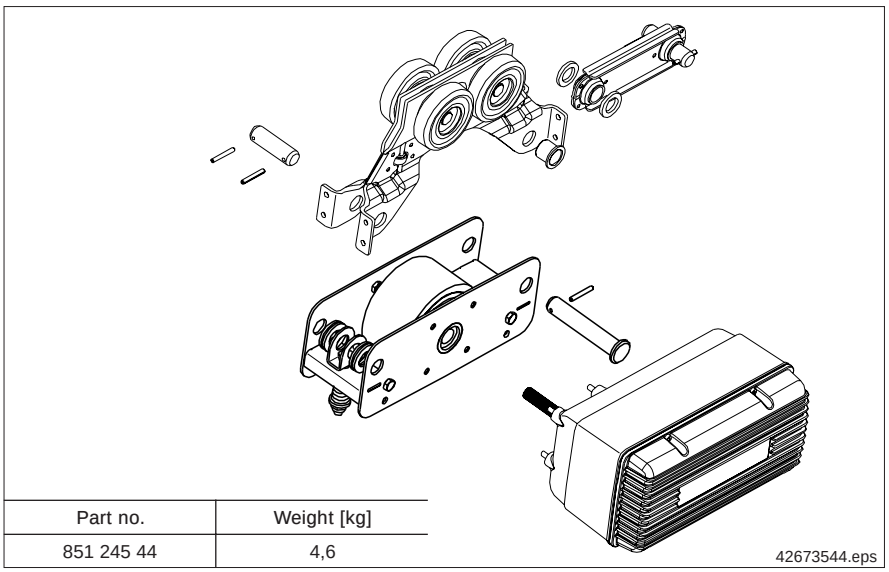
11.2.3 RF 125 rocker
KBK II, II-R, II-L



Part no.	Weight [kg]
851 245 44	4,6

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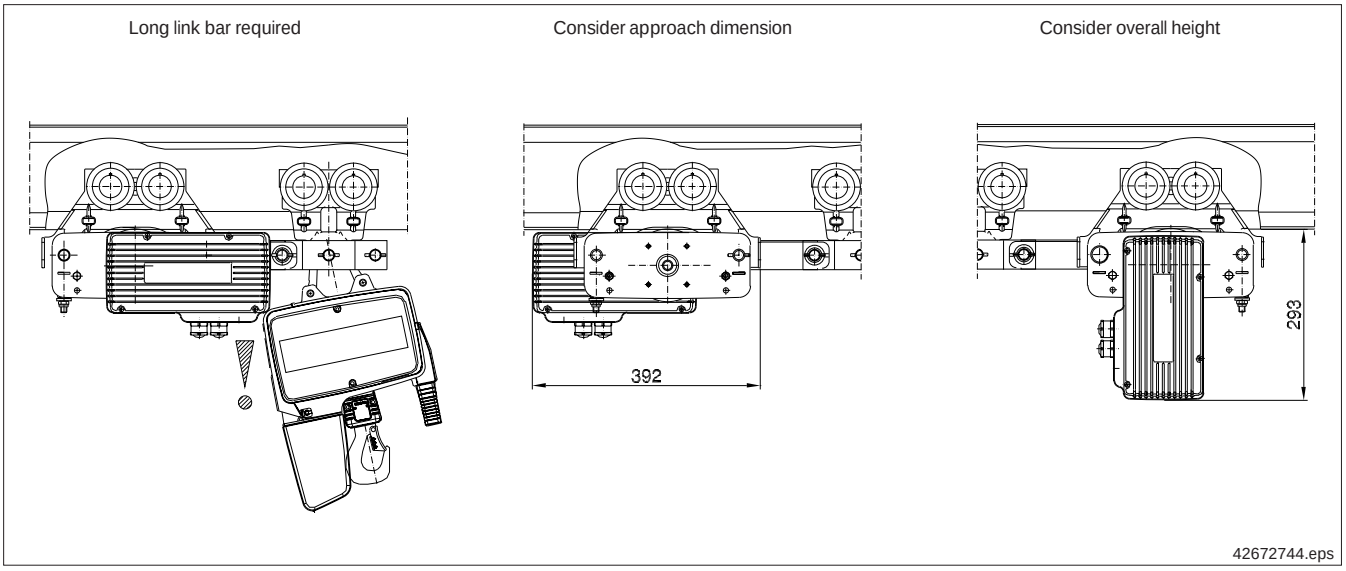
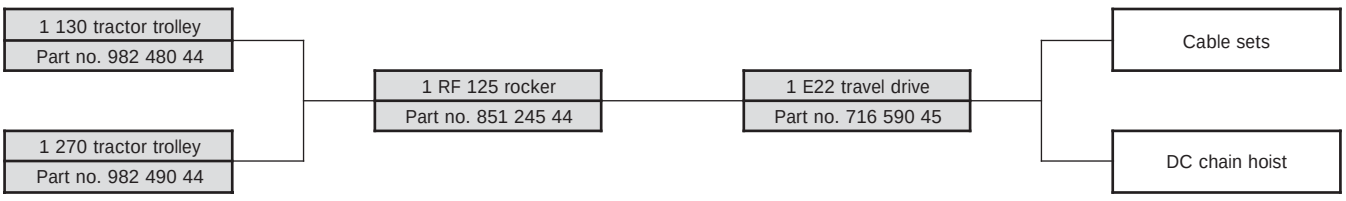
Finish: black (RAL 9005); galvanized

11.2.4 Possible arrangements

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



Example for ordering RF 125:

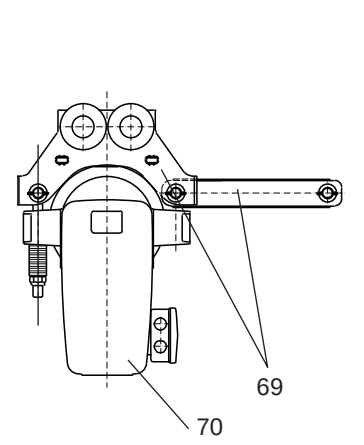


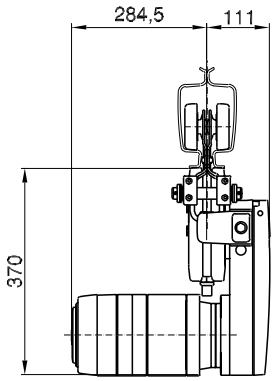
11.3 DRF 200 friction wheel travel drive

(item 70)

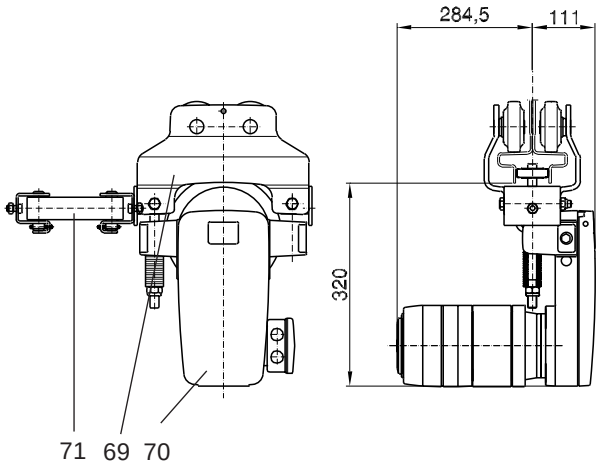
DRF 200 friction wheel travel drives transmit the power of the travel motor specially developed for crane duty via a spring-mounted friction wheel to the bottom flange of KBK rails. The wide friction wheel should be used for KBK II, and the narrow friction wheel for KBK III. DRF 200 mounting components can be relocated to vary the position of the spring assembly and motor as required. Control can be effected direct or via contactors. Contactor control and timed mechanical braking, or timed mechanical braking elements in the control pendant, are required if pole-changing travel drives are used.

KBK II-L, KBK II, KBK II-R





KBK III



Buffer on KBK II-R attached to side of section.

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Technical data: ZBF 63 and 71 travel motors for DRF 200 (motor size allocation) [1]

Travel speed	Output		%	Max. transportable weight in kg [2]
m/min	kW		CDF	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	0,06/0,25	0,09/0,34	40	ZBF 63 A8/2 B003 — 3000 ZBF 71 A8/2 B003
6,3/25				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) Use of ZBF 71 B and KM 80 motors only with special requirements on application; not suitable for KBK II-L and II, or Aluline.

2) Dry, horizontal track. Application with inclined track on request.

Item no.	Designation	KBK II-L, II		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.
70	DRF 200 friction wheel travel drive with wide friction wheel (73 mm), KBK II, II-L	25	Tech. data	—	—
	Narrow friction wheel (35 mm), KBK III	—	—	25	Tech. data

Finish: blue (RAL5009)

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11.4 Disengaging devices

By turning a lever (manually or electrically) the springs of the dished washer pack are relieved from applying pressure to the friction wheel, the friction wheel travel drive is lowered and released from the rail. The unit can be moved freely.

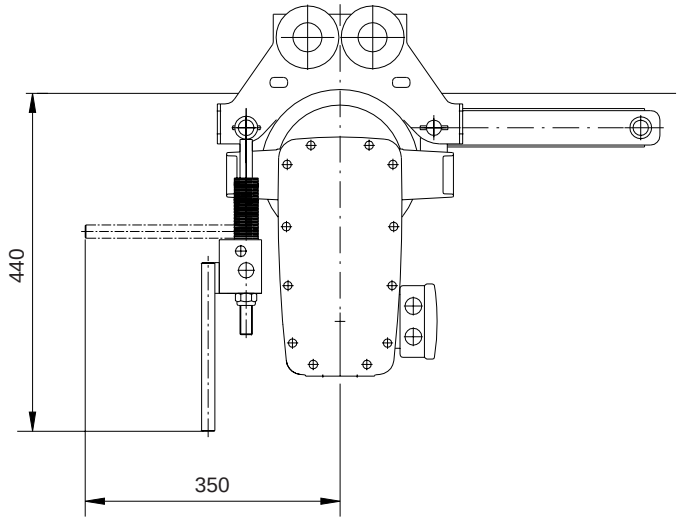
DRF 200
RF 125 (manual only)

Depending on the DRF 200 design, disengaging devices must be used on KBK II-L, -II, -II-R and KBK III rails.

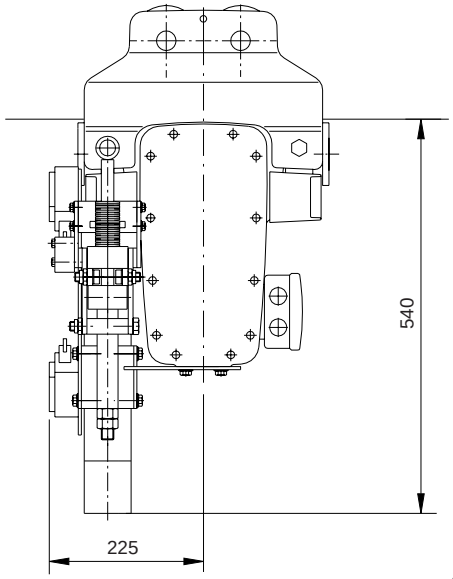
The use of a disengaging device is recommended in the following cases, for example

- 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

Disengaging device, manually actuated, KBK
(KBK III not shown)



Disengaging device, electrically actuated, KBK III
(KBK II not shown)



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Possible actuation methods

A manually actuated disengaging device can only be released at the friction wheel travel drive itself. A control system adapted to the application must be provided for electrically actuated disengaging devices. Electrically actuated disengaging devices consist of a mechanical fitting, an electrical actuating cylinder and 2 limit switches. Control system on request.

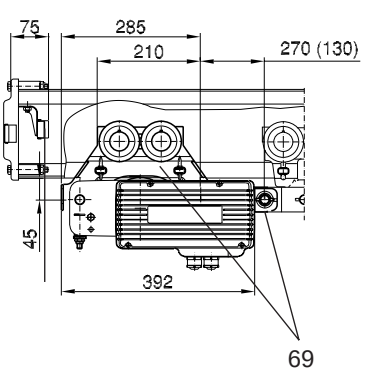
Actuating cylinder voltage: 230 V AC, 50 Hz (other voltages and frequencies on request).

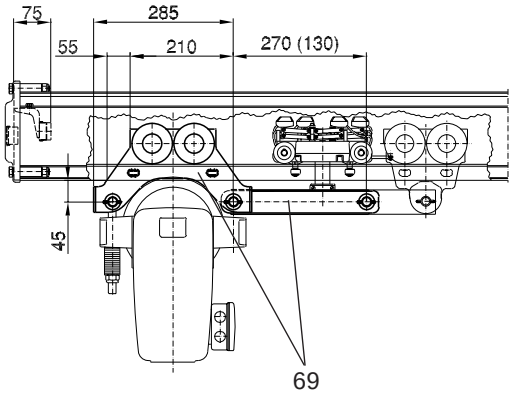
12 Trolleys for travel drives

The trolleys shown are suitable for:

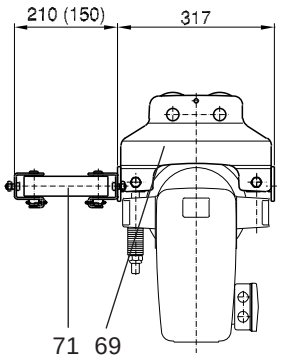
KBK II-L	KBK II	KBK II-R	KBK III
RF 100, RF 125, DRF 200			DRF 200

KBK II-L, KBK II, KBK II-R





KBK III



Buffer on KBK II-R attached to side of section.

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Item	Designation	KBK II-L, II		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.
69	Trolley for travel drive	—	—	9,8	850 171 44
	with 130 short link bar	2,9	982 480 44	—	—
	with 270 long link bar	3,3	982 490 44		
71	Short link bar [1]	—	—	1,4	850 330 44
	Long link bar			1,2	850 340 44
71a	120 trolley coupling (for RF fitted in crab frame)	0,25	984 307 44	—	—

1) not suitable for curve travel

Finish: Trolley KBK II: black (RAL 9005)
KBK III: red (RAL 2002)

RF trolleys

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13 Link and spacer bars

Hinged blocks, link bars and spacer bars can be used for any trolley combinations. Spacer bars are used to distribute loads safely by separating several monorail hoist trolleys or cranes running on a common track. The travel drive must always be connected to the load trolley.

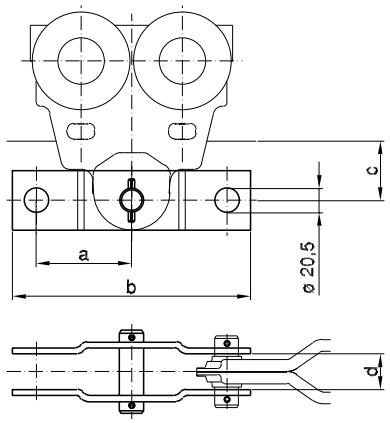
Finish:

Metal parts black (RAL 9005); pins, nuts and bolts galvanised

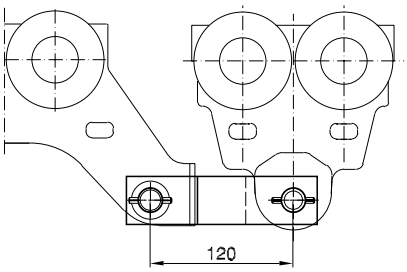
13.1 Single trolley link

Single trolley link
(item 61)
120 trolley coupling
(item 71a)

KBK single trolley link
(item 61)



KBK II 120 trolley coupling
(item 71a)



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	a	b	c	d
KBK I	75	190	46	27
KBK II	80	200	45	28

The link bar provides an additional means for connecting the various trolley combinations for single trolleys. The 120 trolley coupling (item 71a) is used to connect the friction wheel travel drive in the crab frame.

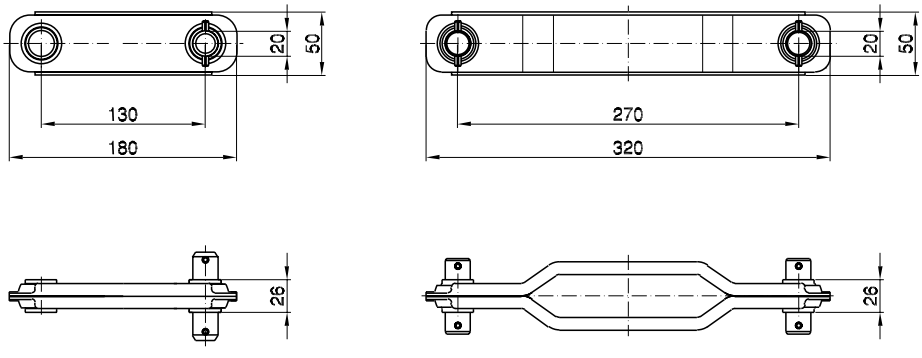
Item	Designation	KBK 100, I [1]		KBK II-L, II	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.
61	Single trolley link	0,7	855 070 44	0,8	982 505 44
71a	120 trolley coupling	-	-	0,25	984 307 44

1) KBK II link bars can be connected.

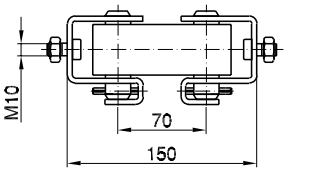
13.2 Link bar

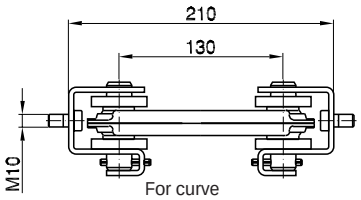
(item 71)

KBK I, II-L, II link bar



KBK III link bar, complete
not for curved track





For curve travel

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KBK II-L, II and KBK III link bars for travel on curved tracks can be used for any trolley combinations and special applications. The articulation bearings consists of universal joint plastic bushes. The longer link bar can be used for combinations with current collector trolleys.

Item	Designation	KBK I, II-L, II		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.
71	Link bar, short	0,4	982 340 44	1,4	850 330 44 [1]
	Link bar, long	0,9	982 345 44	1,2	850 340 44

1) not for curved track

13.3 Spacer bar with hinged blocks, suitable for curved track

(item 77)

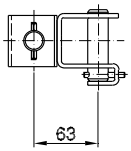
Spacer bars are used to distribute loads safely by separating several monorail hoist trolleys running on the same track. The spacer bar length is determined according to the information given in sections 3.2-3.4. The dead weight of the spacer bar must be included in load K when selecting the monorail. Current collector trolleys or RF travel drives must always be connected to the load trolley.

For spacer bars provided for trolleys running on curved tracks, distance R between the trolleys may be up to the curve radius length.

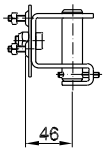
Finish: Metal parts black (RAL 9005); pins, nuts and bolts galvanised

Components

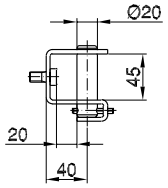
Hinged block
KBK II-L, II



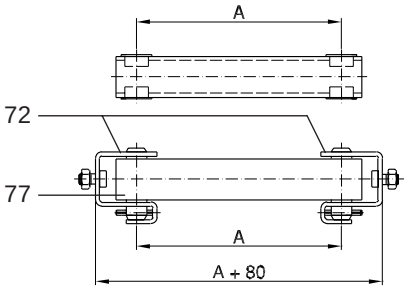
RF hinged block
KBK II-L, II



Hinged block
KBK III



Spacer bar for hinged blocks
KBK II-L, II, III



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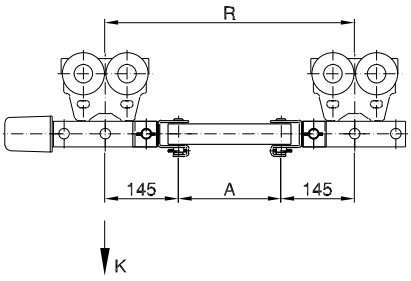
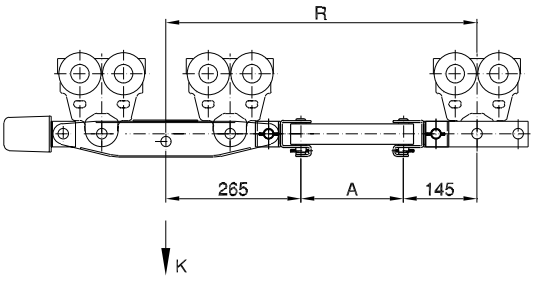
Examples

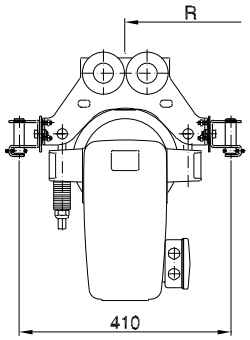
Spacer bar on single trolley
KBK II-L, II



on double trolley
KBK II-L, II



on trolley for RF friction wheel travel drive (one or both sides)
KBK II-L, II



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Item	Designation	Fitted to	Dimension		Weight	Part no.
			A min.	A max.	approx. kg	
72	Hinged block KBK II	Single trolley link	—	—	0,75	982 402 44
	DRF hinged block KBK II	Trolley for DRF	—	—	0,64	982 399 44
	Hinged block KBK III	All KBK III trolleys	—	—	0,46	850 399 44
77	Spacer bar for hinged blocks KBK II, III	Hinged block	200	1500	5,1 kg/m	Standard drawing

Example for ordering

For an articulated spacer bar for a single trolley:

2 off hinged block, part no. 982 402 44

1 off spacer bar for hinged blocks, A = 700 mm

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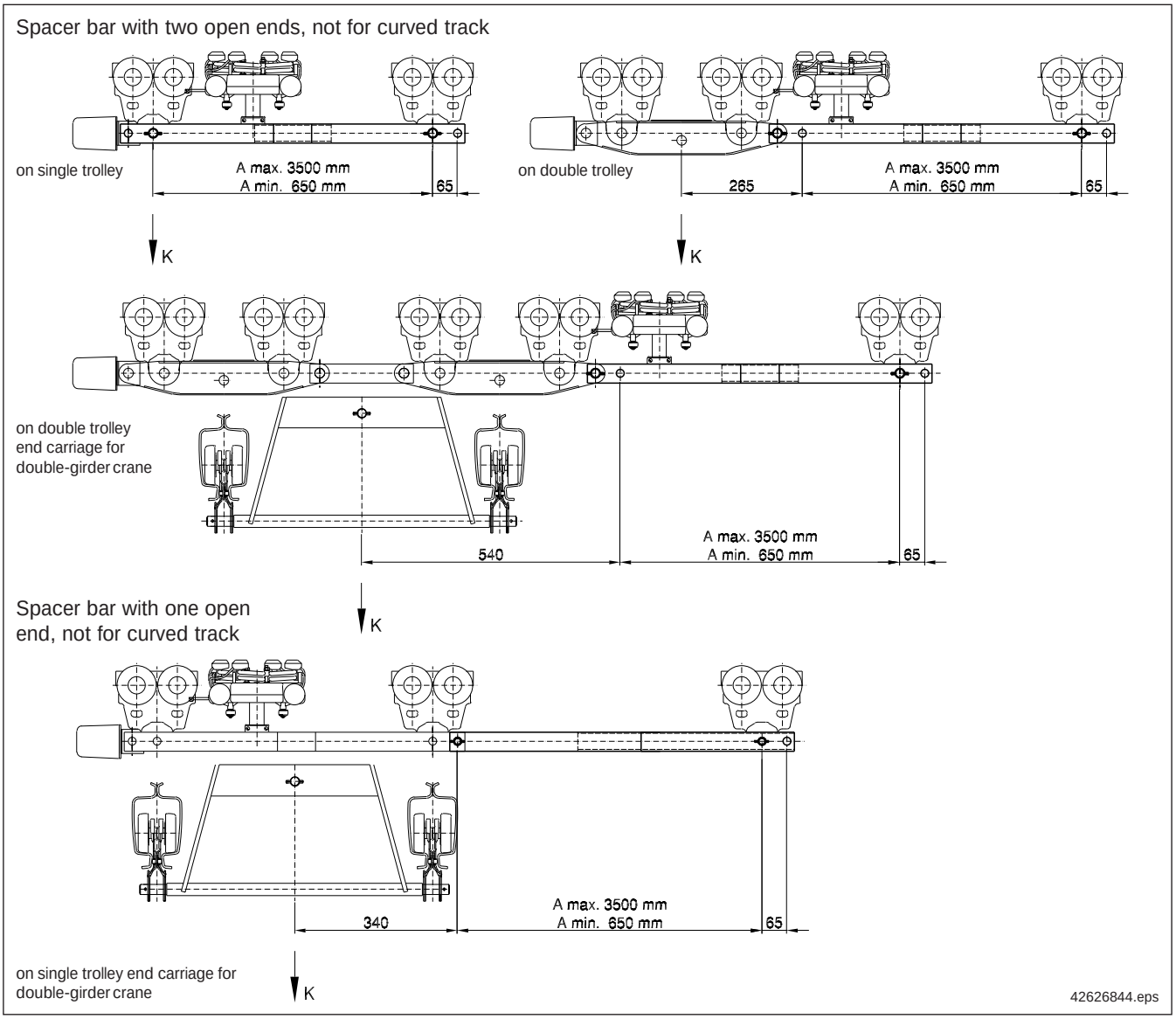
13.4 Spacer bar for straight track

KBK II-L, II (KBK 100, KBK I on application)

(item 76)

Spacer bars are used to distribute loads safely by separating several monorail hoist trolleys and single or double-girder cranes running on a common track. The dead weight of the spacer bar must be included in load K when selecting the crane runway. Current collector trolleys or RF travel drives must always be connected to the load trolley.

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



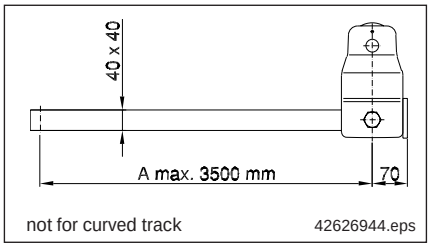
Weight approx. 5,2 kg/m

Examples for ordering:

2 off spacer bar with two open ends, A = 2800 mm

2 off spacer bar with one open end, A = 3000 mm

Spacer bar with KBK III single-axle trolley (item 76)



The spacer bar must be used with a KBK III hinged block (see section 13.1).

Item	Designation	Weight approx. kg	Part no.
76	Spacer bar with single-axle trolley, A max = 3500 mm	6,9/m + 4,8	Standard drawing

Specify length A

14 Buffers and end stops

14.1 KBK I, II-L, II buffer

(item 98)

Limit stops with rubber buffers are fitted into the track section to limit long and cross travel motions in KBK II installations. End stops must be additionally provided in KBK III installations (see end cap).

The impact energy resulting from running against limit stops is absorbed by sway of the crane installation (crane girder and track suspension) and the friction occurring in the joints.

In order to lessen the impact forces of several monorail hoists or cranes on the same crane runway 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 stops are used for normal operating conditions, and foamed plastic buffers for a high degree of impact absorbency (buffer against buffer plate).

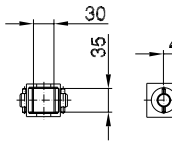
Electrically driven travelling hoists and cranes are fitted with foamed plastic buffers (plastic buffer against buffer plate). Where travel speeds exceed 21 m/min, the ends facing each other must be fitted with identical buffers (foamed plastic buffer against foamed plastic buffer). KBK 100, KBK I buffers on application.

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

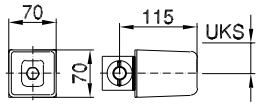
Item no.	Designation	KBK II-L, II	
		Weight approx. kg	Part no.
98	Rubber end stop	0,44	982 395 44
	Buffer fitting (foamed plastic)	0,8	982 378 44
	RF buffer fitting (foamed plastic)	0,45	982 375 44
	Buffer plate	0,49	982 377 44
	RF buffer plate	0,17	982 374 44

Components

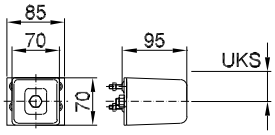
Rubber end stop



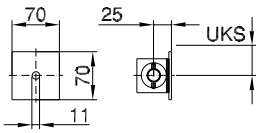
Buffer fitting (foamed plastic)



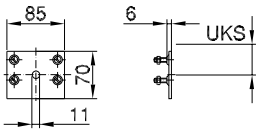
RF buffer fitting (foamed plastic)



Buffer plate



RF buffer plate

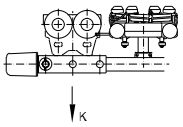


UKS = lower edge of profile section

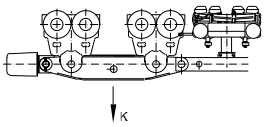
KBK I= 46 mm
KBK II= 45 mm

Examples

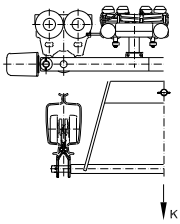
Fitted to single-trolley link



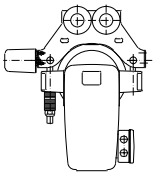
Fitted to load bar



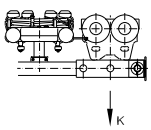
Spacer bar for double-girder crane, special spacer bar



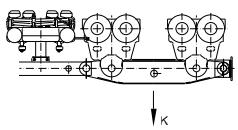
Fitted to trolley unit for RF



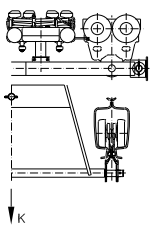
Fitted to single-trolley link



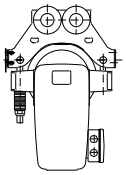
Fitted to load bar



Spacer bar for double-girder crane, special spacer bar



Fitted to trolley unit for RF



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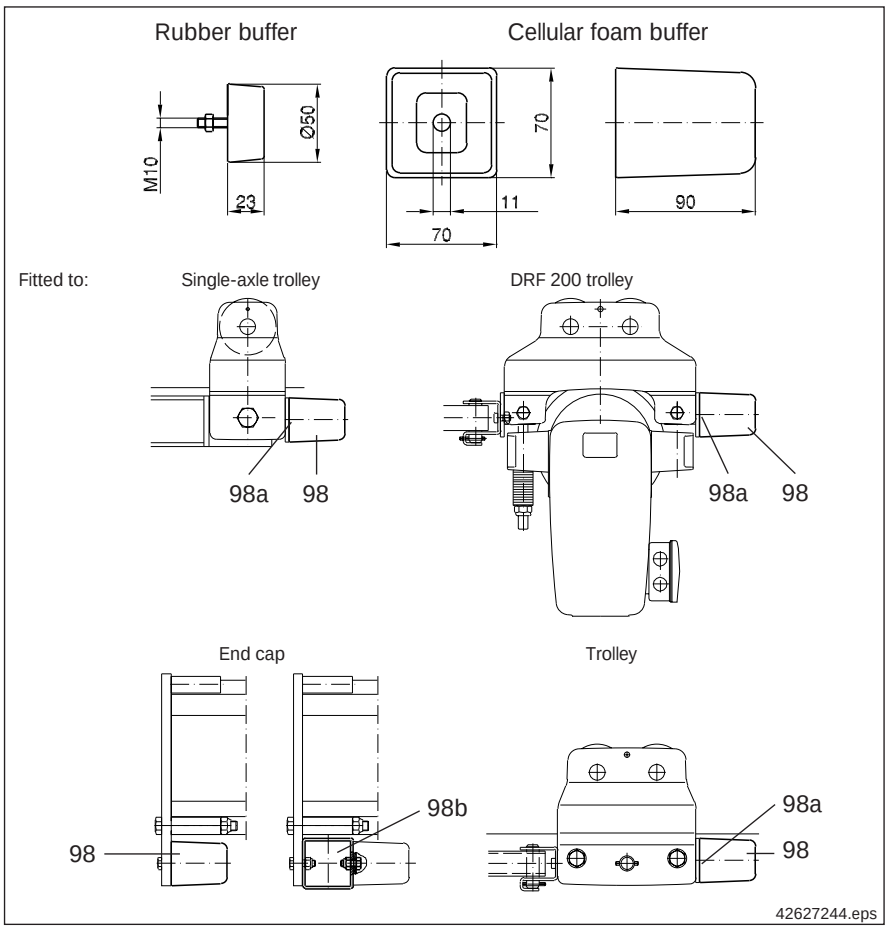
14.2 KBK III buffer

(item 98)

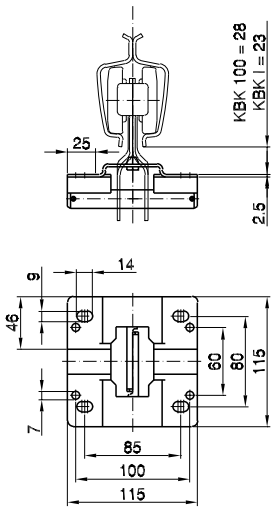


Item no.	Designation	KBK III	
		Weight approx. kg	Part no.
98	Rubber buffer	0,1	978 206 44
	Foamed plastic buffer	0,26	939 666 44
98a	Hexagon bolt, M 10	—	150 446 99
98b	Buffer extension	0,9	850 118 44

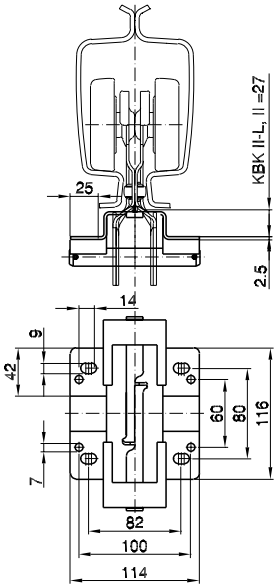
A buffer extension is necessary, for example, to protect the current collector from collision impact if DEL current collectors are arranged such that they face the end cap.

15.1 KBK 100, I, II-L, II, III trolley fittings

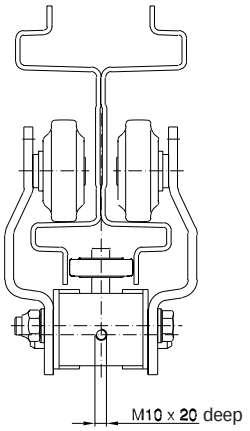
KBK 100, I



KBK II-L, II



KBK III



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KBK 100, I, II-L, II 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 sufficiently balanced by counterweights or by loading the trolley to prevent it from tilting. Fittings are attached to KBK III trolley units and RF trolleys by means of the M10 threaded bore holes on the end surfaces.

Designation	KBK 100, I		KBK II-L, II	
	Weight approx. kg	Part no.	Weight approx. kg	Part no.
Trolley fitting with pin 1)	0,48	980 041 44	0,66	982 041 44

1) Complete with mounting plate, pin, washers and split sleeves.

Finish: black (RAL 9005)

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15.2 Rail attachment

Item no.	Designation	KBK 100		KBK I		KBK II-L, II		KBK III	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.	Weight	Part no.	Weight approx. kg	Part no.
89	Bolted bracket	-	-	0,35	984 690 44	0,35	984 690 44	-	-
	Mounting bracket	0,3	984 556 44	1,4	980 365 44	1,4	982 365 44	1,7	850 032 44

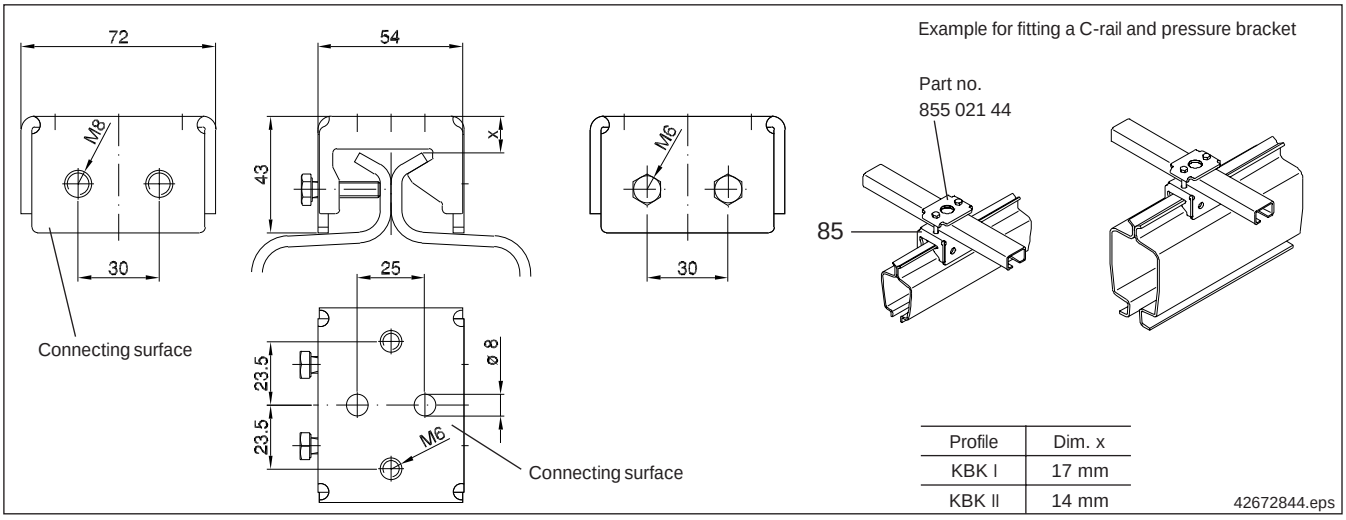
The brackets shown here must not be used as load-supporting parts (suspensions).

15.2.1 Bolted bracket (item 85)

Bolted brackets are suitable for attachment to the following KBK profile sections:
KBK I, KBK II-L, KBK II, KBK II-R.

They can be placed on and attached to profile sections at any position except in the area of the bolted connection. Secure the bracket by evenly tightening the lateral fastening bolts. It should be fully supported by the roof of the profile section.

The flat connecting surfaces facilitate a variety of mounting arrangements.



Profile	Dim. x
KBK I	17 mm
KBK II	14 mm

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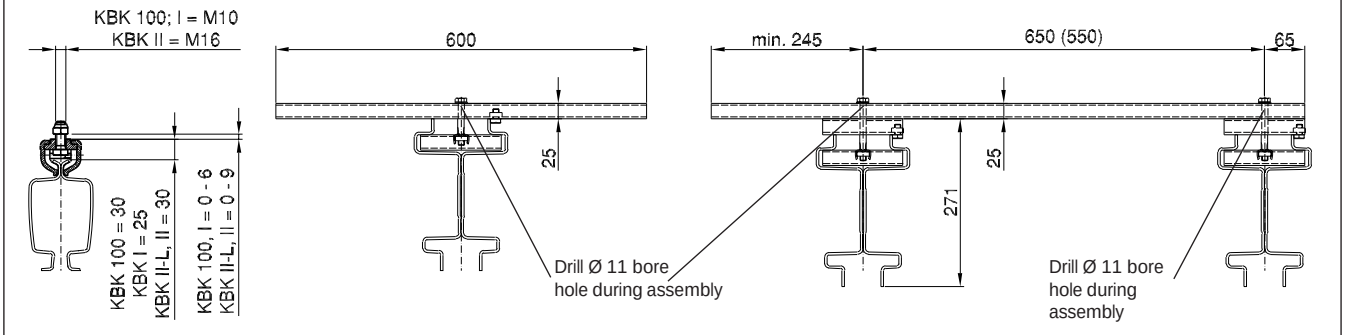
15.2.2 Mounting bracket (item 89)

Mounting bracket
KBK 100, I, II-L, II

Bracket for C-rails, perforated
KBK III

Example for attachment to a double-girder crane with an additional C-rail



The clamping dimension can be increased by replacing the bolt.

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Mounting brackets are used for attaching mounting plates, counterweights and similar parts.

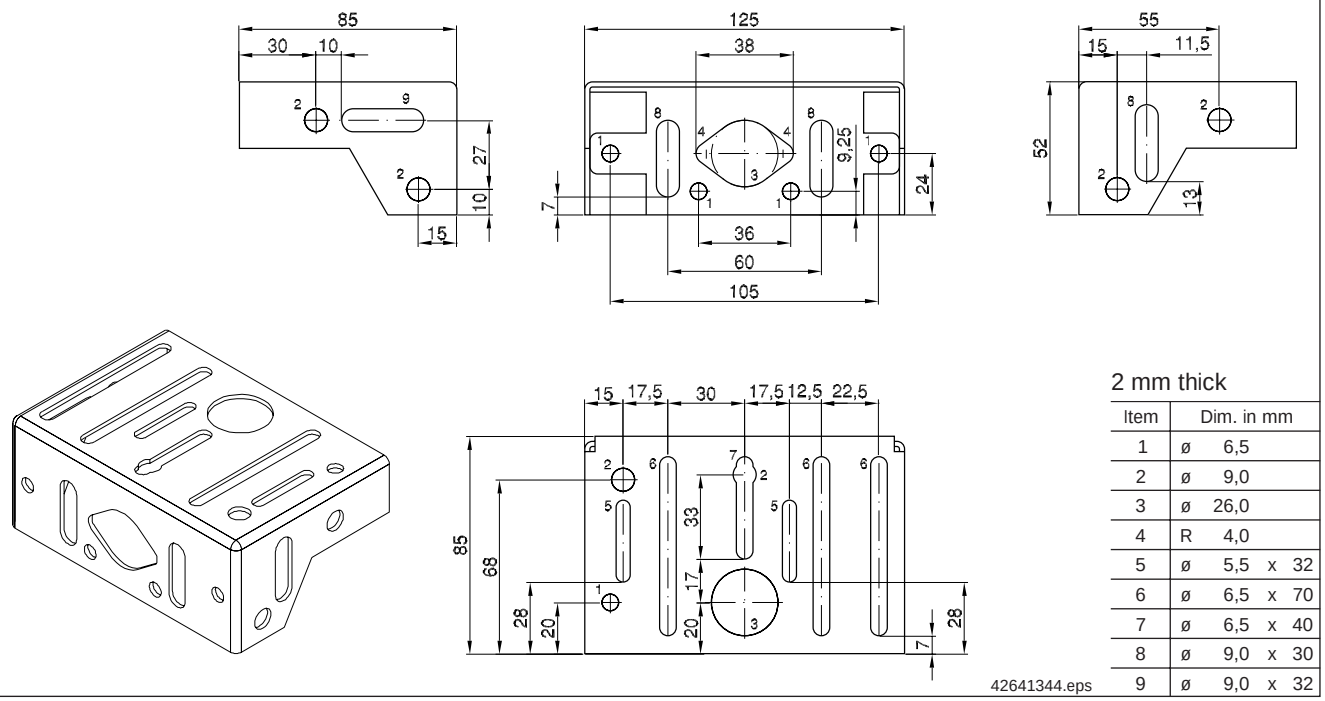
Finish: galvanized

15.3 Mounting plates

15.3.1 Mounting plate 1
for switch and magnet fittings

Item no.	Designation	Weight approx. kg	Part no.
95	Mounting plate 1	0,26	505 753 44

Finish: galvanized



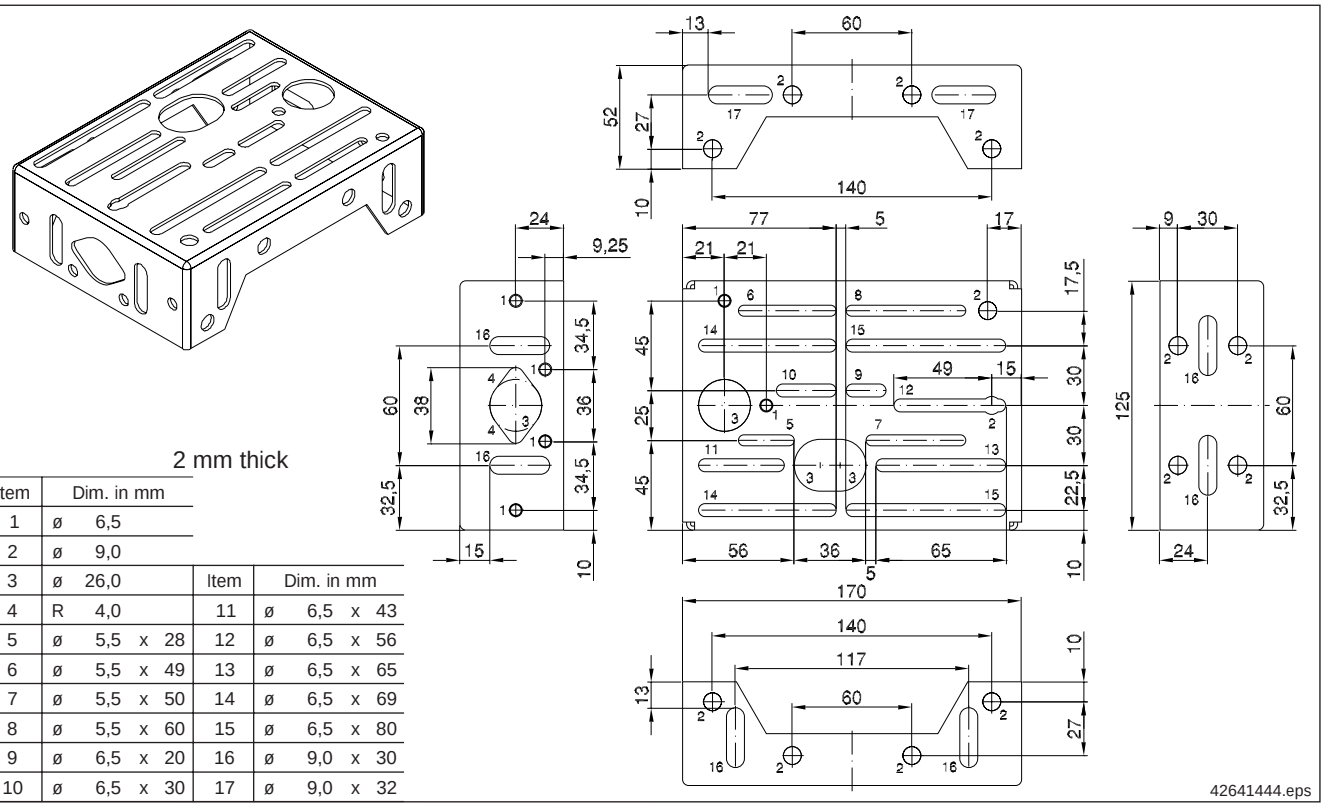
2 mm thick

Item	Dim. in mm
1	ø 6,5
2	ø 9,0
3	ø 26,0
4	R 4,0
5	ø 5,5 x 32
6	ø 6,5 x 70
7	ø 6,5 x 40
8	ø 9,0 x 30
9	ø 9,0 x 32

15.3.2 Mounting plate 2
for switch and magnet fittings

Item no.	Designation	Weight approx. kg	Part no.
95	Mounting plate 2	0,56	505 754 44

Finish: galvanized



2 mm thick

Item	Dim. in mm	Item	Dim. in mm
1	ø 6,5		
2	ø 9,0		
3	ø 26,0	11	ø 6,5 x 43
4	R 4,0	12	ø 6,5 x 56
5	ø 5,5 x 28	13	ø 6,5 x 65
6	ø 5,5 x 49	14	ø 6,5 x 69
7	ø 5,5 x 50	15	ø 6,5 x 80
8	ø 5,5 x 60	16	ø 9,0 x 30
9	ø 6,5 x 20	17	ø 9,0 x 32
10	ø 6,5 x 30		

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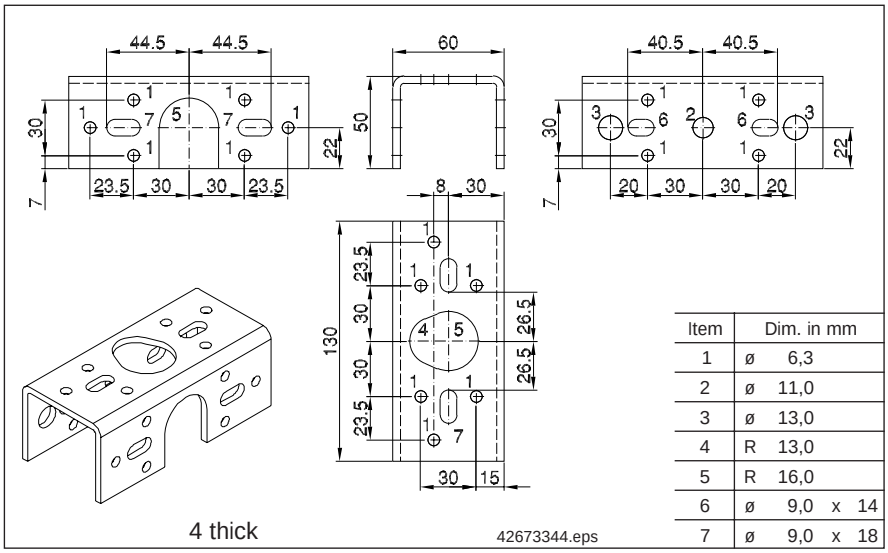
15.3.3 Mounting plate 3
U-plate

Item no.	Designation	Weight approx. kg	Part no.
95	Mounting plate 3	1,1	385 554 46

Finish: galvanized

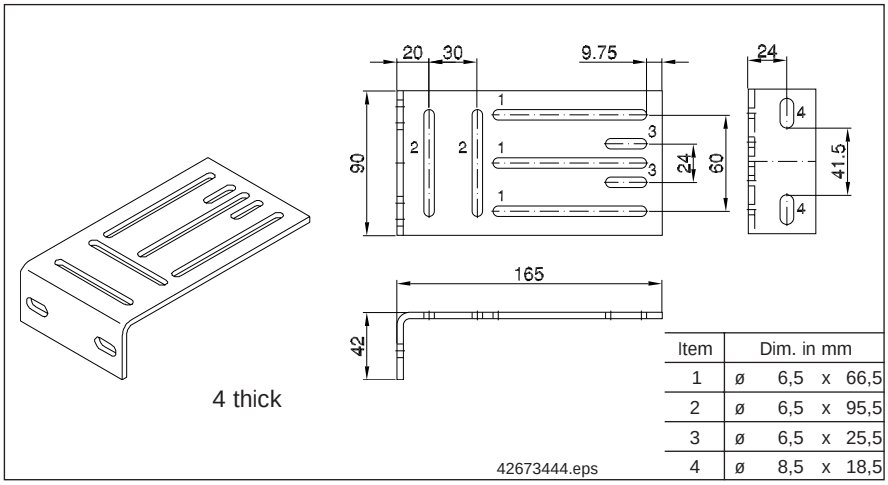


Item	Dim. in mm
1	ø 6,3
2	ø 11,0
3	ø 13,0
4	R 13,0
5	R 16,0
6	ø 9,0 x 14
7	ø 9,0 x 18

15.3.4 Mounting plate 4
L-plate

Item no.	Designation	Weight approx. kg	Part no.
95	Mounting plate 4	0,38	622 533 46

Finish: galvanized



Item	Dim. in mm
1	ø 6,5 x 66,5
2	ø 6,5 x 95,5
3	ø 6,5 x 25,5
4	ø 8,5 x 18,5

16 Power supply to crabs and cranes

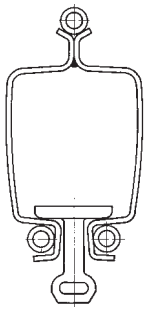
16.1 Electrical power supply

16.1.1 Trailing cable, General information

A cable (4 x 1,5) running on cable sliders and larger or several cables running on cable trolleys in the KBK 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 KBK section.

KBK 100, I, II-L, II trailing cable with cable slider



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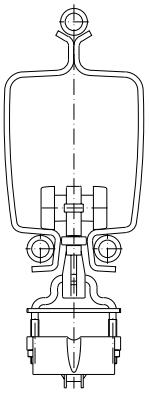
with cable trolley



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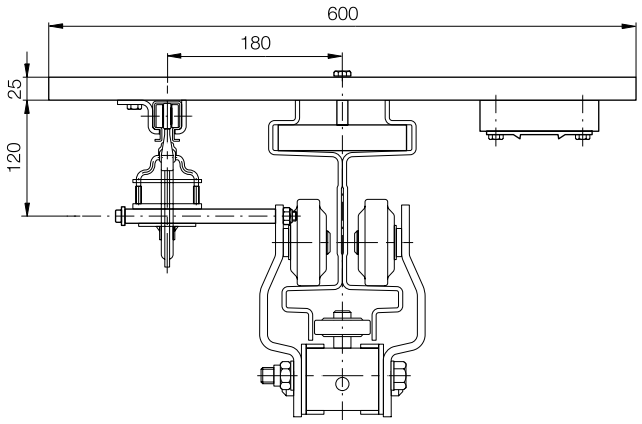
KBK 25 power supply arrangement on KBK III



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Long tracks, curves

Cable trolleys should be used for longer tracks, gentle curves, 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.

Number of sliders or cable trolleys

The number of sliders or cable trolleys required for a crane or track is calculated taking into consideration cable sag and track or crane girder length. Cable sliders must only be used on straight tracks and only up to track length of approx. 30 m for KBK 100, I or 40 m for KBK II-L, II and for 4 x 1,5 mm^2 flat cable (max. 8 mm x 19 mm external dimensions).

Max. trailing cable length with cable trolleys:

50 m for push-travel load, 70 m for electric-travel load.

Required cable length = track and crane girder length in m x 1,2 + length of feed in m

Required number of sliders or trolleys (track or crane)

$$= \frac{\text{Track or crane girder length (m)}}{\text{Length of one cable loop (m) x 2}} - 1$$

Approach dimension

The approach dimension of the crane or travelling hoist is increased by the distance required for close accumulation of cable sliders and cable trolleys. An internal buffer stop should be fitted to protect the accumulated sliders or trolleys. For KBK III installations with KBK 25, the approach dimension can be reduced by arranging the cable trolley accumulating section next to the crane or travelling hoist, or by extending the KBK 25 rail beyond the end of the track.

Two trolleys or cranes on one track

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

For further details, see KBK 25 parts and fittings in data sheet 202 617 44 (KBK 25 trailing cable power supply); for fittings see data sheet 202 588 44 (DKK fittings ...) and data sheet 202 589 44 (Engaging stirrup attachment ...).

More than two trolleys or cranes on one track

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

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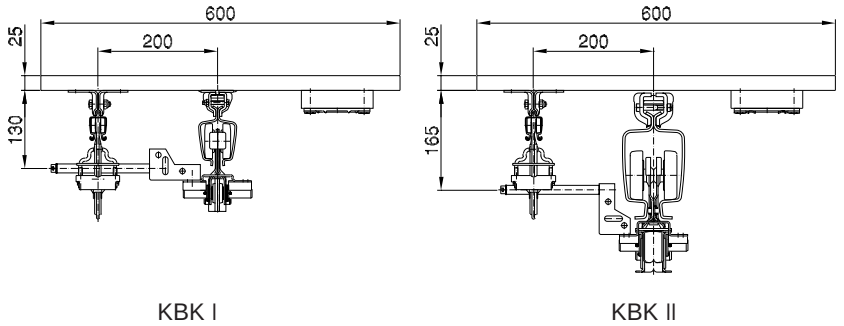
External KBK 0 / KBK 25 trailing cable power supply

KBK 0 trailing cable power supply



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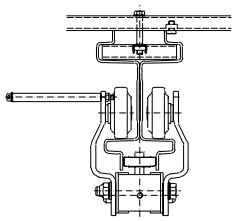
A trailing cable power supply system arranged at the side of the KBK rail can reduce the approach dimension and the section required to accumulate the cable trolleys can extend beyond the end of the track.

See technical data sheet 202 617 44 for details.

KBK III towing arm

KBK III towing arm for towing trolley



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For maximum attachment distance of the C-rail fitting, selection table for KBK 25 parts and further information, see technical data sheet 202 617 44.

Parts	Weight approx. kg	Part no.
Towing arm	0,3	850 368 44

16.1.2 External conductor line

If flat cables cannot be used with KBK I and KBK II-L track sections, or if the 5 integrated busbars of the KBK II-R section are insufficient, a compact busbar line is attached to the KBK section.

Conductor lines offer good protection against moisture and mechanical damage.

Type of enclosure: IP 23;

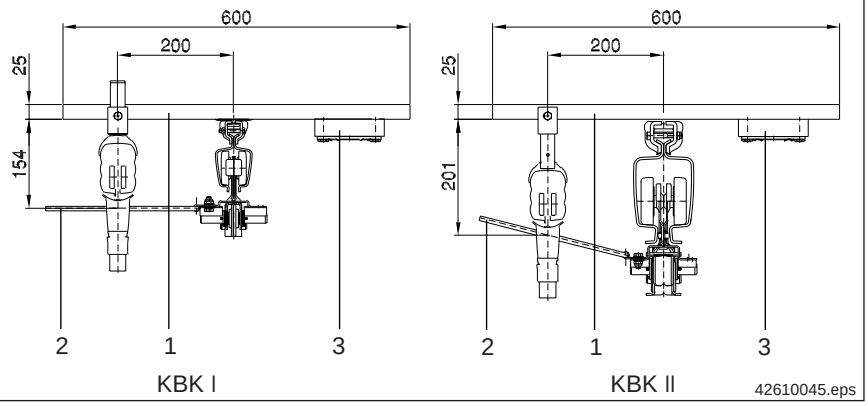
permissble voltage: DCL = 690 V; temperature range: -30 °C to +70 °C,

DKK = 500 V; temperature range: -30 °C to +100 °C,

An external busbar can be fitted on all sections and track layouts without branch elements (track switches, turntable). Special attachments are, however, required. Free trolley entry sections and contact sections can be provided using the DCL / DKK system. If the DCL / DKK is provided in a low-level arrangement (current collector below the track), contact sections may also be provided in layouts which include branch elements. Trolley entry sections must only be fitted along straight track runs.

Demag DCL compact line

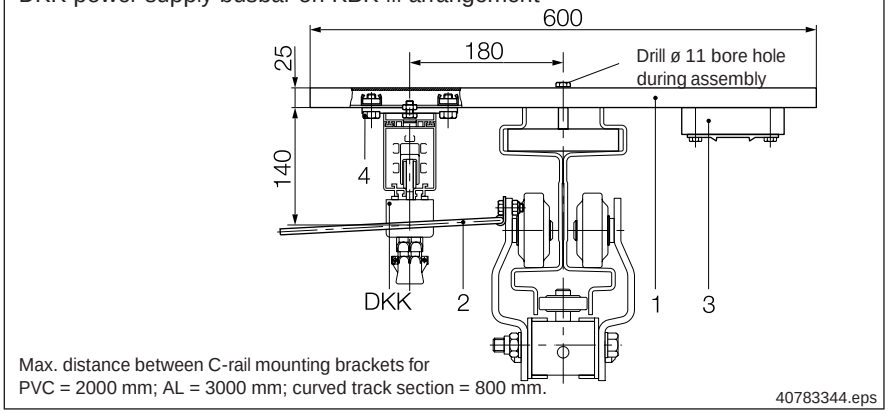
Demag DCL compact conductor line



Details see: Technical data sheet 203 387 44 (Demag Compact Line DCL),
Technical data sheet 203 510 44 (DCL on KBK),

Demag DKK compact conductor line

DKK power supply busbar on KBK III arrangement



For further information and selection table for DKK components, see technical data sheet 202 540 44 (DKK compact busbar lines)

1) See technical data sheet 202 588 44 (DKK attachment on KBK ...).

2) See technical data sheet 202 589 44 (Towing arm attachment ...).

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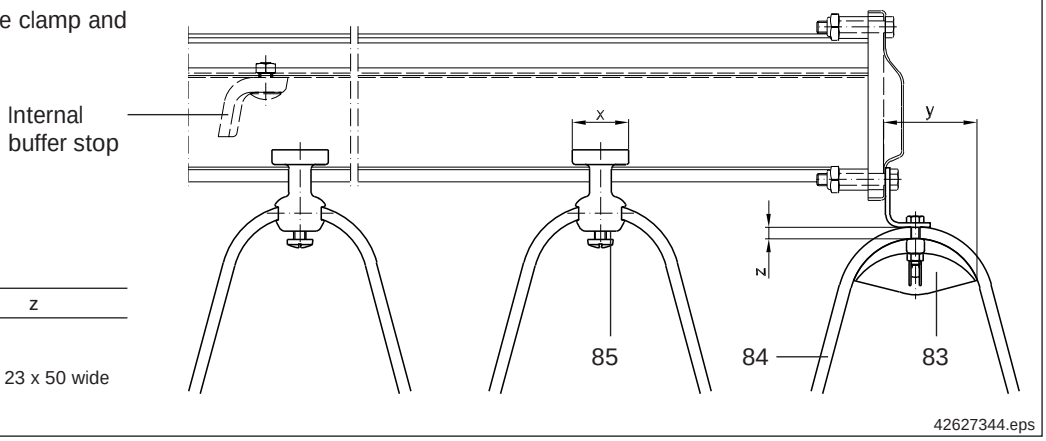
16.1.3 Trailing cable Parts and fittings

Rail end cable clamp (item 83)
Flat cable (item 84)
Cable slider (item 85)

Flat cable with rail end cable clamp and cable slider



	x	y	z
KBK 100	40	65	max. 23 x 50 wide
KBK I	40	65	
KBK II-L	60	65	
KBK II	60	65	

Rail end cable clamps are bolted to the KBK 100, KBK I, KBK II-L or KBK II end cap with buffer. This provides strain relief of the flat cable to the terminal box and a favourable fixing point for the cable between the crane girder and track.

Finish: galvanized

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

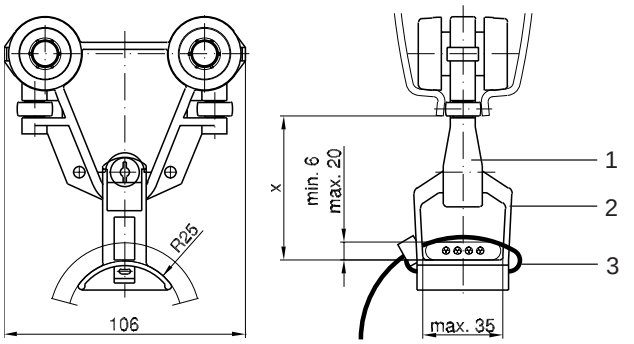
Cable sliders with a cable locking screw are suitable for one flat cable with maximum overall dimensions of 19 mm x 8 mm. They are made of temperature-resistant plastic. Temperature range from –20 °C to +70 °C.

Item no.	Designation	No. of conductors x nominal cross section mm²	Overall dimensions mm	KBK I, 100		KBK II-L, II	
				Weight approx. kg	Part no.	Weight approx. kg	Part no.
83	Rail end cable clamp			0,1	982 114 44	0,1	982 114 44
84	Flat cable with PE	4 x 1,5	19 x 8	0,21/m	471 352 44	0,21/m	471 352 44
		4 x 2,5	21 x 8	0,26/m	504 208 44	0,26/m	504 208 44
		8 x 1,5	33 x 8	0,35/m	504 226 44	0,35/m	504 226 44
		13 x 1,5	31 x 12	0,55/m	895 171 44	0,55/m	895 171 44
85	Cable slider	only for flat cable 4 x 1,5		0,02	855 143 44	0,04	982 325 44

Flat cable trolley with snap connector (item 86)

Flat cable trolley with snap connector

	x
KBK 100	60
KBK I	65
KBK II-L	45
KBK II	45



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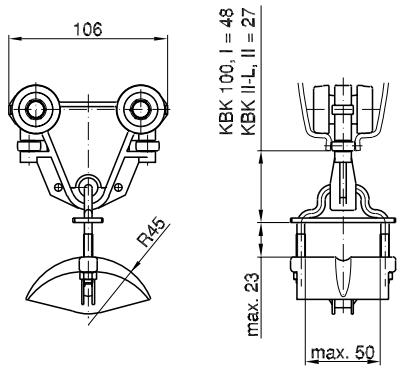
This flat cable trolley is designed for light duty. It is not suitable for round cables. For a flat cable trolley with snap connector, the following must be ordered separately:

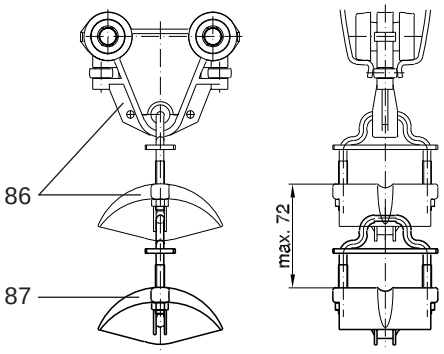
1. Trolley for cable bracket
2. Cable bracket with snap connector
3. 340 x 8 cable straps for cable brackets, (colour: black)

Item no.		KBK 100, I			KBK II-L, II		
		Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.
86	Trolley for cable bracket	—	0,16	980 045 44	—	0,18	982 045 44
	Cable bracket with snap connector	3	0,01	981 018 44	3	0,01	981 018 44
	340 x 8 cable strap for cable bracket	—	—	981 019 44	—	—	981 019 44

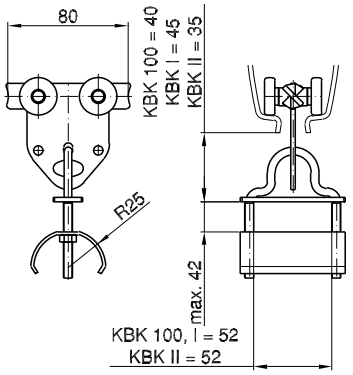
Cable trolley (plastic, item 86)



Stirrup with clamping plate (plastic, item 87)



Cable trolley (steel, item 86)



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Item no.		KBK 100, I			KBK II-L, II		
		Max. load kg	Weight approx. kg	Part no.	Max. load kg	Weight approx. kg	Part no.
86	Cable trolley (galvanized, steel)	40	0,3	984 605 44	40	0,5	855 085 44
	Cable trolley (black, plastic)	25	0,2	980 460 44	25	0,22	982 470 44
87	Stirrup with clamping plate (45 mm radius)	1)	0,1	980 470 44	1)	0,1	980 470 44

1) Only for plastic cable trolley. Several hangers may be arranged below each other. However, the total load of the additional hangers must not exceed 5 kg.

The basic element of the cable trolley is the light-duty trolley (see section 8.3). Cables, compressed air or water hoses can be supported. The cable trolley has bore holes for strain relief cords.

Finish:
Plastic, black; axle with ball bearing: steel;
travel rollers: plain plastic
Temperature range –20 °C to +70 °C.

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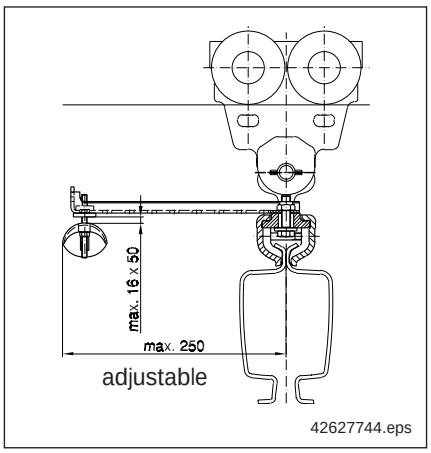
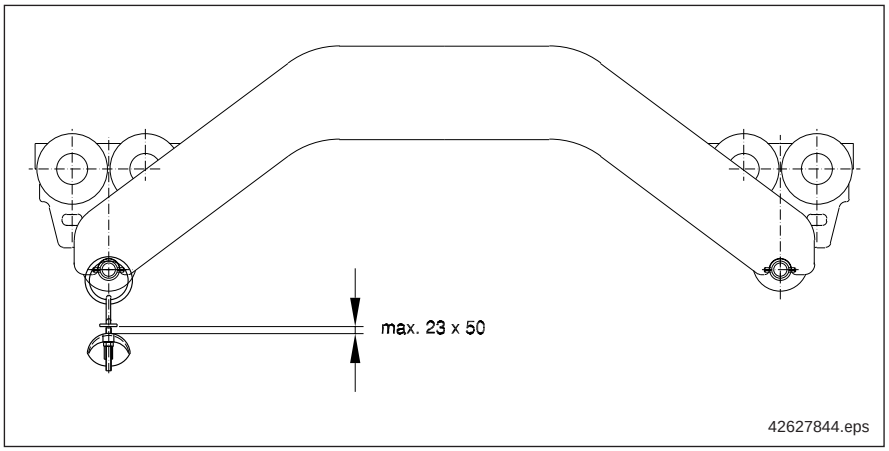
Crane bridge cable clamp (item 80)



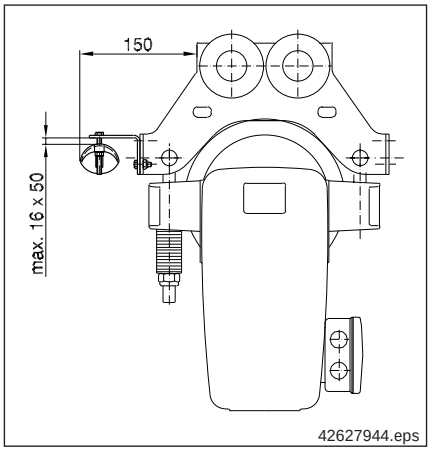
Crane bridge cable clamps are used for KBK 100, I, II-L, II push travel single and double-girder cranes to prevent the flat cable running from the crane runway to the crane girder from being subjected to side pull.

Crab frame cable clamp (item 81)



Crab frame cable clamps are suspended from the trolleys of KBK 100, I, II-L, II push travel crab frame hoists to relieve the pull on the terminals.

RF trolley cable clamp (item 82)

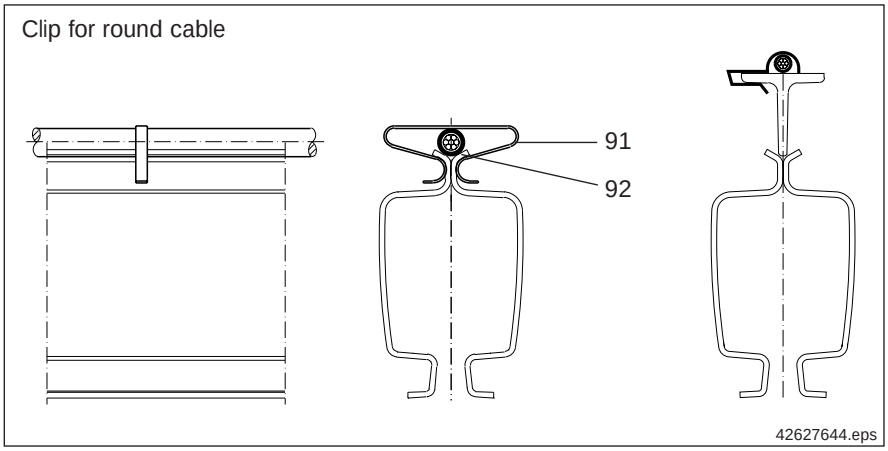


RF trolley cable clamps are fitted to KBK II-L, II electric travel crab frame hoists/cranes to relieve the pull on the terminals.

Item no.		KBK 100, I		KBK II-L, II	
		Weight approx. kg	Part no.	Weight approx. kg	Part no.
80	Crane bridge cable clamp	0,7	984 680 44	0,6	980 680 44
81	Crab frame cable clamp	0,1	982 577 44	0,1	982 577 44
82	RF unit cable clamp	—	—	0,6	982 578 44

Finish: galvanized

Clip for round cable (item 91)
Round cable (item 92)

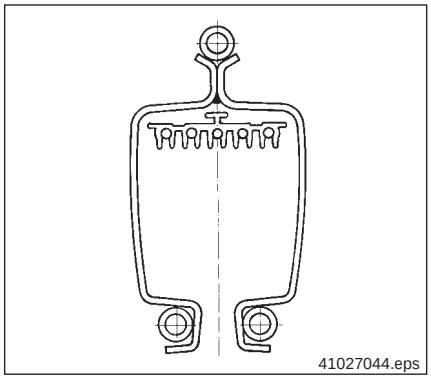


In order to complete the electrical connection between the two travel drives on the track girder for electric-travel cranes, a round cable has to be laid along the crane girder.

Required cable length: Crane span dimension l_{Kr} + 2,5 m. The round cable is attached to the crane girder with clips at intervals of 0,5 m for KBK I, II-L, II (l_{Kr} x 2 + 1) and placed in the upper part of the profile section without any clips for KBK III.

Item no.		KBK I, II-L, II	
		Weight approx. kg	Part no.
91	Clip for round cable on KBK I, II-L, II	—	982 124 44
	Clip for round cable on KBK II-T	—	504 332 44
92	Round cable 4 x 1,5 mm²	0,13	504 931 44
	Round cable 7 x 1,5 mm²	0,21	504 951 44
	Round cable 12 x 1,5 mm²	0,31	504 945 44

16.1.4 Integrated KBK II-R conductor line



KBK II-R profile sections are fitted with five internal conductors. Power is supplied via end or centre powerfeeds. If track switches or turntables are used in R-type systems, the powerfeed may also be arranged at the track switch or turntable for downshop rails. For this purpose, the current collector trolley provides four or five sprung double sliding contacts.

The system should be provided with a maintenance section (item 11) for better maintenance of the current collector trolleys (to check or replace the sliding contacts or replace the entire current collector trolley).

See sections 4.1- 4.3 and 4.5/4.6 for components.

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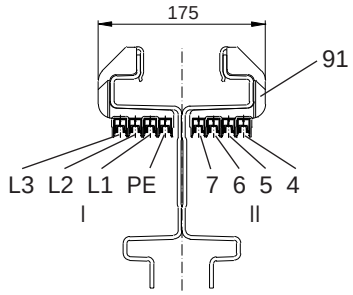
16.1.5 Integrated DEL single-conductor busbar and components for KBK III

DEL single-conductor busbar



Max. distance between brackets (item 91) for
Straight track section: 750 mm
Curved section: 500 mm

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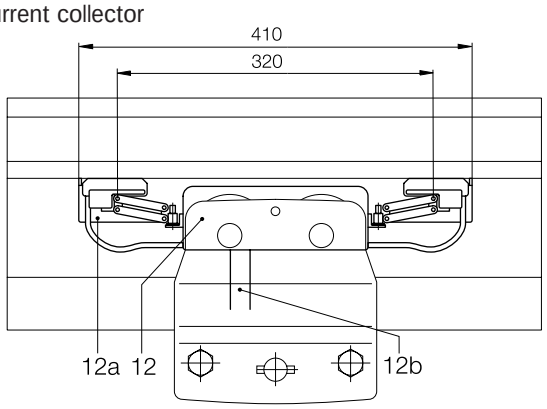
KBK III-DEL current collector



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Up to eight conductors can be integrated in the KBK III track section, more conductors can also be fitted in track layouts without any branch sections. IP 23 enclosure; DEL 25/50 mm², 100/200 A . Maximum conductor cross section at the DEL powerfeed point is 10 mm².

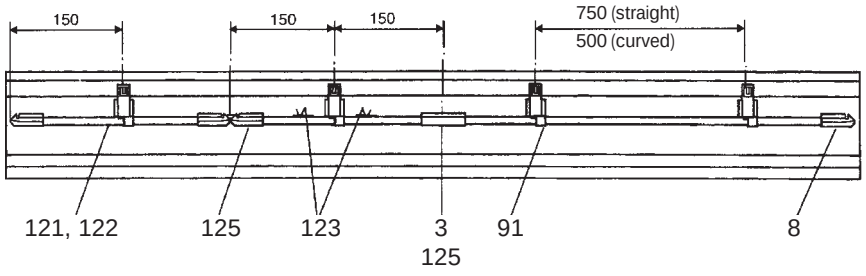
The DEL single-conductor system features a compact design and provides for simple project engineering and maintenance. All parts are accessible for visual inspection and maintenance. Snap-on connections make it easy to replace or fit parts at a later date, e.g. block sections or powerfeeds.

Cable anchor points must be created at the powerfeed points by means of terminal boxes (e.g. terminal box fastened to the end cap or with brackets for isolator switches.

KBK III installations can be easily fitted with DEL at a later date.

Component part overview

DEL conductor line



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Item no.	Designation
121	DEL straight section
122	DEL curved section
123	Anchor point plate
3	Conductor connection 100 A
	Conductor connection 100 A with powerfeed
	Conductor connection 200 A with powerfeed
125	Isolating section
	Air-gap isolating section
8	End cap with powerfeed / ramp section
91	DEL bracket

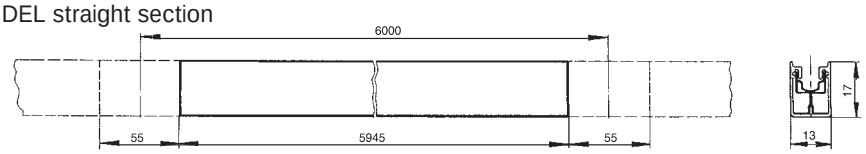
DEL straight section
(item 121)

Straight sections are a maximum of 5945 mm in length. Shorter lengths are obtained by cutting them straight across. The protective earth conductor (PE) marked green/yellow must be attached to the girder web.

The max. distance between brackets is 750 mm. 150 mm at conductor line connections, isolating section and end cap.

2 anchor plates must also be ordered for each conductor to protect against longitudinal displacement.

DEL straight section



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Conductor cross-section	25 mm²	50 mm²
Continuous current at 100% CDF	100 A	200 A
Conductor material	Copper	
Ambient operating temperature	Max. -30° to +60° C	
Enclosure	IP 23	

Design

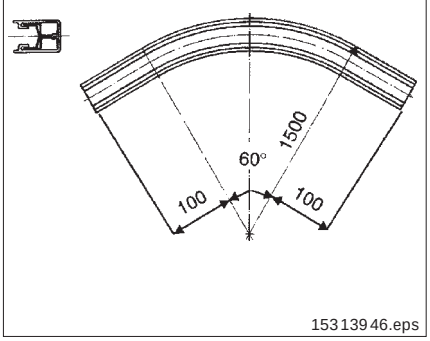
Plastic insulation grey, protective earth conductor grren/yellow, conductor material Cu, alternative conductor materials on request.

Item no.	Designation	kg	Part no.
121	DEL 1 - 25 - PVC PH	1,78	876 206 44
	DEL 1 - 25 - PVC PE		876 216 44
	DEL 1 - 50 - PVC PH	2,97	876 096 44
	DEL 1 - 50 - PVC PE		876 106 44
123	Anchor point plate	0,01	876 095 44

DEL curved section
(item 122)

Curved sections can be fabricated before leaving the factory or on site using a bending jig. Curved sections made in the factory are supplied with a radius of 1500 mm (60°) and must be adapted to the given curved section on site. They are supplied with 100 mm-long straight end sections for connection straight track sections. The straight end sections must be removed if they are not required. Bending jigs for creating horizontal and vertical curved sections on site are available on request. The max. distance between brackets is 500 mm. 150 mm at conductor line connections, isolating section and end cap.

Curved section



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Item no.	Designation	Radius	kg	Part no.
122	DEL curved section 25 mm² PH	1500	0,54	876 230 44
	DEL curved section 25 mm² PE			876 231 44

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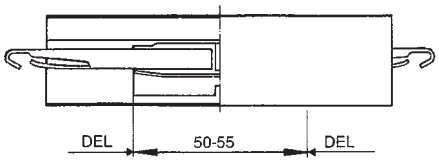
Powerfeed conductor connector (item 3)

Conductor connectors with expansion compensation are inserted into the conductors. Conductor connectors with a powerfeed arrangement must also be provided with a M5 connecting screw to attach cable lugs.

Conductor connector



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Conductor connector	25 mm²	50 mm²
Continuous current at 100% CDF	100 A	200 A
Cyclic duty factor	100% CDF	
Expansion compensation	+/- 2,5 mm	

Conductor connector with powerfeed

Connection cross-section	max. 10 mm²
Cable diameter	max. 7,5 mm²

Item no.	Designation	ME	kg	Part no.
3	Conductor connector 100 A	24	1,0	876 240 44
	Conductor connector 100 A with powerfeed	12	0,55	876 242 44
	Conductor connector 200 A with powerfeed	4	0,5	876 245 44

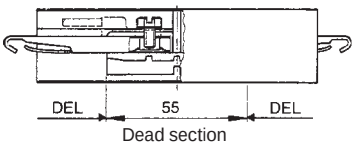
ME = quantity contained in the package

Isolating section (item 125)

Isolating and air-gap isolating sections are available. Air-gap isolating sections must be used for increased requirements and arduous operating conditions.

The connecting parts are interchangeable. Isolating sections have the same dimensions as conductor connectors. Isolating sections are provided with one and air-gap isolating sections are provided with two M5 powerfeed screw (see also conductor connection).

Isolating section



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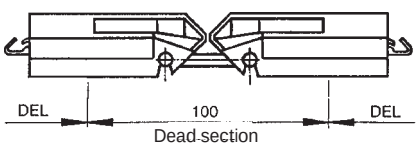
Air-gap isolating section



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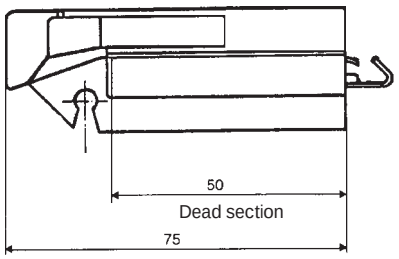
Item no.	Designation	ME	kg	Part no.
125	Isolating section	12	0,43	876 250 44
	Air-gap isolating section	1	0,04	876 055 44

ME = quantity contained in the package

End cap
Entry section
End power feed
(item 8)

The end cap serves as a rail end and as a straight ramp section. It can be used as an end powerfeed arrangement for up to 10 mm² connection cross-sections (see also section 7).

End cap / ramp section



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Item no.	Designation	kg	Part no.
8	End cap / ramp section	0,02	876 065 44

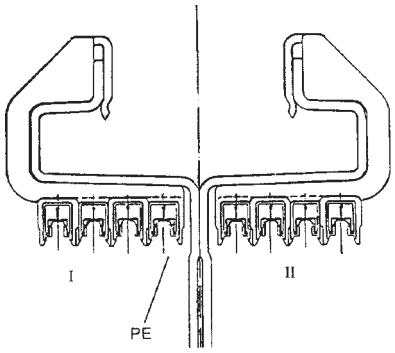
Bracket
(item 91)

The max. 4-pole brackets are fitted to the left and right of KBK III profile sections by means of an integrated clamping device. DEL brackets with more than 4 conductors per side (except for track switch) on request. In each case, the first bracket must be attached 150 mm from the start of the track and conductor joint, all others at a max. distance of 750 mm (500 mm in curved sections).

Finish:

DEL bracket red plastic,
Clip galvanised steel

Bracket



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Item no.	Designation	kg	Part no.
91	Bracket DEL 4	0,06	878 510 44

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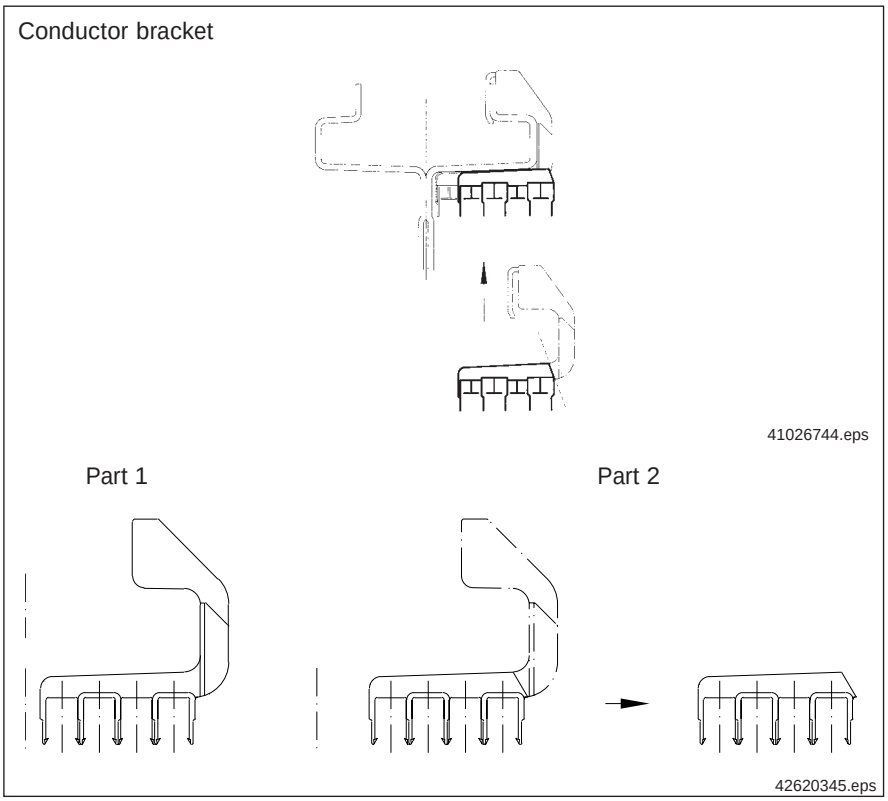
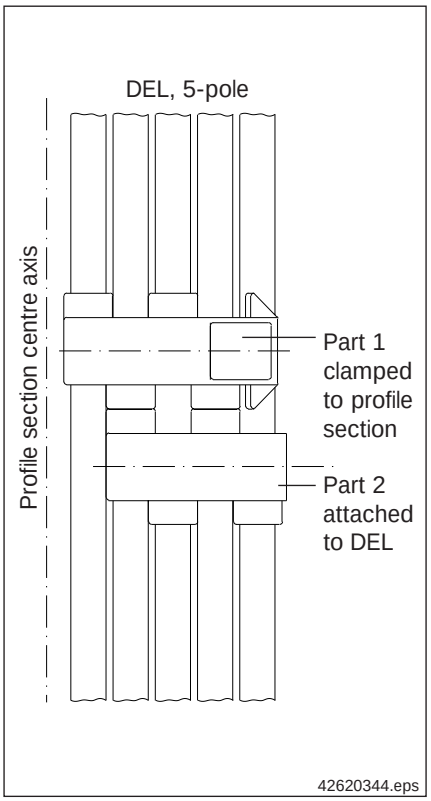
Attachment of more than eight DEL conductor lines to KBK III profile section

Example: 10 DEL conductor lines for electric-travel single-girder cranes





Twice the number of brackets are used for project engineering.

1. The retaining arm is removed from every second bracket (2) during assembly.
2. The bracket is moved to the outside (by a max. of 2 conductors) and fitted direct next to the complete bracket (1) in such a way that it is supported by the conductors.

The 5-pole design is shown without the KBK III profile section.

Enclosures 4 are designed to accommodate additional current collectors. Enclosures with 5 or 6-pole current collectors, with or without PE conductor, on request.

Either 2 x 4 and 1 x 2 conductors or 2 x 5 conductors, each on the outside of the profile sections, must be provided.

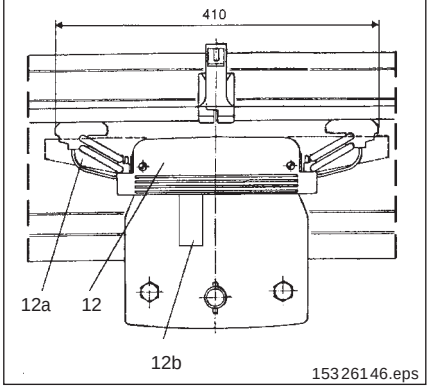
Current collector (item 12)

Enclosures (item 12) with integrated terminal box and current collector carriers for double current collector pantographs (SSD) are used with KBK III load trolleys. The terminal box is suitable for connecting 2,5 mm² flat (max. 30 x 10 mm) or round cable (max. dia. 23 mm/PG 16).

Double current collectors are always fitted to ensure reliable contact. Current collector pantographs with graphite sliding contacts must be used for applications under arduous conditions. (Current collectors with graphite sliding contacts on request.) The enclosures are fitted with prepared openings for a flat and a round cable. The current collectors are additionally provided with a protective frame in straight track sections and in areas within arm's reach.

Finish: plastic enclosure red

Current collector



Item no.	Designation	Part no. 4-pole	Part no. 5-pole
12	Enclosure 4 (5), SSD with PE	878 546 44	878 556 44
	Enclosure 4 (5), SSD with PE	878 547 44	878 557 44
12a	Protective frame 4-pole	878 542 44	
12b	Flat cable 4 x 2,5, cold-resistant	504 208 44	

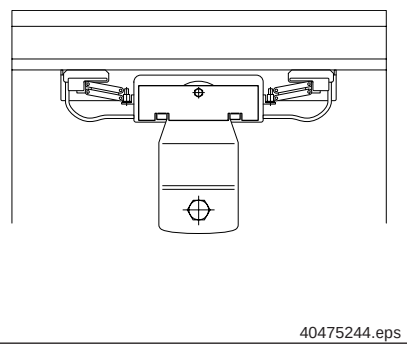
Current collector pantograph [1]	SSD
Continuous current at 100% CDF	50 A
Continuous current at 60% CDF	60 A
Continuous current at 30% CDF	60 A
Flat cable union (standard)	30 x 10 mm
Round cable union [2]	ø 23 mm / PG 16
Connection cross-section	max. 6 mm²
Travel resistance 4-pole approx.	10 N

Current collector pantograph type: SSD = double current collector pantograph

1) Continuous current details for bronze sliding contact

2) When metric union glands are used, a PG16 ⇒ M25 reducer is required.

EA-FW intermediate bracket



The enclosure (item 12) is attached to the single-axle trolleys of the crab frame for double-girder cranes or to traverses with single-axle trolleys by means of an intermediate bracketmit Hilfe eines Zwischenblechs.

Intermediate bracket EA-FW, part no. 850 276 44

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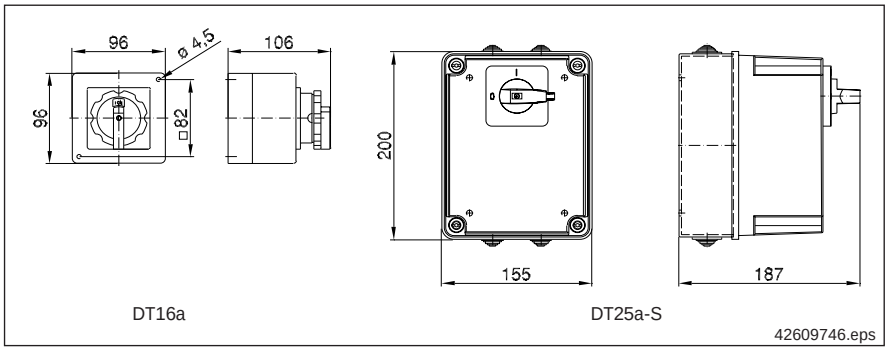
16.1.6 Mains connection switch/ isolating switch (item 88)

Mains connection or isolator switches can be locked in the OFF (0) position against unauthorised restoration of the power supply by up to three padlocks.
Type of enclosure IP 55.

DT 16a mains connection switch without fuses; voltage up to 500 V, max. capacity 20 A.

DT 25a-S mains connection switch with fuse base for three fuses; voltage up to 690 V, max. capacity 25 A. (Suitable for use as mains connection switch for installations with higher back-up fuse or as isolator switch for several trolleys or cranes connected to the same power supply).

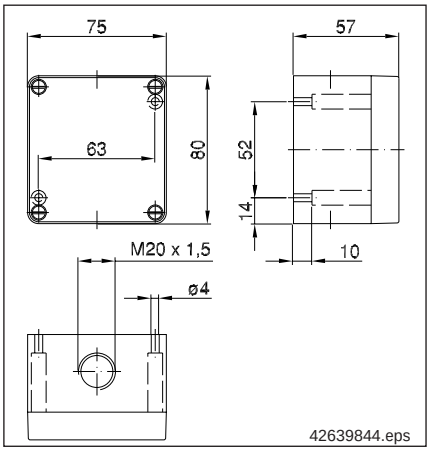


Item no.	Designation	Weight [kg]	Part no.
88	Mains connection switch DT 16a	0,32	575 479 44
	Mains connection switch DT 25a-S	1,60	473 037 44

Rated current A	"D" fuse insert (delayed action) Part no.	"D" screw-in adapter for fuse insert Part no.
6	451 663 99	504 905 99
10	451 643 99	504 906 99
16	451 644 99	504 907 99
20	451 645 99	504 908 99
25	451 646 99	504 909 99

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

Terminal box (item 92a)



Aluminium enclosure with 6 modular spring-loaded terminals (grey) up to (2,5 mm²) fitted on mounting rail.

Finish: RAL 7035 (light grey)

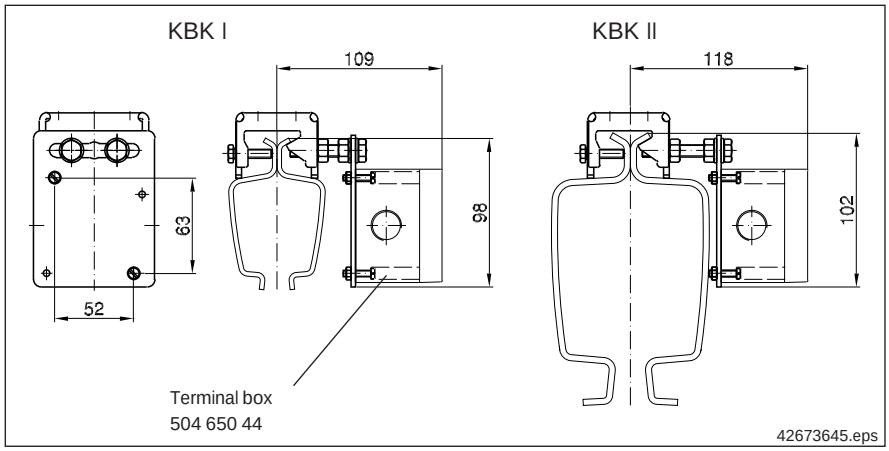
Item no.	Designation	Weight [kg]	Part no.
92a	Enclosure	0,4	504 650 44

For flat cable	Terminal box			Twist-type cable entry gland for	
				Round cable	Flat cable
	Weight [kg]	Part no.	Size	Part no.	Part no.
4 x 1,5 mm²	0,34	504 650 44	M20 x 1,5	794 947 44	794 930 44
4 x 2,5 mm²	0,60	575 351 44	M25 (M16, M32)	794 946 44 794 905 44 [1)]	794 927 44 794 905 44 [1)]

1) Nut

16.1.7 Mounting brackets for switches and terminal boxes

Mounting bracket for terminal box

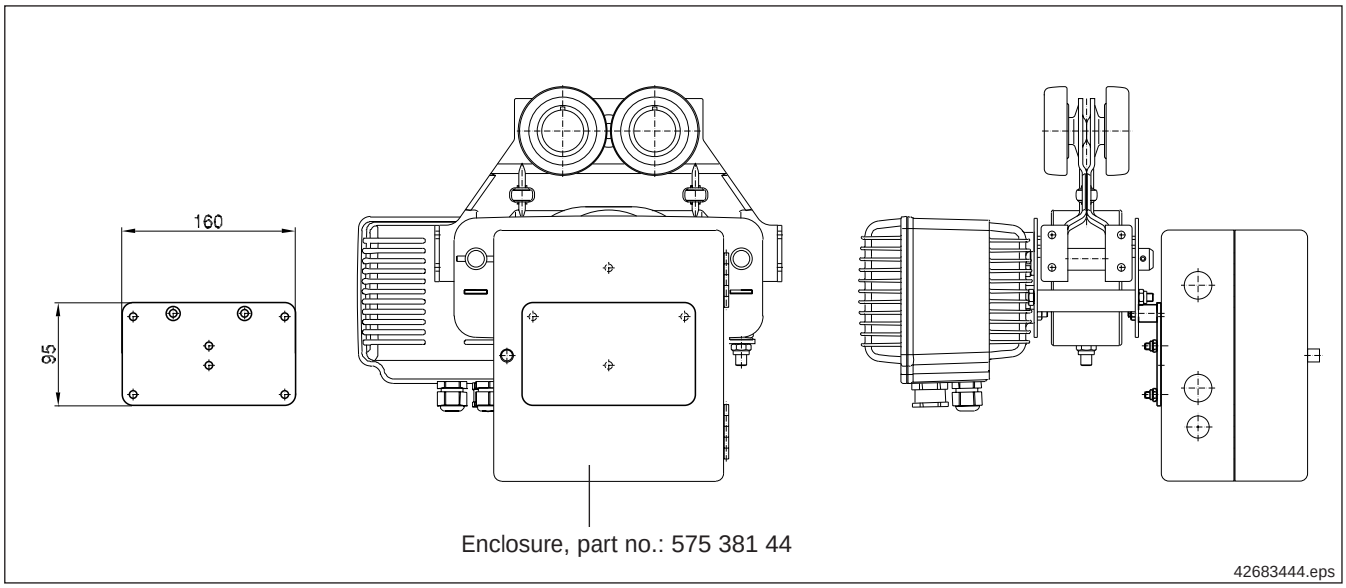


The mounting bracket is used to attach the terminal box, part no. 504 650 44.

Finish: galvanized

Item no.	Weight [kg]	Part no.
92	0,85	984 695 44

Mounting bracket for enclosure on RF 125



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

Finish: black

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

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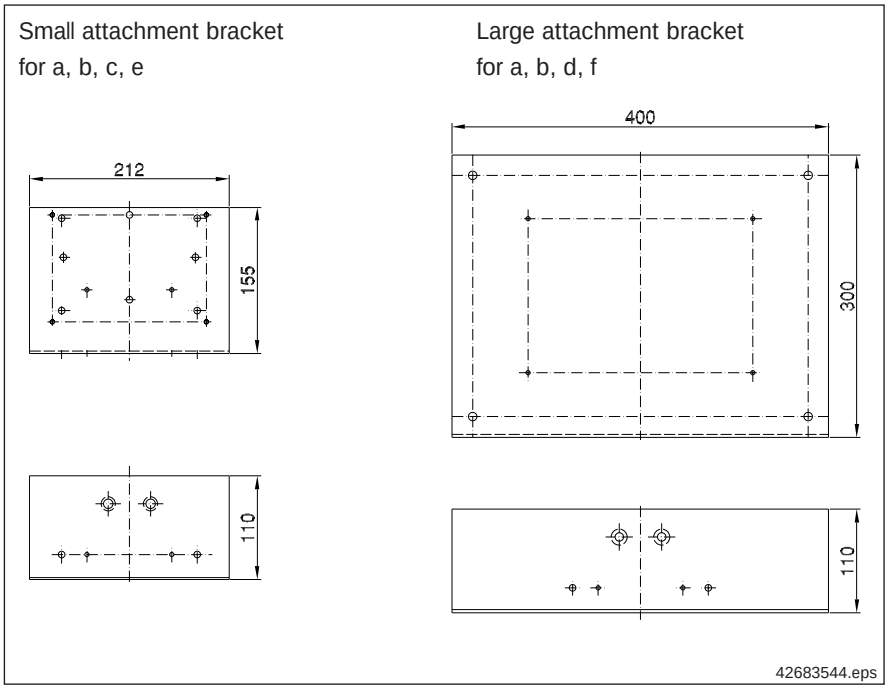
Attachment bracket

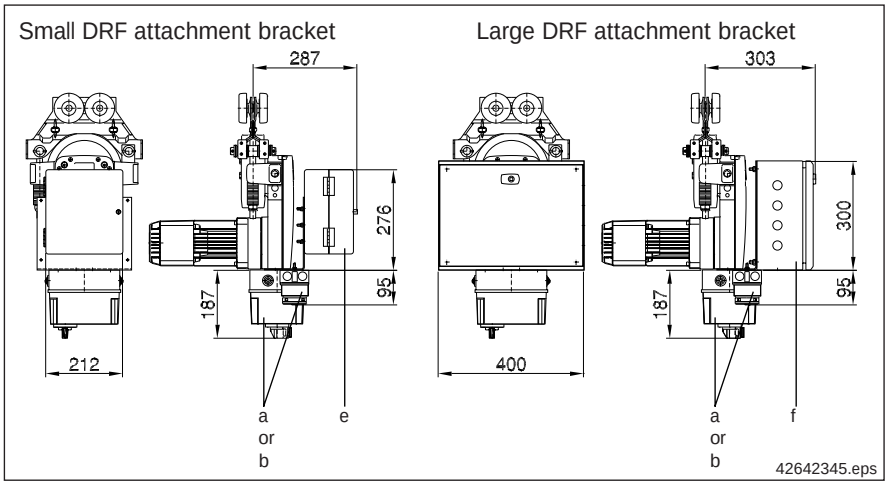


Item no.	Designation	Part no.
a	Mains connection switch/isolating switch DT 16 a	575 479 44
b	Mains connection switch/isolating switch DT 25 a-S	473 037 44
c	Terminal box 180 x 130 x 75	575 351 44
d	Terminal box 255 x 180 x 75	575 352 44
e	Enclosure 212 x 232 x 137	575 381 44
f	Enclosure 400 x 300 x 155	575 382 44

Item no.	Designation	Weight [kg]	Part no.
	Attachment bracket, small	0,9	851 222 44
	Attachment bracket, large	3,9	851 220 44

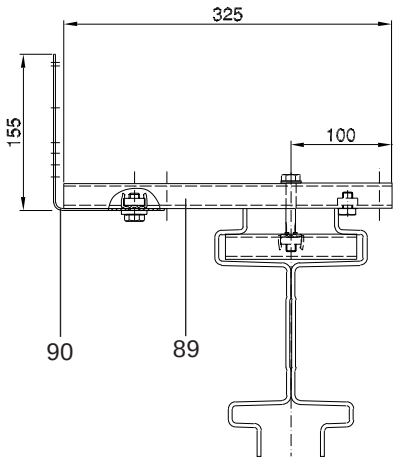
Finish: galvanized

Example: fitted to DRF

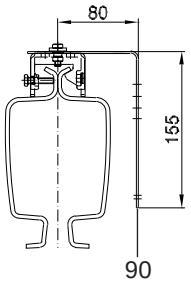


Bracket for on/off switch
Terminal box with mounting bracket, small
(item 90)

Bracket for C-rails, perforated
KBK III



Bracket for isolating switch / terminal box KBK 100, I, II-L, II



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Mounting brackets are used for mounting switches, small terminal boxes, counterweights and similar parts. They must not be used as suspension fittings. The mounting plate for the isolating switch is clamped to the KBK profile section with the mounting bracket.

Finish: galvanized

KBK 100, I, II-L, II: Mounting bracket, fastening bolts and nuts for switch included.

KBK III: Mounting bracket and mounting plate for isolating switch must be ordered for isolating switch bracket.

Item no.		KBK 100			KBK I			KBK II-L, II			KBK III	
		Weight approx. kg	Screw	Part no.	Weight approx. kg	Screw	Part no.	Weight approx. kg	Screw	Part no.	Weight approx. kg	Part no.
90	Bracket for isolating switch	On application			1,4		851 224 44	1,4		851 224 44	2,3	850 032 44 + 850 152 44

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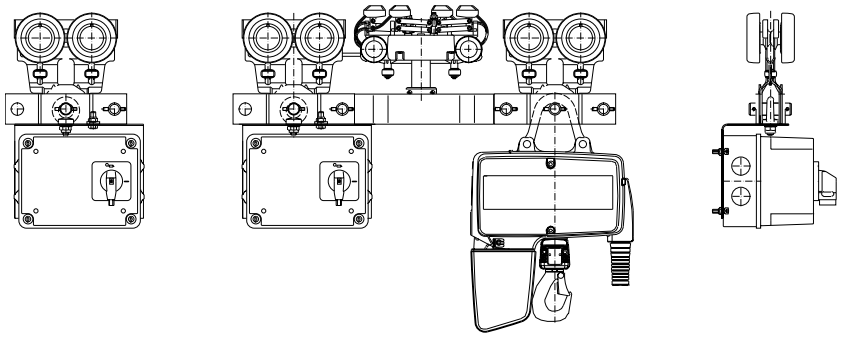
Switch and terminal box mounting with mounting bracket, small

(item 88)

Switch and terminal box mounting brackets on push travel monorail hoists



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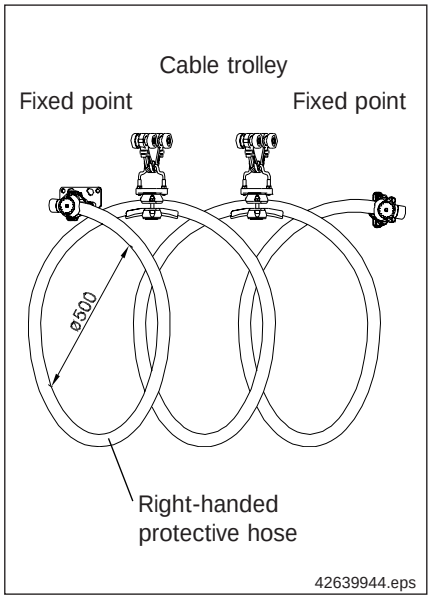
A mounting bracket consists of a bracket, eye with nut for suspension, and fastening material for the enclosure/switch. It may be necessary to drill additional holes for the enclosure when fitting to the mounting bracket.

- Switch brackets for DT 16a/DT 25a-S switches are required when using several push travel monorail trolleys with a common power supply on one track.
- To attach terminal boxes to monorail trolleys; load trolley either as single trolley or double trolley.

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

16.2 Pneumatic power supply

16.2.1 General information



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

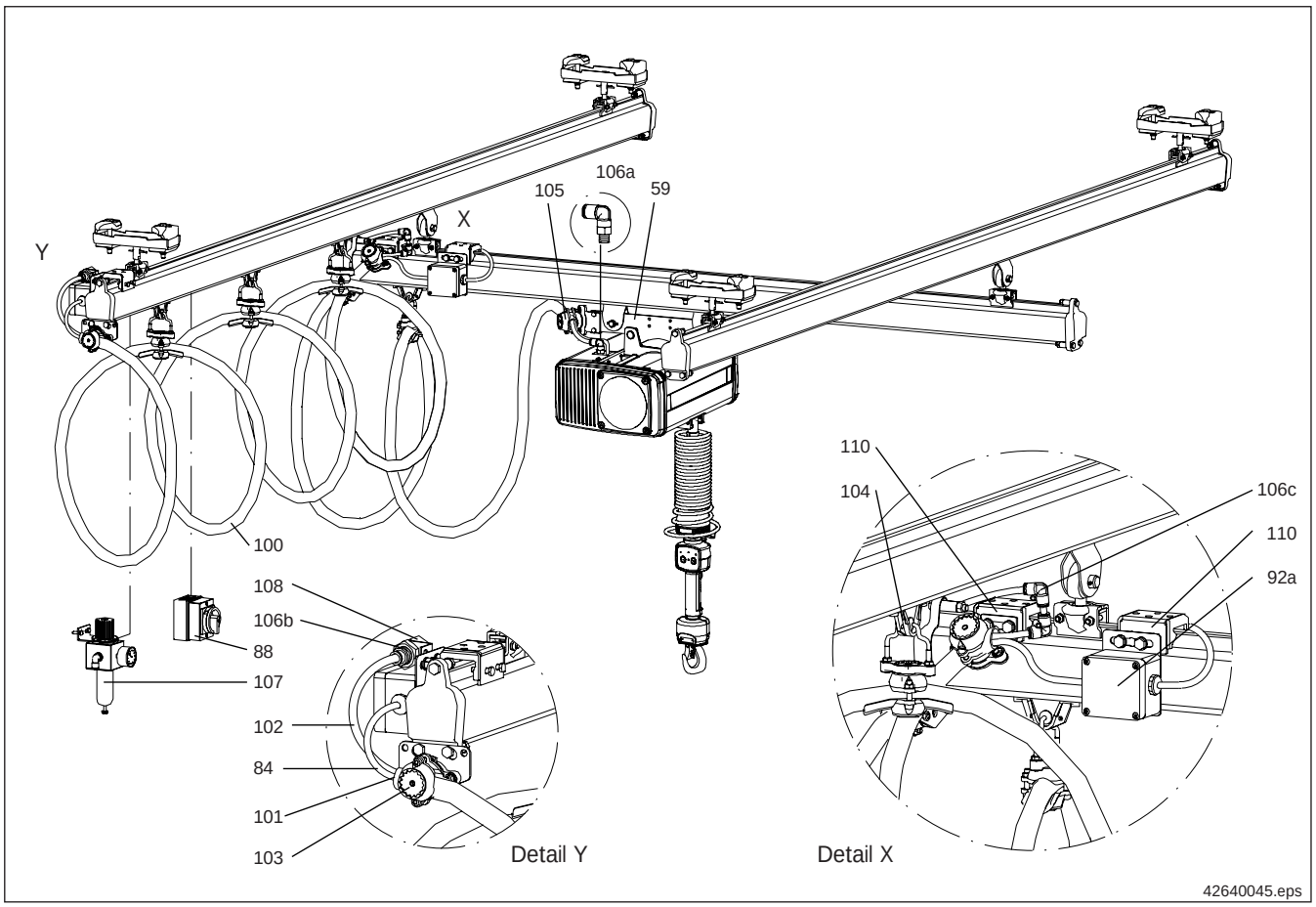
In some applications electric power is required in addition to pneumatic energy (e.g. for manual force control of the Demag- rope balancer).

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

Length of protective hose	=	Travel path [m] x 1,3 + connecting length on both sides [m]
Number of cable trolleys	=	Length of travel path (rounded off to full metres) -1
Length of cable accumulating section	=	Number of cable trolleys x cable length + reserve + feed

Example:
Single-girder crane

Separation of power supply:	Transfer point→ crane bridge/crane track (Detail X)
Power supply interface:	End of crane track (Detail Y)



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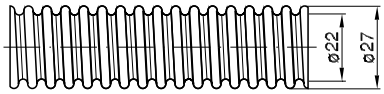
16.2.2 Components

Protective hose (100)



Material
Outer sheath: PVC
Internal spiral: PVC-coated spring steel wire

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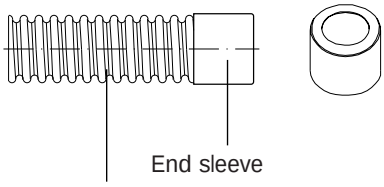
End sleeve for protective hose (101)



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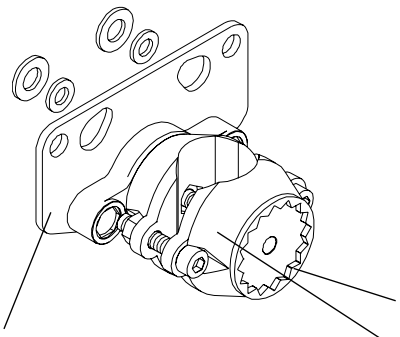
Mounting bracket with hose clip (103)

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



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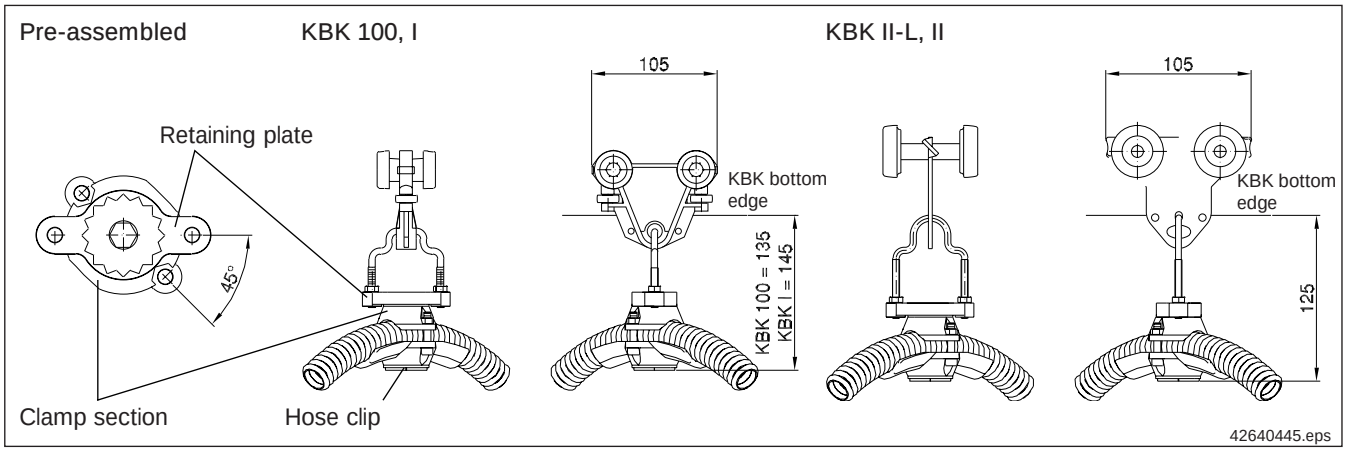
Item no.	Designation	Weight [kg]	Part no.	Design
84	Highly flexible round cable 3 G 1,5 mm ²	0,09 [kg/m]	343 838 44	Outer ø 7,9 mm
84	Highly flexible round cable 5 G 1,5 mm ²	0,14 [kg/m]	343 839 44	Outer ø 9,6 mm
100	Protective hose	0,29 [kg/m]	343 836 44	Plastic, grey
101	End sleeve for protective hose	0,003	343 837 44	Plastic, grey
102	Plastic hose, colour: silver	0,08 [kg/m]	343 840 44	Outer ø 12 mm, inner ø 8 mm
103	Bracket with hose clip	0,27	855 146 44	Retaining plate: galvanized, Hose clip set 2: plastic, black

Cable trolley with hose clip (item 104)

Item no.	Designation	KBK 100, I		KBK II-L, II	
		Weight [kg]	Part no.	Weight [kg]	Part no.
104	Cable trolley with hose clip	0,37	980 958 44	0,37	855 148 44

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

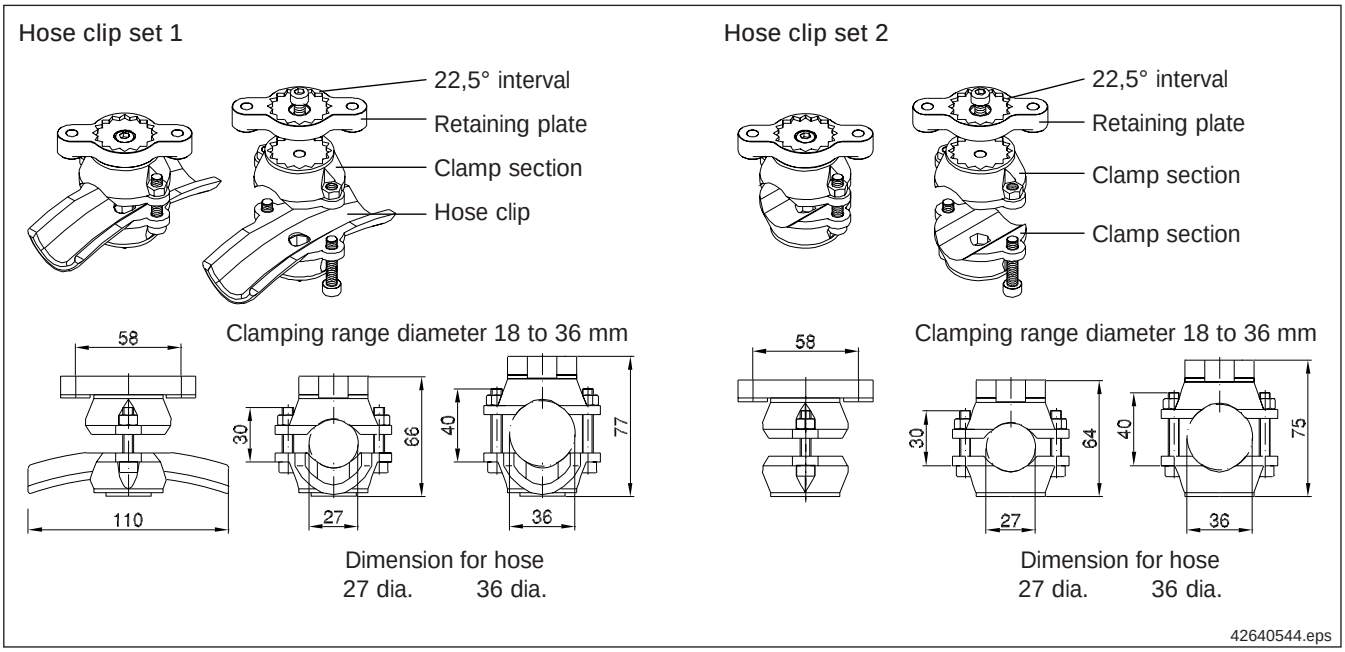
Finish:	Trolley:	Black plastic
	Axle with ball bearings:	Steel
	Travel rollers:	Plain plastic
	Hose clip:	Black plastic
Temperature range:		-20°C to +70°C
Load:		Max. 25 kg



Hose clip set (item 105)

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

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



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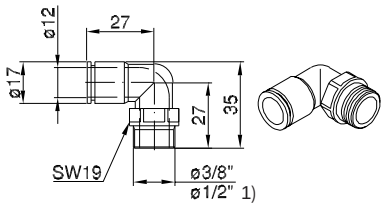
Angular connection for balancer (106a)



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

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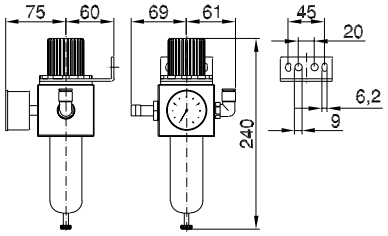
Maintenance unit (107)



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

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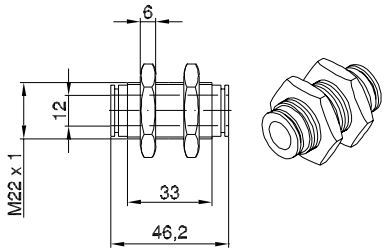
Bulkhead gland (106b)



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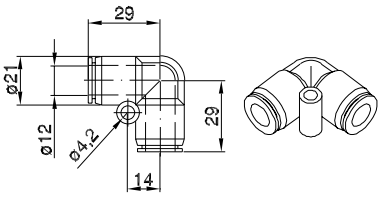
Item no.	Designation	Weight [kg]	Part no.	Finish
59	Load bar for rope balancer D-BP 55 /110	1,85	984 685 44	RAL 9005 (black)
88	Mains connection switch DT 16a	0,32	895 167 44	
92a	Terminal box	0,4	504 650 44	RAL 7035 (light grey)
92b	Terminal box bracket	0,17	984 695 44	Galvanized
106a	Angular connector for balancer 3/8"	0,06	343 777 44	Brass, nickel-plated
106a	Angular connector for balancer 1/2"	0,06	343 778 44	Brass, nickel-plated
106b	Bulkhead gland	0,09	343 786 44	Brass, nickel-plated
106c	Angle connector	0,05	343 835 44	Plastic, black
107	Maintenance unit	1,35	851 199 44	
108	Angle for bulkhead gland	0,03	984 696 44	Galvanized
110	Steel anchorage bracket	0,63	984 693 44	Anchorage plate: steel, galvanized; hose clip set 2: plastic, black

Angle connector (106c)



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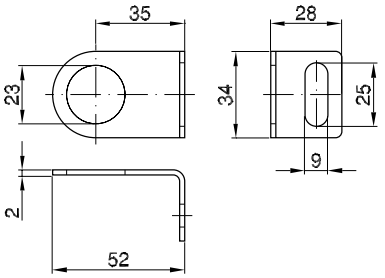
Two hose ends (nominal size 12) can be interconnected.

Angle for bulkhead gland (108)



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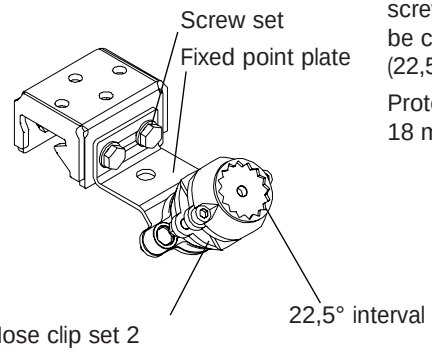
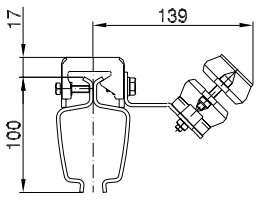
Bracket for fixed steel point (110) consisting of:

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

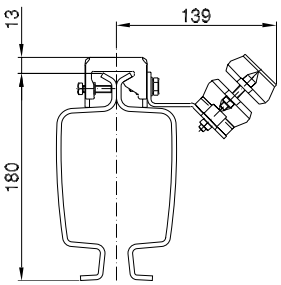
Protective hoses with a diameter of 18 mm to 36 mm may be used.

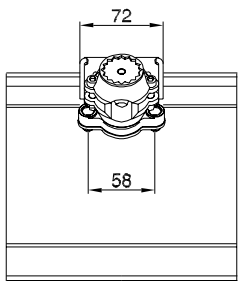


Aluline 120



Aluline 180





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17 KBK standard electrical equipment

17.1 General

KBK installations with DK chain hoists may be controlled either by direct on-line control or through contactors, KBK installations with DC chain hoists are always controlled through contactors.

Direct control

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

Contactor control

Special Demag DSC/DSK/DSE control pendants are used for controlling all drive motors through contactors. The control circuits connected to earth on one side with control transformers. DC chain hoists have 24 V control voltage, DK hoists are preferably operated with 230 V control voltage. Special measures may be required for applications in plants with a corrosive atmosphere or relatively high humidity in order to increase the type of enclosure or to protect the components. A control voltage of 42 V is recommended in such environments.

Conversion

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

Electro-magnetic compatibility (EMC)

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

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
- Galvanising facilities
- Outdoors

Regulations

All Demag components and assemblies fully comply with DIN VDE regulations, relevant accident prevention regulations and relevant standards. All relevant national or local regulations must be taken into account when planning electrical installations. We refer particularly to DIN VDE 0100 and the harmonised European standards. UL, CSA and SEV-tested components available on application.

Important requirements from the standards

1. It must be possible to cut of all phases of the main power supply line by means of one mains switch. This switch must be protected against unauthorized restoration of the power supply.
2. An isolator which can be padlocked should be provided for each hoist if several of these, operating on one track, are fed through one and the same power supply line.
3. Each hoist must be fitted with an emergency-stop device which brings the motive drives to a standstill and interrupts the power supply to these drives.
4. A crane switch is required for
   - electrically powered cranes,
   - cross-travel drives with an output greater than 500 W,
   - wireless control systems.
5. Installation of a protective earth conductor, marked green/yellow over its entire length, is obligatory. It must be impossible for earth conductor current collectors to be exchanged for phase collectors.

Power supply

The required power supply system should be selected and separately ordered in accordance with the KBK standard electrical 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 as indicated in the table for main fuses and maximum lengths of supply lines in section 19.

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17.2 KBK standard electrical equipment with DC

Selection table for installations with DC chain hoist and RF 125

Control method	Control pendant	Travel motion	Power supply on the crane bridge	Lifting / lowering 2 speeds	Cross travel 2 speeds	Long travel 2 speeds	KBK item with DC-Pro 1-20 DC-Com 10-20	Required cable(s) on the crane bridge: Drawing EB, EHK, ZHK see section 17.4	4 x 1,5 flat cable Part no. 471 352 44	13 x 1,5 flat cable Part no. 895 171 44	12 x 1,5 round cable Part no. 504 945 44	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			3+PE
		Electric with crane switch contactor		O	O		E20	3	1			3+PE
				O		O	E28	7		1	1	8+PE
			Conductor line	O		O	E28L					8+PE
			Trailing cable	O	O	O	E32	6		1	1	8+PE
			Conductor line	O	O	O	E32L					8+PE

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

The electrical items include the required enclosures and mounting brackets including the wiring material.

The cables between the chain hoist and the travel drive and between the long-travel drives must be specified and ordered separately as for the main power supply.

17.3 KBK standard electrical equipment with DK

Selection table for basic electrical equipment, chain hoist with emergency stop device

(See section 19 for KBK standard electrical equipment with DKMES and DKES chain hoists)

Operating voltage 220 V - 550 V

Type of control	Control element on hoist [1]	Travel motion (ZBF 63 and 71 travel motors) [7]	Main lifting	Main and creep lifting	Cross travel 1:1	Cross travel 1:4	Long travel 1:1	Long travel 1:4	KBK item with Demag chain hoist						Required cabling and wiiring for crane bridge [6]					Required qty of conductors on crane bridge (PE = protective earth)
									DKM 1	DKM 2	DKUN 1	DKUN 2	DKUN 5	DKUN 10 DKUN 16	Drawing EB, EHK, ZHK see section 17.4	Flat cable: 4 x 1,5 Part no. 471 352 44	Flat cable: 8 x 1,5 Part no. 504 226 44	Round cable: 4 x 1,5 Part no. 504 931 44	Round cable: 7 x 1,5 Part no. 504 951 44	
									Pos.											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Direct control	DSK [2]	Manual	O	—	—	—	—	—	—	—	60101	60201	60501	61001	1	1				3 + PE
			—	O	—	—	—	—	60151	60251	60102	60202	60502	61002	1	1				3 + PE
	DST	Electric	O	—	O	—	—	—	—	—	60105	60205	60505	61005	2	1				3 + PE
			—	O	O	—	—	—			60106	60206	60506	61006	2	1				3 + PE
			O	—	—	—	O	—			60107[3]	60207[3]	60507[3]	61007[3]	4		1	1		6 + PE
			—	O	—	—	O	—			60108[3]	60208[3]	60508[3]	61008[3]	4		1	1		6 + PE
			O	—	O	—	O	—			60109[3]	60209[3]	60509[3]	61009[3]	6		1	1		6 + PE
			—	O	O	—	O	—			60110[3]	60210[3]	60510[3]	61010[3]	6		1	1		6 + PE
			O	—	—	O	—	—			60171	60271	60571	61071	2	1				3 + PE
			—	O	—	O	—	—			60172	60272	60572	61072	2	1				3 + PE
			O	—	—	—	—	O			60173[3]	60273[3]	60573[3]	61073[3]	7	1	1		1	8 + PE
			—	O	—	—	—	O	—	—	60174[3]	60274[3]	60574[3]	61074[3]	7	1	1		1	8 + PE
			O	—	O	—	—	O			8)	8)	8)	8)						
			—	O	O	—	—	O			60176[3]	60276[3]	60576[3]	61076[3]	5	1	1		1	8 + PE
			O	—	—	O	O	—			60177[3]	60277[3]	60577[3]	61077[3]	5		1	1		6 + PE
			—	O	—	O	O	—			60178[3]	60278[3]	60578[3]	61078[3]	5		1	1		6 + PE
			O	—	—	O	—	O			8)	8)	8)	8)						
			—	O	—	O	—	O			60180[3]	60280[3]	60580[3]	61080[3]	5	1	1		1	8 + PE
Contactor control with transformer	DSK [2]	Manual	O	—	—	—	—	—	—	—	60111	60211	60511	61011	1	1				3 + PE
			—	O	—	—	—	—	60152	60252	60112	60212	60512	61012	1	1				3 + PE
	DSE	Electric	O	—	O	—	—	—	—	—	60113	60213	60513	61013	2	1				3 + PE
			O	—	—	O	—	—			60114	60214	60514	61014	2	1				3 + PE
			—	O	O	—	—	—			60115	60215	60515	61015	2	1				3 + PE
			—	O	—	O	—	—			60116[4]	60216[4]	60516	61016	3	1				3 + PE
		Electric with crane switch contactor	O	—	O	—	—	—	—	—	60117	60217	60517	61017	2	1				3 + PE
			O	—	—	O	—	—			60118[4]	60218[4]	60518	61018	3	1				3 + PE
			—	O	O	—	—	—			60119[4]	60219[4]	60519	61019	3	1				3 + PE
			—	O	—	O	—	—			60120[4]	60220[4]	60520	61020	3	1				3 + PE
			O	—	—	—	O	—	—	—	60121[5]	60221[5]	60521[5]	61021[5]	7	1	1	1		8 + PE
			—	O	—	—	O	—			60122[5]	60222[5]	60522[5]	61022[5]	7	1	1	1		8 + PE
			O	—	O	—	O	—			60123[5]	60223[5]	60523[5]	61023[5]	5	1	1	1		8 + PE
			—	O	O	—	O	—			60124[5]	60224[5]	60524[5]	61024[5]	5	1	1	1		8 + PE
			O	—	—	O	O	—	—	—	60125[5]	60225[5]	60525[5]	61025[5]	5	1	1	1		8 + PE
			—	O	—	O	O	—			60126[4]	60226[5]	60526[5]	61026[5]	5	1	1	1		8 + PE
			O	—	—	—	—	O			60127[3]	60227[5]	60527[5]	61027[5]	7	1	1		1	9 + PE
			—	O	—	—	—	O			60128[5]	60228[5]	60528[5]	61028[5]	7	1	1		1	9 + PE
			O	—	O	—	—	O	—	—	60129[5]	60229[5]	60529[5]	61029[5]	5	1	1		1	9 + PE
			—	O	O	—	—	O			60130[5]	60230[5]	60530[5]	61030[5]	5	1	1		1	9 + PE
			O	—	—	O	—	O			60131[5]	60231[5]	60531[5]	61031[5]	5	1	1		1	9 + PE
			—	O	—	O	—	O			60132[5]	60232[5]	60532[5]	61032[5]	5	1	1		1	9 + PE
			—	O	—	O	—	O			60132[5]	60232[5]	60532[5]	61032[5]		Busbar			1	9 + PE

1) Control element on the crane bridge on request.

2) or DSM for DKM.

3) Plastic terminal enclosure 89542144 44 on DRF 200 crane travel drive.

4) Steel enclosure 50521144 (for plastic enclosure 792 145 44) on DRF 200 cross-travel drive. If attachment to DRF is not possible – DRF within crab frame –, then directly mounted on crab frame, special mounting on request, if required.

5) Steel enclosure 50403944 (for plastic enclosure 792 145 44) on DRF 200 long-travel drive. Can also be fitted to bracing frame or to crane end carriage bar.

3), 4), 5) The enclosures (one in each case) with mounting plate are included in the KBK standard electrical equipment item. A DT 16a or DT 25a-S switch can be attached if required.

6) On the crane runway: 1 flat cable 4 x 1,5 or 4 x 2,5. Consider max. supply line length in section 19.

7) Other drive motors require special controls.

8) Not KBK standard

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Important	The service life may be reduced and increased load sway may occur with direct online control of pole-changing travel motors.
Notes	The basic electrical equipment only applies to KBK installations with Demag chain hoists and comprises all electrical components (contactor set, terminal and contactor box, installation material and control pendant). Hoists ordered with the basic equipment are pre-wired and parts required for mounting on the trolley or crane bridge are supplied with the assemblies. Circuit and wiring diagrams are supplied if complete control systems are ordered.
Example for ordering	Basic electrical equipment for 1 KBK suspension crane with DKUN 5-500 V1 1/1, 3 m hook path and travel drives for 1:1 cross travel and 1:1 long travel to item 60523. Operating voltage 400 V, 50 Hz; contactor control with 230 V control voltage. Control pendant suspended from the hoist.

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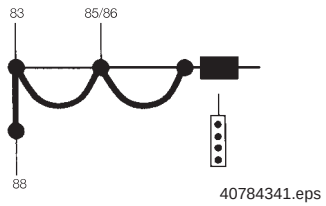
Key to symbols

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

Item no.	Designation	Section
80	Crane bridge cable clamp	16.1.3
81	Crab frame cable clamp	16.1.3
82	RF trolley cable clamp	16.1.3
83	Rail end cable clamp	16.1.3
85	Cable slider	16.1.3
86	Cable trolley	16.1.3
88	Mains connection switch	16.1.3
91	Clip for round cable	16.1.3

Suspension monorail

EB 1



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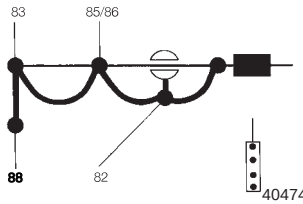
EB 2



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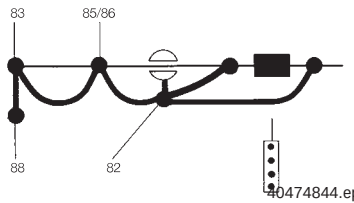
EB 3



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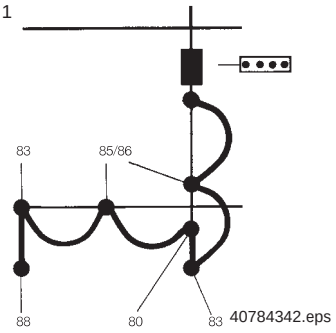
Single-girder crane

EHK 1



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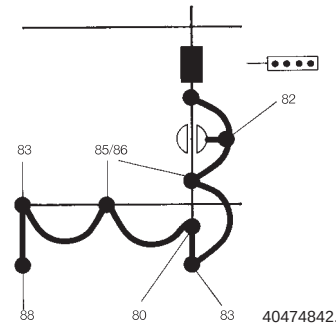
EHK 2



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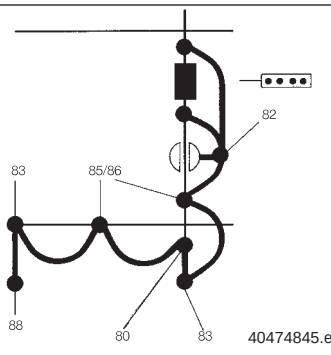
EHK 3



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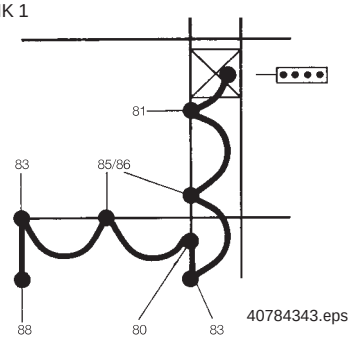
Single-girder crane, rigid/double-girder crane

ZHK 1



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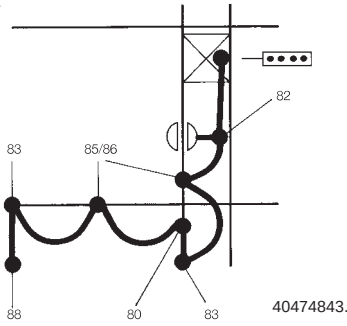
ZHK 2



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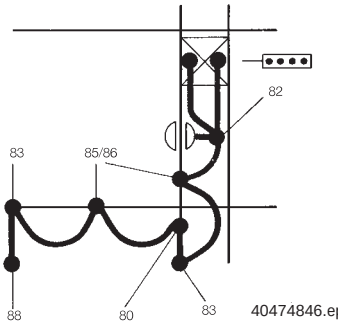
ZHK 3



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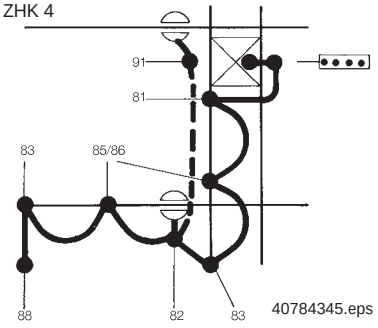
ZHK 4



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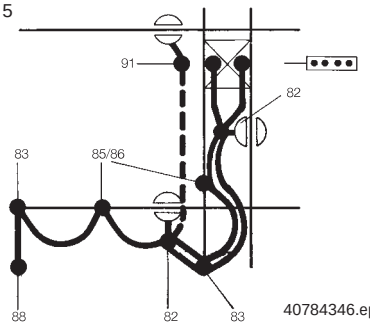
ZHK 5



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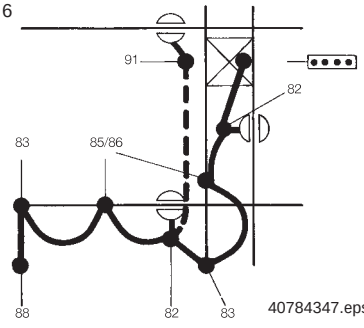
ZHK 6



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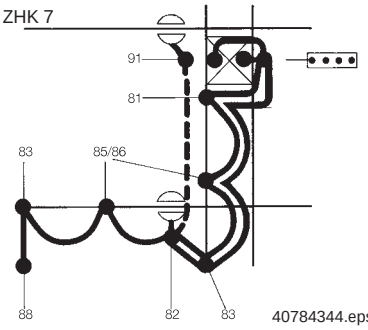
ZHK 7



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17.5 KBK standard electrical equipment with DKMES and DKES chain hoists

Type of control	Control unit on hoist	Travel motion	Variable hoist speed	Cross travel 1:4	Long travel 1:4	KBK item with Demag chain hoist					Required cabling for crane bridge				Required qty of conductors on crane bridge (PE = protective earth)
						DKM ES 1	DKMES 2	DKES 1	DKES 2	DKES 5	Drawing EB, EHK, ZHK see section 18	4 x 1,5 flat cable Part no. 471 352 44	8 x 1,5 flat cable Part no. 504 226 44	7 x 1,5 rnd cable Part no. 504 951 44	
						Pos.									
1	2	3	4	7	9	10	11	12	13	14	16	17	19	20	21
	DSK	Manual	O	—	—	60512E	60252E	60112E	60212E	60512E	1	1			3 + PE
	DSE	Electric with crane switch contactor	O	O	—			60120E	60220E	60520E	3		1		3 (4) + PE 1)
			O	—	O			60128E	60228E	60528E	7	1	1	1	9 (10) + PE 1)
			O	O	O			60132E	60232E	60532E	5	1	1	1	9 (10) + PE 1)

1) Value in brackets applies to single-phase chain hoist variant. The 0 conductor must be led to the chain hoist. Power supply must then be implemented via KBK II-R5, DEL 5 or 8 x 1,5 flat cable.

Main fuses and maximum supply line lengths for power supply via flat cable

Basis of calculation: 1 hoist and 3 travel drives				Rated capacities of the (delay) fuse links I Si and max. supply line length L for 5% voltage drop, cross section A and operating voltage								
No.	Chain hoist size	Creep lifting	Lifting speed code	230 V			400 V			500 V		
				A	I Si	L	A	I Si	L	A	I Si	L
				mm²	A	m	mm²	A	m	mm²	A	m
0	1	2	3	5	6	7	8	9	10	11	12	13
1	DK1-125	—	V1	1,5	6	67	1,5	6	205	1,5	6	332
2		F4				58			174			290
3		—	V2		10	54			164			272
4		F6				41			125			209
5	DK2-160	—	V3			35			105			177
6		F6				32			97			163
7	DK2-200/250	—	V1			35			105			177
8		F4				49			146			243
9		—	V2			35			105			177
10		F4				33			99			166
11	DK2-315	—	V1/V2			35			105			177
12		F4				33			99			166
13	DK2-400	—	V1			35			105			177
14		F4				33			99			166
15	DK5-250	—	V3	2,5	16	30		10	55		10	93
16		F6				28			51			86
17	DK5-315	—	V1	1,5	10	35		6	105		6	177
18			V2	2,5	16	30		10	55		10	93
19		F4	V1/V2	1,5	10	33		6	99		6	166
20	DK5-400/500	—	V1			35			105			177
21		F4				28			85			144
22		—	V2	2,5	16	30		10	55		10	93
23		F4				25			52			89
24	DK5-630	—	V1			30			55			93
25		F4				25			52			89
26	DK10-500	—	V3		20	23		16	41		10	69
27		F6				22			40			66
28	DK10-630-1000	—	V1/V2			23			41			69
29		F4			16	25			52			89
30	DK10-1250	—	V1		20	23			41			69
31		F4				22			40			
32	DKM1	F6		1,5	6	58		6	174		6	290
33	DKM1		V2		10	41			124			208
34	DKM2-125		V3			32			97			163
35	DKM2-250	F4	V1			49			146			243
36			V2			33			99			166

If the supply line cross section is increased from 1,5 mm² to 2,5 mm², the lengths indicated should be multiplied by a factor of 1,66.

Guidelines for project drafting KBK installations

Please enclose sketch!

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

Customer

Project no.

Customer no.

Customer

Processed by Date

Dept. / Sales Office

Stage of customer's planning

Financial planning for investments

☐ Techn. ☐ Preliminary ☐ Detailed

Implementation expected _____

☐ Invitation to tender

☐ Placing of order imminent

Extent of tender required

☐ Short tender

☐ without ☐ with sketch

☐ Drawing with loadings

☐ Detailed tender with drawing

☐ with steelwork ☐ with erection

negotiation on _____

with _____

☐ Customer visit

☐ Telephone

Quote deadline _____ Delivery deadline _____

Type of installation

☐ Monorail ☐ Double-rail track KBK track section _____

☐ Single-girder crane ☐ with latching Crane section KBK _____ KBK track section _____

☐ Double-girder crane ☐ More than two crane tracks Crane section KBK _____ KBK track section _____

Technical data

SWL _____ kg

Track length _____ m

Crane girder length _____ m

Number of trolleys on one track _____

Number of cranes on one runway _____

Average operating time _____ hours / day

Span _____ m

Minimum load hook distance _____ mm

Highest hook position above floor _____ m

Erection site _____

Type of supporting structure / Suspension method / Flange _____

Clear height from floor to lower edge of supporting structure _____

Hoist

Electric chain hoist, type _____

Hook path _____ m

Lifting speed v _____ / _____ m / min

Travel speeds

Cross travel ☐ manual ☐ electric, v = _____ / _____ m / min

Long travel ☐ manual ☐ electric, v = _____ / _____ m / min

Power supply lines

On crane ☐ Trailing cable ☐ Cable sliders ☐ Cable trolleys ☐ KBK II-R4 ☐ KBK II-R5

☐ DKK ☐ DEL ☐ Continuous ☐ in sections

On track ☐ Trailing cable ☐ Cable sliders ☐ Cable trolleys ☐ KBK II-R4 ☐ KBK II-R5

☐ DKK ☐ DEL ☐ Continuous ☐ in sections

Power supply

☐ Three-phase ☐ AC Operating voltage _____ V, _____ Hz, Control voltage _____ V

Control

☐ from trolley ☐ from crane ☐ mobile ☐ stationary ☐ direct control ☐ contactor control

Additional specifications (e.g. special environmental conditions)

Special commercial conditions

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Notes

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