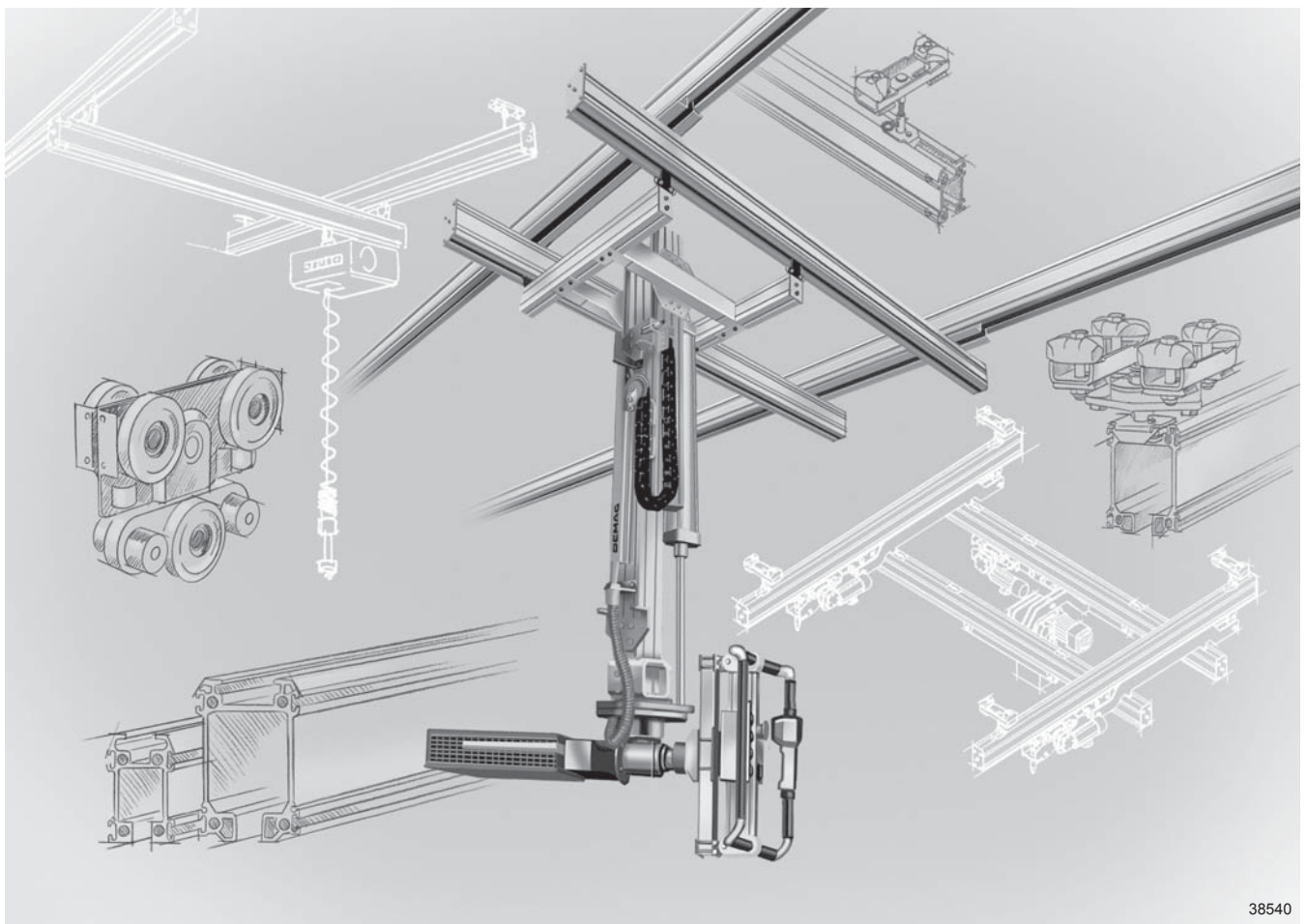


KBK Aluline 120, 180 crane construction kit

Classic/ergo system

Project drafting and components

Design principles, selection criteria, components



38540

Contents

1	Supplementary documents and other publications	5
2	Aluline crane construction kit	6
2.1	General	6
2.2	Structure of the crane construction kit	7
2.3	Design principles	7
3	KBK Aluline classic – Planning and project drafting	10
3.1	Project drafting of suspension crane and suspension monorail installations	10
3.2	Profile load capacities according to the diagram	11
3.3	Steps for project drafting and technical specification	12
3.4	Reading off from the diagram	13
3.5	Calculating load G_{AB} on one suspension fitting	14
3.6	System dimensions and system limits	15
3.7	Hoists with KBK	16
3.8	Suspension monorails	18
3.8.1	Specifying suspension monorails	18
3.8.2	Specifying monorails according to selection table	19
3.9	Single and double-girder cranes	20
3.9.1	Specifying single-girder cranes	20
3.9.2	Specifying double-girder cranes	21
3.9.3	Specifying single and double-girder cranes according to selection tables	22
3.10	Structural dimensions for monorail tracks and cranes	26
4	KBK Aluline ergo – Planning and project engineering	27
4.1	Cranes with a large overhang	27
4.1.1	Single-girder crane with a large overhang	27
4.1.2	Double-girder crane with a large overhang	28
4.1.3	Specifying cranes with large overhang according to selection tables	30
4.2	Structural dimensions for cranes with large overhang, manipulator cranes	31
4.3	Manipulator cranes	32
4.3.1	Specifying manipulator crabs, manipulator cranes	32
4.3.2	Specifying manipulator crabs according to selection table	33
4.3.3	Specifying manipulator cranes according to selection table	36
5	Monorail track, crane runway and crane girder basic components	40
5.1	Crane and track elements	40
5.1.1	Straight section	40
5.2	Joint bolt set	41
5.3	Internal buffer stop	41
5.4	End cap with buffer	42
5.5	Information plates	43
6	Track suspension	44
6.1	Remarks and overview	44
6.2	Vertical suspension on I-beams	46
6.2.1	I-beam assignment	46
6.2.2	Suspension with suspension rod	46
6.2.3	Coupling for suspension rod	48
6.2.4	Short suspension arrangement with height adjustment	48
6.3	Vertical suspension from U-sections	49
6.4	Ceiling attachment	50
6.4.1	Suspension with anchor bolt connection	50
6.4.2	U-bolt with upper suspension bracket A	50
6.4.3	Suspension from ceiling section rails with upper suspension bracket A	51
6.4.4	Suspension with floor fixture plate and cover	52
6.4.5	Suspension with upper suspension bracket A and suspension rods or positive anchors	52

Contents

6.5	V-type suspension	53
6.6	Stiffener	54
6.7	Components for V-type suspension/stiffener arrangement	55
6.7.1	V-type upper suspension bracket	55
6.7.2	Packing plate for upper suspension bracket	56
6.7.3	V-type hinged suspension bracket	56
6.7.4	Spring clip, suspension rod strainer, hinged end piece	57
6.7.5	Wall fixture	58
6.8	Determining suspension rod length h_1 for V-type suspensions and stiffeners	58
6.9	Ergo suspension fitting	59
7	Trolley combinations	60
7.1	Single trolleys	60
7.1.1	Classic trolleys	60
7.1.2	Ergo trolleys	60
7.2	Double trolleys	61
7.3	Classic crane end carriages	62
7.3.1	Frame for double-girder crane	62
7.3.2	Rigid single-girder crane traverse, rigid double-girder crane traverse	63
7.4	Ergo crane end carriages	64
7.4.1	Single-girder crane end carriage	64
7.4.2	Double-girder crane end carriage	65
7.4.3	Tandem crane end carriage	66
8	Monorail trolley for special hoists	68
8.1	Low-headroom frame for monorail travelling hoists	68
8.2	Load bar for DS-1 rope winch and D-SH SpeedHoist	68
8.3	Load bar for D-BP 55/110 rope balancer	69
9	Crab	70
9.1	Crab frame	70
9.2	Raised crab frame	71
9.3	Ergo crab trolley	72
10	Crane suspension eye	73
11	Travel drives for crabs and cranes	74
11.1	RF 100 PN friction wheel travel drive	74
11.1.1	Travel drive with disengaging cylinder	74
11.1.2	Counterweight	75
11.1.3	Travel drive with pressure spring	75
11.1.4	RF 100 PN controls	76
11.2	RF 125 friction wheel travel drive	78
11.2.1	Drive data	78
11.2.2	Control	78
11.2.3	RF 125 rocker	79
11.2.4	Possible arrangements	79
11.3	DRF 200 friction wheel travel drive	80
11.4	Disengaging devices	81
11.4.1	RF 125/DRF 200 manually actuated disengaging devices	81
11.4.2	RF 125/DRF 200 electrically actuated disengaging devices	82
11.4.3	Angle bracket for housing	83
11.5	Travel limit switches	84
12	Trolleys for travel drives	85

Contents

13	Link and spacer bars	86
13.1	Single-trolley link	86
13.2	165 trolley coupling/long link bar	86
13.3	RF ergo hinged block/link bar	87
13.4	Articulated spacer bar	88
13.5	Spacer bar for straight track, Aluline 180	89
14	Buffers and end stops	90
15	Fittings	92
15.1	Trolley attachment bracket with pin	92
15.2	Mounting bracket/screw set	92
15.3	Mounting plates	93
15.3.1	Mounting plate 1 for switch and magnet fittings	93
15.3.2	Mounting plate 2 for switch and magnet fittings	94
15.3.3	Mounting plate 3 U-plate	95
15.3.4	Mounting plate 4 L-plate	95
16	Power supply to crabs and cranes	96
16.1	Electrical power supply	96
16.1.1	Trailing cable, general information	96
16.1.2	External DCL Demag Compact Line	97
16.1.3	Trailing cable, components and attachments	98
16.1.4	Mains connection switch/isolating switch	100
16.1.5	Terminal box	101
16.1.6	Mounting brackets for switches and terminal boxes	102
16.2	Pneumatic power supply	105
16.2.1	General information	105
16.2.2	Components	106
17	KBK standard electrical equipment	112
17.1	General	112
17.2	KBK standard electrical equipment with DC	114
17.3	Schematic illustrations of cable arrangements and cable clamps	116
17.4	Electrical key values for DC-Pro, DC-Com, DCS-Pro, DCMS-Pro, DCRS-Pro	118
	Project engineering sheet for KBK installations	119

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	208 756 44
Technical data sheets for KBK installations	
DKK arrangement on KBK cranes and tracks	202 586 44
Engaging stirrup attachment for DKK current collector trolleys on KBK trolleys	202 589 44
KBK 0, 25, 100 trailing cable power supply	202 617 44
KBK crane construction kit	202 976 44
Heavy-duty anchor for KBK suspensions and KBK slewing jib cranes	203 276 44
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
Redundant systems in the KBK crane construction kit	203 334 44
KBK cranes and tracks in explosion hazard areas	203 371 44
DCL arrangement on KBK cranes and tracks	203 510 44
Slewing jib cranes, portal cranes	
KBK slewing jib cranes	203 565 44
EVP-KBK single-girder full portal crane, ZVP-KBK double-girder full portal crane	201 780 44
Operating instructions, component parts	
Suspension monorails and cranes (KBK)	206 076 44
Pillar and wall-mounted slewing jib cranes (KBK)	206 070 44
EVP-KBK single-girder full portal cranes, VP-KBK double-girder full portal cranes	206 213 44
RF disengaging device	206 854 44
KBK Aluline classic and ergo	214 173 44
Load bar for D-BP 55/110	214 196 44
KBK ergo operating instructions, component parts	214 475 44
RF 100 travel drive	214 559 44
DRF 200 travel drive	214 395 44
E11-E34 DC travel drive	214 810 44
DRF200 travel drive component parts	222 572 44
Test and inspection booklet	
KBK system test and inspection booklet	206 020 44
Demag chain hoist	
Demag DC-Pro, DCS-Pro chain hoist	203 525 44
Demag DC-Com chain hoist	203 571 44
Various other data sheets, operating instruction manuals, spare parts lists for electric chain hoist types DK, DC and DS1 (rope winch), DB block winches, friction wheel travel drive units and conductor lines are also available.	

2 Aluline crane construction kit

2.1 General

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

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

The 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 handling requirements.

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

Regulations

KBK Aluline installations are dimensioned on the basis of the DIN 15018, DIN 4132 and DIN 18800 Part 1 standards. The material properties of aluminium have been taken into consideration.

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

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

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

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

Spare parts



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

Spare parts not approved by us may lead to damage, incorrect functioning or total failure of the installation.

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

Inspection

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

See KBK Aluline installation operating instructions 214 173 44 for further details.

Information



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

2.2 Structure of the crane construction kit

General

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

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

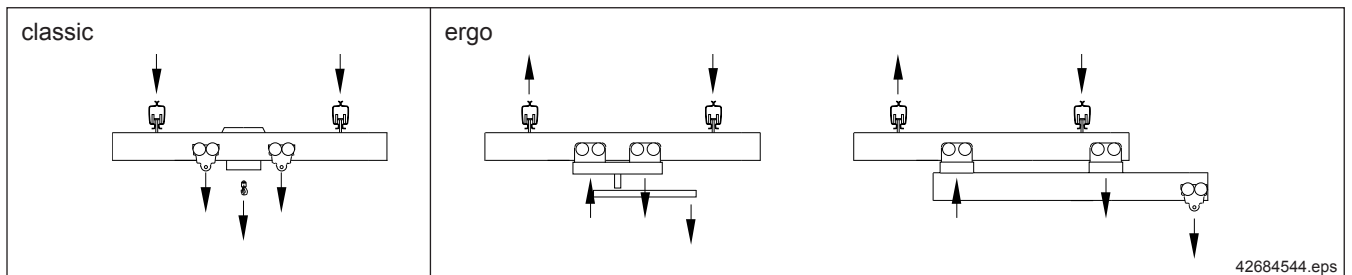
The modular construction kit is designed for normal operating conditions.

classic

The Aluline construction kit is designed in the same way as the KBK classic system for suspended loads with centric load transmission.

ergo

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



2.3 Design principles

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

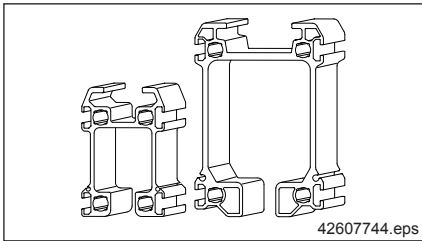
KBK Aluline classic Installation type

- Suspension monorail
- Single and double-girder crane

KBK Aluline ergo Installation type

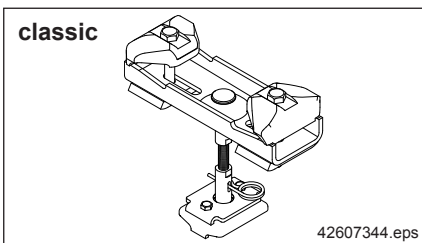
- Double-rail track
- Single and double-girder crane
- Cranes with a large overhang
- Manipulator crane

Section

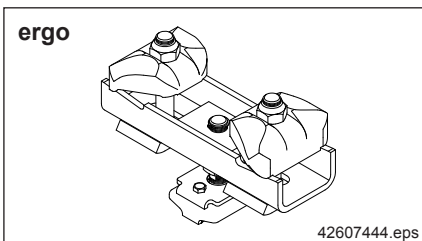


The basic elements of the KBK Aluline construction kit are special extruded profile sections of aluminium featuring high rigidity optimised by hollow sections in the top and bottom, low deadweight and anodized surfaces. The rails are of inside-running design to protect the trolleys. Lateral attachment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

Suspension system

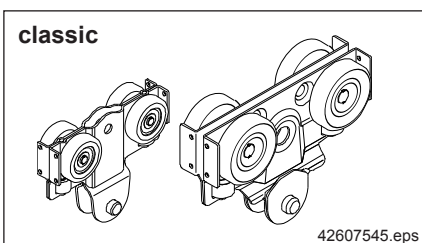


- Flexible, ball-and-socket universal joint suspension, minimum torque transmission to roof and ceiling superstructures, minimum lateral forces transmitted to the track system
- Low-maintenance ball-and-socket joints with plastic sockets
- Threaded connections for height adjustment
- Spring clip through cross hole locks connection
- Universal suspension fittings for virtually any superstructure provided as standard
- High suspension load bearing capacities adapted to the track system
- Low headroom possible with short suspension fittings

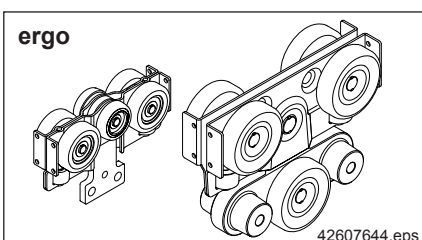


- **Ergo** suspension to accommodate loads resulting from counter-forces (from handling devices and cranes with large overhang) with rigid suspensions, featuring rubber buffers
- Threaded connections for height adjustment
- Low headroom dimension

Travel unit



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



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

Combined crane installations

Cranes and tracks of different section types can be combined.

Crane installation ergo

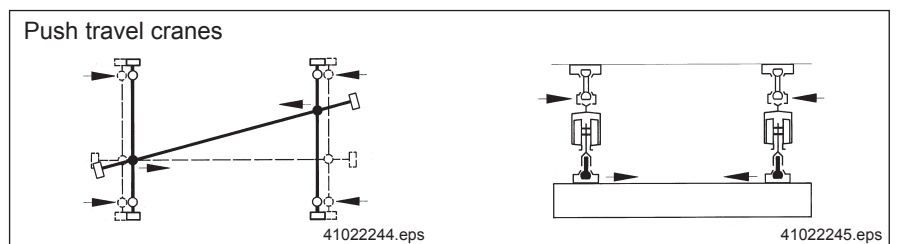
Manipulator cranes and trolleys, cranes with a large overhang for handling offset loads or moments which transfer kick-up forces to the Aluline components are designed with special parts.

Travel drive

Special trolleys make it possible to fit electrical and pneumatic travel drives. Friction wheels with a high frictional coefficient ensure the reliable transmission of the drive torque.

Push travel cranes

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



Electric travel cranes

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

Power supply

Flat cable power lines on cable sliders and power supply systems with cable trolleys run in the same track section. Compact conductor lines, single conductor lines and travel rails for power supply systems can be fitted.

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 Aluline components are protected against corrosion as standard. Suspension components are zinc-galvanised, track sections are anodized, other components are provided with a painted finish; special coatings are possible.

Environmental conditions

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

Horizontal forces

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

For cranes, this does not exceed 10% of trolley load K that occurs.

For single and double-girder runways, the value amounts to 5% of K

3 KBK Aluline classic – Planning and project drafting

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

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

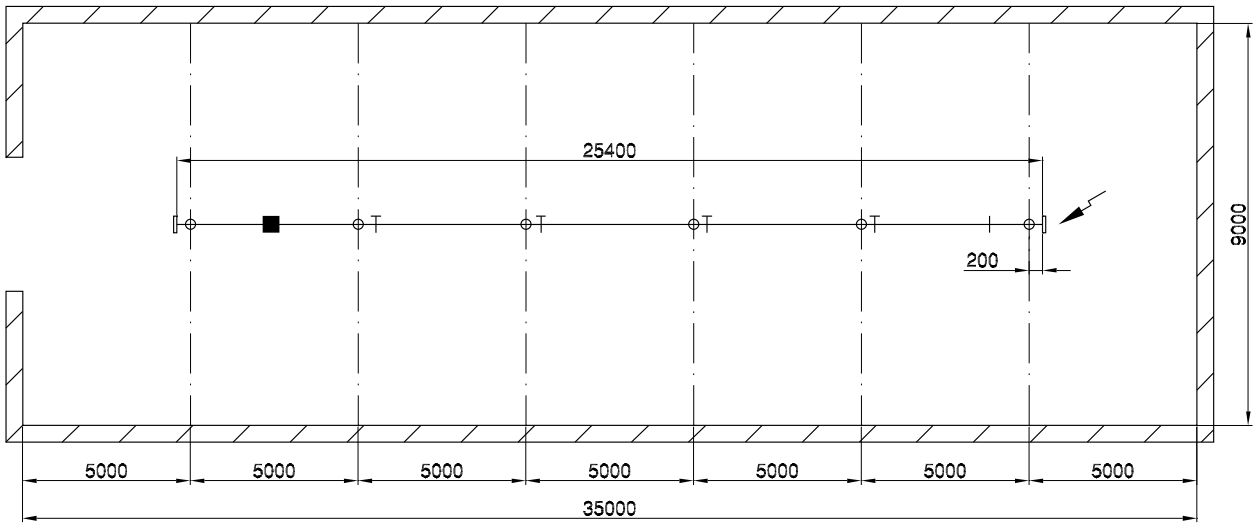
3.1 Project engineering suspension crane and suspension monorail installations

All information and data necessary for project drafting are required for Aluline installation projects.

As a planning basis, 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.

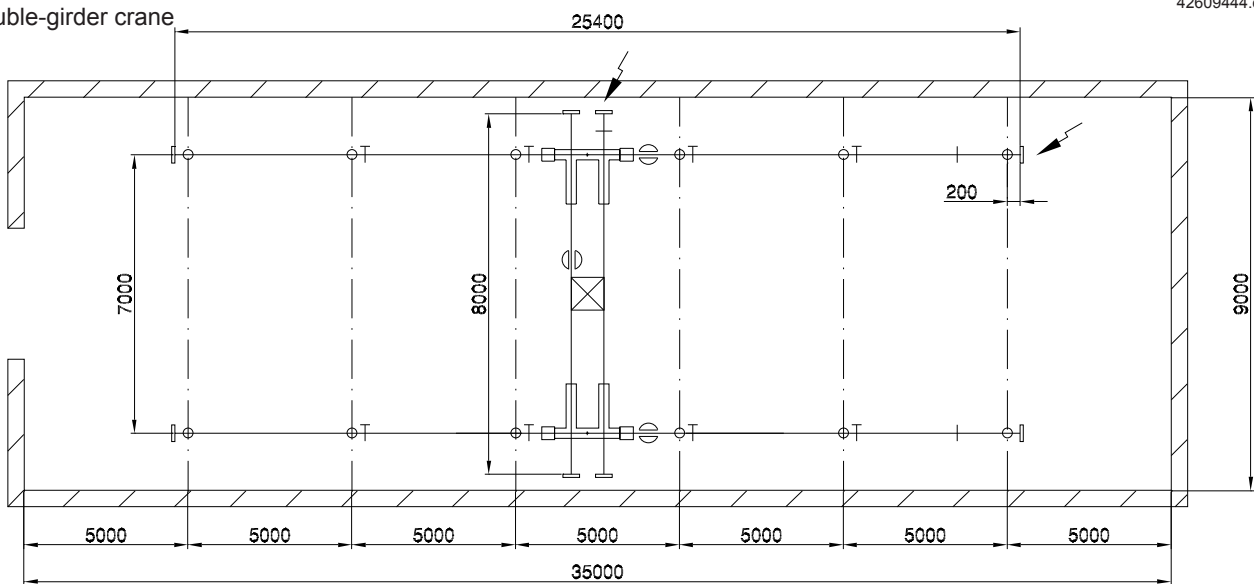
All installations must be dimensioned in such a way that the end caps and internal buffer stops are not approached during normal operation.

Suspension monorail



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Double-girder crane



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Symbols for use in drawings

Straight track section		Track suspension		Travel unit	
Track joint		Power feed		Monorail trolley	
End cap		Travel drive		Crab	
Buffers		Rigid crane end carriage			

42606645.eps

3.2 Profile load capacities according to the diagram

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 .

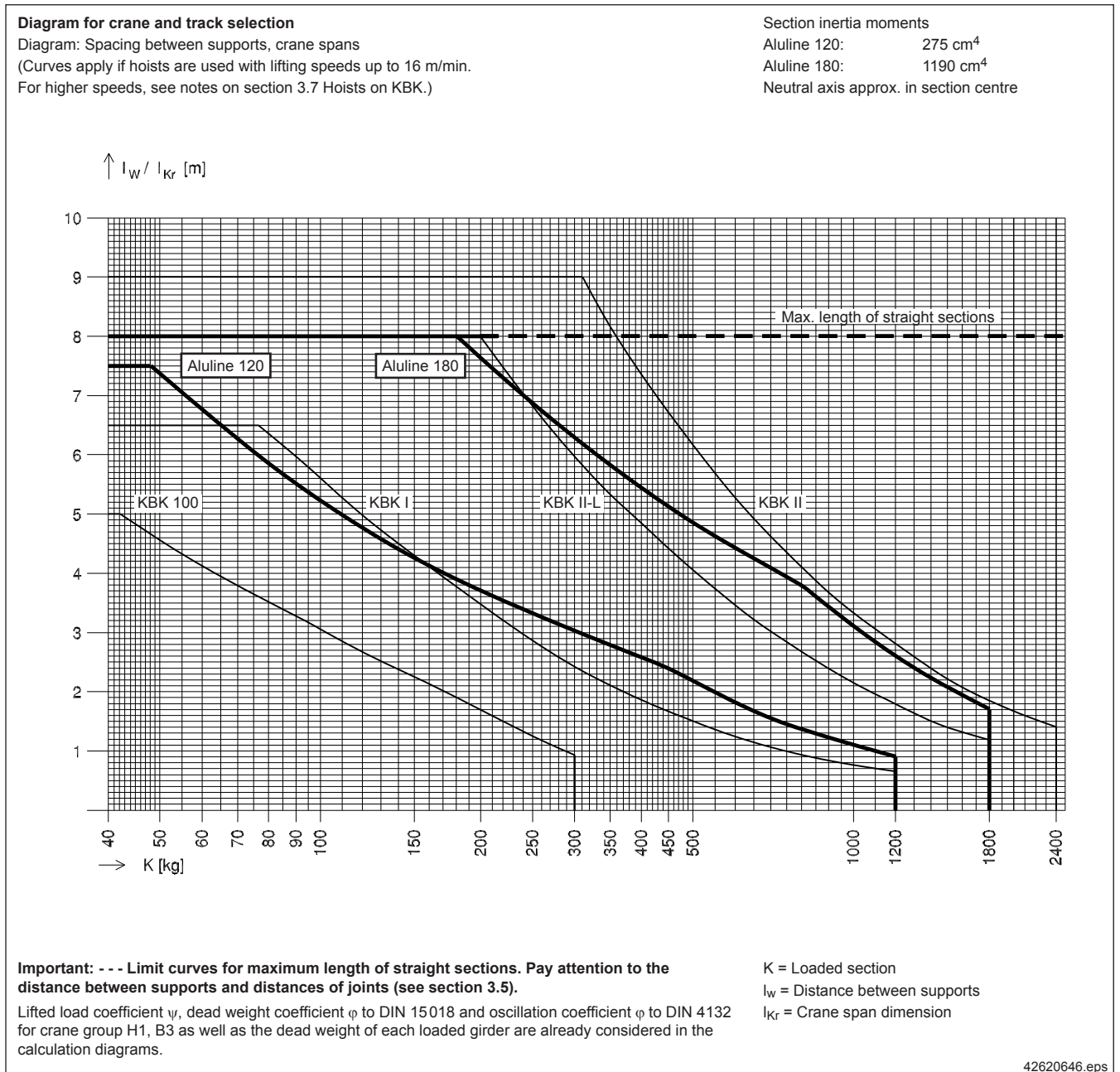
The span and spacing between supports which are permissible for the individual crane and track sections can be read off for a given load.

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

Selecting the section

Determining the spacing between supports or crane span:

1. Determine load K_{Ges} according to sections 3.3 to 3.5.
2. Determine the maximum value for l_w and l_{Kr} in the diagram (where it intersects the limit curve)
3. Select the most suitable profile section



3.3 Steps for project engineering and technical specification

Calculating load K

Monorail track and single girder crane

$$K = G_H + G_3$$

Double-girder crane

The girder with the least favourable load and 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 fittings

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

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

G_{RFK} = Dead weight of cross-travel drive and fittings

3.4 Reading off from the diagram

Span l_{Kr}

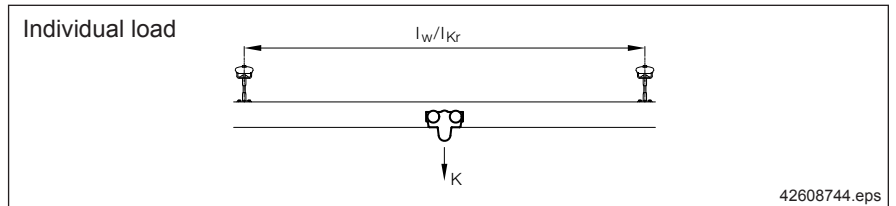
Distance between suspensions l_w
(Monorail track and crane runway)

Individual load

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

e_{Ka} = Distance between cross-travel units or wheel 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 read off direct from the diagram.



Two identical loads or load bar



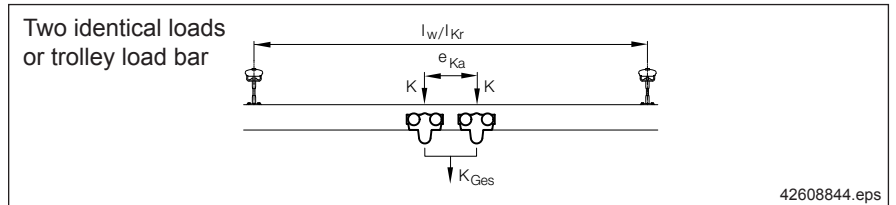
For two or more loads at a maintained distance in one panel, the max. l_w or l_{Kr} must never exceed the permissible limit for one of the individual loads. The minimum distance (e_{Ka} , e_{KT}) between loaded trolleys is that defined by the articulated frame or crane traverse.

Pay attention to maximum permissible trolley loads.

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

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

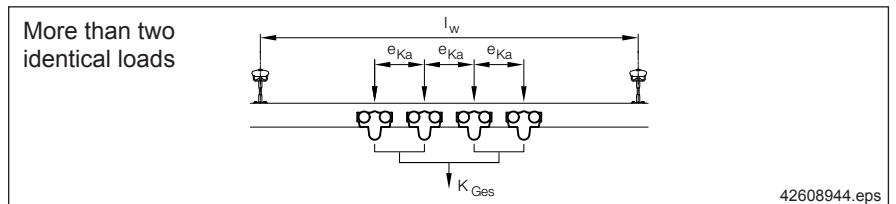
$$\max. l_{Kr} = l_{Kr}(K_{Ges}) + 0,9 \times e_{Ka} \text{ (or } e_{KT})$$



More than two identical loads at equal distances

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

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



3.5 Calculating load G_{AB} on one suspension fitting

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

Suspension load

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

Aluline 120: max. $G_{AB} = 750$ kg
 Aluline 180: max. $G_{AB} = 1400$ kg

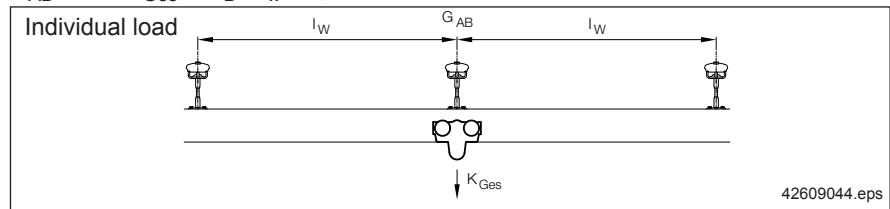
Individual load

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

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

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

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

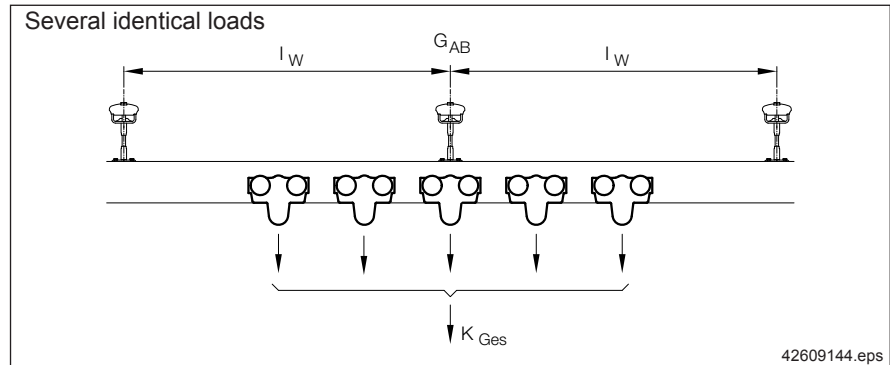


Two or more loads in one of two panels between supports

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 measures is required:

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

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

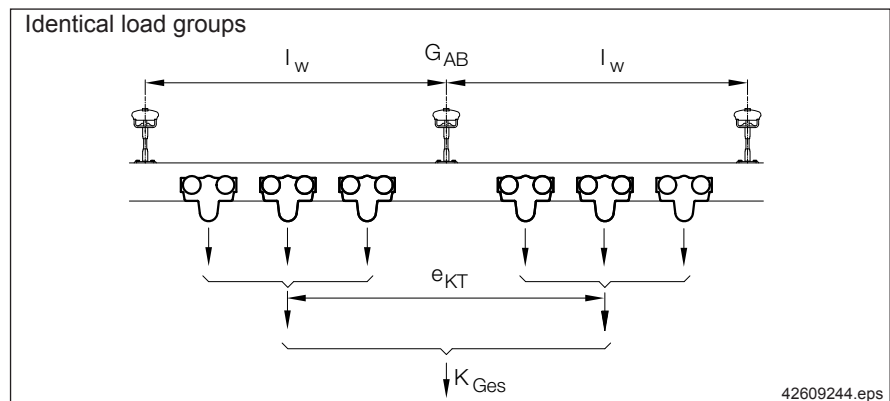


Two loads or groups of loads at a distance e_{KT}

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

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

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



3.6 System dimensions and system limits

Overhang

			Aluline 120	Aluline 180
Shortest possible overhang	u_{min}	[mm]	40	50
Project engineering values for overhang	u	[mm]	200	300

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

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



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

Solution: Use Aluline ergo suspensions and/or ergo crane end carriages.

Crane overhang

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

The length of overhang u can be increased for

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

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

Track overhang

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

Approach dimension

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

Permissible distance st of joint from suspension fitting

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

				Aluline 120	Aluline 180
Minimum distance	st_{min}	[mm]	$l_w \leq 5 \text{ m}$	40	50
			$l_w > 5 \text{ m}$	$0,05 \cdot l_w$	
Maximum permissible distance	st_{max}	[mm]		$0,1 \cdot l_w$	

Drive

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

Deflection

If the maximum spacing between supports/crane span is selected from the middle load range in the selection diagram, the deflection ratio ranges from 1/350 to 1/500. Deflection can be reduced by using larger Aluline or steel profile sections.

3.7 Hoists with KBK

The layout diagrams and tables in KBK documentation are valid for Demag chain hoists with lifting speeds up to max. 16 m/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:

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

v_H = Hoist speed in m/min

Use of balancer with KBK

Balancers on KBK:

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

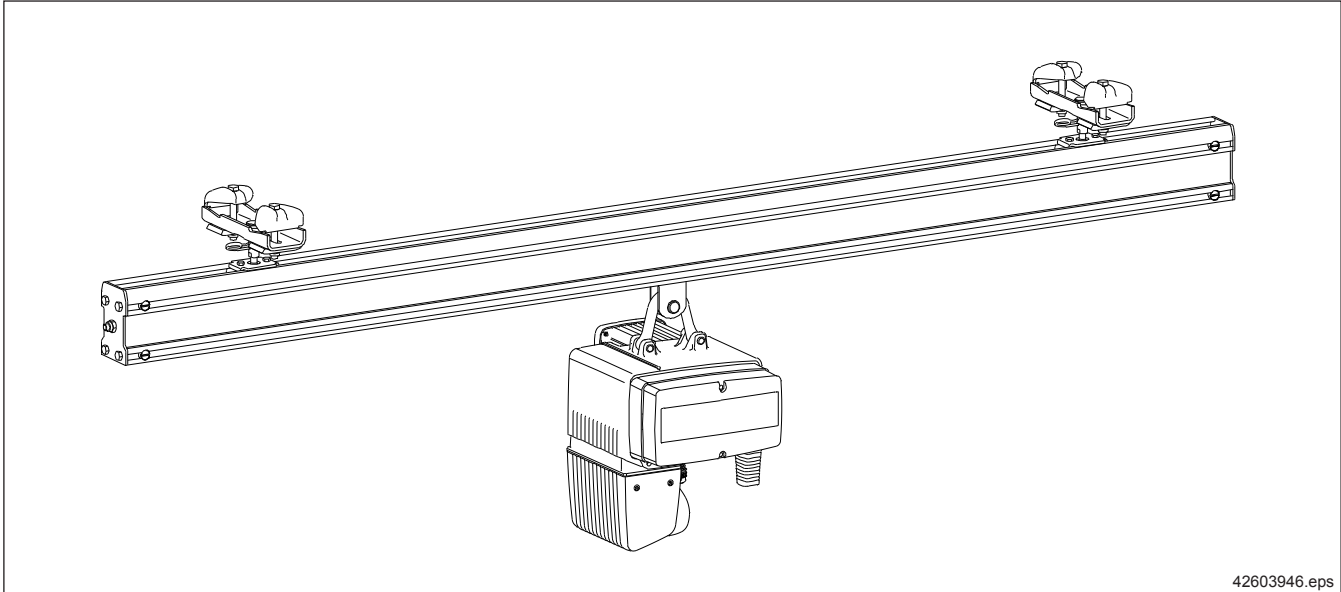
- Rope balancers operate at higher speeds and have higher acceleration values than chain hoists. This increases the lifted load coefficient. The air cushion reduces the negative effect of the high acceleration.
- In load handling applications, smaller deflections and vibrations are often required than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

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

- a factor of at least 1,1 is used to calculate load K by means of the diagrams \Rightarrow
 $K = G_H \times 1,1 + G_3$
 (this factor may be increased to avoid high deflections and unwanted vibrations)
- the selection table for 80 kg 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.

3.8 Suspension monorails

3.8.1 Specifying suspension monorails



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

Design: Flexible track suspensions

3.8.2 Specifying monorails according to selection table

Tracks according to DIN 4132: H1; B3

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

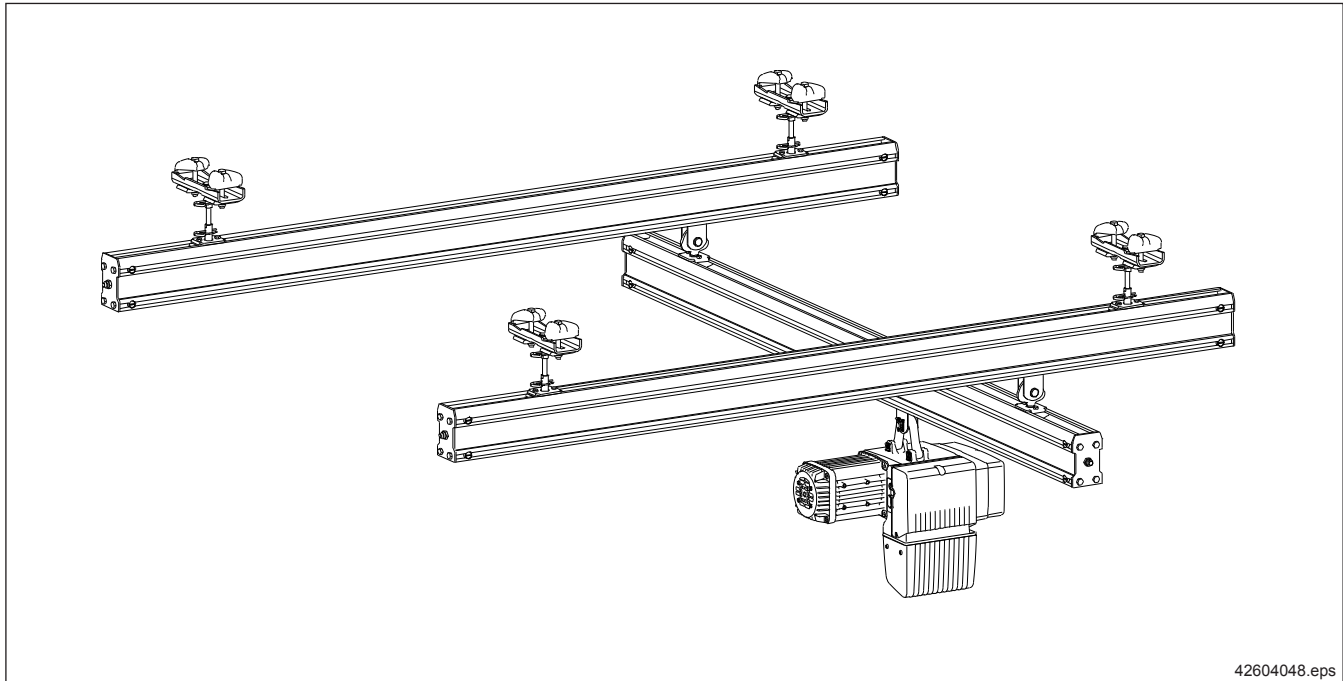
Selection basis: 1 load on the monorail track

The KBK Aluline monorail selection table is based on the diagram in section 3.2. In individual cases, exact static analysis calculations may lead to different results. Enquire about details for higher or multiple loads on one track.

G_H	Aluline 120				Aluline 180			
	$K_{(1)}$	e_{Ka}	l_w	G_{AB}	$K_{(1)}$	e_{Ka}	l_w	G_{AB}
	$K_{(2)}$				$K_{(2)}$			
[kg]	[kg]	[m]	[m]	[kg]	[kg]	[m]	[m]	[kg]
50	75	0,106	6,00	120	75	0,150	8,00	180
	90	0,106	5,45	130	105	0,150	8,00	210
80	105	0,106	5,05	145	105	0,150	8,00	210
	120	0,106	4,75	155	135	0,150	8,00	240
125	160	0,106	4,10	195	170	0,150	8,00	280
	175	0,106	3,90	205	200	0,150	7,60	310
160	205	0,106	3,60	235	205	0,150	7,55	310
	220	0,106	3,50	250	235	0,150	7,05	335
200	245	0,106	3,30	270	245	0,150	6,90	340
	260	0,106	3,20	285	275	0,150	6,50	365
250	300	0,106	3,00	320	305	0,150	6,15	390
	315	0,106	2,90	335	335	0,150	5,90	415
315	370	0,210	2,80	390	370	0,150	5,60	450
	385	0,210	2,75	405	400	0,150	5,40	475
400	455	0,210	2,45	470	455	0,150	5,05	520
	470	0,210	2,35	485	485	0,150	4,90	545
500	590	0,210	1,90	605	590	0,150	4,40	655
	605	0,210	1,85	620	620	0,150	4,30	685
630					720	0,250	4,10	780
					750	0,250	4,00	810
800					890	0,250	3,50	940
					920	0,250	3,40	970
1000					1090	0,250	2,90	1130
					1120	0,250	2,80	1160

3.9 Single and double-girder cranes

3.9.1 Specifying single-girder cranes

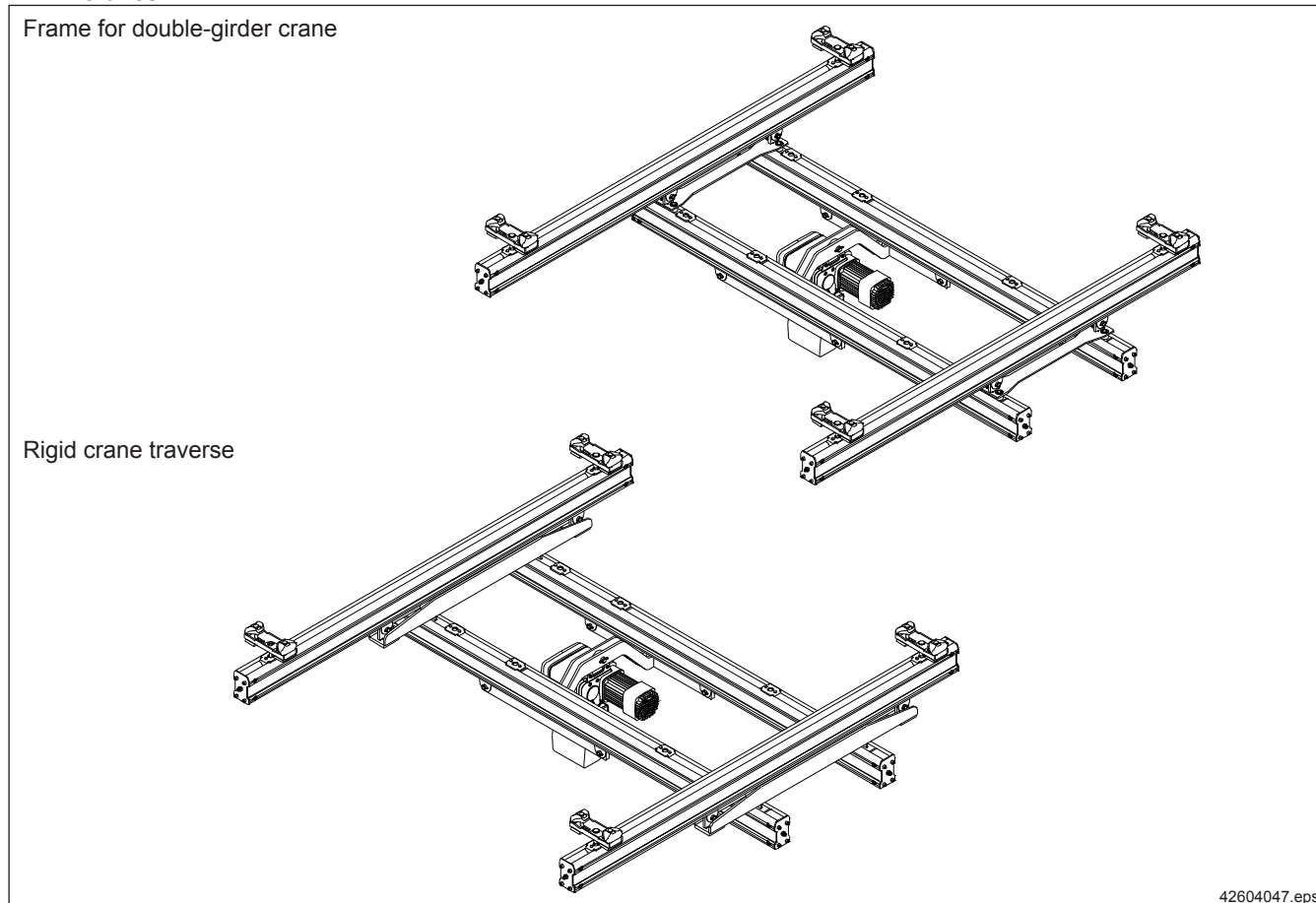


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Single-girder crane		
Components	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	5
Track suspension	Suspension, short suspension, upper suspension bracket, upper suspension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

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

3.9.2 Specifying double-girder cranes



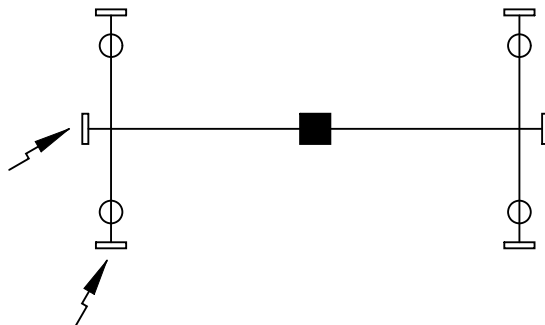
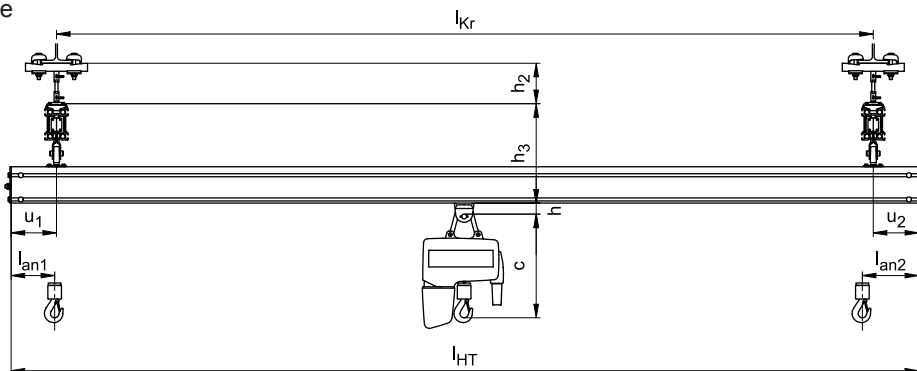
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Double-girder crane		
Components	Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, information plates	5
Track suspension	Short suspension, upper suspension bracket, upper suspension clamp, ball-head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

Design: Articulated track suspensions with rigid crane end carriages (Articulated crane girder suspensions will not be provided).

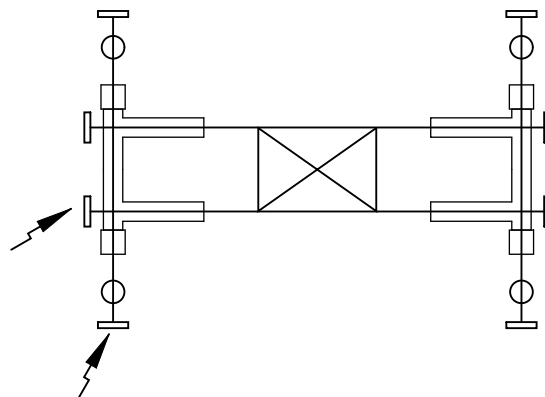
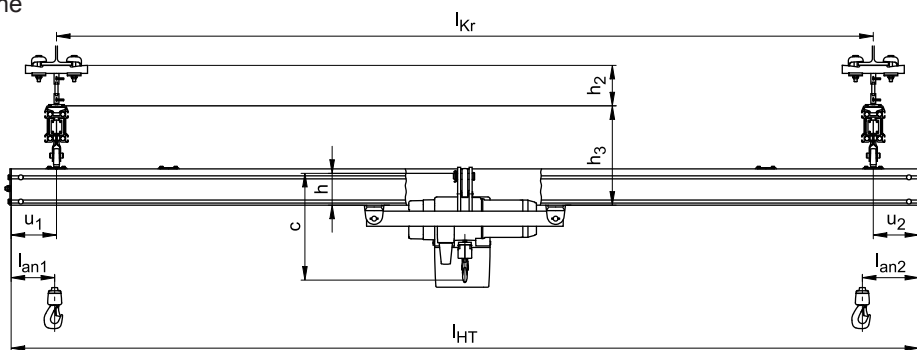
3.9.3 Specifying single and double-girder cranes according to selection tables

Single-girder crane



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Double-girder crane



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

h = Rail LE to pin top edge
 h_2 = I-beam LE to track girder top edge
 h_3 = Track girder top edge to crane girder LE

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

l_w data apply to one crane on the crane runway

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

Deflection limits:

Cranes and runways 1/350, frequency $\geq 2,8$ Hz

l_{HT} = Crane girder length

l_{Kr} = Crane span dimension

l_w = Distance between suspensions

Suspension loads on request

All dimensions in m

Max. hoist speed 16 m/min

		Load capacity: 50 kg								Load capacity: 80 kg								
		Hoist weight: 35 kg								Hoist weight: 35 kg								
		Single-girder crane				Double-girder crane				Single-girder crane				Double-girder crane				
		l_{HT}	l_{Kr}		l_w		min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180
	min		max	Aluline 120	Aluline 180													
Crane girder section, crane girder length	Aluline 120	1	0,80	- 0,90	5,20	8,00	0,25	- 0,90	4,80	8,00	0,80	- 0,90	4,60	8,00	0,25	- 0,90	4,35	8,00
		2	1,65	- 1,90	5,05	8,00	1,05	- 1,90	4,40	8,00	1,70	- 1,90	4,45	8,00	1,10	- 1,90	4,05	8,00
		3	2,45	- 2,90	4,90	8,00	1,80	- 2,90	4,25	8,00	2,55	- 2,90	4,35	8,00	1,85	- 2,90	3,90	7,95
		4	3,20	- 3,90	4,80	8,00	2,40	- 3,90	4,15	8,00	3,35	- 3,90	4,30	8,00	2,55	- 3,90	3,80	7,75
	5	3,85	- 4,90	4,70	8,00	2,95	- 4,90	4,00	8,00	4,05	- 4,80	4,20	8,00	3,20	- 4,90	3,70	7,55	
	6	4,95	- 5,55	4,70	8,00	3,45	- 5,90	3,80	7,65	-	-	-	-	3,75	- 5,90	3,55	7,15	
	7	-	-	-	-	4,50	- 6,90	3,80	7,65	-	-	-	-	4,80	- 6,35	3,55	7,15	
	8	-	-	-	-	5,70	- 7,25	3,85	7,70	-	-	-	-	6,00	- 6,35	3,60	7,15	
Aluline 180	1	0,70	- 0,90	5,05	8,00	0,20	- 0,90	4,85	8,00	0,75	- 0,90	4,50	8,00	0,20	- 0,90	4,40	8,00	
	2	1,50	- 1,90	4,80	8,00	0,80	- 1,90	4,05	8,00	1,55	- 1,90	4,30	8,00	0,80	- 1,90	3,75	7,65	
	3	2,15	- 2,90	4,60	8,00	1,40	- 2,90	3,85	7,80	2,30	- 2,90	4,15	8,00	1,50	- 2,90	3,60	7,30	
	4	2,75	- 3,90	4,45	8,00	1,90	- 3,90	3,65	7,45	2,95	- 3,90	4,05	8,00	2,05	- 3,90	3,45	7,00	
	5	3,25	- 4,90	4,30	8,00	2,30	- 4,90	3,50	7,15	3,55	- 4,90	3,95	8,00	2,55	- 4,90	3,30	6,70	
	6	3,70	- 5,90	4,15	8,00	2,65	- 5,90	3,30	6,65	4,05	- 5,90	3,85	7,85	2,95	- 5,90	3,15	6,30	
	7	4,10	- 6,90	4,05	8,00	3,00	- 6,90	3,20	6,45	4,55	- 6,90	3,75	7,70	3,35	- 6,90	3,05	6,15	
	8	5,00	- 7,90	4,05	8,00	3,40	- 7,90	3,15	6,30	5,70	- 7,90	3,75	7,75	3,65	- 7,90	3,00	5,95	
		Load capacity: 125 kg								Load capacity: 160 kg								
		Hoist weight: 35 kg								Hoist weight: 35 kg								
		Single-girder crane				Double-girder crane				Single-girder crane				Double-girder crane				
		l_{HT}	l_{Kr}		l_w		min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180
	min		max	Aluline 120	Aluline 180													
Crane girder section, crane girder length	Aluline 120	1	0,80	- 0,90	3,95	8,00	0,25	- 0,90	3,85	7,90	0,80	- 0,90	3,65	7,45	0,25	- 0,90	3,60	7,30
		2	1,75	- 1,90	3,90	7,95	1,15	- 1,90	3,60	7,35	1,75	- 1,90	3,55	7,30	1,15	- 1,90	3,35	6,85
		3	2,65	- 2,90	3,80	7,85	1,95	- 2,90	3,55	7,15	2,65	- 2,90	3,50	7,20	2,00	- 2,90	3,30	6,65
		4	3,45	- 3,90	3,75	7,75	2,70	- 3,90	3,45	7,00	3,55	- 3,65	3,45	7,10	2,80	- 3,90	3,25	6,55
	5	-	-	-	-	3,40	- 4,90	3,40	6,85	-	-	-	-	3,50	- 4,90	3,15	6,40	
	6	-	-	-	-	4,05	- 5,50	3,25	6,55	-	-	-	-	4,20	- 5,05	3,10	6,15	
	7	-	-	-	-	5,10	- 5,50	3,25	6,55	-	-	-	-	-	-	-	-	
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aluline 180	1	0,75	- 0,90	3,90	8,00	0,20	- 0,90	3,95	8,00	0,75	- 0,90	3,60	7,35	0,20	- 0,90	3,70	7,50	
	2	1,60	- 1,90	3,75	7,75	0,85	- 1,90	3,40	6,95	1,65	- 1,90	3,50	7,15	0,85	- 1,90	3,20	6,50	
	3	2,40	- 2,90	3,70	7,55	1,60	- 2,90	3,30	6,65	2,45	- 2,90	3,40	7,00	1,65	- 2,90	3,10	6,25	
	4	3,15	- 3,90	3,60	7,40	2,20	- 3,90	3,15	6,40	3,25	- 3,90	3,35	6,85	2,30	- 3,90	3,00	6,05	
	5	3,80	- 4,90	3,50	7,20	2,80	- 4,90	3,10	6,20	3,95	- 4,90	3,25	6,70	2,90	- 4,90	2,90	5,90	
	6	4,45	- 5,90	3,45	7,05	3,30	- 5,90	2,95	5,90	4,60	- 5,90	3,20	6,60	3,45	- 5,90	2,80	5,60	
	7	5,05	- 6,90	3,40	6,95	3,70	- 6,90	2,90	5,75	5,35	- 6,90	3,15	6,50	3,95	- 6,90	2,75	5,50	
	8	6,30	- 7,90	3,40	7,00	4,10	- 7,90	2,80	5,60	6,55	- 7,65	3,20	6,55	4,40	- 7,90	2,70	5,35	

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

Project engineering data for crane installations should be selected from the following tables. 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 trolleys.

Distances between suspensions l_w must be calculated separately. 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

		Load capacity: 200 kg								Load capacity: 250 kg								
		Hoist weight: 35 kg								Hoist weight: 35 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		
I _{HT}	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180		
	Crane girder section, crane girder length	Aluline 120	1	0,85	- 0,90	3,35	6,85	0,25	- 0,90	3,35	6,80	0,85	- 0,90	3,05	6,25	0,25	- 0,90	3,10
2			1,80	- 1,90	3,25	6,70	1,15	- 1,90	3,15	6,35	1,80	- 1,90	3,00 ¹⁾	6,15	1,20	- 1,90	2,90	5,90
3			2,70	- 2,90	3,25	6,65	2,05	- 2,90	3,10	6,20	2,70	- 2,90	2,95 ¹⁾	6,10	2,05	- 2,90	2,85	5,75
4			-	-	-	-	2,85	- 3,90	3,05	6,10	-	-	-	-	2,90	- 3,90	2,85	5,70
5		-	-	-	-	3,60	- 4,65	3,00	6,00	-	-	-	-	3,70	- 4,25	2,80	5,60	
6		-	-	-	-	4,35	- 4,65	2,90	5,80	-	-	-	-	-	-	-	-	
7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aluline 180	1	0,75	- 0,90	3,30	6,80	0,20	- 0,90	3,45	7,00	0,75	- 0,90	3,00	6,20	0,20	- 0,90	3,20	6,50	
	2	1,65	- 1,90	3,20	6,60	0,90	- 1,90	3,00	6,10	1,70	- 1,90	2,95 ¹⁾	6,05	0,90	- 1,90	2,80	5,65	
	3	2,50	- 2,90	3,15	6,45	1,70	- 2,90	2,90	5,90	2,55	- 2,90	2,90 ¹⁾	5,95	1,75	- 2,90	2,75	5,50	
	4	3,30	- 3,90	3,10	6,35	2,40	- 3,90	2,85	5,70	3,40	- 3,90	2,85 ¹⁾	5,85	2,50	- 3,90	2,65	5,35	
	5	4,05	- 4,90	3,05	6,25	3,05	- 4,90	2,75	5,55	4,20	- 4,90	2,80 ¹⁾	5,80	3,15	- 4,90	2,60	5,25	
	6	4,80	- 5,90	3,00 ¹⁾	6,15	3,65	- 5,90	2,70	5,35	4,95	- 5,90	2,80 ¹⁾	5,70	3,80	- 5,90	2,55	5,05	
	7	5,60	- 6,90	2,95 ¹⁾	6,10	4,15	- 6,90	2,65	5,25	5,75	- 6,35	2,75 ¹⁾	5,65	4,40	- 6,90	2,50	4,95	
	8	6,75	- 6,95	2,95 ¹⁾	6,10	4,65	- 7,90	2,60	5,10	-	-	-	-	4,95	- 7,90	2,45	4,85	
		Load capacity: 315 kg								Load capacity: 400 kg								
		Hoist weight: 55 kg								Hoist weight: 55 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		
I _{HT}	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180		
	Crane girder section, crane girder length	Aluline 120	1	0,65	- 0,90 ²⁾	2,70 ¹⁾	5,55	0,25	- 0,90	2,80	5,60	0,65	- 0,90 ²⁾	2,45 ¹⁾	5,00	0,25	- 0,90	2,55
2			1,60	- 1,90 ²⁾	2,65 ¹⁾	5,45	1,20	- 1,90	2,65	5,25	1,60	- 1,90 ²⁾	2,40 ¹⁾	4,95	1,20	- 1,90	2,40	4,80
3			2,55	- 2,65 ²⁾	2,65 ¹⁾	5,40	2,10	- 2,90	2,60	5,20	-	-	-	-	2,15	- 2,90	2,40	4,75
4			-	-	-	-	2,95	- 3,75	2,55	5,10	-	-	-	-	3,00	- 3,40	2,35	4,70
5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aluline 180	1	0,75	- 0,90	2,70 ¹⁾	5,50	0,20	- 0,90	2,90	5,85	0,75	- 0,90	2,45 ¹⁾	5,00	0,20	- 0,90	2,65	5,35	
	2	1,70	- 1,90	2,65 ¹⁾	5,40	0,90	- 1,90	2,55	5,10	1,70	- 1,90	2,40 ¹⁾	4,90	0,95	- 1,90	2,35	4,70	
	3	2,60	- 2,90	2,60 ¹⁾	5,30	1,80	- 2,90	2,50	5,00	2,65	- 2,90	2,35 ¹⁾	4,85	1,80	- 2,90	2,30	4,60	
	4	3,45	- 3,90	2,55 ¹⁾	5,25	2,55	- 3,90	2,45	4,90	3,55	- 3,90	2,35 ¹⁾	4,80	2,65	- 3,90	2,30	4,50	
	5	4,30	- 4,90	2,55 ¹⁾	5,20	3,30	- 4,90	2,40	4,80	4,40	- 4,90	2,30 ¹⁾	4,75	3,40	- 4,90	2,25	4,45	
	6	5,10	- 5,55	2,50 ¹⁾	5,10	4,00	- 5,90	2,35	4,65	-	-	-	-	4,15	- 5,90	-	4,35	
	7	-	-	-	-	4,65	- 6,90	2,30	4,55	-	-	-	-	4,85	- 6,90	-	4,25	
	8	-	-	-	-	5,25	- 7,65	2,30	4,50	-	-	-	-	5,50	- 6,95	-	4,20	

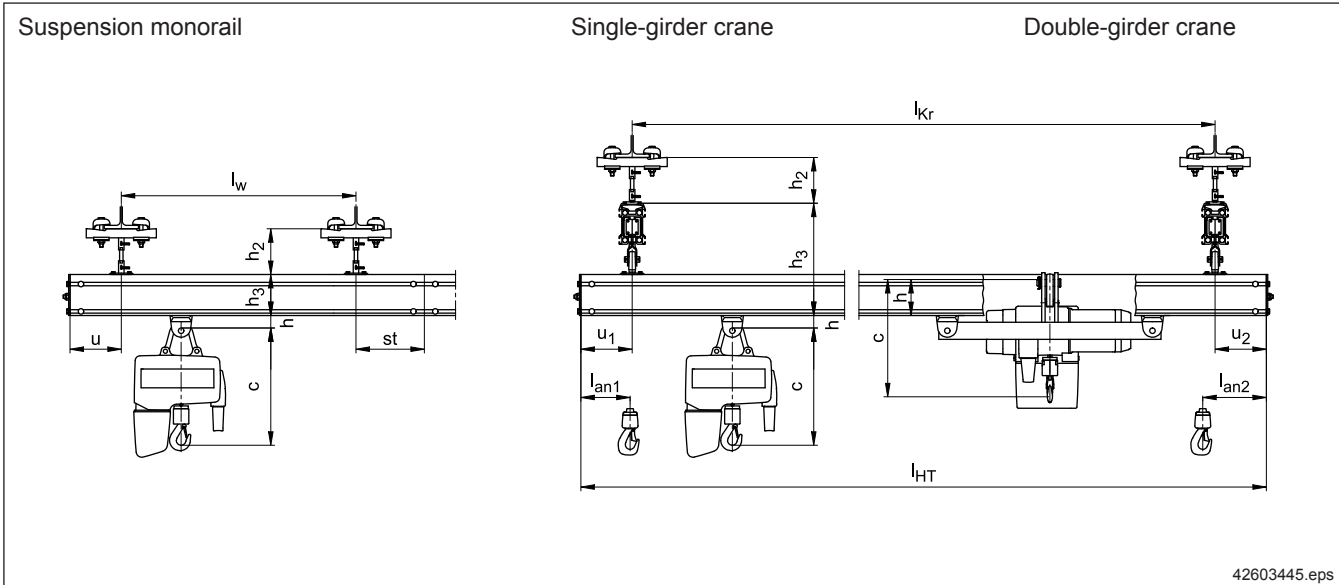
1) Two end carriages on each side of the crane
 2) Double trolley unit

		Load capacity: 500 kg								Load capacity: 630 kg										
		Hoist weight: 55 kg								Hoist weight: 55 kg										
		Single-girder crane				Double-girder crane				Single-girder crane				Double-girder crane						
		I _{HT}	I _{Kr}		I _w		I _{Kr}		I _w		min	max	I _{Kr}		I _w		min	max	I _{Kr}	
min	max		Aluline 120	Aluline 180	min	max	Aluline 120	Aluline 180	Aluline 120	Aluline 180			Aluline 120	Aluline 180	Aluline 120	Aluline 180				
Crane girder section, crane girder length	Aluline 120	1	0,65	- 0,90 ²⁾	2,20 ¹⁾	4,55	0,25	- 0,90	2,35	4,70	-	-	-	-	-	-	-	-	-	-
		2	1,60	- 1,90 ²⁾	2,15 ¹⁾	4,50	1,20	- 1,90	2,25	4,40	-	-	-	-	-	-	-	-	-	-
		3	-	-	-	-	2,15	- 2,90	-	4,35	-	-	-	-	-	-	-	-	-	-
		4	-	-	-	-	3,05	- 3,10	-	4,30	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluline 180	1	0,75	- 0,90	2,15 ¹⁾	4,55	0,20	- 0,90	2,45	4,90	0,50	- 0,90 ²⁾	-	4,10 ¹⁾	0,20	- 0,90	2,25	4,45	-	-	
	2	1,75	- 1,90	2,10 ¹⁾	4,45	0,95	- 1,90	-	4,35	1,50	- 1,90 ²⁾	-	4,00 ¹⁾	0,95	- 1,90	-	3,95	-	-	
	3	2,65	- 2,90	2,05 ¹⁾	4,40	1,85	- 2,90	-	4,25	2,45	- 2,90 ²⁾	-	4,00 ¹⁾	1,85	- 2,90	-	3,90	-	-	
	4	3,55	- 3,90	-	4,35 ¹⁾	2,70	- 3,90	-	4,15	3,35	- 3,90 ²⁾	-	3,95 ¹⁾	2,75	- 3,90	-	3,85	-	-	
	5	4,45	- 4,55	-	4,30 ¹⁾	3,50	- 4,90	-	4,10	-	-	-	-	3,60	- 4,90	-	3,80	-	-	
	6	-	-	-	-	4,30	- 5,90	-	4,05	-	-	-	-	4,40	- 5,75	-	3,70	-	-	
	7	-	-	-	-	5,00	- 6,35	-	4,00	-	-	-	-	5,15	- 5,75	-	3,70	-	-	
	8	-	-	-	-	5,70	- 6,35	-	3,95	-	-	-	-	-	-	-	-	-	-	
Crane girder section, crane girder length	Aluline 120	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Aluline 180	1	0,50	- 0,90 ²⁾	-	3,70 ¹⁾	0,20	- 0,90	2,05	4,05	0,50	- 0,90 ²⁾	-	3,15 ¹⁾	0,20	- 0,90	0,80	3,65	-	-
		2	1,50	- 1,90 ²⁾	-	3,60 ¹⁾	0,95	- 1,90	-	3,60	1,50	- 1,90 ²⁾	-	3,05 ¹⁾	0,95	- 1,90	-	3,20	-	-
		3	2,45	- 2,90 ²⁾	-	3,60 ¹⁾	1,90	- 2,90	-	3,55	2,45	- 2,90 ²⁾	-	3,00 ¹⁾	1,90	- 2,90	-	3,10	-	-
		4	3,40	- 3,65 ²⁾	-	3,55 ¹⁾	2,80	- 3,90	-	3,50	-	-	-	-	2,85	- 3,90	-	3,05	-	-
		5	-	-	-	-	3,65	- 4,90	-	3,45	-	-	-	-	3,70	- 4,65	-	3,00	-	-
		6	-	-	-	-	4,50	- 5,20	-	3,40	-	-	-	-	-	-	-	-	-	
		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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

3.10 Structural dimensions for monorail tracks and cranes



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

Dimension h_2

Dimension h_2 [mm] (I-beam bottom edge to track girder top edge)				
	Short suspension with spring clip	Length of suspension rod for spring clip		
		80	100	300
Aluline 120	75	135	-	355
Aluline 180	115	-	195	395

For l_w , l_{Kr} , l_{HT} , see diagram (section 3.2) and selection tables (section 3.9.3).

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

Dimension h_3

Dimension h_3 [mm] (I-beam top edge to crane girder bottom edge)							
Suspension monorail		Crane					
Aluline		Aluline crane runway		120		180	
120	180	Aluline crane girder		120	180	120	180
120	180	Trolleys	single	330	390	390	450
			double	340	400	405	465

Rigid crane traverses: + 15

Dimension h

Dimension h [mm] (bottom edge of rail to top edge of pin)			
Crane and suspension monorail			
Aluline		120	180
Hoist trolleys	single	36,5	35
	double	46	50
	Double-girder crab frame	-105	-150

Dimension c = Hoist headroom dimension

4 KBK Aluline ergo – Planning and project engineering

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

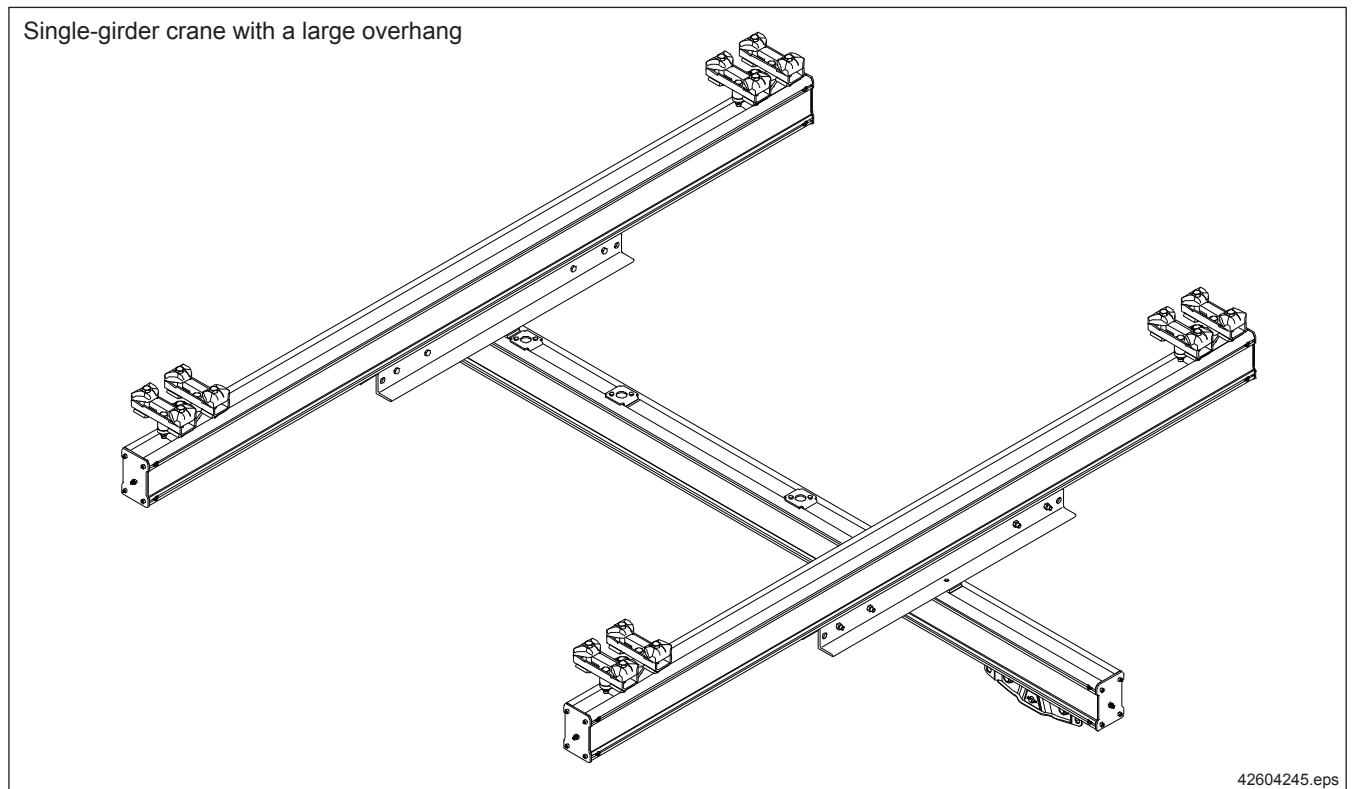
- Cranes with a large overhang
- Manipulator cranes and crabs

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

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

4.1 Cranes with a large overhang

4.1.1 Single-girder crane with a large overhang

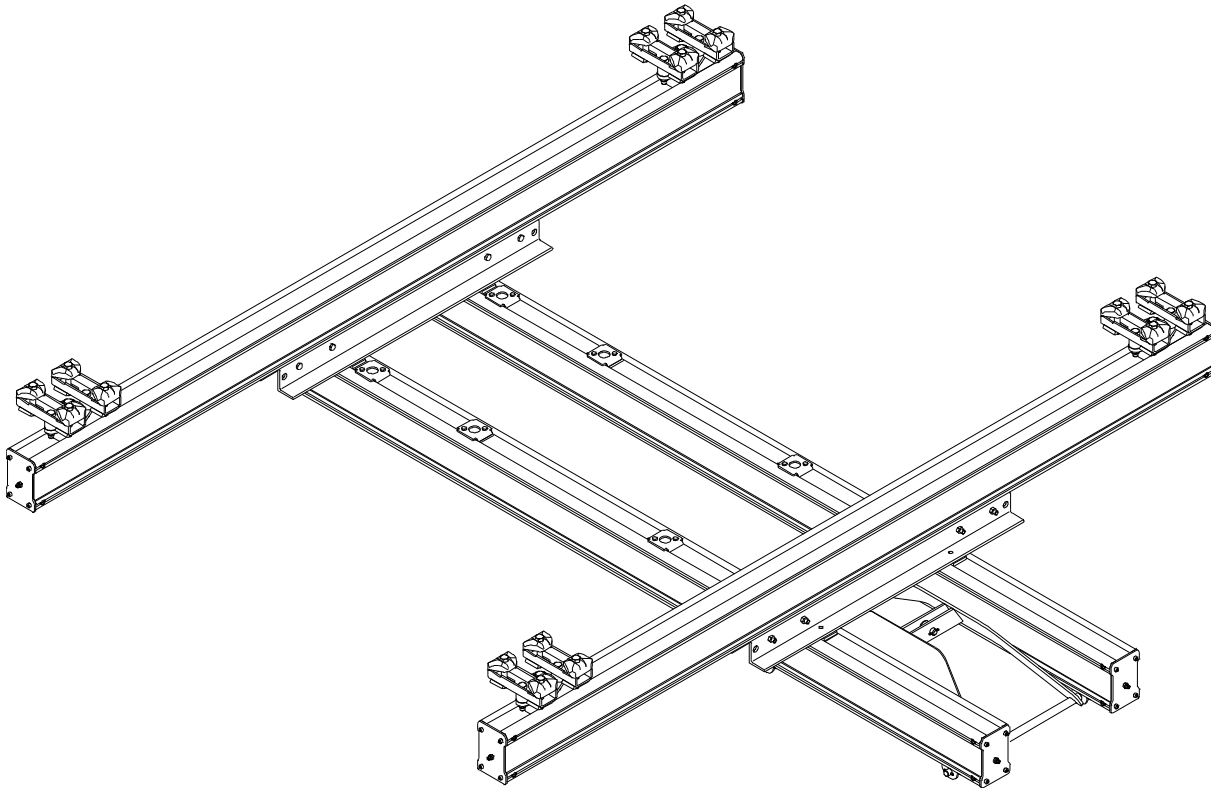


Components	Single-girder crane Components	See chapter/section
Rail elements	Rail, joint bolt set, end cap, buffer, internal buffer stop, shock absorber, information plates	5
Track suspension	Short suspension, Ergo suspension	6
Trolley combination	Trolley, ergo crane trolley, ergo crab trolley	7
Travel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

Design: Rigid track suspensions and crane end carriages

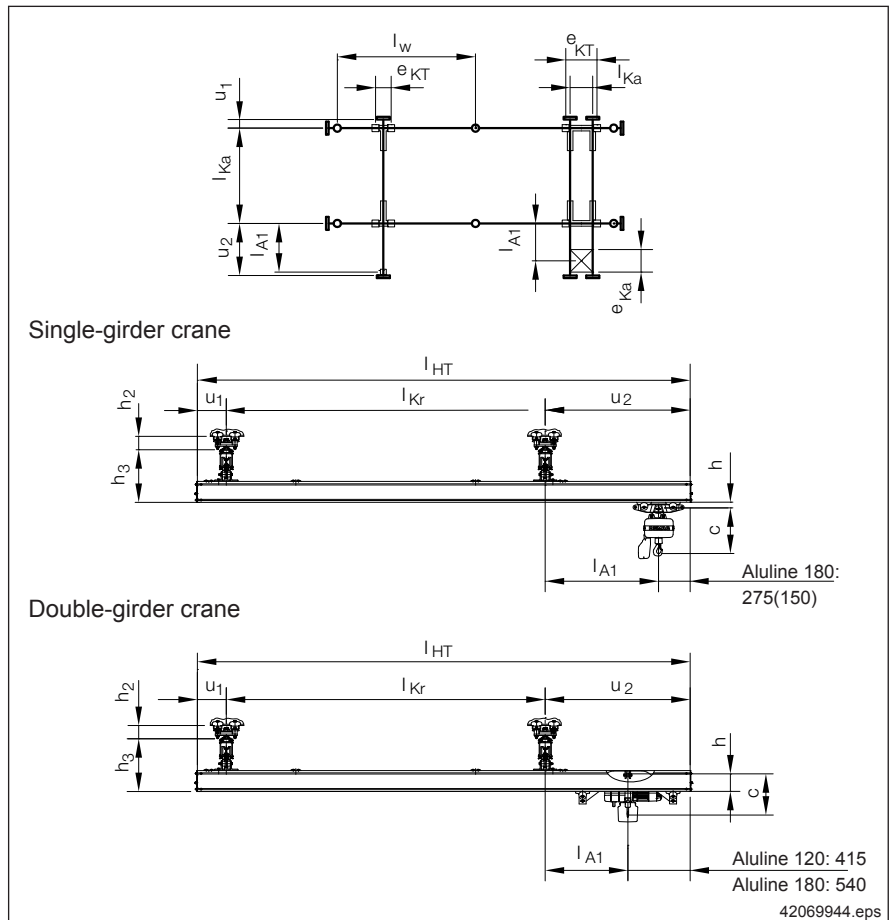
4.1.2 Double-girder crane with a large overhang

Double-girder crane with a large overhang



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



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

Refer to the crane selection table in section 4.1.3 for values for maximum permissible overhang travel dimension l_{A1} .

Crane types:

- Single-girder crane: Cranes and runways made of KBK Aluline 180
- Double-girder crane: Cranes and runways made of KBK Aluline 180

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

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

The hoist/load connection is articulated.

l_{KR} = Crane span dimension	u_1 = Overhang
l_{HT} = Crane girder length	u_2 = Overhang
l_{Ka} = Crab span	h = Rail LE to pin top edge
e_{KT} = Distance between crane trolleys	h_2 = I-beam LE to track girder top edge
e_{Ka} = Distance between cross-travel units	h_3 = Track girder top edge to crane girder LE
l_{A1} = Permissible overhang travel dimension	c = Hoist headroom dimension

4.1.3 Specifying cranes with large overhang according to selection tables

Larger overhangs are possible using cranes built with KBK Aluline ergo components.

The maximum overhang travel distance, the suspension distance and the suspension load can be taken from the following tables depending on the load to be lifted and the crane girder length. The tables are based on the following specified values and conditions:

- $u_1 = 250 \text{ mm}$
- Track overhang: 200 mm
- $u_2 \leq l_{Kr}$
- **Maximum possible overhang dimension l_{A1}** according to profile and crane type:

	Aluline 180
Single-girder crane	$l_{A1} = 1,5 \text{ m}$
Double-girder crane	$l_{A1} = 2,3 \text{ m}$

Overhang dimension l_{A1} depends on the load to be lifted.

Layout of results in the tables:

		l_{HT}	
SWL	Single-girder crane	l_{A1}	l_{A1}
	Double-girder crane	l_{A1}	l_{A1}
Hoist unit		min l_w - max l_w	min G_{AB} / max G_{AB}
		min l_w - max l_w	min G_{AB} / max G_{AB}

Example

The example is indicated in the table by

$G_H = 250 \text{ kg}$; $l_{HT} = 5 \text{ m}$; crane type: Double-girder crane

The limits for the values sought are as follows:

Aluline 180 Overhang travel dimension: max $l_{A1} = 885 \text{ mm}$
 Suspension distance: $l_w = 2,0 - 3,4 \text{ m}$
 Suspension load: $G_{AB} = 20 / 625 \text{ kg}$

Aluline 180 runway and crane

G_H Hoist unit	Type	2 m		3 m		l_{HT} 4 m		5 m		6 m	
50 kg	Single-girder crane	760	2,0 - 5,0 -35 / 285	1260	2,0 - 4,8 -35 / 295	1500	2,0 - 4,8 -5 / 280	1500	2,0 - 4,7 15 / 260	1500	2,0 - 4,5 15 / 255
	Double-girder crane	625	2,0 - 4,5 -40 / 360	1125	2,0 - 4,3 -40 / 390	1625	2,0 - 4,2 -40 / 415	2005	2,0 - 4,1 -25 / 425	1775	2,0 - 4,0 20 / 380
80 kg	Single-girder crane	760	2,0 - 4,5 -70 / 350	1260	2,0 - 4,4 -70 / 365	1500	2,0 - 4,5 -35 / 340	1500	2,0 - 4,5 10 / 315	1450	2,0 - 4,4 15 / 300
	Double-girder crane	625	2,0 - 4,1 -75 / 430	1125	2,0 - 4,0 -75 / 460	1625	2,0 - 3,9 -75 / 485	1655	2,0 - 4,0 0 / 440	1475	2,0 - 3,9 20 / 405
125 kg	Single-girder crane	760	2,0 - 3,9 -125 / 455	1260	2,0 - 3,9 -125 / 470	1470	2,0 - 4,0 -70 / 425	1240	2,0 - 4,3 5 / 370	1130	2,0 - 4,3 15 / 350
	Double-girder crane	625	2,0 - 3,7 -130 / 535	1125	2,0 - 3,6 -130 / 565	1605	2,0 - 3,5 -125 / 585	1335	2,0 - 3,9 15 / 480	1205	2,0 - 4,3 20 / 455
160 kg	Single-girder crane	760	2,0 - 3,6 -165 / 535	1260	2,0 - 3,6 -165 / 550	1250	2,0 - 3,9 -55 / 455	1060	2,0 - 4,1 10 / 405	970	2,0 - 4,2 15 / 395
	Double-girder crane	625	2,0 - 3,5 -170 / 615	1125	2,0 - 3,4 170 / 645	1395	2,0 - 3,4 -100 / 600	1175	2,0 - 3,8 20 / 515	1055	2,0 - 3,7 20 / 490
200 kg	Single-girder crane	750	2,6 - 3,3 -200 / 625	1250	3,3 - 3,3 -200 / 640	1070	2,0 - 3,8 -50 / 495	920	2,0 - 3,9 10 / 455	840	2,0 - 4,0 15 / 440
	Double-girder crane	615	3,0 - 3,2 -200 / 700	1105	2,9 - 3,2 -200 / 730	1225	2,0 - 3,3 -85 / 635	1035	2,0 - 3,6 20 / 560	935	2,0 - 3,6 20 / 540
250 kg	Single-girder crane	660	2,0 - 3,0 -200 / 690	1100	2,5 - 3,1 -200 / 705	890	2,0 - 3,5 -45 / 560	770	2,0 - 3,7 10 / 525		
	Double-girder crane	545	2,1 - 3,3 -200 / 765	985	2,1 - 2,9 -200 / 795	1045	2,0 - 3,2 -75 / 695	885	2,0 - 3,4 20 / 625		
315 kg	Single-girder crane	590	2,5 - 2,8 -200 / 770	980	2,4 - 3,0 -200 / 785	760	2,0 - 3,3 -40 / 635	660	2,0 - 3,4 10 / 600		
	Double-girder crane	485	2,0 - 2,8 -200 / 835	895	2,7 - 2,7 -200 / 875	905	2,0 - 3,1 -70 / 765	775	2,0 - 3,3 20 / 705		
400 kg	Single-girder crane	510	2,0 - 2,6 -200 / 865	820	2,0 - 2,9 -185 / 865	640	2,0 - 3,1 -40 / 735				
	Double-girder crane	425	2,0 - 2,6 -195 / 935	785	2,0 - 2,6 -200 / 970	785	2,0 - 3,0 -65 / 865				
500 kg	Single-girder crane	440	2,0 - 2,5 -200 / 980	700	2,0 - 2,7 -180 / 980	550	2,0 - 2,9 -45 / 855				
	Double-girder crane	375	2,0 - 2,5 -200 / 1055	695	2,3 - 2,5 -200 / 1090	685	2,0 - 2,8 -70 / 985				

4.2 Structural dimensions for cranes with large overhang, manipulator cranes

The following tables list the structural dimensions of the various crane type assemblies.

The dimensions are shown on the crane type drawings.

Dimension h [mm] (bottom edge of rail to top edge of pin)			
Cranes and double rail track			
Aluline		120	180
Hoist trolleys	single	36,5	35
	double	46	50
	Crab frame	-105	-150

Dimension h ₂ [mm] (I-beam bottom edge to crane girder top edge)	
Aluline 120	75
Aluline 180	115

The suspension headroom dimensions apply to the short adjustable KBK Aluline suspensions and KBK Aluline ergo suspensions.

Cranes

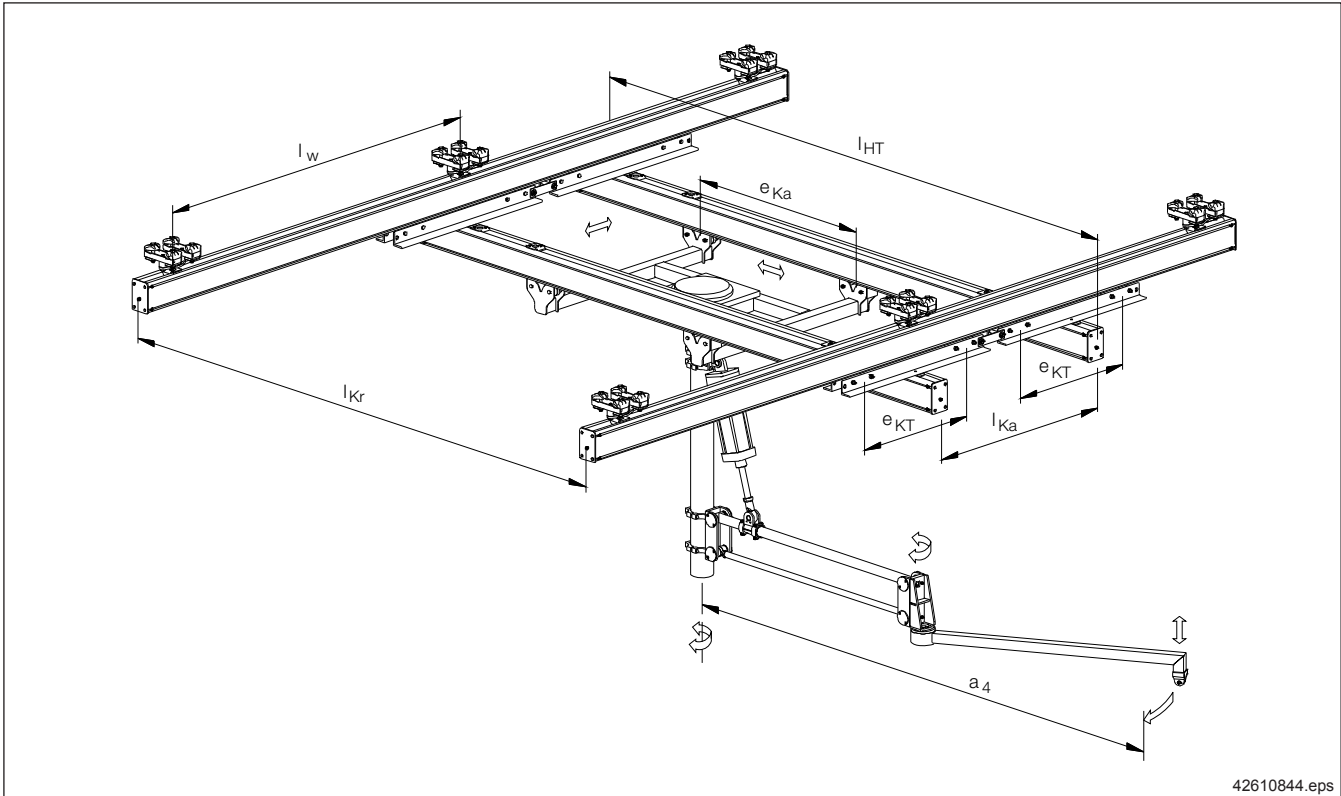
Dimension h ₃ [mm] (Track girder top edge / crane girder LE)			
Aluline crane runway	120		180
Aluline crane girder	120	180	180
h ₃	300	360	470

Double-rail track

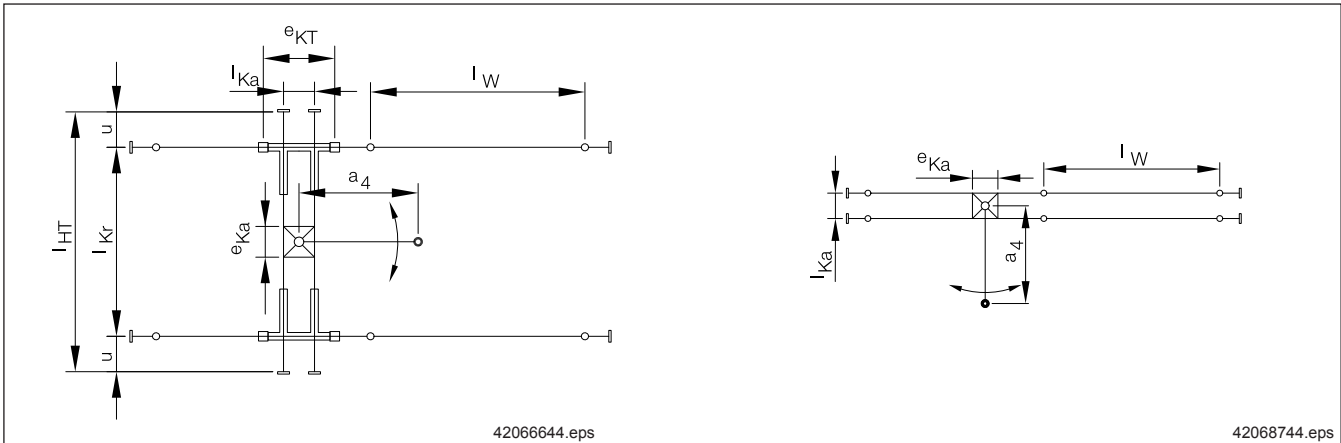
Dimension h ₃ [mm] (crane runway height)		
Aluline crane runway	120	180
h ₃	120	180

4.3 Manipulator cranes

4.3.1 Specifying manipulator crabs, manipulator cranes



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Double-girder crane

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

Design: Rigid runway and crane suspensions

4.3.2 Specifying manipulator crabs according to selection table

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

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

Otherwise, KBK Aluline classic components can be used.

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

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



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

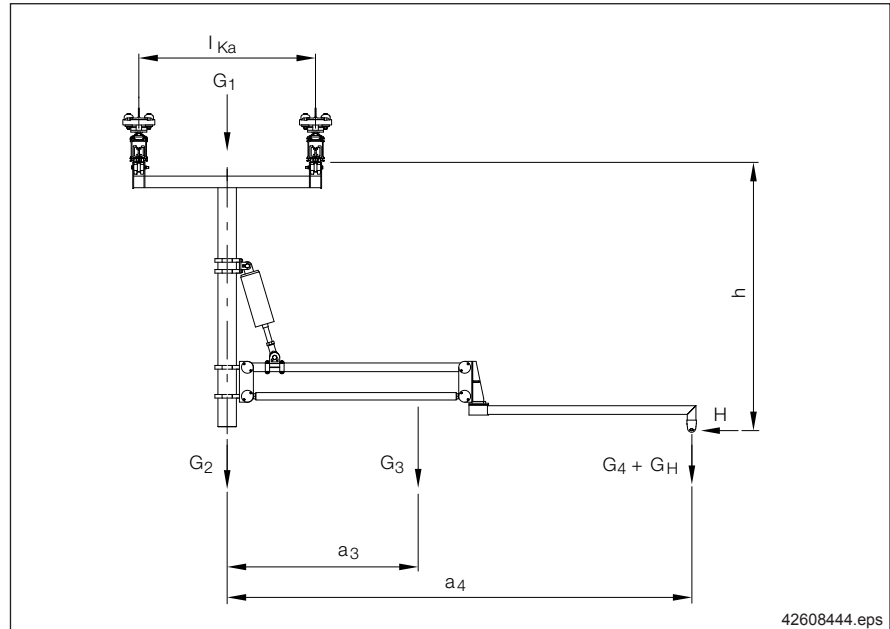
Determining the device geometry, weights and moments is particularly important for specifying the crab frame size and the double-rail track.

The table in section 3 provides the basis for dimensioning a double-rail track.

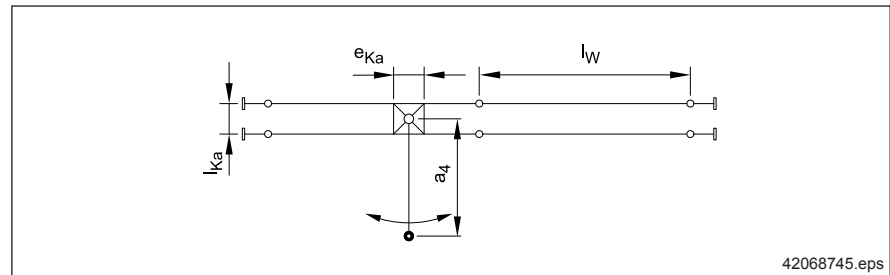
More precise calculations may result in different values.

1. Determining the weights and moments from the device geometry Selection with example

Loads		
Crab frame:	$G_1 =$	75 kg
Mast:	$G_2 =$	28 kg
Arm:	$G_3 =$	122 kg
Device:	$G_4 =$	10 kg
Load:	$G_H =$	30 kg
Total:	$G_{Ges} =$	265 kg
Manual force:		
	$H =$	5 kg
Distances:		
Arm:	$a_3 =$	0.94 m
Device:	$a_4 =$	2.60 m
Manual force:	$h =$	3.00 m
Moments:		
Arm:	$G_3 \times a_3 =$	114.7 kgm
Device, load:	$(G_4 + G_H) \times a_4 =$	104.0 kgm
Manual force:	$H \times h =$	15.0 kgm
Total:	$M_{Ges} =$	233,7 kgm



2. Specifying the device base



Using the loads calculated, the device base is determined from the table:

Starting with the smallest device base, the next highest value is selected for M_{Ges} in the table.		
M_{Ges} is greater than the given maximum value for the device base	M_{Ges} in the given range	
	Check G_{Ges}	
Check next highest device base in the table	G_{Ges} is outside the given range	G_{Ges} is within the given range
	Check next highest device base in the table	Device base can be used for the calculated loads

The table shows that the calculated values $M_{Ges} = 233,7 \text{ kgm}$ and $G_{Ges} = 265 \text{ kg}$ result in a device base dimension of $e_{Ka} = 1000 \text{ mm}$.

3. Suspension load G_{AB} and suspension distance l_w for the track of the manipulator crab from the table

The calculated values $e_{Ka} = 1000$ mm; $M_{Ges} = 250$ kgm and $G_{Ges} = 265$ kg result in the following values, as shown in the table:
 $l_w = 1,0$ -3,6 m (Aluline 180), $G_{AB} = 200 / 570$ kg (Aluline 180).
 The selected line in the table is marked with .

e_{Ka} [mm]	M_{Ges} [kgm]	G_{Ges} [kg]	Aluline 120		Aluline 180		
			l_w [m]	G_{AB} [kg]	l_w [m]	G_{AB} [kg]	
550	25	50 - 100	1,0 - 3,4	-30 / 145	1,0 - 6,2	-20 / 175	
		100 - 300	1,0 - 2,5	-10 / 265	1,0 - 4,9	-5 / 295	
		300 - 500	1,0 - 2,1	5 / 385	1,0 - 4,1	15 / 415	
		500 - 800			1,0 - 3,4	30 / 600	
	50	50 - 200	1,0 - 2,5	-85 / 260	1,0 - 4,9	-80 / 290	
		100 - 400	1,0 - 2,1	-20 / 380	1,0 - 4,1	-15 / 410	
		400 - 700			1,0 - 3,4	5 / 595	
		700 - 800			1,0 - 3,3	30 / 655	
	75	50 - 150	1,0 - 2,0	-80 / 435	1,0 - 4,7	-135 / 315	
		150 - 400			1,0 - 3,9	-75 / 470	
		400 - 600			1,0 - 3,5	15 / 590	
		600 - 800			1,0 - 3,2	0 / 715	
	100	50 - 300			1,0 - 3,9	-190 / 460	
		300 - 500			1,0 - 3,5	-45 / 585	
		500 - 700			1,0 - 3,2	25 / 710	
		700 - 800			1,0 - 3,0	-10 / 770	
150	400 - 600			1,0 - 3,2	-155 / 695		
	600 - 800			1,0 - 2,9	-60 / 880		
	650	25	50 - 150	1,0 - 3,2	-20 / 160	1,0 - 5,9	-15 / 195
			150 - 300	1,0 - 2,6	0 / 250	1,0 - 4,9	5 / 285
300 - 600			1,0 - 2,0	15 / 425	1,0 - 3,9	20 / 465	
600 - 800					1,0 - 3,5	45 / 585	
50		100 - 200	1,0 - 2,4	-65 / 295	1,0 - 4,6	-60 / 330	
		200 - 400	1,0 - 2,1	0 / 410	1,0 - 3,9	5 / 450	
		400 - 600			1,0 - 3,5	25 / 570	
		600 - 800			1,0 - 3,4	40 / 630	
75		100 - 200	1,0 - 2,4	-80 / 280	1,0 - 4,7	-105 / 315	
		200 - 400	1,0 - 2,1	-35 / 400	1,0 - 4,0	25 / 435	
		400 - 600			1,0 - 3,6	5 / 555	
		600 - 800			1,0 - 3,2	20 / 675	
100		50 - 100			1,0 - 4,8	-150 / 300	
		100 - 300			1,0 - 4,1	-120 / 420	
		300 - 600			1,0 - 3,4	35 / 600	
		600 - 800			1,0 - 3,2	0 / 725	
150	150 - 200			1,0 - 3,9	-185 / 455		
	200 - 400			1,0 - 3,0	-155 / 575		
	400 - 600			1,0 - 3,2	-60 / 695		
	600 - 800			1,0 - 3,0	-35 / 815		
250	500 - 600			1,0 - 2,9	-170 / 850		
	600 - 700			1,0 - 2,8	-115 / 940		
	800	75	50 - 150	1,0 - 2,6	-80 / 250	1,0 - 4,9	-75 / 285
			150 - 300	1,0 - 2,2	-25 / 360	1,0 - 4,2	-20 / 400
300 - 600					1,0 - 3,5	15 / 575	
600 - 800					1,0 - 3,4	45 / 635	
100		50 - 150	1,0 - 2,1	-45 / 395	1,0 - 4,9	-110 / 320	
		150 - 300			1,0 - 4,0	-40 / 440	
		300 - 600			1,0 - 3,6	-5 / 555	
		600 - 800			1,0 - 3,3	25 / 670	
150		50 - 150			1,0 - 4,5	-180 / 355	
		150 - 300			1,0 - 3,9	-155 / 455	
		300 - 600			1,0 - 3,5	-60 / 570	
		600 - 800			1,0 - 3,2	-30 / 685	
250		50 - 150			1,0 - 3,1	5 / 755	
		150 - 300			1,0 - 3,2	-200 / 715	
		300 - 600			1,0 - 3,0	-100 / 835	
		600 - 800			1,0 - 2,9	-75 / 890	
1000	100	50 - 200			1,0 - 4,9	-80 / 285	
		200 - 400			1,0 - 4,2	-30 / 400	
		400 - 700			1,0 - 3,6	20 / 570	
		700 - 800			1,0 - 3,4	55 / 625	
	150	50 - 150			1,0 - 4,7	-135 / 315	
		150 - 300			1,0 - 4,2	-90 / 400	
		300 - 600			1,0 - 3,6	-45 / 570	
		600 - 800			1,0 - 3,3	25 / 680	
	250	150 - 400			1,0 - 3,6	-200 / 570	
		400 - 600			1,0 - 3,3	-100 / 685	
		600 - 800			1,0 - 3,1	-55 / 795	
		400 - 500			1,0 - 3,2	-200 / 740	
	350	500 - 600			1,0 - 3,1	-160 / 795	
		600 - 800			1,0 - 2,9	-135 / 905	

4.3.3 Specifying manipulator cranes according to selection table

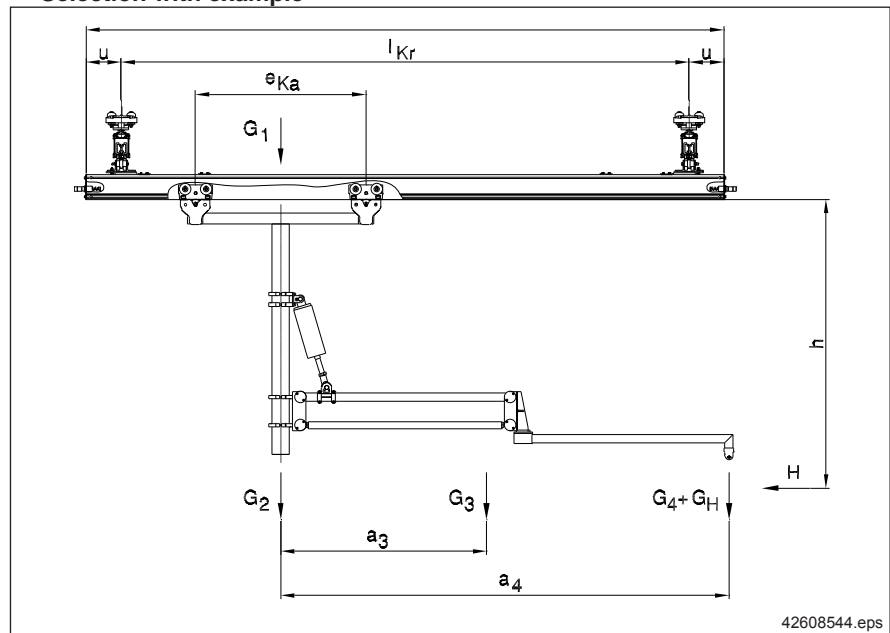
Determining the weights and moments from the device geometry is particularly important for specifying the crab frame size, the double-girder crane and the crane runway.

Tables A and B in this section provide the basis for specifying the complete installation.

More precise calculations may result in different values.

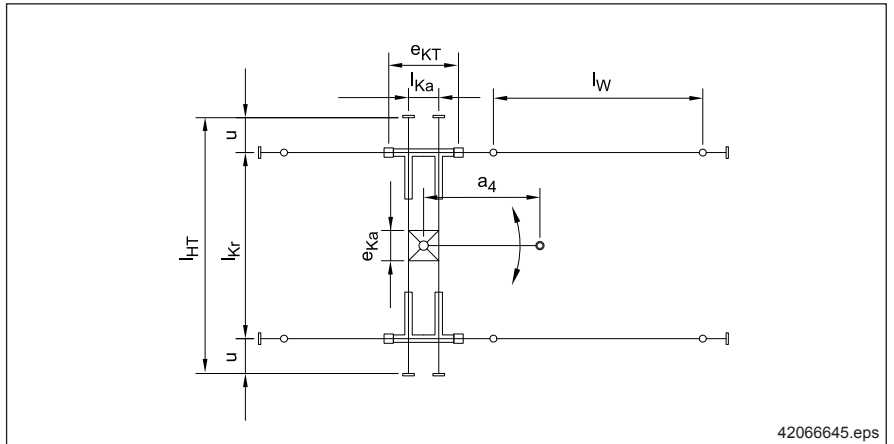
1. Determining the weights and moments from the device geometry Selection with example

Loads		
Crab frame:	$G_1 =$	75 kg
Mast:	$G_2 =$	78 kg
Arm:	$G_3 =$	122 kg
Device:	$G_4 =$	10 kg
Load:	$G_H =$	30 kg
Total:	$G_{Ges} =$	315 kg
Manual force:	$H =$	5 kg
Distances:		
Arm:	$a_3 =$	0.94 m
Device:	$a_4 =$	2.60 m
Manual force:	$h =$	3.00 m
Moments:		
Arm:	$G_3 \times a_3 =$	114.7 kgm
Device, load:	$(G_4 + G_H) \times a_4 =$	104.0 kgm
Manual force:	$H \times h =$	15.0 kgm
Total:	$M_{Ges} =$	233,7 kgm



42608544.eps

2. Specifying the device base



Using the loads calculated, the device base is determined from the table:

Starting with the smallest device base, the next highest value is selected for M_{Ges} in the table.

M_{Ges} is greater than the given maximum value for the device base	M_{Ges} in the given range	
	Check G_{Ges}	
Check next highest device base in the table	G_{Ges} is outside the given range	G_{Ges} is within the given range
	Check next highest device base in the table	Device base can be used for the calculated loads

The table shows that the calculated values $M_{Ges} = 233,7 \text{ kgm}$ and $G_{Ges} = 315 \text{ kg}$ result in a device base dimension of $e_{Ka} = 800 \text{ mm}$.

3. Selecting the crane

$l_{HT} = 4 \text{ m}$

Crane profile section	Crane span dimension l_{Kr}	Table
Aluline 180	3.1 m	B

For cost reasons and due to the low deadweight, smaller profile sections should preferably be used.

4. Results from the tables

The calculated values

- $e_{Ka} = 800 \text{ mm}$
- $M_{Ges} = 250 \text{ kgm}$
- $G_{Ges} = 315 \text{ kg}$

result in the following values from table B:

- Crane span dimension: $l_{Kr} = 3.1 \text{ m}$
- Crane runway: Aluline 180
- Suspension distance: $l_W = 2.9 \text{ m}$
- Suspension load: $G_{AB} = 815 \text{ kg}$



Intermediate values for l_{Kr} and l_{HT} must not be interpolated.

Manipulator cranes from the selection table

Table A
Aluline 120 crane

e _{Ka} [mm]	M _{Ges} [kgm]	G _{Ges} [kg]	l _{Kr} [m]	l _{HT} = 2m				l _{HT} = 3m				
				Aluline 120		Aluline 180		l _{Kr} [m]	Aluline 120		Aluline 180	
				l _w [m]	G _{AB} [kg]	l _w [m]	G _{AB} [kg]		l _w [m]	G _{AB} [kg]	l _w [m]	G _{AB} [kg]
550	25	50 - 100	1,50 - 1,85	1,0 - 3,0	-20 / 180	1,0 - 5,3	5 / 240	2,50 - 2,85	1,0 - 3,0	-20 / 180	1,0 - 5,3	5 / 240
		100 - 150		1,0 - 2,7	-15 / 235	1,0 - 4,8	20 / 290	2,50 - 2,85	1,0 - 2,6	-15 / 240	1,0 - 4,8	20 / 295
		150 - 200		1,0 - 2,4	-10 / 295	1,0 - 4,4	20 / 345	2,50 - 2,85	1,0 - 2,4	-5 / 300	1,0 - 4,4	25 / 350
		200 - 300		1,0 - 2,1	0 / 405	1,0 - 3,9	20 / 455	2,50 - 2,50	1,0 - 2,0	0 / 415	1,0 - 3,8	25 / 460
		300 - 400				1,0 - 3,5	25 / 560					
		400 - 500				1,0 - 3,2	25 / 670					
	50	50 - 100	1,50 - 1,85	1,0 - 2,9	-50 / 210	1,0 - 5,1	-25 / 260	2,50 - 2,85	1,0 - 2,9	-55 / 215	1,0 - 5,2	-25 / 250
		100 - 150		1,0 - 2,5	-45 / 265	1,0 - 4,7	-10 / 310	2,50 - 2,70	1,0 - 2,6	-45 / 270	1,0 - 4,7	-10 / 310
		150 - 200		1,0 - 2,3	-40 / 320	1,0 - 4,3	5 / 365	2,50 - 2,55	1,0 - 2,3	-40 / 325	1,0 - 4,3	5 / 365
75	50 - 100	1,50 - 1,85	1,0 - 2,5	-75 / 300	1,0 - 6,5	-55 / 305	2,50 - 2,55				1,0 - 5,1	-60 / 265
	100 - 150				1,0 - 6,0	-40 / 360						
	150 - 200				1,0 - 5,6	-25 / 410						
	200 - 300				1,0 - 5,0	-10 / 520						
	300 - 400				1,0 - 4,5	15 / 630						
	400 - 500				1,0 - 4,2	15 / 740						
650	25	50 - 100	1,50 - 1,85	1,0 - 3,1	-15 / 175	1,0 - 5,4	10 / 235	2,50 - 2,85	1,0 - 3,1	-15 / 175	1,0 - 5,3	15 / 235
		100 - 150		1,0 - 2,7	-5 / 225	1,0 - 4,9	20 / 285	2,50 - 2,85	1,0 - 2,7	-5 / 235	1,0 - 4,8	25 / 290
		150 - 200		1,0 - 2,5	5 / 280	1,0 - 4,5	25 / 335	2,50 - 2,85	1,0 - 2,4	5 / 290	1,0 - 4,4	25 / 345
		200 - 300		1,0 - 2,1	5 / 385	1,0 - 3,9	25 / 435	2,50 - 2,55	1,0 - 2,1	0 / 400	1,0 - 3,9	30 / 450
		300 - 400		1,0 - 1,9	10 / 490	1,0 - 3,6	30 / 540					
		400 - 500				1,0 - 3,3	30 / 640					
	50	50 - 100	1,50 - 1,85	1,0 - 2,9	-45 / 200	1,0 - 5,2	-20 / 255	2,50 - 2,85	1,0 - 3,0	-45 / 205	1,0 - 5,2	-20 / 250
		100 - 150		1,0 - 2,6	-35 / 250	1,0 - 4,7	0 / 305	2,50 - 2,80	1,0 - 2,6	-35 / 255	1,0 - 4,7	0 / 305
		150 - 200		1,0 - 2,4	25 / 305	1,0 - 4,4	15 / 355	2,50 - 2,65	1,0 - 2,4	-25 / 305	1,0 - 4,4	20 / 360
		200 - 300		1,0 - 2,1	15 / 410	1,0 - 3,9	20 / 460					
		300 - 400				1,0 - 3,5	25 / 560					
		400 - 500				1,0 - 3,2	30 / 660					
	75	50 - 100	1,50 - 1,85	1,0 - 2,8	-75 / 235	1,0 - 5,0	-45 / 275	2,50 - 2,70			1,0 - 5,1	-50 / 260
		100 - 150		1,0 - 2,5	-65 / 280	1,0 - 4,6	-30 / 325	2,50 - 2,55	1,0 - 2,5	-70 / 290	1,0 - 4,6	-30 / 315
		150 - 200		1,0 - 2,3	-55 / 330	1,0 - 4,3	-10 / 375					
		200 - 300				1,0 - 3,8	5 / 480					
		300 - 400				1,0 - 3,4	15 / 580					
		400 - 500				1,0 - 3,2	20 / 660					
100	150 - 200	1,50 - 1,85			1,0 - 4,1	-40 / 395						
	200 - 300		1,0 - 3,7	-25 / 500								
	300 - 400			1,0 - 3,4	10 / 600							

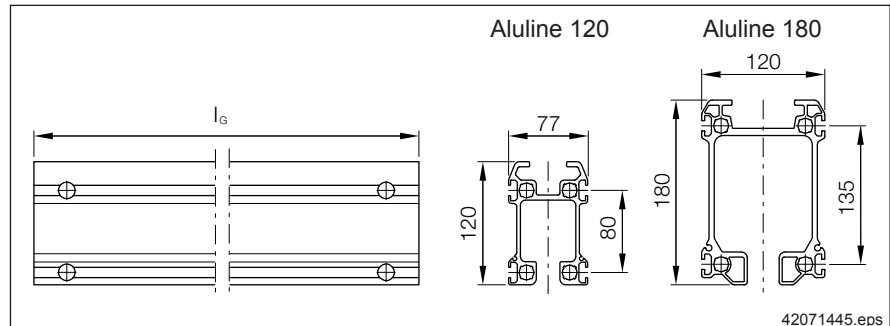
Table B
Aluline 180 crane

eKa [mm]	M _{Ges} [kgm]	G _{Ges} [kg]	l _{HT} = 3m			l _{HT} = 4m		
			l _{Kr} [m]	Aluline 180		l _{Kr} [m]	Aluline 180	
	l _w [m]	G _{AB} [kg]			l _w [m]		G _{AB} [kg]	
550	75	50 - 150	2,00 - 2,75	1,0 - 4,3	-60 / 365	3,00 - 3,75	1,0 - 4,4	-55 / 365
		150 - 400		1,0 - 3,2	-25 / 670	3,00 - 3,75	1,0 - 3,2	-20 / 665
		400 - 600		1,0 - 2,8	10 / 915	3,00 - 3,40	1,0 - 2,8	20 / 905
		600 - 800		1,0 - 2,4	10 / 1170	3,00 - 3,10	1,0 - 2,4	20 / 1160
	100	50 - 300	2,00 - 2,75	1,0 - 3,5	-95 / 565	3,00 - 3,75	1,0 - 3,5	-90 / 560
		300 - 500		1,0 - 2,9	-10 / 810	3,00 - 3,45	1,0 - 3,0	-5 / 800
		500 - 700		1,0 - 2,5	5 / 1070	3,00 - 3,10	1,0 - 2,5	20 / 1055
	150	700 - 800	2,00 - 2,75	1,0 - 2,4	0 / 1170	3,00 - 3,00	1,0 - 2,4	15 / 1175
		200 - 300		1,0 - 3,4	-110 / 670	3,00 - 3,45	1,0 - 3,5	-105 / 605
300 - 500		1,0 - 2,8		-75 / 915	3,00 - 3,15	1,0 - 2,8	-70 / 800	
650	75	50 - 200	2,00 - 2,75	1,0 - 4,1	-50 / 420	3,00 - 3,75	1,0 - 4,1	-45 / 415
		200 - 400		1,0 - 3,3	10 / 650	3,00 - 3,75	1,0 - 3,3	15 / 650
		400 - 600		1,0 - 2,8	15 / 880	3,00 - 3,50	1,0 - 2,8	25 / 880
		600 - 800		1,0 - 2,5	15 / 1105	3,00 - 3,20	1,0 - 2,5	25 / 1100
	100	50 - 100	2,00 - 2,75	1,0 - 4,5	-80 / 315	3,00 - 3,75	1,0 - 4,5	-75 / 320
		100 - 300		1,0 - 3,6	-60 / 555	3,00 - 3,75	1,0 - 3,6	-55 / 550
		300 - 600		1,0 - 2,8	10 / 900	3,00 - 3,35	1,0 - 2,8	20 / 895
		600 - 800		1,0 - 2,5	10 / 1125	3,00 - 3,10	1,0 - 2,5	25 / 1120
	150	100 - 200	2,00 - 2,75	1,0 - 3,9	-130 / 480	3,00 - 3,75	1,0 - 3,9	-125 / 480
		200 - 400		1,0 - 3,2	-90 / 705	3,00 - 3,45	1,0 - 3,2	-85 / 690
		400 - 600		1,0 - 2,7	-10 / 935	3,00 - 3,15	1,0 - 2,7	-5 / 925
		600 - 800		1,0 - 2,4	0 / 1155			
250	500 - 600	2,00 - 2,75	1,0 - 2,6	-80 / 1010				
	600 - 700		1,0 - 2,5	-50 / 1125				
800	75	50 - 100	2,00 - 2,75	1,0 - 4,1	-35 / 405	3,00 - 3,75	1,0 - 4,1	-30 / 405
		200 - 400		1,0 - 3,4	25 / 625	3,00 - 3,75	1,0 - 3,4	35 / 630
		400 - 700		1,0 - 2,8	30 / 940	3,00 - 3,45	1,0 - 2,7	30 / 945
		700 - 800		1,0 - 2,6	30 / 1125	3,00 - 3,30	1,0 - 2,6	40 / 1020
	100	50 - 200	2,00 - 2,75	1,0 - 4,1	-65 / 420	3,00 - 3,75	1,0 - 4,1	-60 / 420
		200 - 400		1,0 - 3,3	5 / 640	3,00 - 3,75	1,0 - 3,3	10 / 640
		400 - 600		1,0 - 2,9	20 / 850	3,00 - 3,50	1,0 - 2,9	30 / 855
		600 - 800		1,0 - 2,5	25 / 1020	3,00 - 3,20	1,0 - 2,5	35 / 1025
	150	50 - 100	2,00 - 2,75	1,0 - 4,5	130 / 355	3,00 - 3,75	1,0 - 4,5	-125 / 365
		100 - 300		1,0 - 3,5	-105 / 565	3,00 - 3,75	1,0 - 3,6	-100 / 555
		300 - 500		1,0 - 3,0	-10 / 780	3,00 - 3,45	1,0 - 3,1	-5 / 780
		500 - 700		1,0 - 2,6	10 / 960	3,00 - 3,20	1,0 - 2,7	25 / 965
250	700 - 800	2,00 - 2,75	1,0 - 2,5	20 / 1055	3,00 - 3,05	1,0 - 2,5	30 / 1060	
	300 - 500		1,0 - 2,9	140 / 830	3,00 - 3,10	1,0 - 2,9	135 / 815	
	500 - 700		1,0 - 2,6	-15 / 1030				
	700 - 800		1,0 - 2,5	-10 / 1130				

5 Monorail track, crane runway and crane girder basic components

5.1 Crane and track elements

5.1.1 Straight section (item 1)



Item	Designation	Length l_G [mm]	Aluline 120		Aluline 180	
			Weight [kg]	Part no.	Weight [kg]	Part no.
1	Straight section	1000	5,3	855 001 44	9,9	855 011 44
		2000	10,6	855 002 44	19,8	855 012 44
		3000	15,9	855 003 44	29,7	855 013 44
		4000	21,2	855 004 44	39,6	855 014 44
		5000	26,5	855 005 44	49,5	855 015 44
		6000	31,8	855 006 44	59,4	855 016 44
		7000	37,1	855 007 44	69,3	855 017 44
		8000	42,4	855 008 44	79,2	855 018 44

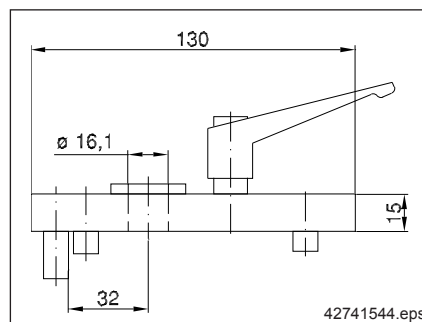
The ends of KBK Aluline straight track sections, which are made of extruded, anodized special profiles, feature 4 bore holes for bolting the individual track sections together or for fitting end caps.

Special lengths can be supplied ex works (minimum length: 150 mm).

Temperature range

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

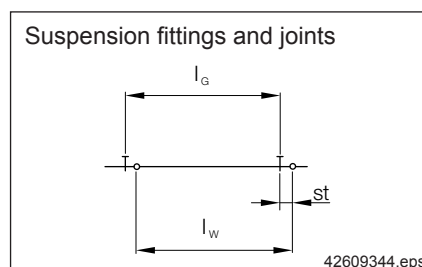
Finish: anodized



A special jig with special drills is required for cutting shorter section lengths on site (see operating instructions).

Item	Designation	Weight [kg]	Part no.
5	Drilling jig for bolted joints	0,35	712 123 47
	Special 16,1 mm dia. drill	0,25	712 175 47

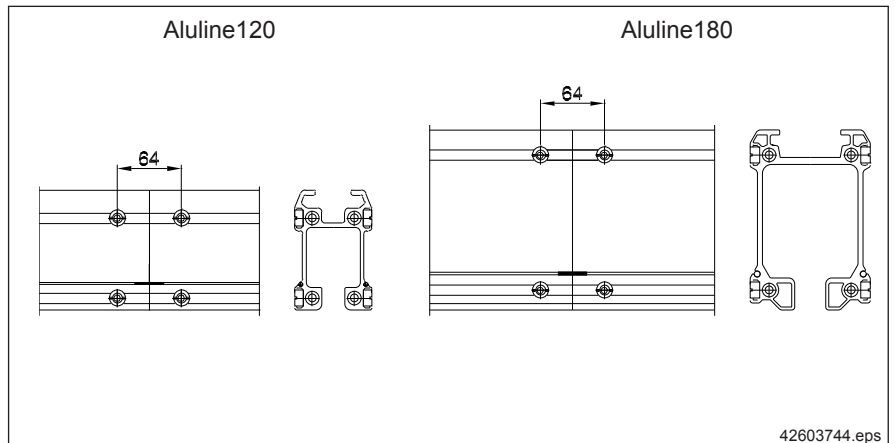
Suspension of straight sections



See sections 3.4 to 3.6 for distance between supports l_w and distance st of joint from suspension fitting.

Drilling jig (Item 5)

5.2 Joint bolt set (Item 2)



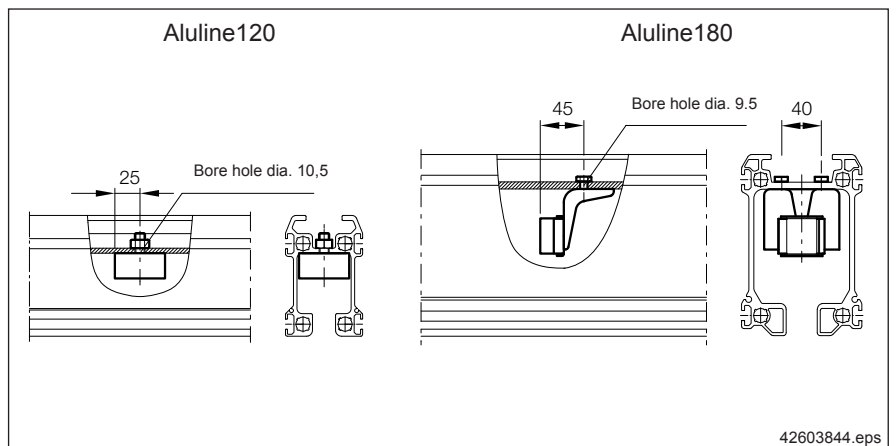
Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
2	Joint bolt set	0,45	855 060 44	0,45	855 060 44

The joint bolt set for one track joint consists of four connecting anchors with connecting sleeves and springs. Alignment pins facilitate alignment of the straight track sections.

The connection is a positive and friction connection.

Finish: black coated

5.3 Internal buffer stop (Item 6)



Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
6	Internal buffer stop	0,1	855 062 44	0,2	855 098 44

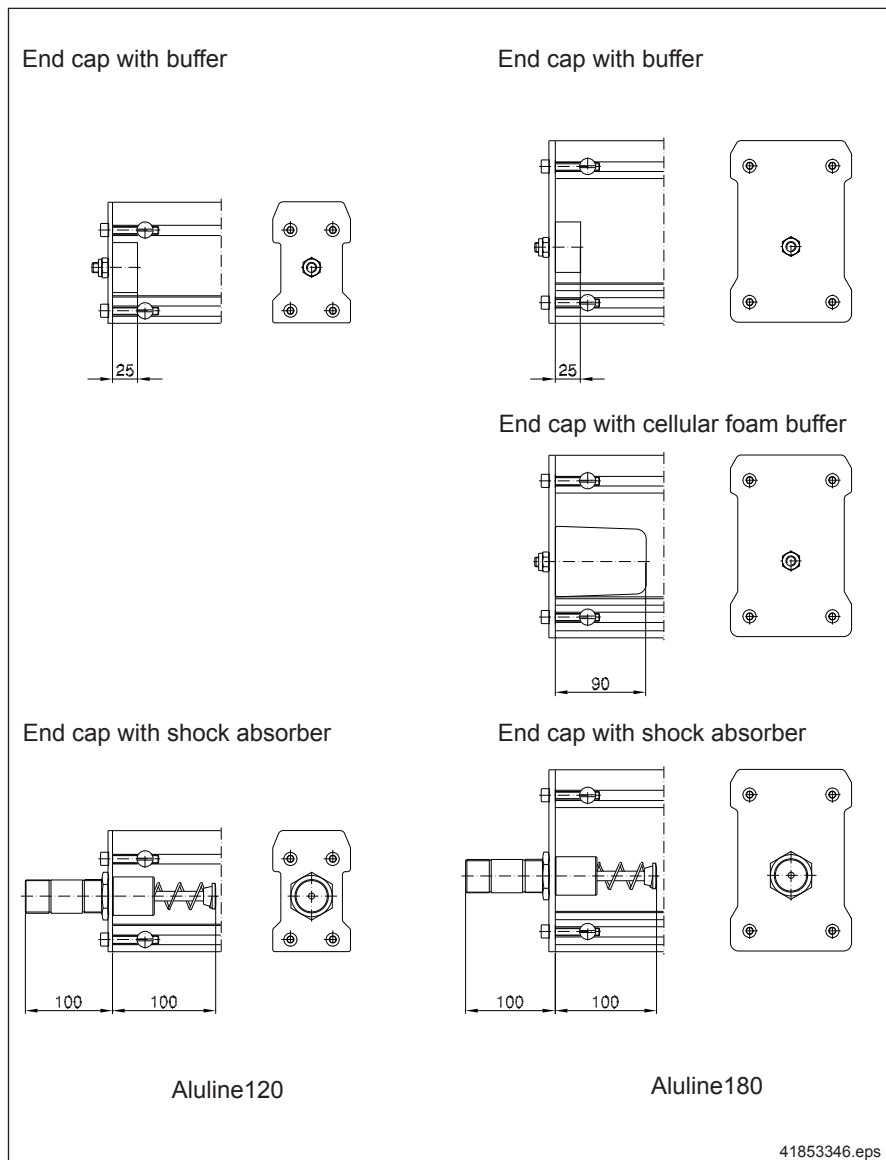
An internal buffer stop is fitted as protection for accumulated cable sliders (item 85) and cable trolleys (item 86) and to limit crane or hoist trolley travel. Drill holes in the top of the track section to secure the internal buffer stop.

Finish:

Aluline 120: Rubber

Aluline 180: Zinc-galvanised steel with buffer element

5.4 End cap with buffer (Item 7) (Item 7e)



Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
7	End cap with buffer	0,6	855 040 44	1,2	855 042 44
7e	End cap with cellular foam buffer			1,4	855 073 44
	End cap with shock absorber	1,3	855 044 44	1,2	855 046 44

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

End caps with rubber buffers are used for lighter loads.

End caps with cellular foam buffers can be used on Aluline 180 for heavy loads, electrical and pneumatic drives and for crane runways.

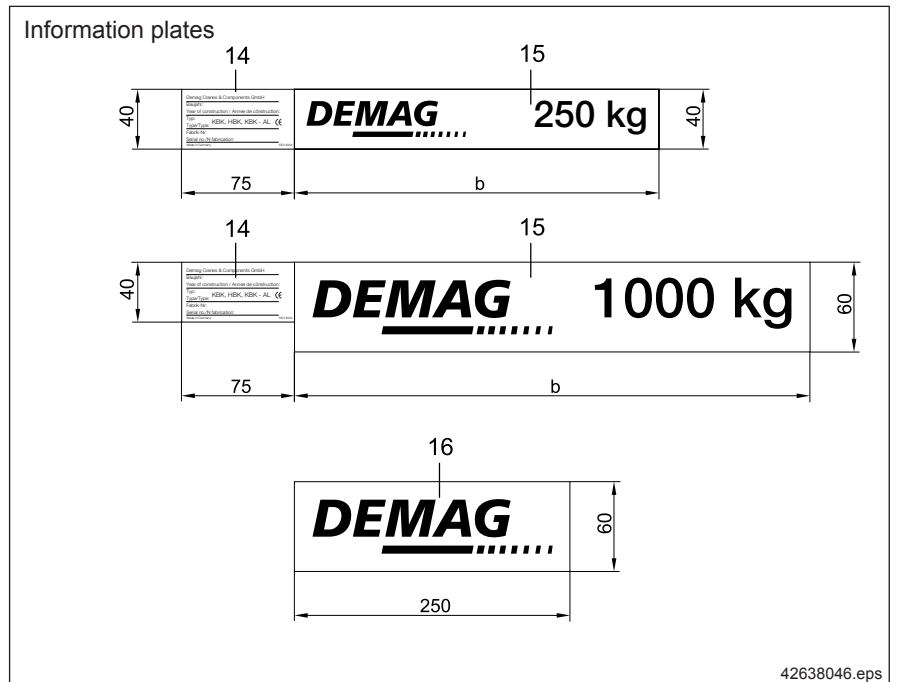
End caps with shock absorbers are used for installations featuring manipulators.

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

Finish: black (RAL 9005), steel

5.5 Information plates

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



Item	Designation	Load capacity [kg]	40 high		60 high	
			b [mm]	Part no.	b [mm]	Part no.
14	Manufacturer's plate	-	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		
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
16	Name plate	-	-	-	250	850 150 44

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 and in such a manner that operators can see the permissible load capacity from any operating position. The load capacity stated on the hoist and on the crane or suspension monorail must be identical.

60 mm high plates are recommended for use on Aluline 180 sections.

Finish:

Manufacturer's plate of self-adhesive aluminium foil

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

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.

Supporting structure

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

Short suspension fitting

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

Sloping steel superstructure

Suspension from inclined steelwork is also possible.

Stiffeners

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

For monorails and crane runways, transverse stiffeners should be provided approx. every 15 m for KBK Aluline 120 and approx. every 20 m for KBK Aluline 180. One stiffener is usually sufficient in the longitudinal direction. All crane runways must be provided with stiffeners.

Transverse and longitudinal stiffeners are of V-type design.

V-type suspensions

V-type suspension fittings may also replace missing suspension points in vertical suspension arrangements.

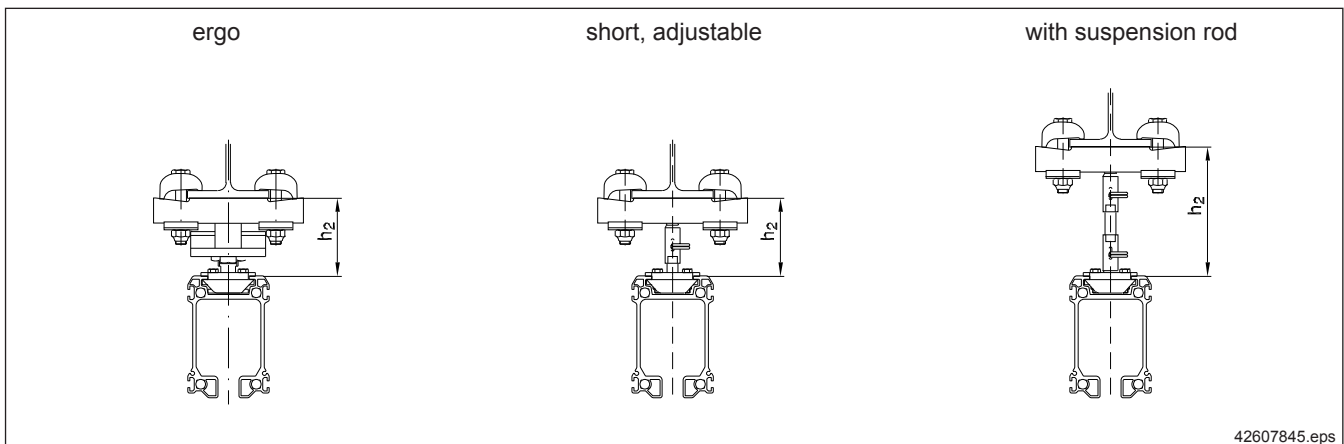
Max. vertical dimension as for vertical suspension arrangements

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

	Thread	Load capacity ¹⁾ [kg]	Suspension dimension h ₂			h ₁ max. Threaded suspension rod length [m]
			ergo [mm]	Short suspension fitting adjustable [mm]	Suspension fitting with suspension rod 80/100 mm	
Aluline 120	M10	750	73 ± 4	73 ± 4	134 ± 9	2
Aluline 180	M16 x 1,5	1400	115 ± 7	115 ± 7	195 ± 14	3

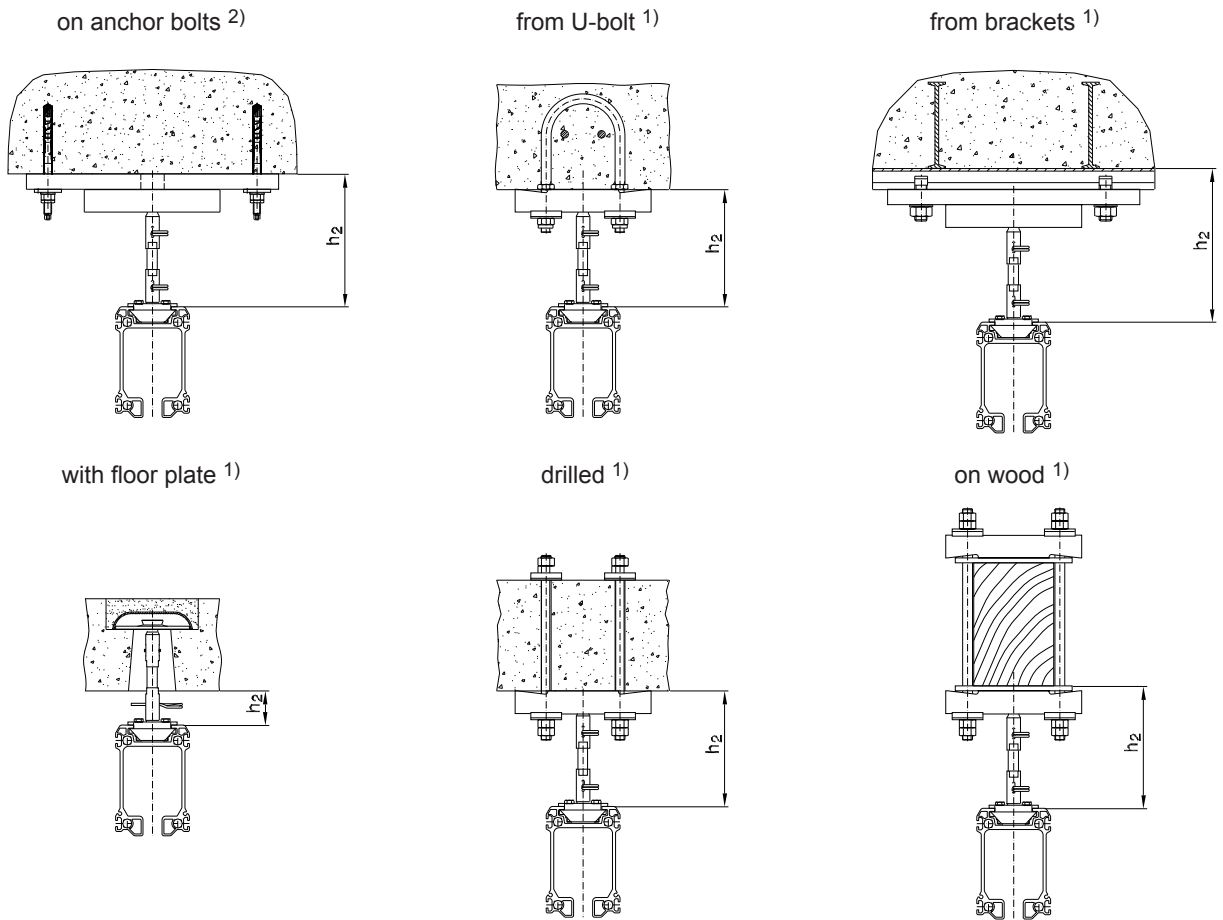
1) Static or alternating load

Examples

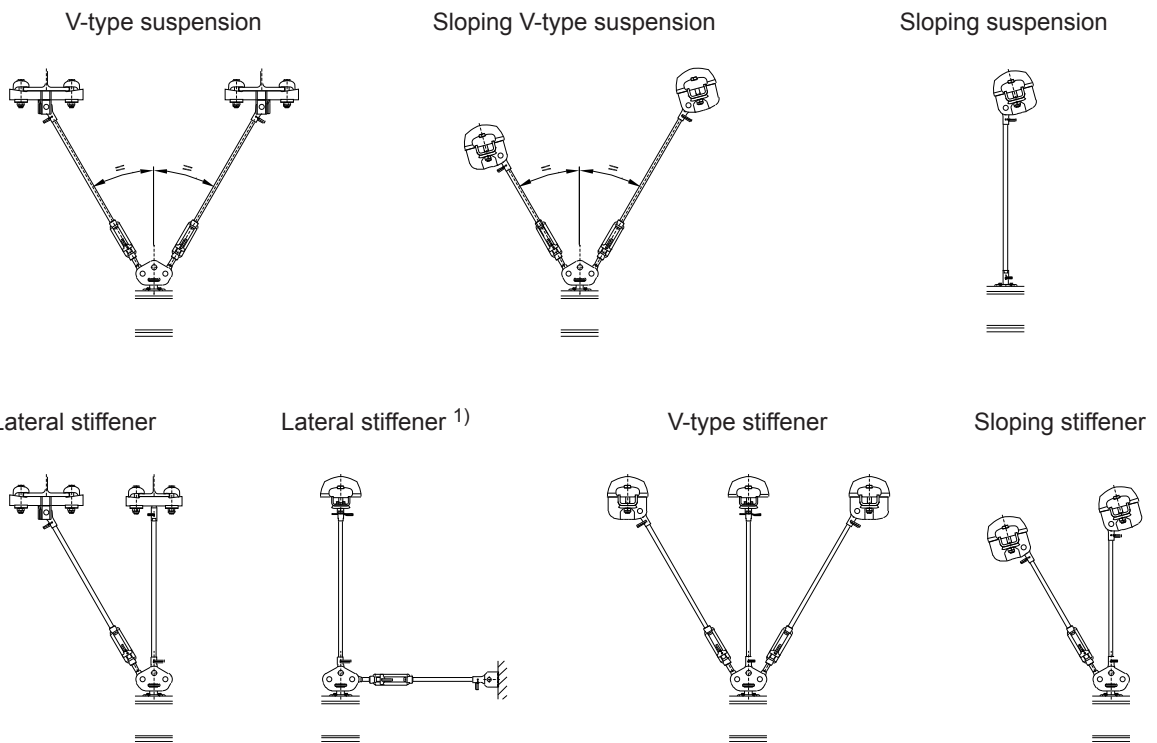


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Examples



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

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6.2 Vertical suspension on I-beams

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

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

6.2.1 I-beam assignment

Section		Suitable for profile sections		
		I	IPE	HE-B (IPB)
Aluline 120	Suspension bracket A	140 - 260	120 - 270	100 - 140
	Suspension bracket B	-	220 - 450	120 - 200
Aluline 180	Suspension bracket A	140 - 320	140 - 270	100 - 120
	Suspension bracket B	220 - 450	180 - 500	100 - 200

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

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



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.

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

6.2.2 Suspension with suspension rod

1) Max. girder gradient $\pm 1,5^\circ$						
Section	h_2 [mm]	m [mm]	n [mm]	w [mm]	x [mm]	z [mm]
Aluline 120	$54 + h_1 \pm 9$	M10	70	60	40	4
Aluline 180	$95 + h_1 \pm 14$	M16x1,5	90	95	60	5

Section		a [mm]	f [mm]	c [mm]	d [mm]
Aluline 120	Suspension bracket A	205	66 - 142	70	27
	Suspension bracket B	270	110 - 210		23
Aluline 180	Suspension bracket A	221	71 - 139	72	37
	Suspension bracket B	290	100 - 208		36

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Complete suspension fittings, pre-assembled (Item 30)

Item	Designation	Suspension rod h_1 [mm]	Upper suspension bracket Type	Aluline 120		Aluline 180	
				Weight [kg]	Part no.	Weight [kg]	Part no.
30	Complete suspension fitting with suspension rod	80	A	2,10	855 169 44	-	-
			B	2,33	517 729 46	-	-
		100	A	-	-	4,18	855 175 44
			B	-	-	5,02	855 176 44
		300	A	2,23	517 730 46	4,50	517 740 46
			B	2,47	517 731 46	5,34	517 741 46
		600	A	2,42	517 732 46	4,97	517 742 46
			B	2,65	517 733 46	5,81	517 743 46
		1000	A	2,66	517 734 46	5,60	517 744 46
			B	2,90	517 735 46	6,44	517 745 46
Load capacity [kg]				750		1400	

Suspension fitting in component parts

Item	Designation	h ₁ [mm]	Aluline 120			Aluline 180		
			Weight [kg]	Part no.	[Qty / susp.]	Weight [kg]	Part no.	[Qty / susp.]
25	Suspension bracket A		0,65	980 302 44	1	1,20	982 302 44	1
	Suspension bracket B		0,85	980 304 44		2,40	982 304 44	
26	Upper suspension clamp		0,45	980 326 44	2	1,00	982 326 44	2
40	Ball head suspension rod		0,08	980 333 44	2	0,15	982 333 44	2
41	Suspension rod	80	0,07	980 346 44	1			1
		100				0,22	982 446 44	
		300	0,18	980 347 44		0,53	982 447 44	
		600	0,33	980 348 44		1,01	982 448 44	
		1000	0,53	980 349 44		1,64	982 449 44	
		3000			-	4,80	982 445 44	
42	Track suspension clamp		0,30	855 020 44	1	0,80	855 025 44	1
43	Spring clip		0,01	342 200 99	2	0,02	342 201 99	2
	SWL			750 kg			1400 kg	

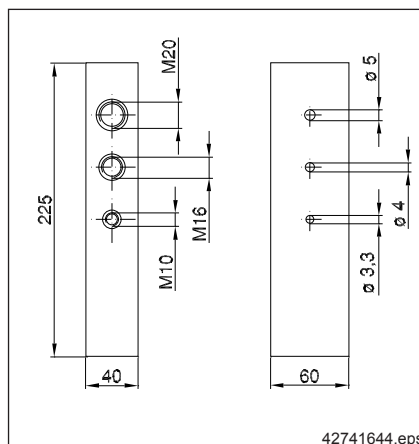
The ball head suspension rod (item 40) and suspension rod coupling (item 50) are provided with slotted holes. The threaded rod (item 41) has a cross hole at both ends. If standard threaded suspension rods have to be shortened, a new transverse hole must be drilled at the end of the threaded rod.

Finish: galvanized

Wear parts

Item	Designation	Aluline 120		Aluline 180	
		Weight/unit [kg]	Part no.	Weight/unit [kg]	Part no.
42d	Sliding shell for ball-head suspension rod/ball head bolt (25 off)	0,02	980 815 44	0,05	851 394 44

Drilling jig (Item 38)



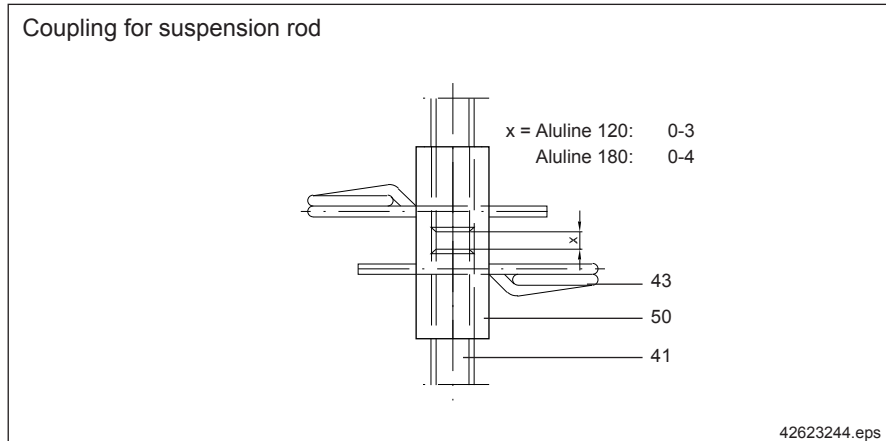
The drilling jig facilitates drilling transverse holes in suspension rods. This ensures that the distance to the end of the rod is reliably maintained.

Suspension

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

Finish: galvanized

6.2.3 Coupling for suspension rod (Item 50)

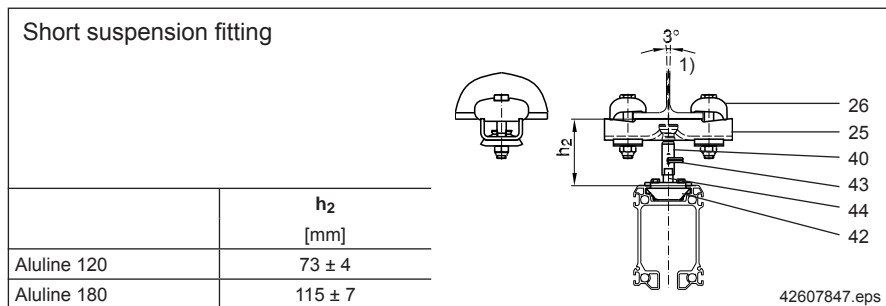


Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
50	Coupling for suspension rod	0,10	980 277 44	0,17	982 277 44

Use couplings to connect several suspension rods.

Finish: galvanized

6.2.4 Short suspension arrangement with height adjustment



Complete suspension fittings, pre-assembled (Item 31)

Item	Designation	Upper suspension bracket Type	Aluline 120		Aluline 180	
			Weight [kg]	Part no.	Weight [kg]	Part no.
31	Complete suspension fitting, short, adjustable	A	2,02	855 167 44	3,98	855 173 44
		B	2,25	517 727 46	4,82	855 174 44
SWL			750 kg		1400 kg	

Suspension fitting in component parts

Item	Designation	Aluline 120			Aluline 180		
		Weight [kg]	Part no.	[Qty / susp.]	Weight [kg]	Part no.	[Qty / susp.]
25	Suspension bracket A	0,65	980 302 44	1	1,20	982 302 44	1
	Suspension bracket B	0,85	980 304 44		2,40	982 304 44	
26	Upper suspension clamp	0,45	980 326 44	2	1,00	982 326 44	2
40	Ball head suspension rod	0,08	980 333 44	1	0,15	982 333 44	1
44	Ball head bolt	0,06	980 283 44	1	0,14	982 283 44	1
42	Track suspension clamp	0,30	855 020 44	1	0,80	855 025 44	1
43	Spring clip	0,01	342 200 99	1	0,02	342 201 99	1
SWL		750 kg			1400 kg		

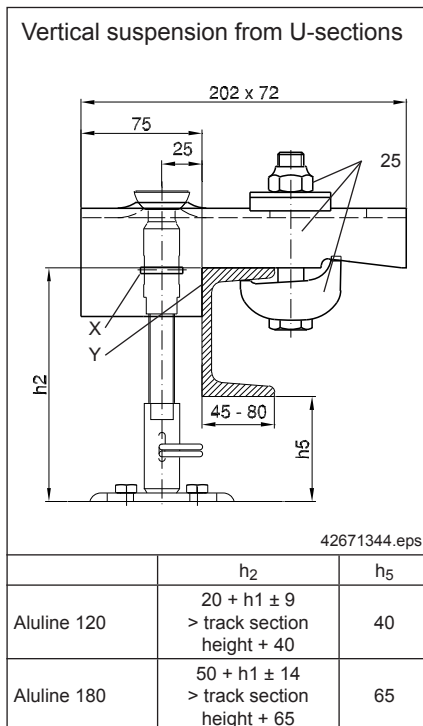
A particularly low suspension headroom can be achieved using the ball head bolt/ball head suspension rod connection arrangement with spring clip. Slotted holes facilitate height adjustment.

Finish: galvanized

Wear parts

Item	Designation	Aluline 120		Aluline 180	
		Weight/unit [kg]	Part no.	Weight/unit [kg]	Part no.
42d	Sliding shell for ball-head suspension rod/ball head bolt (25 off)	0,02	980 815 44	0,05	851 394 44

6.3 Vertical suspension from U-sections



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

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

Item	Section	Weight [kg]	Part no.	Max. suspension load G_{AB} [kg]	Girder section
25	Aluline 120	2	980 377 44	750	U 80 - U 220
				750	U 80 - U 100
	Aluline 180	2	984 377 44	1000	U 120 - U 140
				1250	U 160
				1400	U 180 - U 220

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

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

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

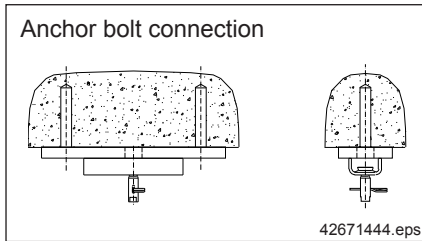
The ball head suspension rods, the threaded rods, the spring clip and the suspension clamp must be ordered separately.

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.

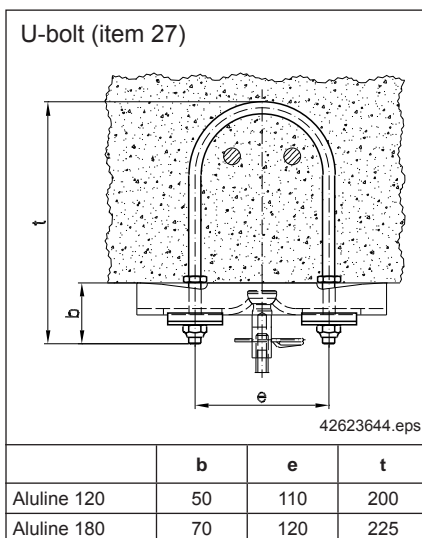
6.4 Ceiling attachment

6.4.1 Suspension with anchor bolt connection



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

6.4.2 U-bolt with upper suspension bracket A



Item	Designation	Qty/ susp.	Aluline 120		Aluline 180	
			Weight [kg]	Part no.	Weight [kg]	Part no.
27	U-bolt (complete)	1	0,15	980 330 44	0,8	982 330 44

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.

Finish: galvanized

6.4.3 Suspension from ceiling section rails with upper suspension bracket A

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

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 33

	d	m 1)
Aluline 120	70	M10
Aluline 180	80	M16

Item	Designation	Qty/ susp.	Aluline 120		Aluline 180	
			Weight [kg]	Part no.	Weight [kg]	Part no.
32	Packing plate	2	0,1	980 429 44	0,21	984 329 44
33	Lock nut	2	-	334 610 44	-	334 614 44
51	Packing plate for upper suspension bracket	1	1,6	984 088 44	1,6	984 088 44

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

A-type upper suspension brackets are secured to section rails cast in concrete using a packing plate and 2 special bolts with nuts and tab washers. The M10 for KBK Aluline 120 and M16 for KBK Aluline 180 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.

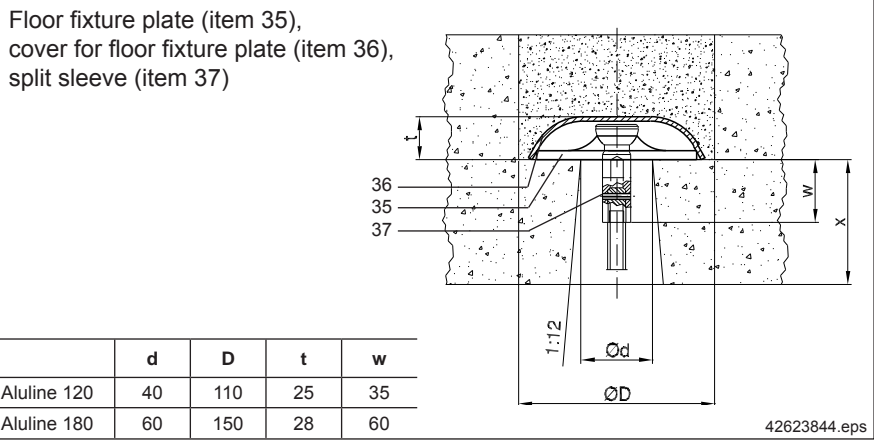
Important: This KBK suspension fitting must be regarded as a concentrated load on the securing section rail (low load-bearing capacity).

Finish: galvanized

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

See technical data sheet 203 072 44.

6.4.4 Suspension with floor fixture plate and cover



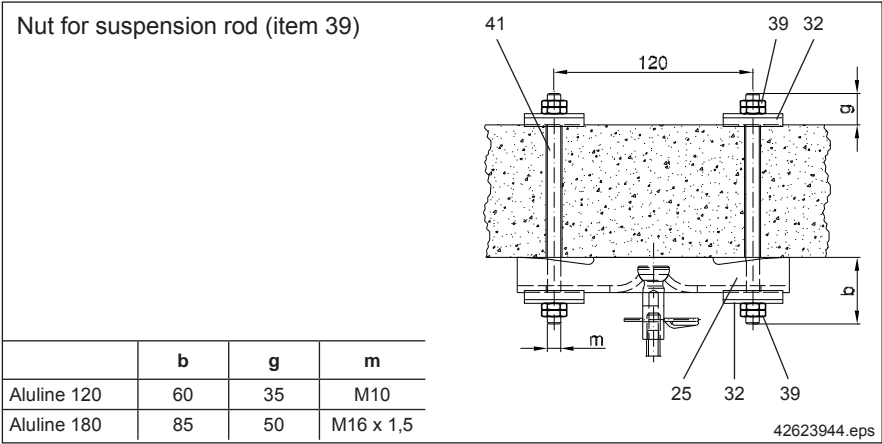
Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
35	Floor slab	0,2	980 336 44	0,4	982 336 44
36	coverage	0,2	980 338 44	0,2	982 338 44
37	Split sleeve 3 x 18	-	345 095 99	-	-
	Split sleeve 4 x 26	-	-	-	345 008 99

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

Finish: galvanized

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

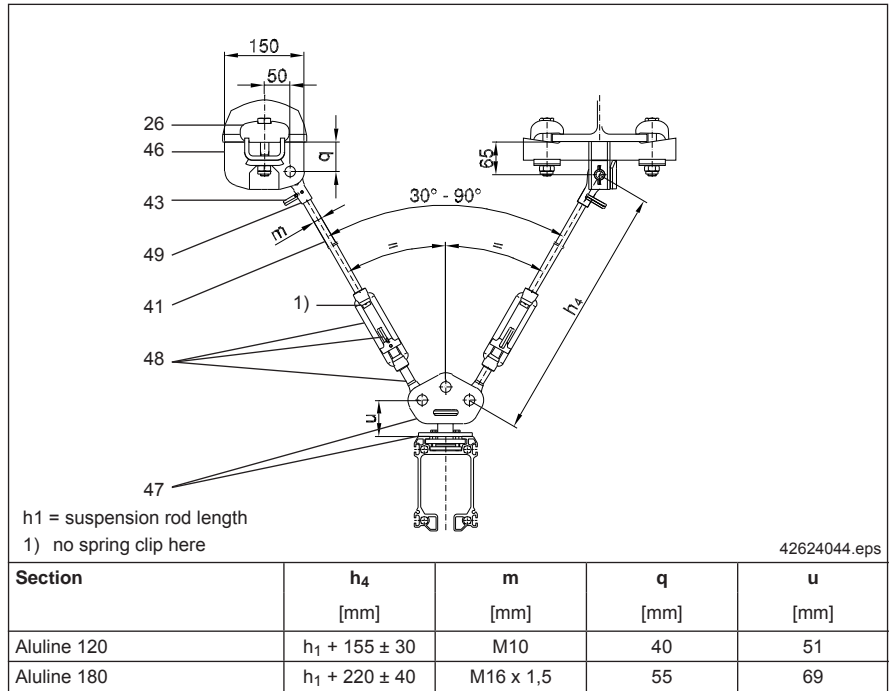
Suspension



Item	Designation	Aluline 120	Aluline 180
		Part no.	Part no.
39	Nut for suspension rod	150 509 99	150 678 99

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

6.5 V-type suspension



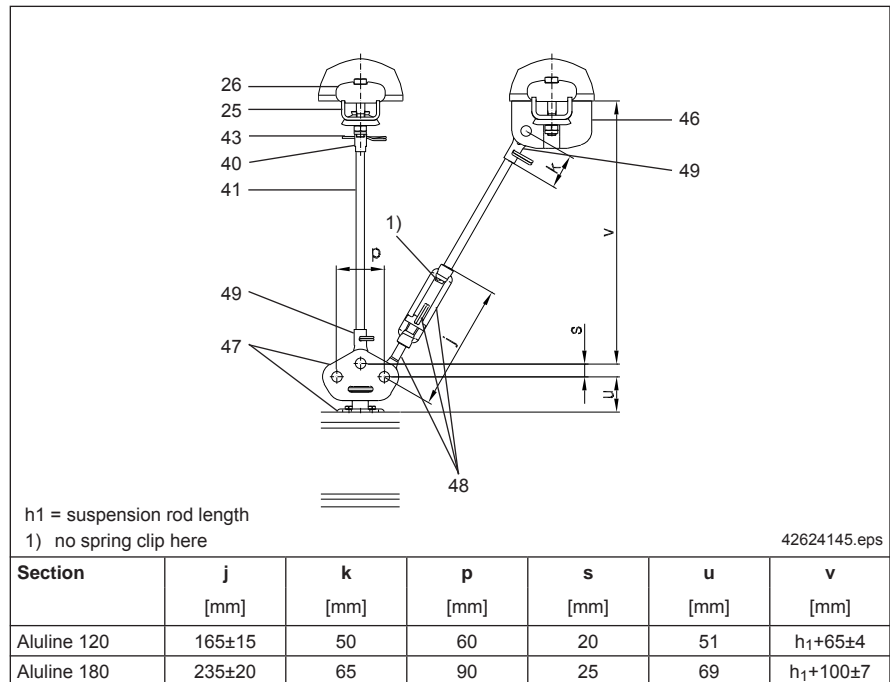
Item	V-type suspension fitting, parallel or perpendicular	h1 [mm]	Aluline 120			Aluline 180		
			Weight [kg / unit]	Part no.	[Qty / susp.]	Weight [kg / unit]	Part no.	[Qty / susp.]
26	Upper suspension clamp		0,45	980 326 44	4	1,00	982 326 44	4
40	Ball head suspension rod		0,08	980 333 44		0,15	982 333 44	
41	Suspension rod	80	0,07	980 346 44	2			2
		100				0,22	982 446 44	
		300	0,18	980 347 44		0,53	982 447 44	
		600	0,33	980 348 44		1,01	982 448 44	
		1000	0,53	980 349 44		1,64	982 449 44	
		3000			-	4,80	982 445 44	
43	Spring clip		0,01	342 200 99	2	0,02	342 201 99	2
46	V-type upper suspension bracket B		1,39	980 360 44	2	3,20	984 075 44	2
47	V-type suspension bracket		1,24	855 160 44		2,56	855 166 44	1
54	Pin with BoClip for third hinged end piece		0,08	851 305 44		0,16	851 317 44	
48	Suspension rod strainer		0,29	980 310 44	2	0,85	984 085 44	2
49	Hinged end piece		0,10	980 315 44	2	0,30	984 083 44	2
	SWL			750 kg			1400 kg	

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

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

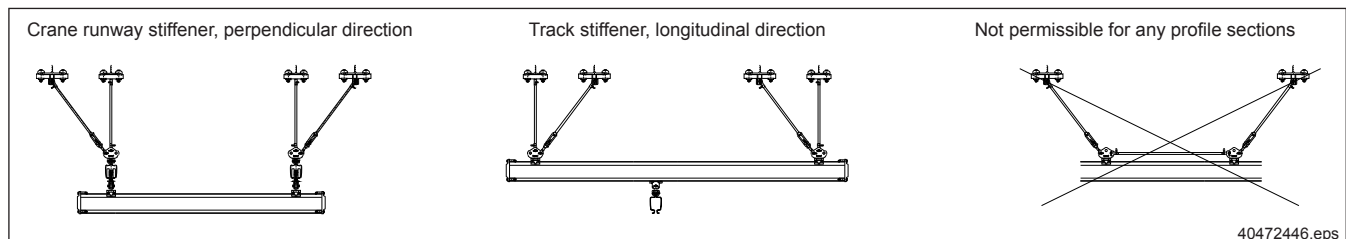
Finish: galvanized

6.6 Stiffener



Item	Stiffener, parallel or perpendicular	h1 [mm]	Aluline 120			Aluline 180		
			Weight [kg / unit]	Part no.	[Qty / susp.]	Weight [kg / unit]	Part no.	[Qty / susp.]
25	Suspension bracket A		0,65	980 302 44	1	1,20	982 302 44	1
	Suspension bracket B		0,85	980 304 44		2,40	982 304 44	
26	Upper suspension clamp		0,45	980 326 44	4	1,00	982 326 44	4
40	Ball head suspension rod		0,08	980 333 44	1	0,15	982 333 44	1
41	Suspension rod	80	0,07	980 346 44	1+1			1+1
		100				0,22	982 446 44	
		300	0,18	980 347 44		0,53	982 447 44	
		600	0,33	980 348 44		1,01	982 448 44	
		1000	0,53	980 349 44		1,64	982 449 44	
		3000			-	4,80	982 445 44	
43	Spring clip		0,01	342 200 99	3	0,02	342 201 99	3
46	V-type upper suspension bracket B		1,39	980 360 44	1	3,20	984 075 44	1
47	V-type suspension bracket		1,24	855 160 44		2,56	855 166 44	1
54	Pin with BoClip for third hinged end piece		0,08	851 305 44		0,16	851 317 44	
47a	Filler plates for sloping surface		-	-	-	0,60	516 833 46	
48	Suspension rod strainer		0,29	980 310 44	1	0,85	984 085 44	1
49	Hinged end piece		0,10	980 315 44	2	0,30	984 083 44	2
SWL			750 kg			1400 kg		

Suspension

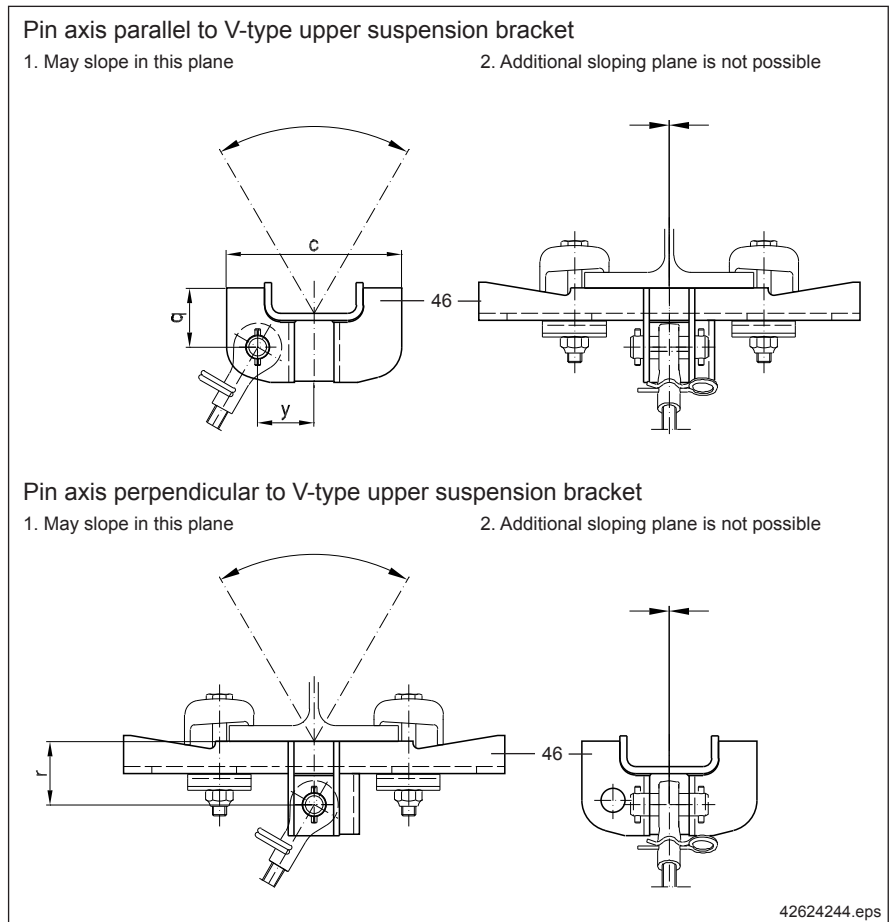


Stiffeners are fitted as shown in the diagrams. V-type hinged suspension bracket (item 47) and V-type upper suspension bracket (item 46) are connected to each other by suspension rod strainer (item 48), suspension rod (item 41) and hinged end piece (item 49). Each bolted connection with a hinged end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

6.7 Components for V-type suspension/stiffener arrangement

6.7.1 V-type upper suspension bracket (item 46)

Section	c [mm]	q [mm]	r [mm]	y [mm]
Aluline 120	125	40	45	40
Aluline 180	150	55	65	50



Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
46	V-type upper suspension bracket B	1,39	980 360 44	3,20	984 075 44

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

Possible arrangements

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

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

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

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

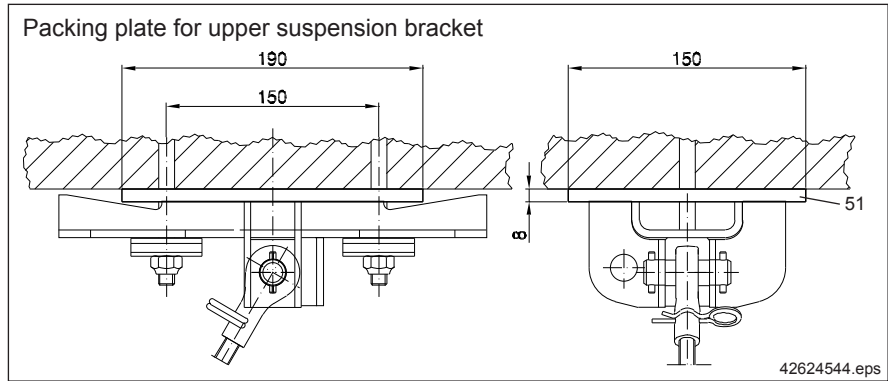
The pin axis of the V-type upper suspension bracket must always be horizontal and parallel to the pin axis of the V-type hinged suspension bracket (item 47) and perpendicular to the suspension rod axis. V-type upper suspension brackets on sloping superstructures must be anchored against movement. If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

Finish: galvanized

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.



6.7.2 Packing plate for upper suspension bracket (Item 51)

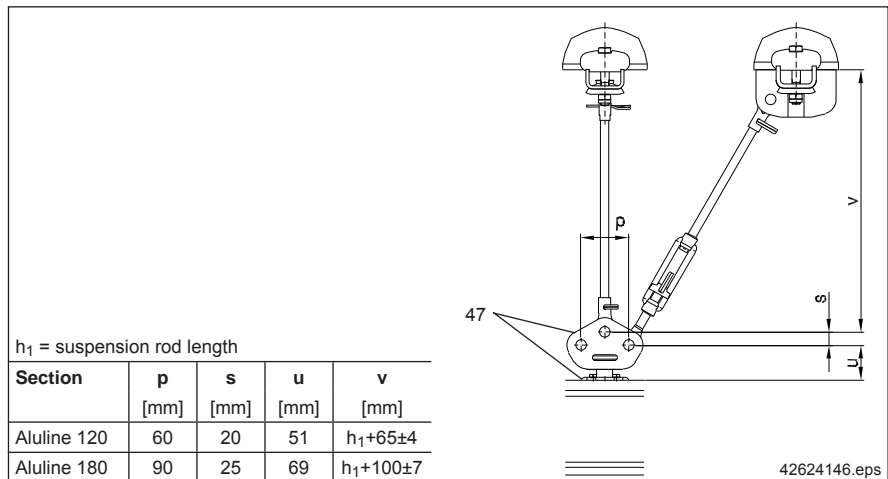


Item	Designation	Weight [kg]	Part no.
51	Packing plate for upper suspension bracket	1,79	984 088 44

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

Connections with U-bolt on request

6.7.3 V-type hinged suspension bracket (Item 47)



Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
47	V-type hinged suspension bracket	1,24	855 160 44	2,56	855 166 44
54	Pin with BoClip for third hinged end piece	0,08	851 305 44	0,16	851 317 44

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

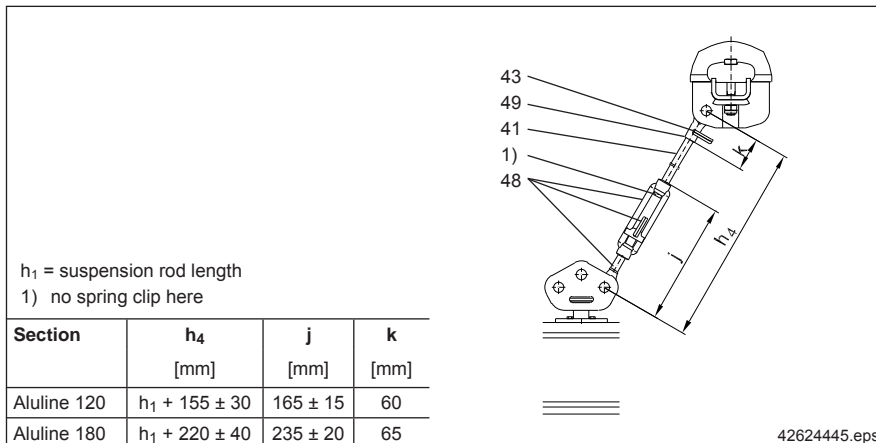
The V-type hinged suspension bracket is designed for a maximum of three suspension rod connections (suspension rod strainer or hinged end piece). On a V-type suspension arrangement, the rods are fitted to the outer holes, on a lateral stiffener to the centre and one outer hole.

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



Possible arrangements

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



Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
43	Spring clip	0,01	342 200 99	0,02	342 201 99
48	Suspension rod strainer	0,29	980 310 44	0,85	984 085 44
49	Hinged end piece	0,10	980 315 44	0,30	984 083 44

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, a hinged end piece (item 49) is used at the top and bottom, and the V-type upper suspension brackets can be pulled apart to level the track.

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

Aluline 120: 20 mm Aluline 180: 25 mm

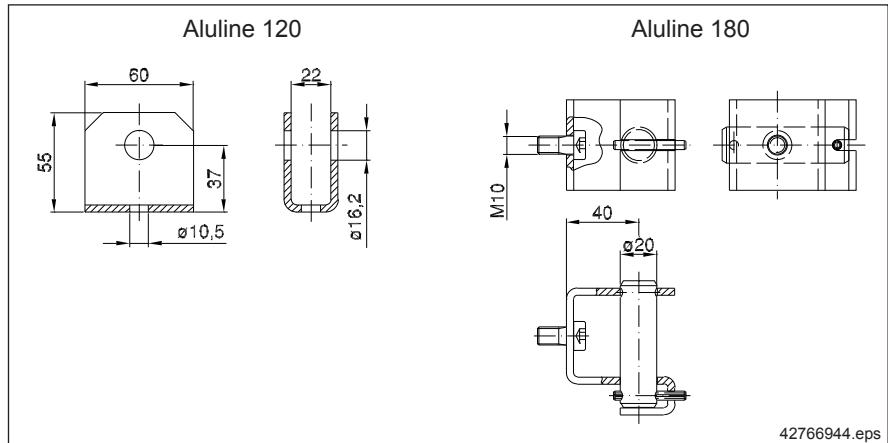
Length of the left-hand thread of the hinged end piece and of the suspension rod thread in the strainer nut:

Aluline 120: 45 mm Aluline 180: 60 mm at full ± adjustment.



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

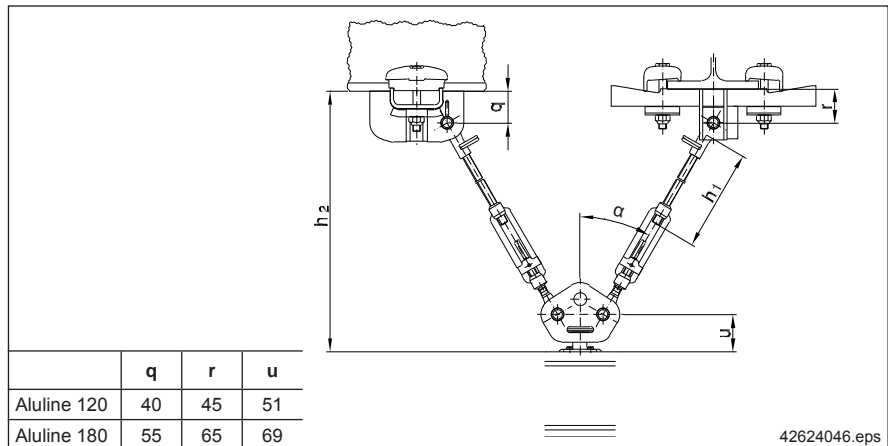
6.7.5 Wall fixture



Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
34	Hinged block/connection block	0,2	980 272 44	0,46	850 399 44
54	Pin with BoClip	0,08	851 305 44	-	-

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

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



Suspension rod length h_1 can be determined depending on:

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

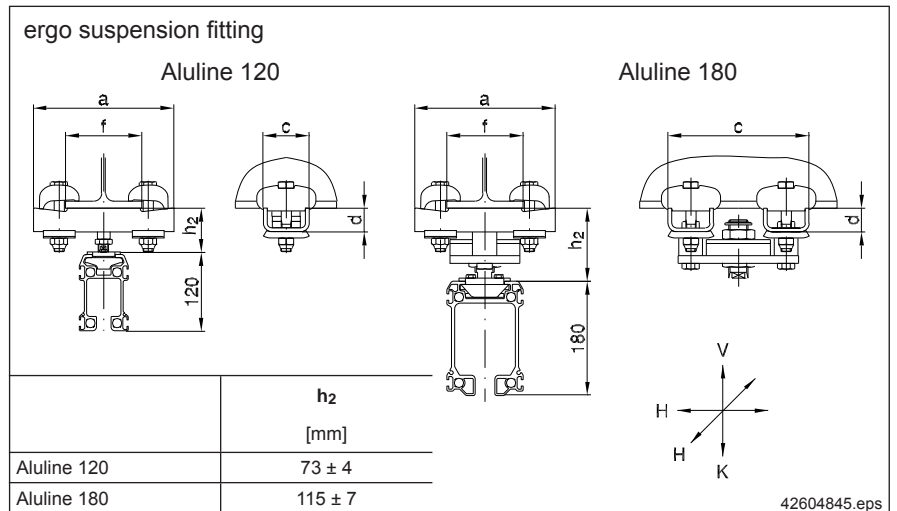
The following simplified formulas may be used, since the suspension rod strainer offer as wide range for adjustment.

$$\text{Aluline 120} \quad \rightarrow \quad h_1 = \frac{h_2 - 95}{\cos \alpha} - 155$$

$$\text{Aluline 180} \quad \rightarrow \quad h_1 = \frac{h_2 - 135}{\cos \alpha} - 220$$

6.9 ergo suspension fitting

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



Section	Upper suspension bracket	a [mm]	f [mm]	c [mm]	d [mm]
Aluline 120	Suspension bracket A	221	71 - 139	72	37
Aluline 180	Suspension bracket A	221	71 - 139	222	37
	Suspension bracket B	290	100 - 208	226	36

Item	Designation	Aluline 120		Aluline 180		
		Weight [kg]	Part no.	Weight [kg]	Part no.	
31e	ergo suspension fitting A	4,25	855 031 44	11,0	855 033 44	
	ergo suspension fitting B			12,5	855 034 44	
	SWL	Load K	750 kg		1400 kg	
		Load V	100 Kg		200 kg	
Load H		100 kg		200 kg		

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

KBK ergo suspension fittings can accommodate loads resulting from the use of handling equipment and cranes with a large overhang.

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

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



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

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

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

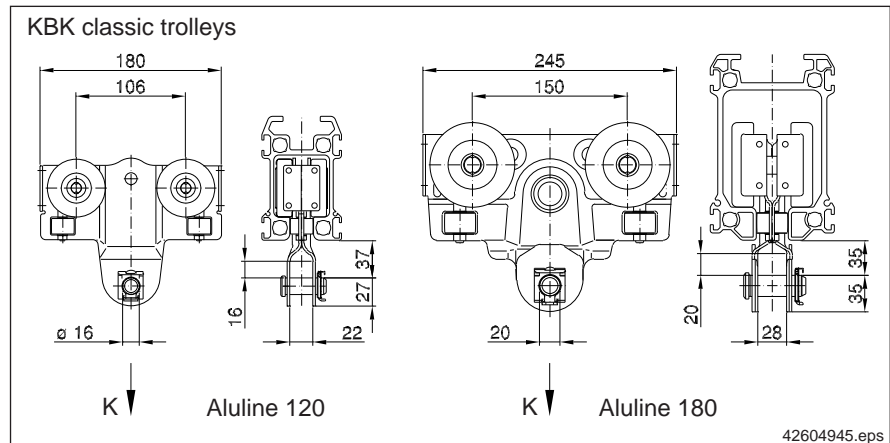
KBK **ergo** suspension fittings A must be used at runway ends.

Finish: galvanized

7 Trolley combinations

7.1 Single trolleys

7.1.1 Classic trolleys (Item 55)



Item	Designation	Aluline 120			Aluline 180		
		Load [kg]	Weight [kg]	Part no.	Load [kg]	Weight [kg]	Part no.
55	Travel unit	300	1,2	855 050 44	600	2,2	855 080 44

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

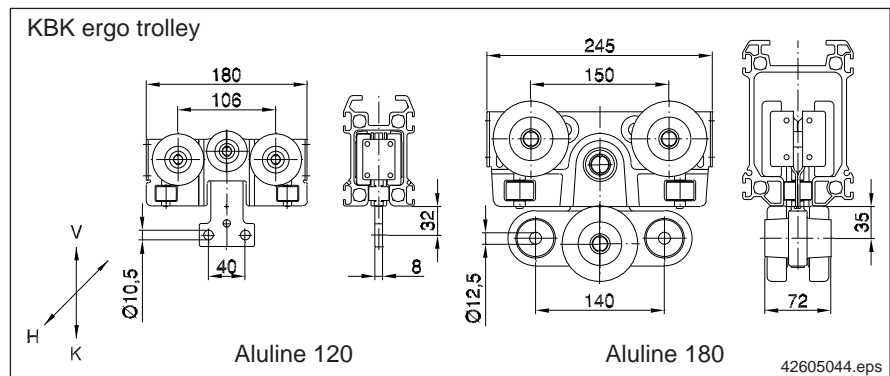
The **traction resistance** of a loaded trolley is $< 0,4 \%$ of the attached load with constant displacement.

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

Temperature range: $0 \text{ }^\circ\text{C}$ to $+50 \text{ }^\circ\text{C}$

Finish: black (RAL 9005), steel

7.1.2 Ergo trolleys (Item 55)



Item	Designation	Aluline 120					Aluline 180				
		Load K [kg]	Vert. load V [kg]	Hor. load H [kg]	Weight [kg]	Part no.	Load K [kg]	Vert. load V [kg]	Hor. load H [kg]	Weight [kg]	Part no.
55e	KBK ergo trolley	300	100	50	1,3	855 055 44	600	200	100	2,6	855 075 44

KBK ergo trolleys can accommodate forces in all axes.

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

KBK ergo trolleys are rigidly bolted to end carriages or crab frames.

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

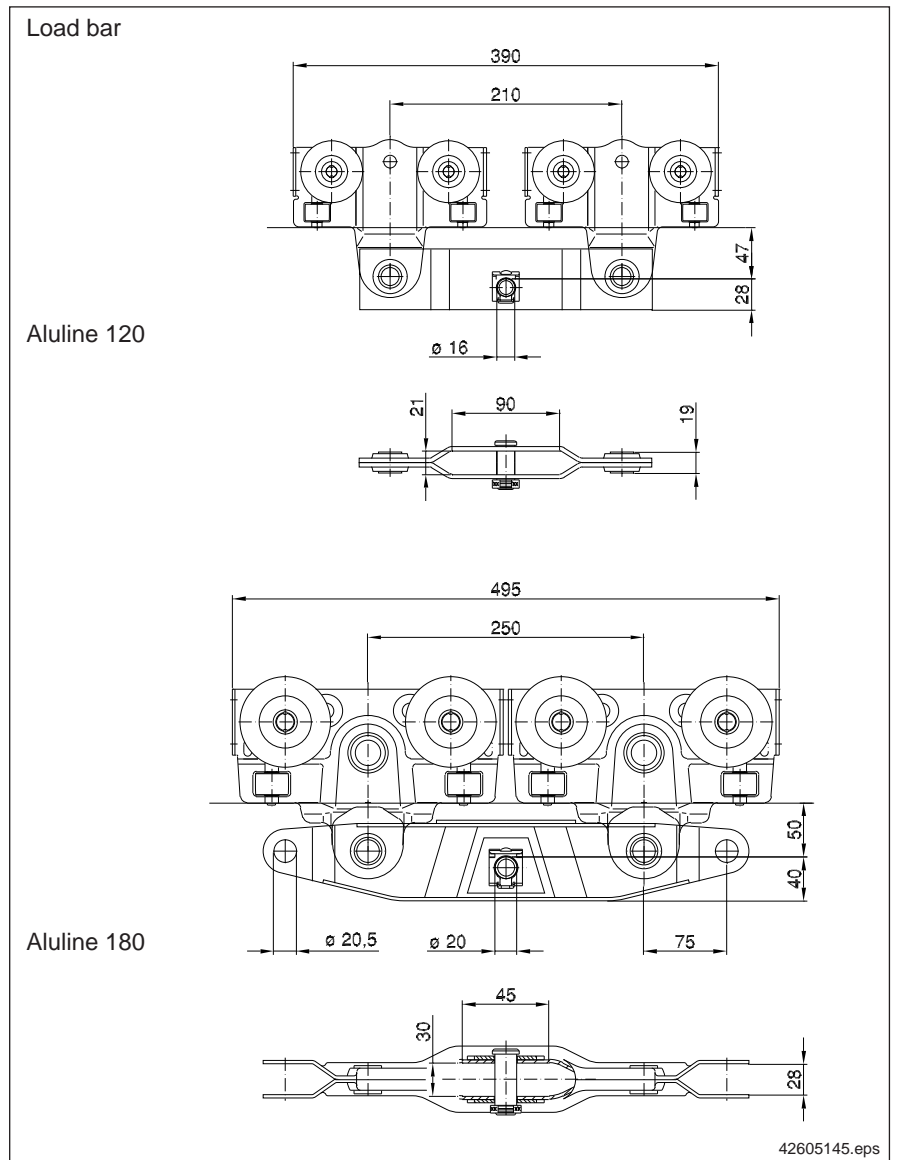
Temperature range: $0 \text{ }^\circ\text{C}$ to $+50 \text{ }^\circ\text{C}$

Finish: black (RAL 9005), steel

ergo connecting element for Aluline 180: aluminium

7.2 Double trolleys

KBK classic load bar



Item	Designation	Aluline 120			Aluline 180		
		Load [kg]	Weight [kg]	Part no.	Load [kg]	Weight [kg]	Part no.
57	Load bar	600	1	980 305 44	1200	2	982 305 44

A double trolley is created by joining two trolleys with a load bar. Holes drilled in the ends of Aluline 180 load bars are provided for fitting spacer bars and link bars, they are not designed for connecting loads.

Use the long suspension eye for DC and DK hoists.

Finish: black (RAL 9005), steel

Wearing parts for single and double trolleys

Item	Designation	Aluline 120		Aluline 180	
		Weight/unit [kg]	Part no.	Weight/unit [kg]	Part no.
54	Pin with BoClip	0,08	851 305 44	0,16	851 317 44

7.3 Classic crane end carriages

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

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

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

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

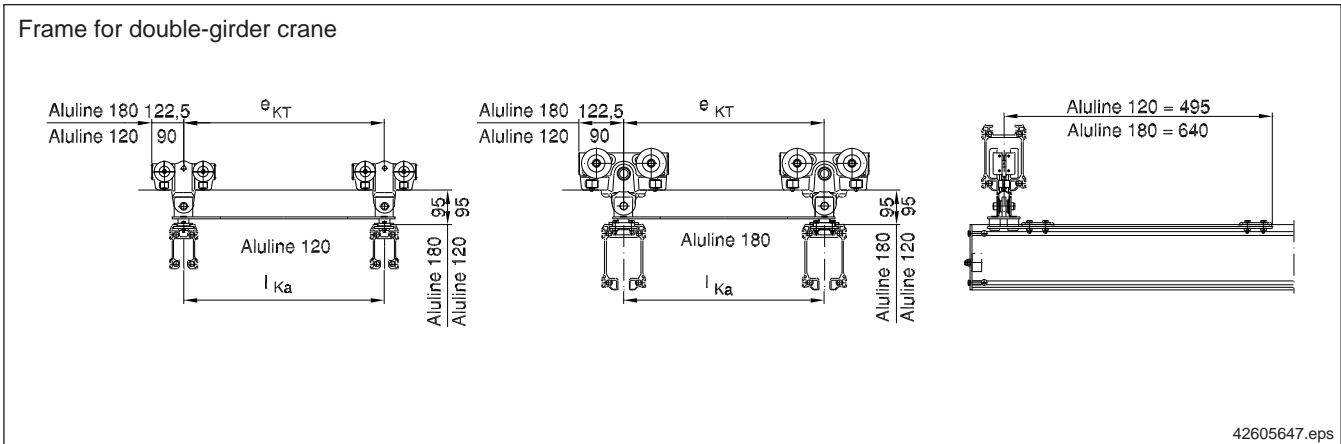
Length of stiffener on the crane:

Aluline 120: **495 mm**;

Aluline 180: **640 mm**.

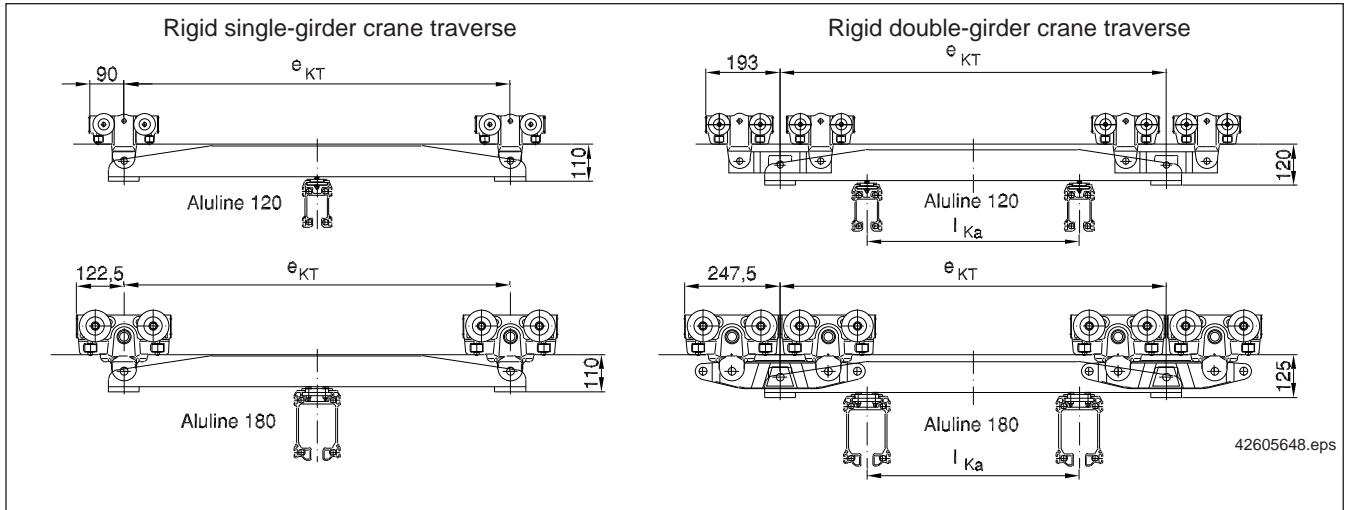
Frame and crane traverse not including trolleys and load bars.

7.3.1 Frame for double-girder crane (Item 63)



Item	Designation	Crane section	e_{KT} [mm]	l_{Ka} [mm]	Max. hoist load [kg]	Weight [kg]	Part no.
63	Frame for double-girder crane	Aluline 120	550	550	500	5,5	855 115 44
		Aluline 180			1000	8,5	855 120 44

**7.3.2 Rigid single-girder crane traverse,
traverse,
Rigid double-girder crane
traverse
(Item 62)**



Item	Designation	Crane section	e_{KT} [mm]	l_{Ka} [mm]	Max. hoist load [kg]	Weight [kg]	Part no.	
62	Rigid single-girder crane traverse	Aluline 120	1000	550 - 610	500	14	517 672 46	
	Rigid double-girder crane traverse		1200			16		
	Rigid single-girder crane traverse	Aluline 180	1000	915 - 1000	1000	25	517 678 46	
	Rigid double-girder crane traverse		1000			26		
			1250			30		
			1500			37		
				1750	1524		41	



Finish: black (RAL 9005), steel

Check trolley loads.

Example for ordering:

2 off Aluline 180 rigid double-girder crane traverse, $e_{KT} = 1000$, $l_{Ka} = 550$

7.4 Ergo crane end carriages

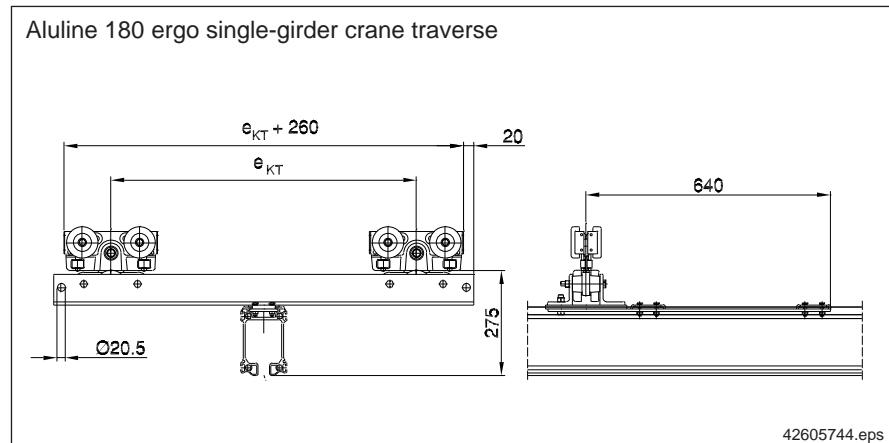
The end carriage length required depends on the crane span and the load. Wheel base e_{KT} of the end carriage should not be less than 1/8 of crane span l_{Kr} .

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

The permissible maximum loads on KBK ergo trolleys determine the maximum load on the end carriages. The given stated apply only to centrally-acting forces transmitted free of moment.

For offset loads or if moments are transmitted, the maximum permissible load of -100 kg to +300 kg for Aluline 120 and -200 kg to +600 kg for Aluline 180 must not be exceeded on the individual trolleys.

7.4.1 Single-girder crane end carriage (Item 62e) Aluline 180 ergo



Item	Standard dimension	Aluline 180 track section	
	e_{KT} [mm]	Max. load [kg]	Weight [kg]
62e	450	- 400 to +1200	25,0
	550		26,7
	650		28,4
	800		31,0
	1050		34,4
	1250		37,7

Crane runways and crane girders are made of Aluline 180.

The trolleys are an integral part of the end carriage.

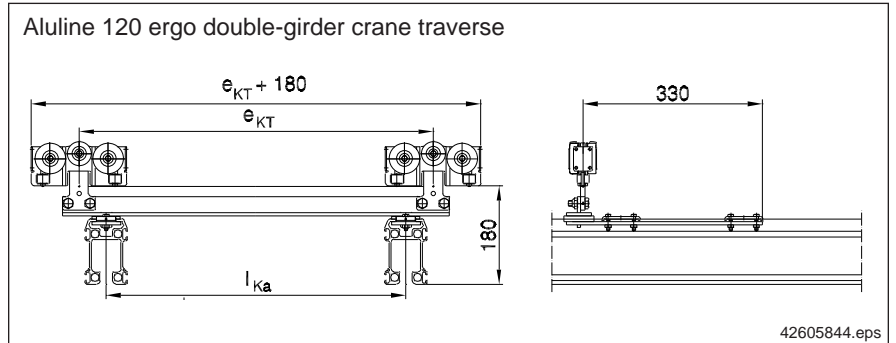
Aluline 120 ergo should not be used for rigid single-girder cranes and single-girder crane traverses.

Finish: black (RAL 9005), steel

Example for ordering:

2 off KBK Aluline 180 ergo single-girder crane traverse, $e_{KT} = 550$ mm

7.4.2 Double-girder crane end carriage
(Item 62e)
Aluline 120 ergo

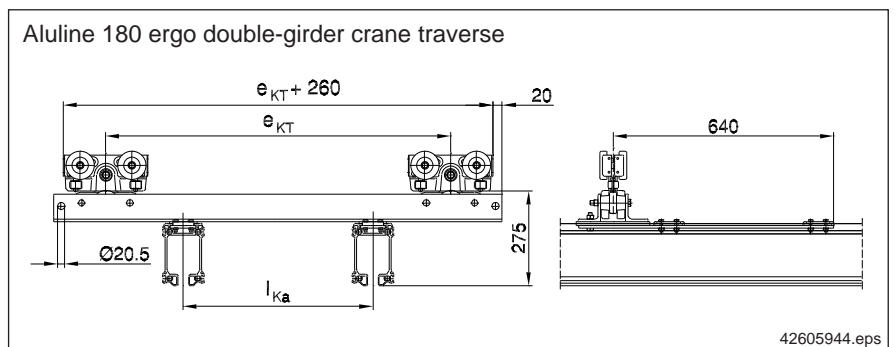


Item	Standard dimension		Aluline 120 runway and crane section	
	l_{Ka} [mm]	e_{KT} [mm]	Max. load [kg]	Weight [kg]
62e	550	650	- 200 to +600	8,9
	610	750		9,3
	650	750		9,3
	762	900		9,9
	800	900		9,9
	915	1100		10,7

Crane runways and crane girders are made of Aluline 120.
The trolleys are an integral part of the end carriage.

Finish: black (RAL 9005), steel

Aluline 180 ergo



Item	Standard dimension		Aluline 180 track section		
	l_{Ka} [mm]	e_{KT} [mm]	Max. load [kg]	Aluline 120 crane section Weight [kg]	Aluline 180 crane section Weight [kg]
62e	550	800	- 400 to +1200	34,0	36,5
	610	900		35,7	38,2
	650	900		35,7	38,2
	762	1050		38,4	40,9
	800	1050		38,4	40,9
	915	1250		41,8	44,3
	1000	1250		41,8	44,3

Crane runways are made of Aluline 180, crane girders of Aluline 120 or Aluline 180.

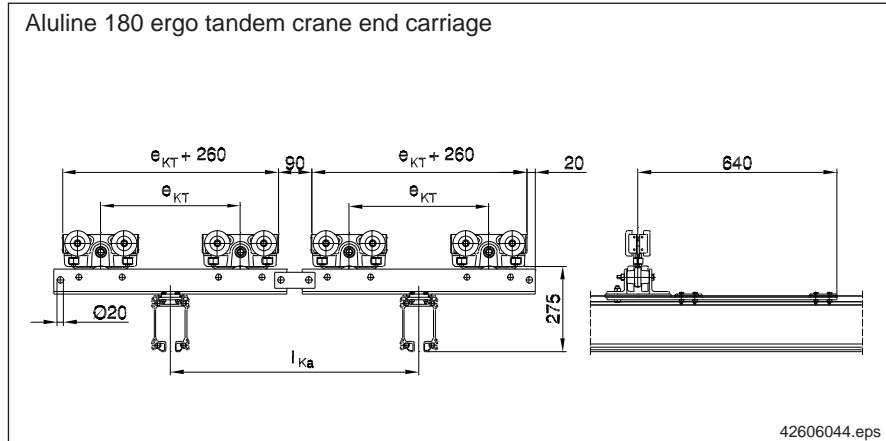
The trolleys are an integral part of the end carriage.

Finish: black (RAL 9005), steel

Example for ordering: 2 off KBK Aluline 180 ergo double-girder crane traverse, $l_{Ka} = 610$ mm, Aluline 180 crane profile section.

7.4.3 Tandem crane end carriage
(Item 62e)

Aluline 180 ergo



Item	Standard dimension		Aluline 180 runway and crane section	
	l_{Ka} [mm]	e_{KT} [mm]	Max. load [kg]	Weight [kg]
62e	800	450	- 2 x 400 to + 2 x 1200	51,5
	1000	650		58,3
	1250	900		66,9

Crane runways and crane girders are made of Aluline 180.

The trolleys are an integral part of the end carriage.

Tandem end carriages are used when crab span dimension l_{Ka} is > 1000 mm, or the permissible crane trolley load for a double-girder crane end carriage is exceeded.

The total length of the tandem crane end carriage results from $2 \times l_{Ka} - 50$ mm.

Tandem crane end carriages consist of two single-girder crane traverses and a spacer bar.

Single-girder crane traverses are supplied pre-assembled complete with trolleys. During final assembly they only have to be connected to the spacer bar.

The permissible maximum loads on KBK ergo trolleys determine the maximum load on the end carriages. The given stated apply only to centrally-acting forces transmitted free of moment.

For offset loads or if moments are transmitted, the permissible maximum load of -400 kg and +1200 kg on the individual single-girder crane traverses must not be exceeded.

Finish: black (RAL 9005), steel

Example for ordering:

2 off KBK Aluline 180 ergo tandem crane end carriage, $l_{Ka} = 800$ mm

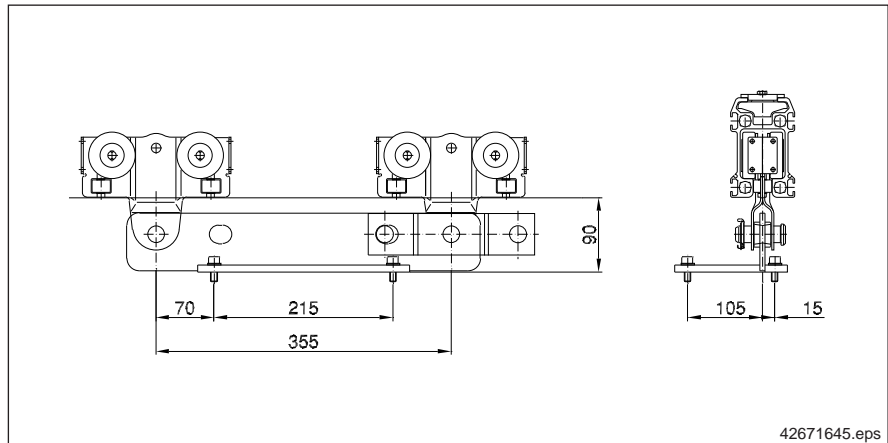
8 Monorail trolley for special hoists

8.1 Low-headroom frame for monorail travelling hoists

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

Further information on request.

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



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

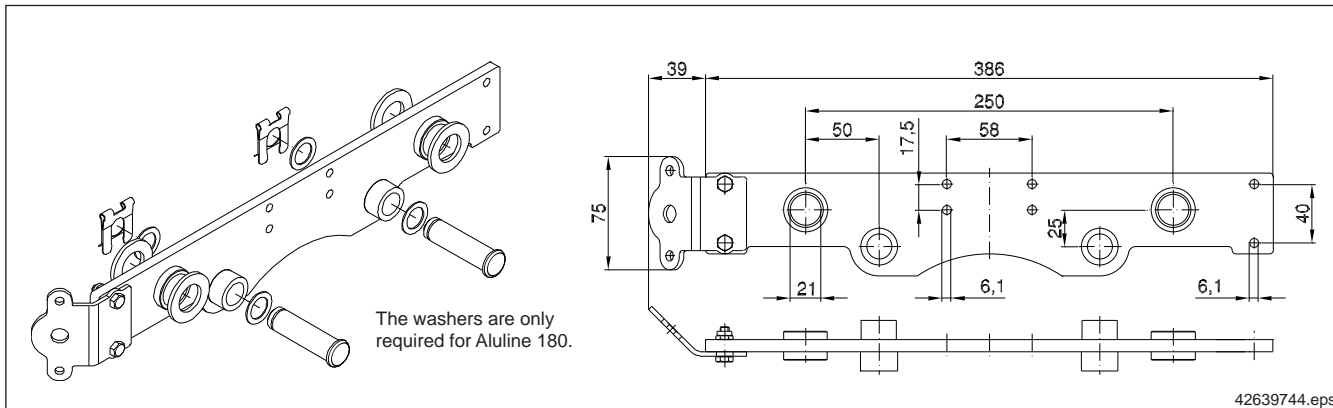
The load bar is used for fitting DS-1 rope winch and D-SH SpeedHoist lifting appliances.

The single-trolley link can be fitted.

The load bar is suitable for trolleys: Aluline 120 and Aluline 180

Finish: Load bar RAL 9005 (black)

8.3 Load bar for D-BP 55/110 rope balancer (Item 68)



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

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

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

The load bar is suitable for trolleys: Aluline 120 and Aluline 180

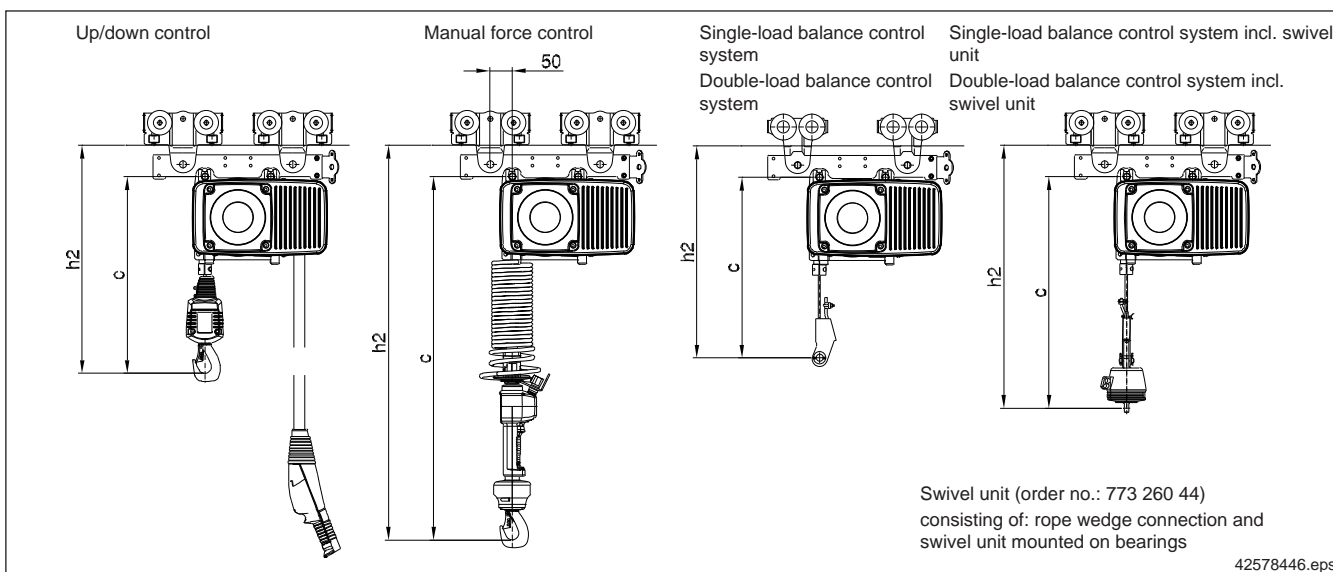
The following values are applied for specifying the track and crane:

D-BP 55 : K = 80 kg

D-BP 110 : K = 160 kg

Balancer dimensions

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



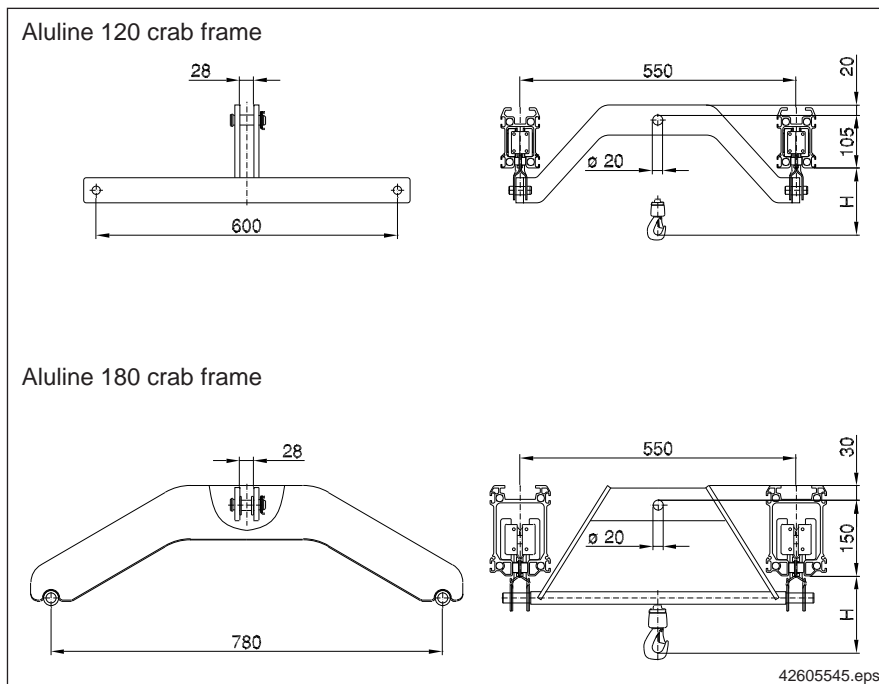
Installation dimensions

Profile section: Aluline 120 and Aluline 180

	Up/down control c / h2	Manual force control c / h2	Single-load (double-load) balancer control c / h2	Single-load (double-load) balancer control incl. swivel unit 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)



Item	Designation	Aluline 120			Aluline 180		
		Load [kg]	Weight [kg]	Part no.	Load [kg]	Weight [kg]	Part no.
78	Crab frame	600	13,0	980 600 44	1200	18,4	855 110 44

Dimension H	DKM 1 DKM 2 (+10)	DKUN 1		DKUN 2		DKUN 5	
Reeving		1/1	2/1	1/1	2/1	1/1	2/1
Aluline 120	625	250	305	250	310	290	360
Aluline 180	585	205	260	205	265	245	315

Dimension H	DCM 1	DCM 2	DCM 5	DC 1	DC 2	DC 5	DC 10
Reeving				1/1			
Aluline 120	568	568	613	238	238	283	-
Aluline 180	523	523	568	193	193	238	343

Aluline 120 or 180 crab frames fitted with four trolleys and the hoist form a double-rail crab for double-rail tracks or double-girder cranes.

Only the normal crab frame can pass under crane traverses.

Travel drives are fitted inside the crab frame for Aluline 120, and can be fitted both inside and outside the crab frame for Aluline 180. The drive motor must face outwards and the hoist motor must face the drive.

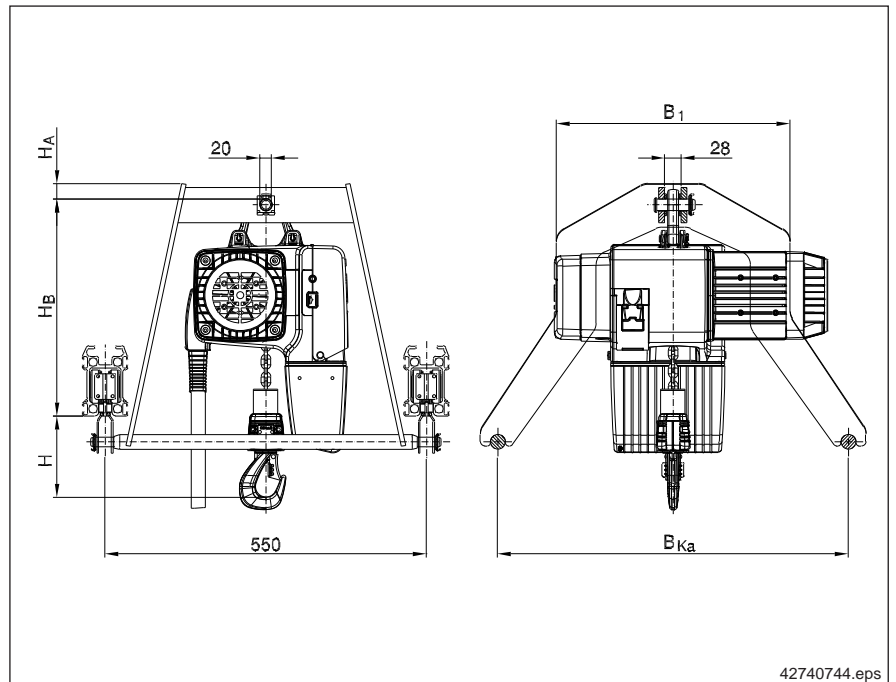
All hoists must be used with the long suspension eye.

Finish: black (RAL 9005), steel

Wearing parts on the hoist support pin

Item	Designation	Aluline 120/180	
		Weight/unit [kg]	Part no.
54	Pin with BoClip	0,18	851 318 44

9.2 Raised crab frame (Item 77)



Item	Section	Max. load [kg]	for Hoist unit	alternative ¹⁾	H _B [mm]	H			H _A [mm]	B _{Ka} [mm]	B ₁ [mm]	Weight [kg]	Part no.
						DC 1/2 [mm]	DC 5 [mm]	DC 10 1/1 [mm]					
77	Aluline 120	600	DC 1/2	DC 5	319	45	97	-	27	600	400	15,7	517 890 46
			DC 5	-	371	-	45	-				16,7	517 900 46
	Aluline 180	1200	DC 1/2	DC 5/10	320	44	96	185	32	700	510	26,7	517 910 46
			DC 5	DC 10	372	-	44	133				28,7	517 920 46
			DC 10	-	461	-	-	44				30,9	517 930 46

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

Raised crab frames utilise the space between the crane girders of double-girder cranes and make it possible to achieve a minimum dimension H.

However, the crab frame cannot pass under the crane runway, spacer bars or crane traverses. A solution is available with the maximum possible height for every chain hoist type and application (profile section, load). If this is not possible due to obstacles on site, there are alternatives for DC 5/10.

Electric travel drives are arranged inside the crab frame.

All hoists must be used with the long suspension eye.

Finish: black (RAL 9005)

Wearing parts on the hoist support pin

Item	Designation	Aluline 120/180	
		Weight/unit [kg]	Part no.
54	Pin with BoClip	0,18	851 318 44

Crab

9.3 Ergo crab trolley

Aluline ergo crab frame
(Item 78e)

Item	Crab frame	l_{Ka} [mm]	e_{Ka} [mm]	Max. load [kg]	Weight [kg]
78e	Aluline 120	550	550	600	19,1
		610	650		21,0
		650	650		21,3
		762	800		24,3
		800	800		24,6
		915	1000		29,0
	Aluline 180	550	550	1200	64,0
		610	650		66,9
		650	650		67,5
		762	800		72,1
		800	800		72,7
		915	1050		78,3
		1000	1050		79,6
		1250	1250		88,3

Wheel base e_{Ka} and crab span dimension l_{Ka} are equal.

The trolleys are an integral part of the crab frame.

The crab frame is pre-assembled complete with trolleys.

The maximum permissible loads on the KBK ergo trolleys determine the maximum load on the crab frame. The given stated apply only to centrally-acting forces transmitted free of moment.

For offset loads or if moments are transmitted, the maximum permissible load of - 100 kg to +300 kg for Aluline 120 and -200 kg to +600 kg for Aluline 180 must not be exceeded on the individual trolleys.

The crab frame angle strut distance a depends on the handling devices to be connected to the crab frame.

Specify distance a in the order.

Finish: black (RAL 9005), steel

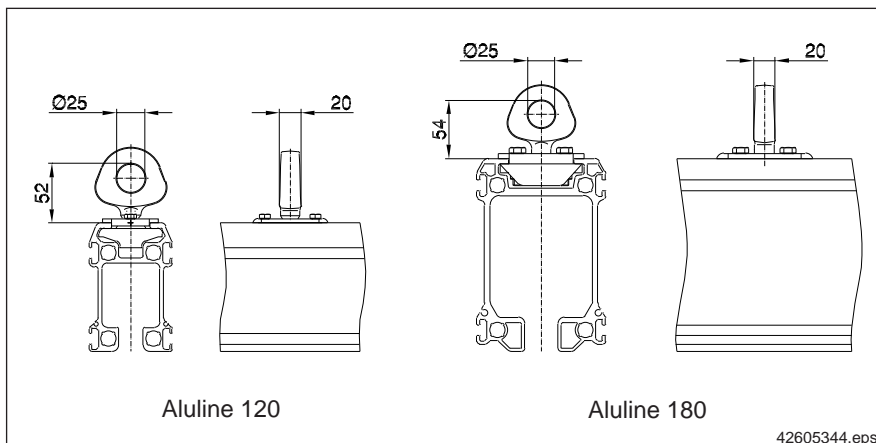
Example for ordering: 1 off Aluline 180 ergo crab frame,
 $l_{Ka} = 915$ mm, $e_{Ka} = 1000$ mm
Distance $a =$ mm

72

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10 Crane suspension eye

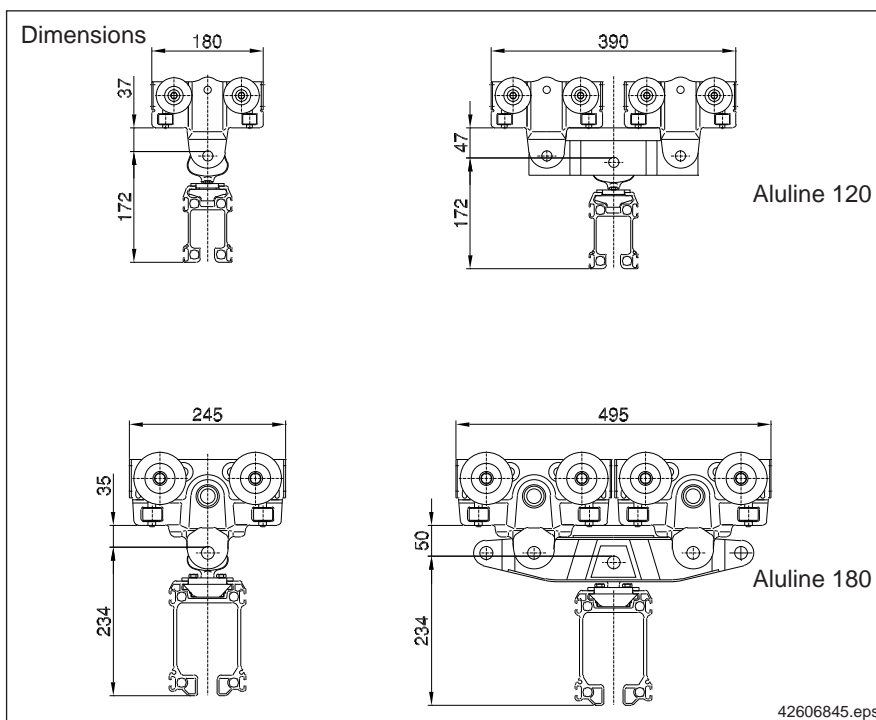
Crane suspension eye (item 75)



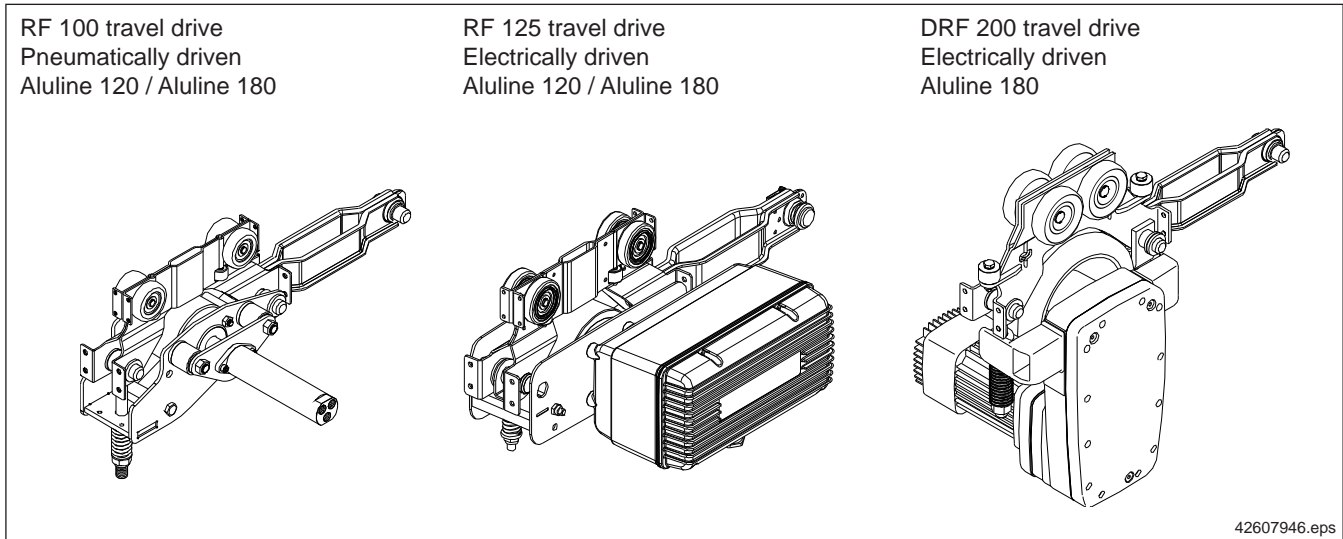
Item	Designation	Aluline 120			Aluline 180		
		Max. load [kg]	Weight [kg]	Part no.	Max. load [kg]	Weight [kg]	Part no.
75	Crane suspension eye	600	0,7	855 036 44	1400	1	855 038 44

The crane suspension eye connects crane girders with the trolley or the load bar of the runway girder. Due to the ball-and-socket type mounting of the suspension eye, KBK Aluline single-girder cranes can adopt a diagonal position. They can, therefore, also travel on converging crane runways. The suspension eye and clamp are irreversibly joined before leaving the factory and must not be separated. Crane suspension eyes should not be used as a swivel joint.

Finish: Galvanised steel



11 Travel drives for crabs and cranes



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

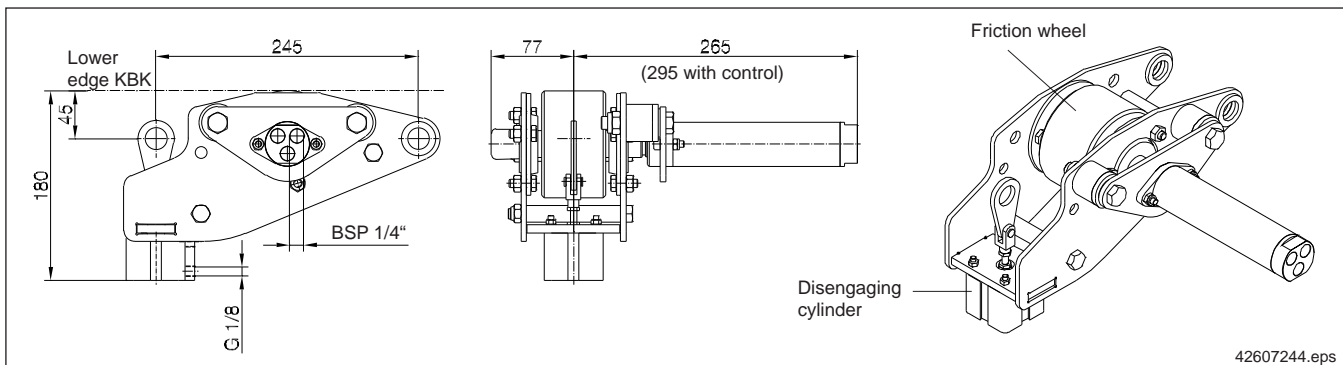
The RF 100 PN friction wheel travel drive is a pneumatic drive unit specially developed for handling equipment duty and loads up to 500 kg. The output of the pneumatic travel motor is transmitted to the bottom flange of the rails by means of a friction wheel.

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

Technical data

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

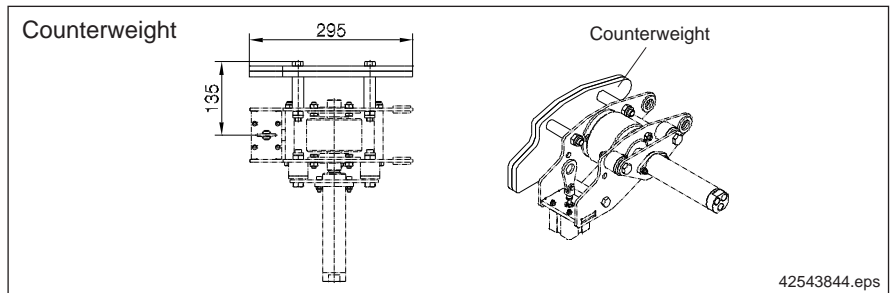
11.1.1 Travel drive with disengaging cylinder (Item 70)



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

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

**11.1.2 Counterweight
(Item 70a)**

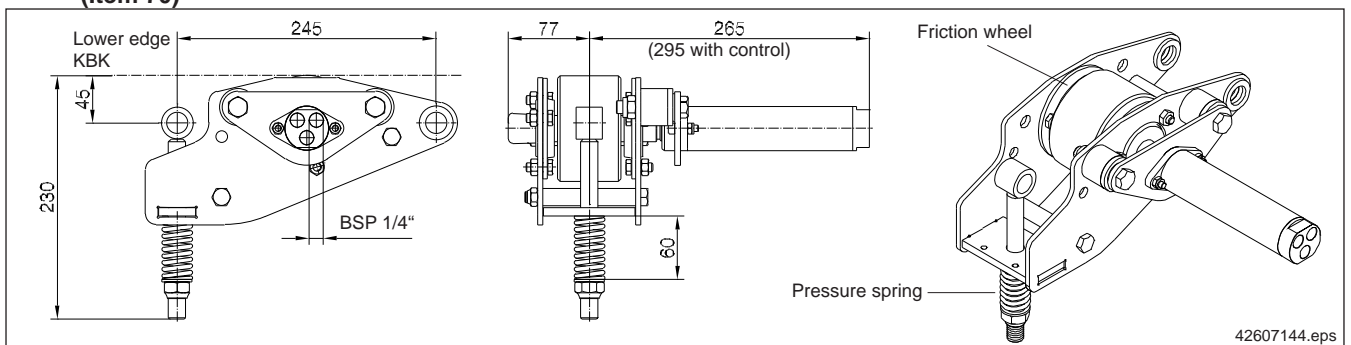


Item	Designation	Weight [kg]	Part no.
70a	Counterweight	4,5	851 205 44

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

Finish: black (RAL 9005)

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

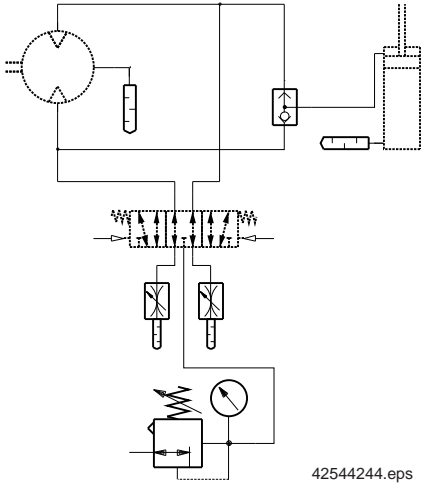


Item	Designation	Weight [kg]	Part no.
70	RF 100 PN with pressure spring	7,2	851 079 44

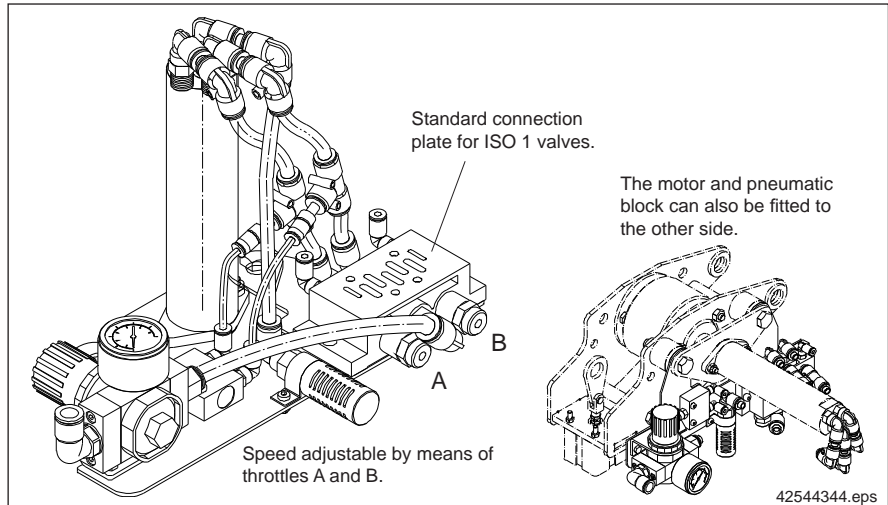
The friction wheel is permanently pressed against the bottom flange of the rail by means of a pressure spring. The crane or trolley can be moved within certain limits by pushing the load.

11.1.4 RF 100 PN controls

RF pneumatic equipment base block (Item 113)



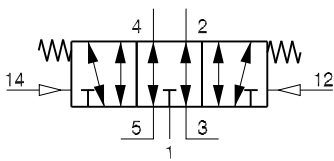
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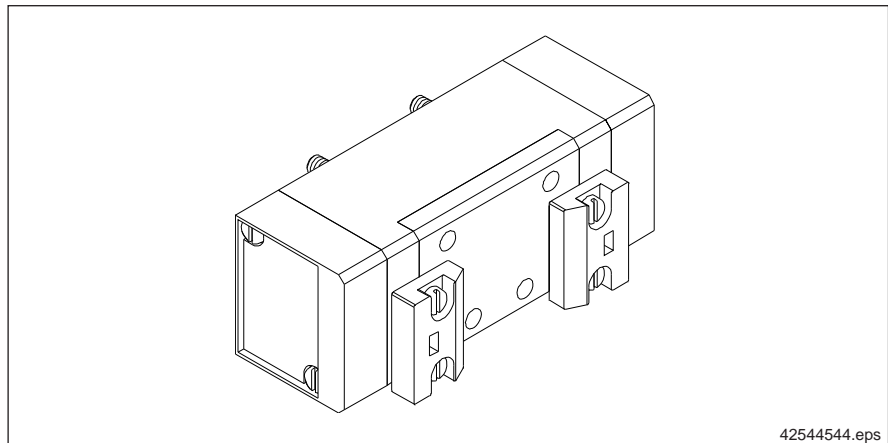
Item	Designation	Weight [kg]	Part no.
113	RF pneumatic equipment base block	1,55	851 201 44

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

Pneumatic control, pneumatic valve (Item 114)



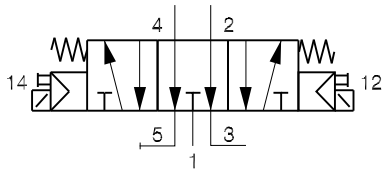
42544444.eps



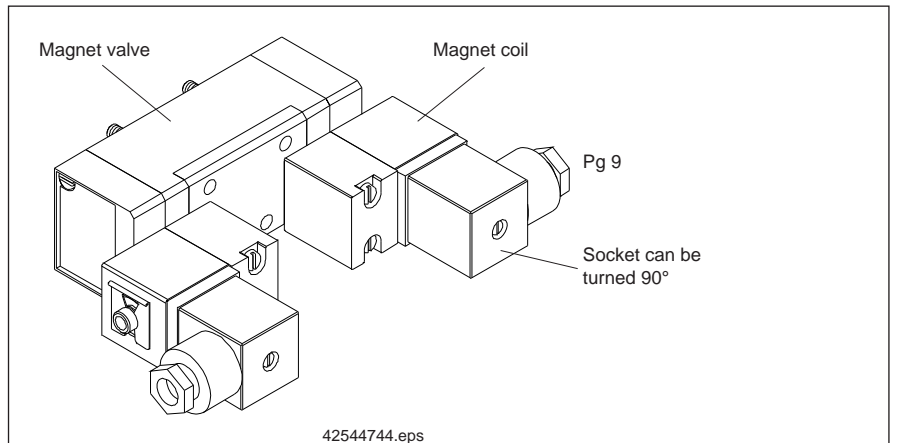
Item	Designation	Weight [kg]	Part no.
114	Pneumatic valve	0,39	343 791 44

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 the compressed air outputs and connections 3 and 5 are used for venting.

**Electrical control
(Item 115)**



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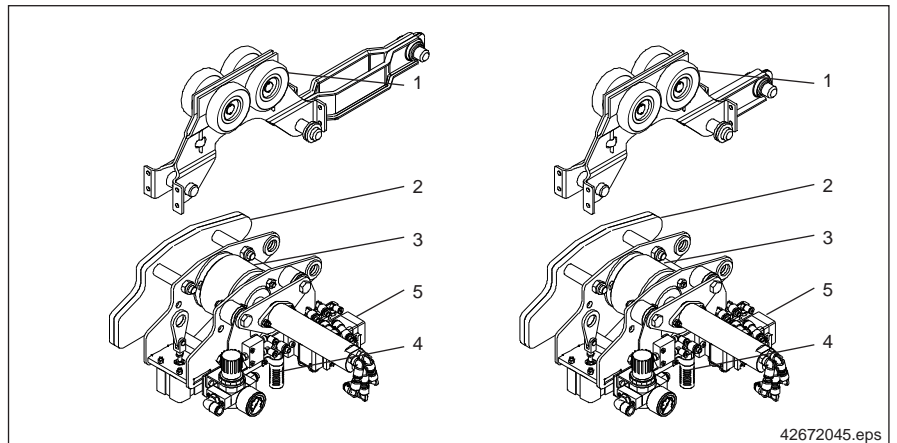


Item	Designation	Rated voltage	Weight	Part no.
			[kg]	
115	Electrical control	24 V _{DC}	0,62	851 203 44
		230 V _{AC}	0,62	851 204 44

The unit consists of:

- Solenoid valve
- Magnet coil 24 V_{DC} or 230 V_{AC} (2 off)
- Standard socket (2 off)

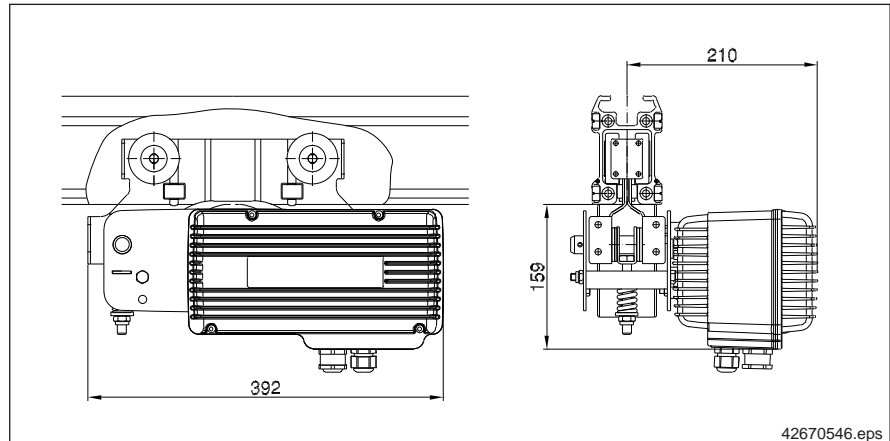
Example for ordering



Item	Designation	Part no.
1	Trolley with rigid link bar 270, Aluline 180	855 096 44
2	Counterweight	851 205 44
3	RF 100 PN	851 078 44
4	base block	851 201 44
5	Pneumatic valve	343 791 44

RF 100 PN travel drive with disengaging cylinder, suitable for Aluline 180 with RF pneumatic base block as well as pneumatic valve with 5/3-way function.

11.2 RF 125 friction wheel travel drive (Item 70)



Technical data

DC motor with E 22 worm gearbox							
Travel speed	Scope	CDF	Voltage	Frequency	Max. displaceable hoist load incl. Dead load	Weight	Part no.
[m/min]	[W]	[%]	[V]	[Hz]	[kg]	[kg]	
7/27 ¹⁾	50/200	20/40	3 ~ 220-480	50/60	2200	5	716 590 45

1) By programming the parameters can be changed to:

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

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

Finish: blue (RAL 5009)

11.2.1 Drive data

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

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

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

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

11.2.2 Control

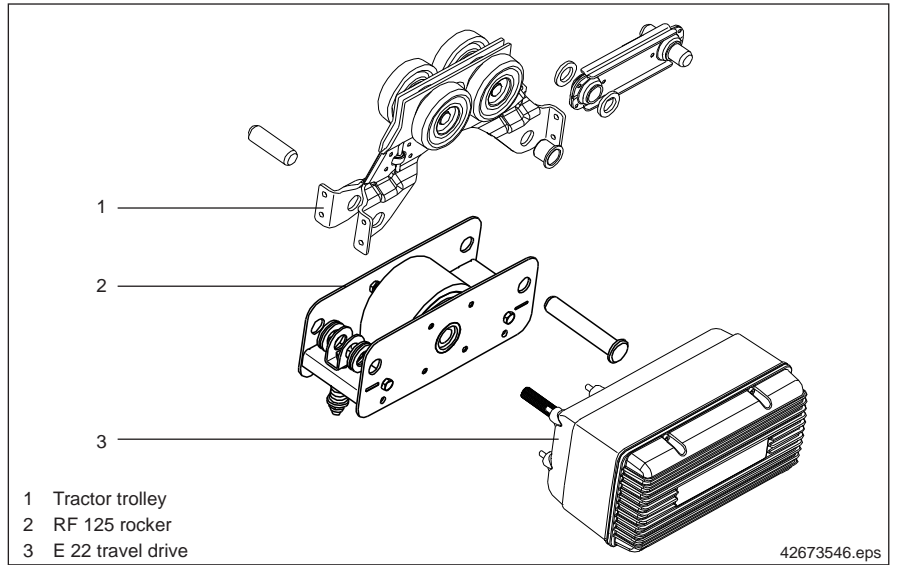
The control card features a wide voltage range input (220-480 V). The line voltage supplies a regulated link. The motor is supplied from the link by a PWM power module. Ramps are output for acceleration and braking. The motor is braked electrically while in motion and stopped by a short circuit of the 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;
- programmable parameters for speed, acceleration, etc.;
- temperature monitoring and cut-off in the event of overtemperature;
- signal transmission with tri-state signals (half-wave evaluation).

11.2.3 RF 125 rocker

Aluline 120
Aluline 180
(Item 135)

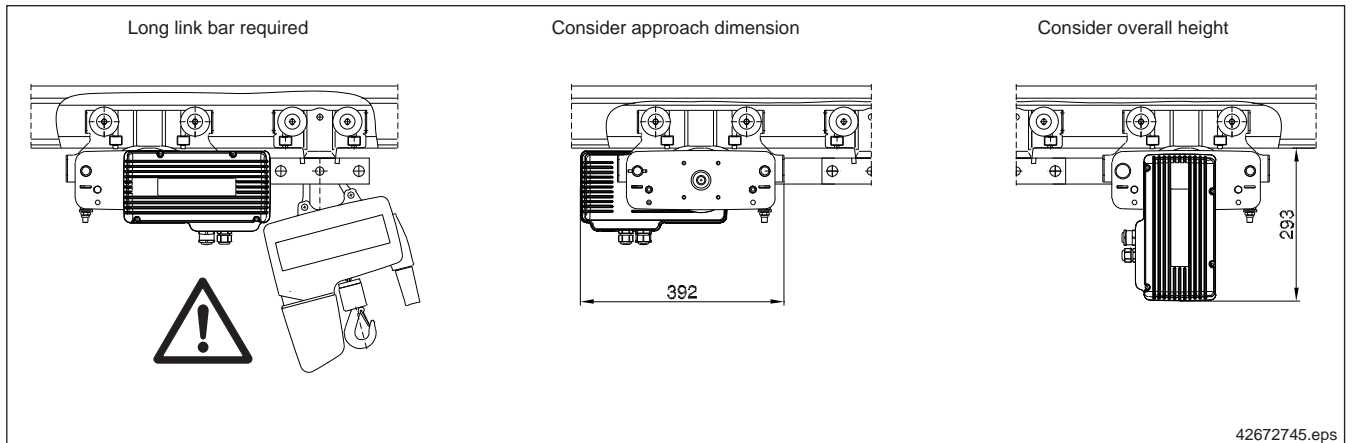


Item	Designation	Weight [kg]	Part no.
135	RF 125 rocker	4,6	851 245 44

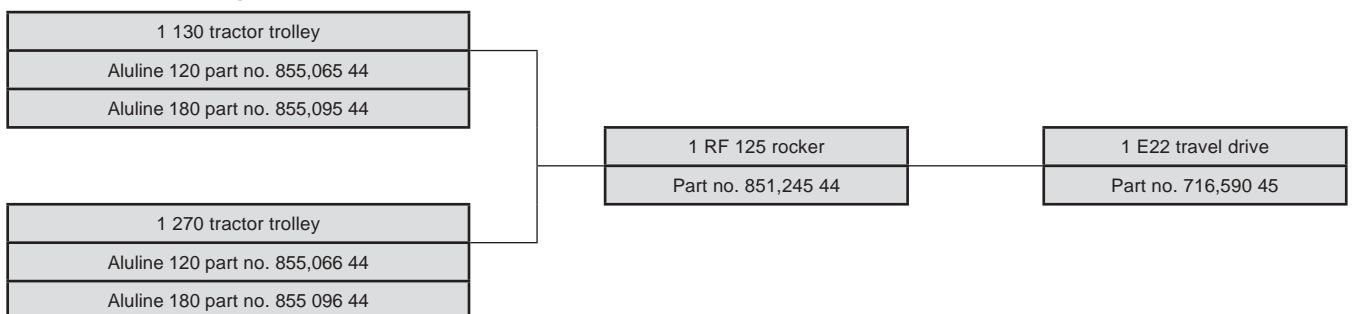
Finish: black (RAL 9005); galvanized

11.2.4 Possible arrangements

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

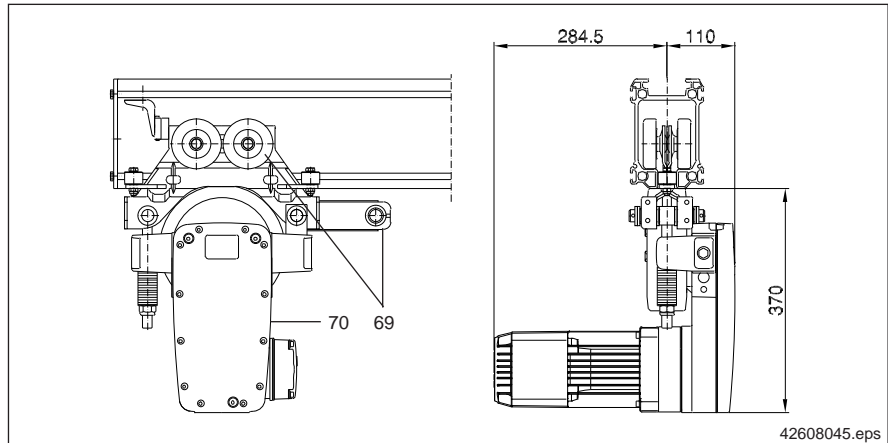


Example for ordering RF 125:



203245k3.indd/261109

11.3 DRF 200 friction wheel travel drive (Item 70)



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

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

Travel drives

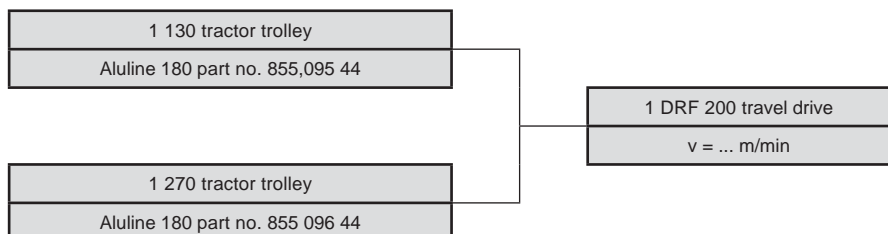
- 1) ZBF 71 B and KM 80 motors cannot be used with Aluline.
- 2) Dry, horizontal track. Application with inclined track on request.

Item	Designation	Weight [kg]	Part no.
70	DRF 200 friction wheel travel drive with wide travel wheel (73 mm), Aluline 180	25	Tech. data

DRF 200 friction wheel travel drives transmit the output of the travel motor, which is specially developed for crane duty, via a spring-mounted friction wheel to the bottom flange of KBK rails. The drive is not suitable for use on Aluline 120. DRF 200 mounting components can be relocated to vary the position of the spring assembly and motor as required. Control can be effected direct or via contactors. Contactor control and timed mechanical braking, or timed mechanical braking elements in the control pendant are required if pole-changing travel drives are used.

Finish: blue (RAL5009)

Example for ordering DRF 200:



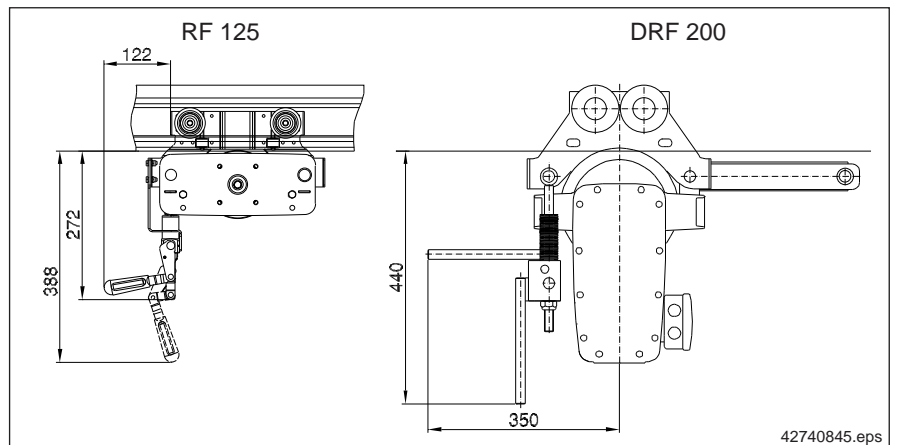
11.4 Disengaging devices

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

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

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

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



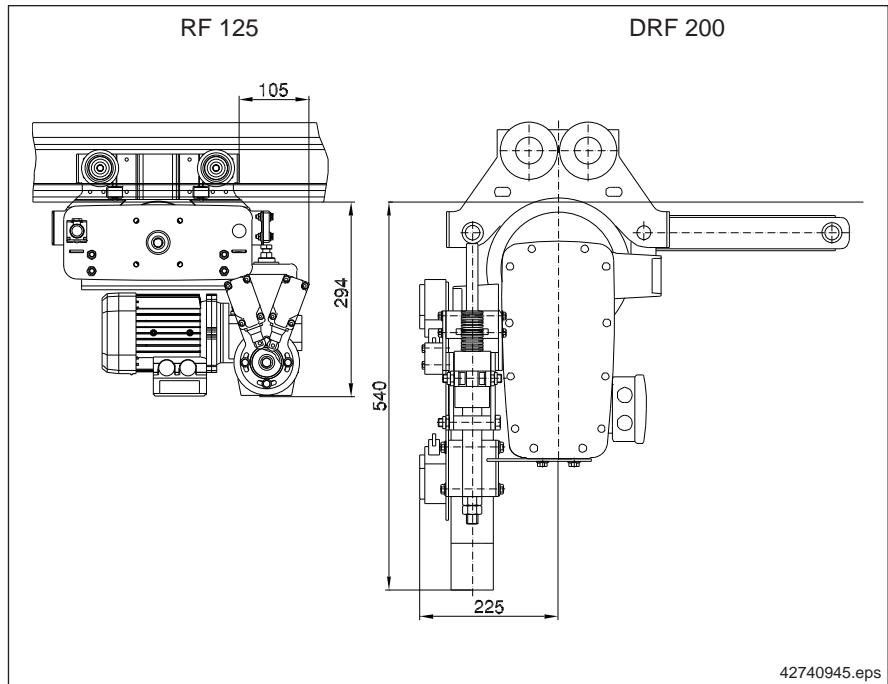
Travel drives

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

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

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

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



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

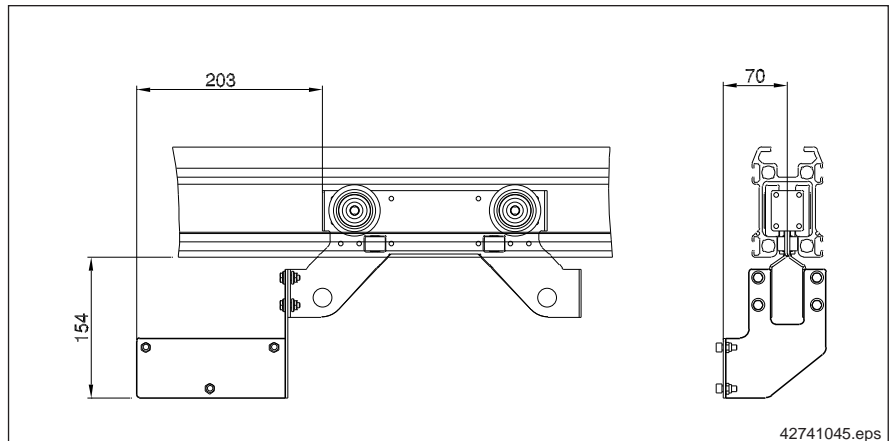
Drive	Disengaging time [s]	CDF [%]	Voltage [V]	Frequency [Hz]	Scope [W]
RF 125	1	50	380 - 415	50	120
			440 - 480	60	140
DRF 200	3	10	230	50	30

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

Control

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

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



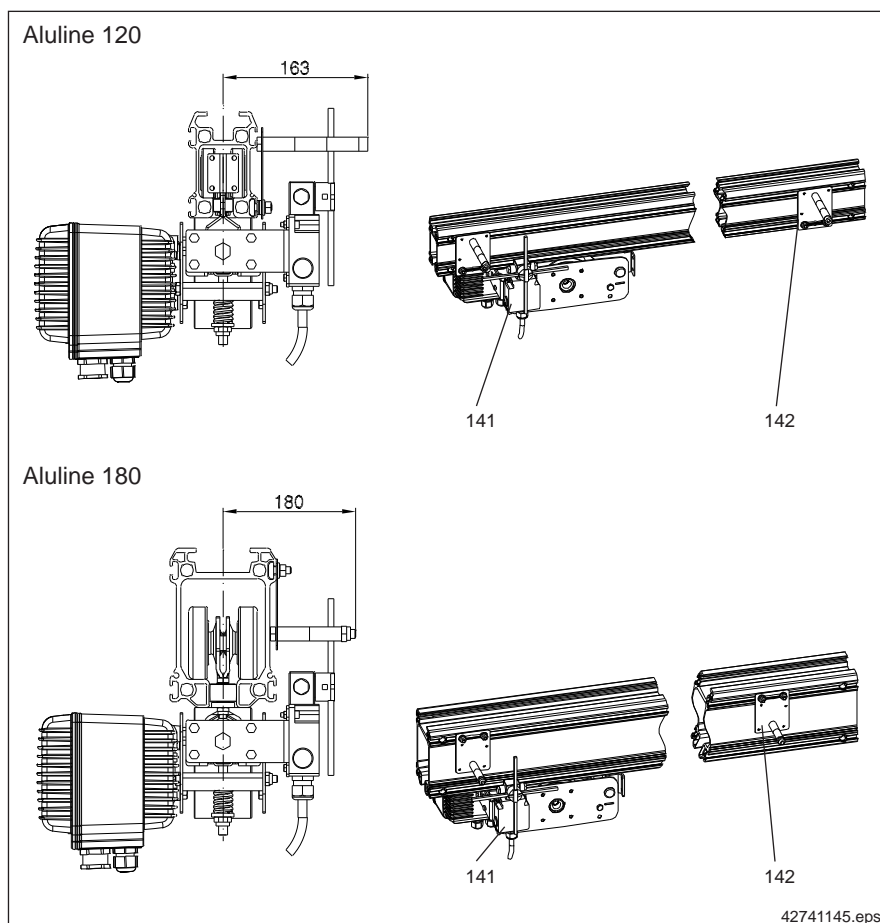
Item	Designation	Weight [kg]	Part no.
92	Angle bracket	0,55	851 357 44

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

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

11.5 Travel limit switches

RF 125 limit switch fitting (Items 141, 142)



Item	Designation	Weight		Part no.
		[kg]		
141	Limit switch, cpl.	0,9		851 351 44
142	Switching vane, cpl.	Aluline 120	0,7	517 964 46
		Aluline 180	0,6	517 965 46

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

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

Crane application

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

The cable set required for this is available on request.

Contents

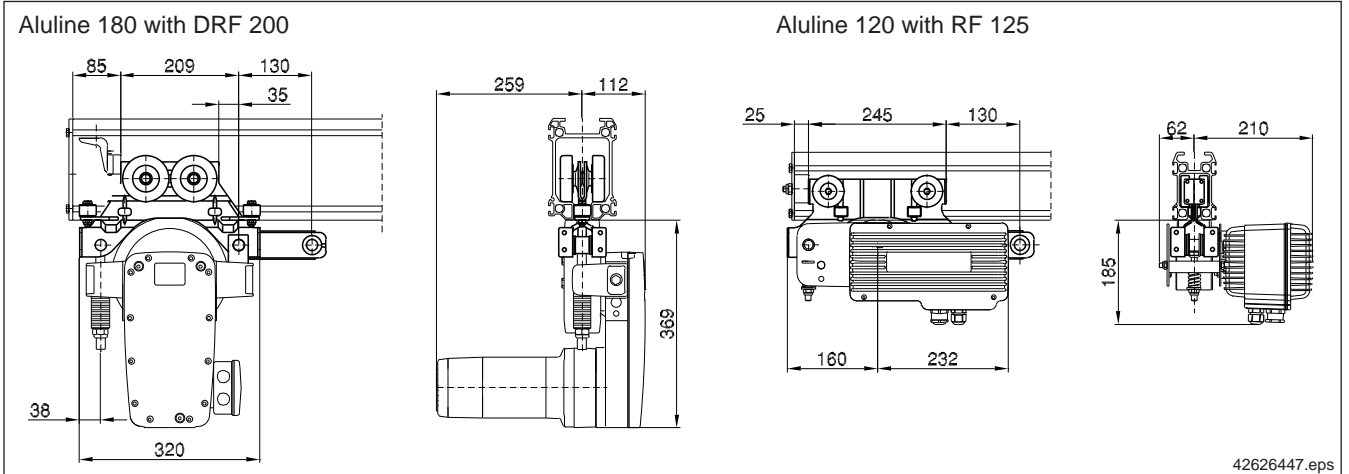
The limit switch cpl. includes the switch, the rail fitting and the electrical cable to the drive.

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

Finish: galvanized

12 Trolleys for travel drives

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



Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
69	130 trolley	3,0	855 065 44	4,0	855 095 44
	270 trolley	3,5	855 066 44	4,3	855 096 44
71	165 trolley coupling			0,3	855 142 44

The trolleys shown are suitable for the following drives:

Trolley for Aluline 120: RF 100, RF 125

Trolley for Aluline 180: RF 100, RF 125, DRF 200

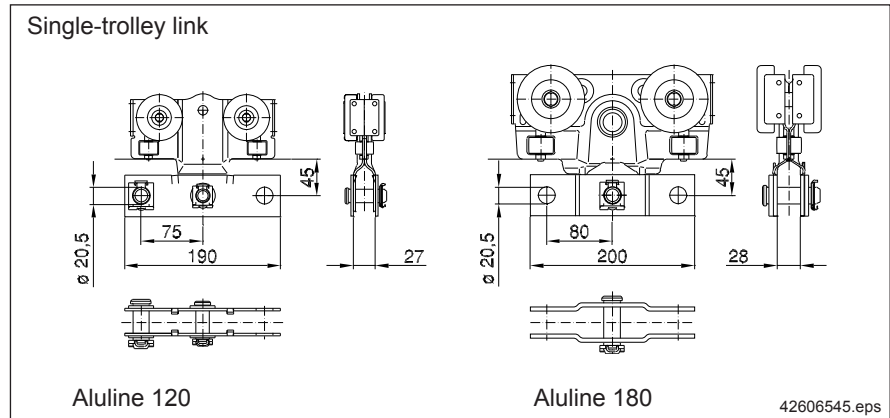
Finish: black (RAL 9005)

13 Link and spacer bars

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

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

13.1 Single-trolley link (Item 61)

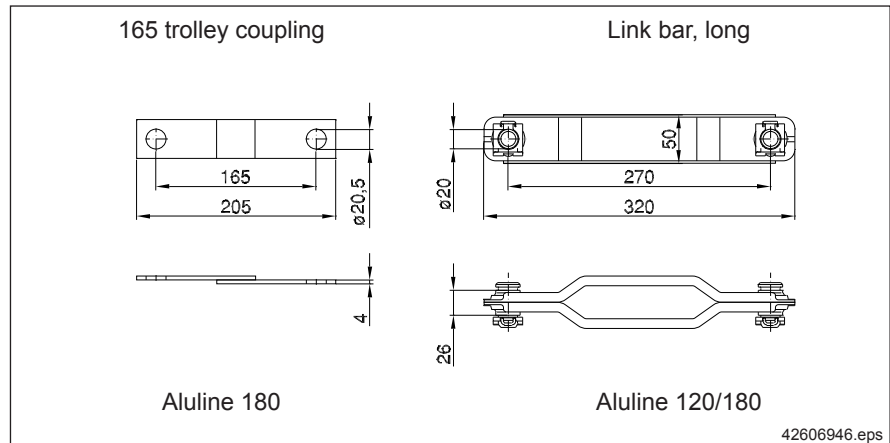


Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
61	Single-trolley link	0,7	855 070 44	0,8	982 505 44

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

Finish: black (RAL 9005), steel

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



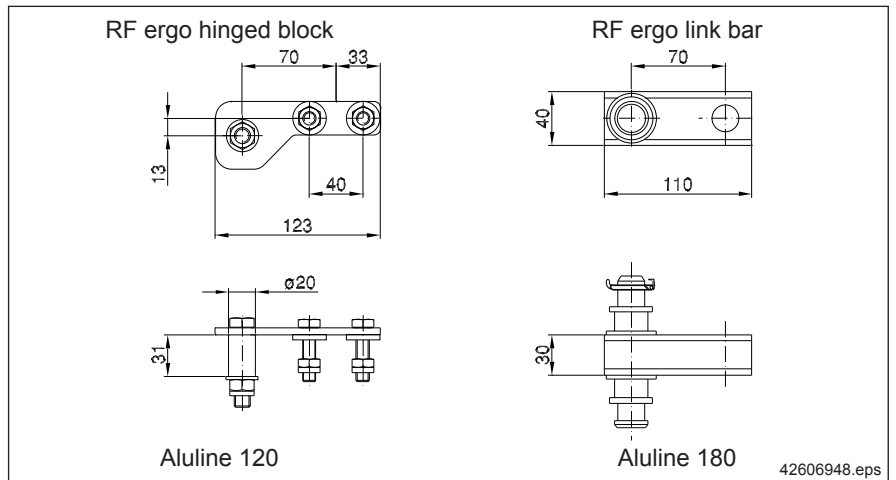
Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
71	165 trolley coupling			0,3	855 142 44
	Link bar, long	0,9	982 345 44	0,9	982 345 44

165 trolley couplings are used to connect friction wheel units in Aluline 180 crab frames.

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

Finish: black (RAL 9005), steel

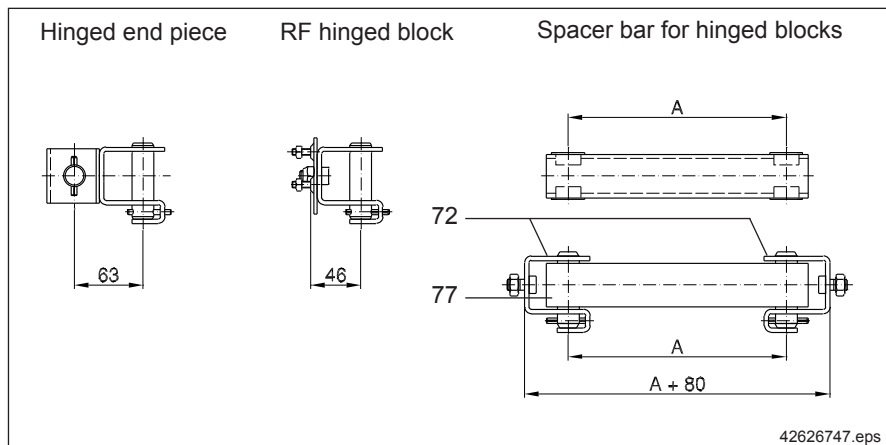
**13.3 RF ergo hinged block/
link bar
(Item 71e)**



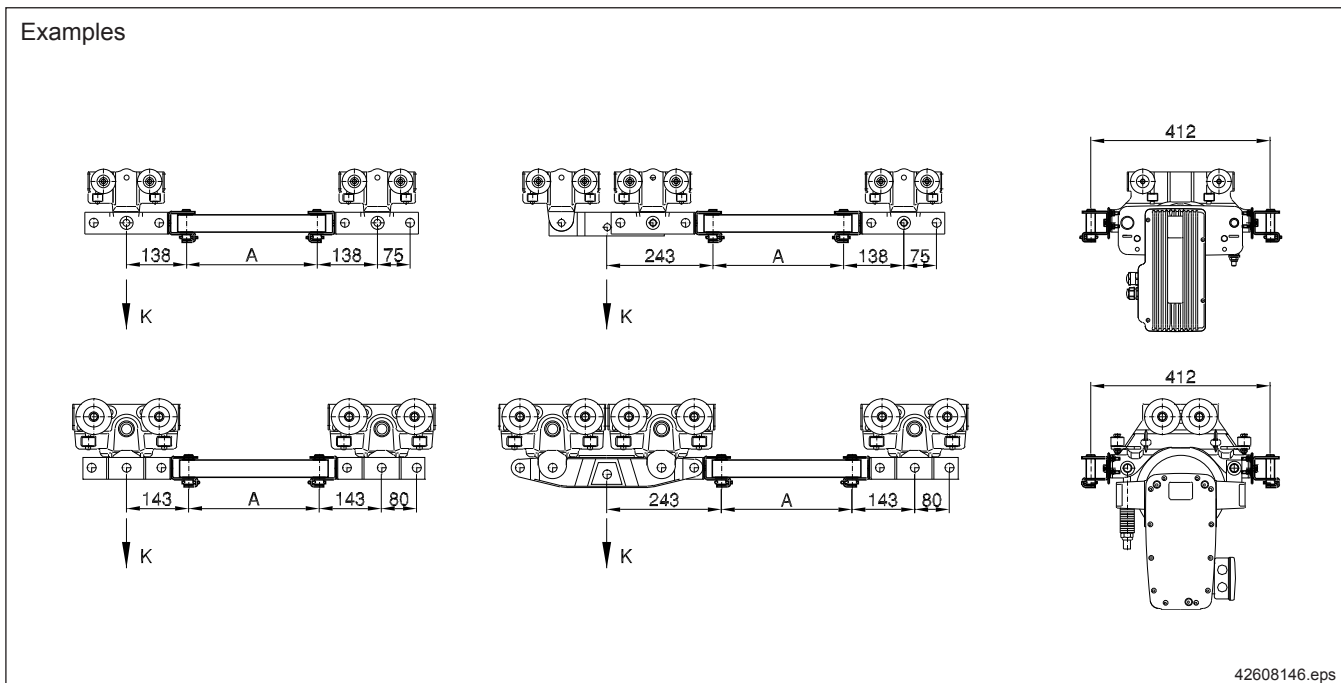
Item	Designation	Section	Weight [kg]	Part no.
71e	RF ergo hinged block	Aluline 120	0,38	855 125 44
	RF ergo link bar	Aluline 180	0,84	851 120 44

Hinged blocks and link bars are used to connect tractor trolleys to ergo crab frames and ergo crane end carriages.

13.4 Articulated spacer bar (Items 72, 73)



Examples



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

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

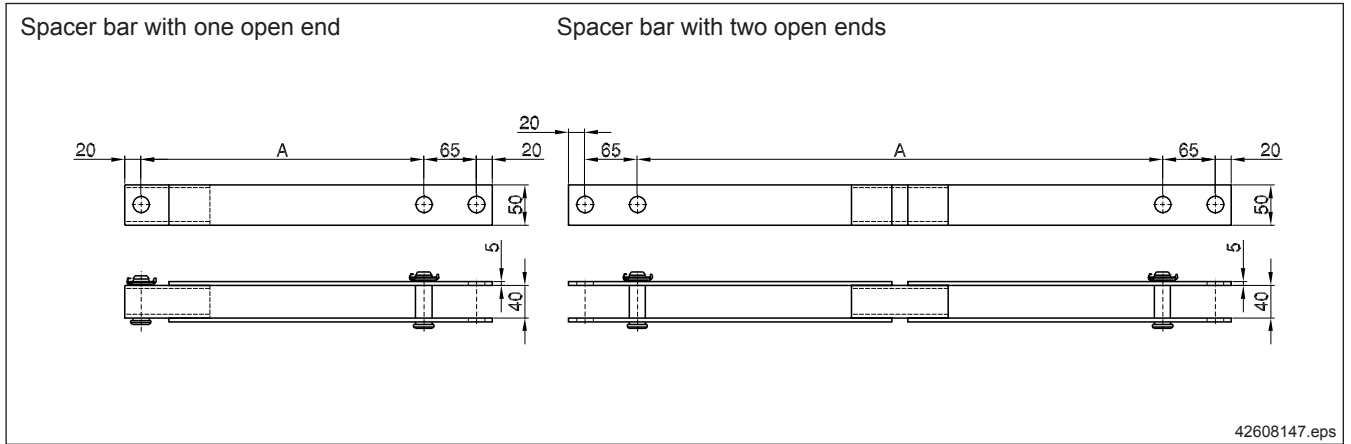
Finish: Metal parts black (RAL 9005); pins, nuts and bolts galvanised

Example for ordering:

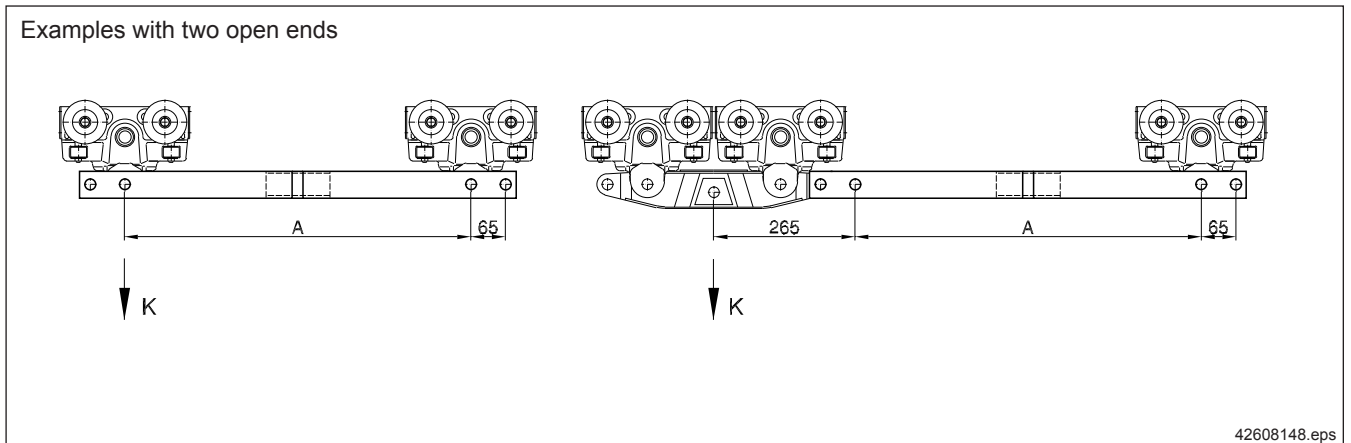
2 off hinged block, part no. 982 402 44

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

13.5 Spacer bar for straight track, Aluline 180 (Item 76)



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

Spacer bars are used to distribute loads safely by separating several monorail hoist trolleys and single or double-girder cranes running on the same track.

The dead weight of the spacer bar must be included in load K when selecting the monorail.

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

Examples for ordering:

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

14 Buffers and end stops

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

Components

Examples

Rubber end stop

Single trolley (Aluline 120)

Single trolley (Aluline 180)

Buffer fitting (foamed plastic)

Double trolley (Aluline 120)

Double trolley (Aluline 180)

Buffer plate

Possible combinations	Single trolley			Double trolley		
	Aluline 120	Aluline 180		Aluline 120	Aluline 180	
	Buffer plate	Rubber	Cellular foam	Buffer plate	Rubber	Cellular foam
Buffer plate		x	x			x
Rubber end stop	x	x			x	x
Buffer fitting (foamed plastic)	x		x	x		x

RF buffer fitting (foamed plastic)

RF buffer plate

Trolley for RF 125

Trolley for DRF 200

RF buffer fitting or RF buffer plate

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

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

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

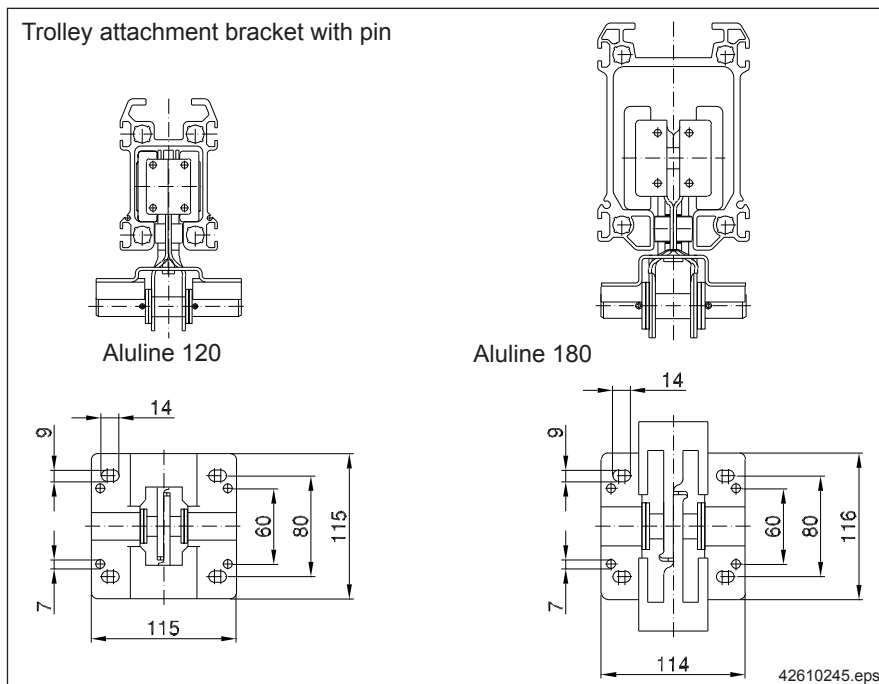
For push travel hoist trolleys and cranes, rubber buffers are used for normal operating conditions, and foamed plastic buffers for a high degree of impact absorbency (buffer against buffer plate).

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

Finish: black (RAL 9005), metallic parts of steel

15 Fittings

15.1 Trolley attachment bracket with pin (Item 53)

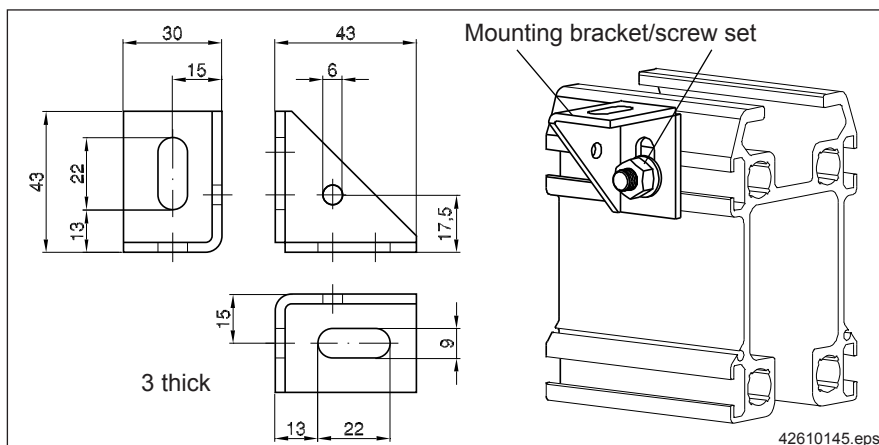


Item	Designation	Aluline 120		Aluline 180	
		Weight [kg]	Part no.	Weight [kg]	Part no.
53	Trolley attachment bracket with pin	0,48	980 041 44	0,66	982 041 44

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

Finish: black (RAL 9005)

15.2 Mounting bracket/ screw set (Item 89)



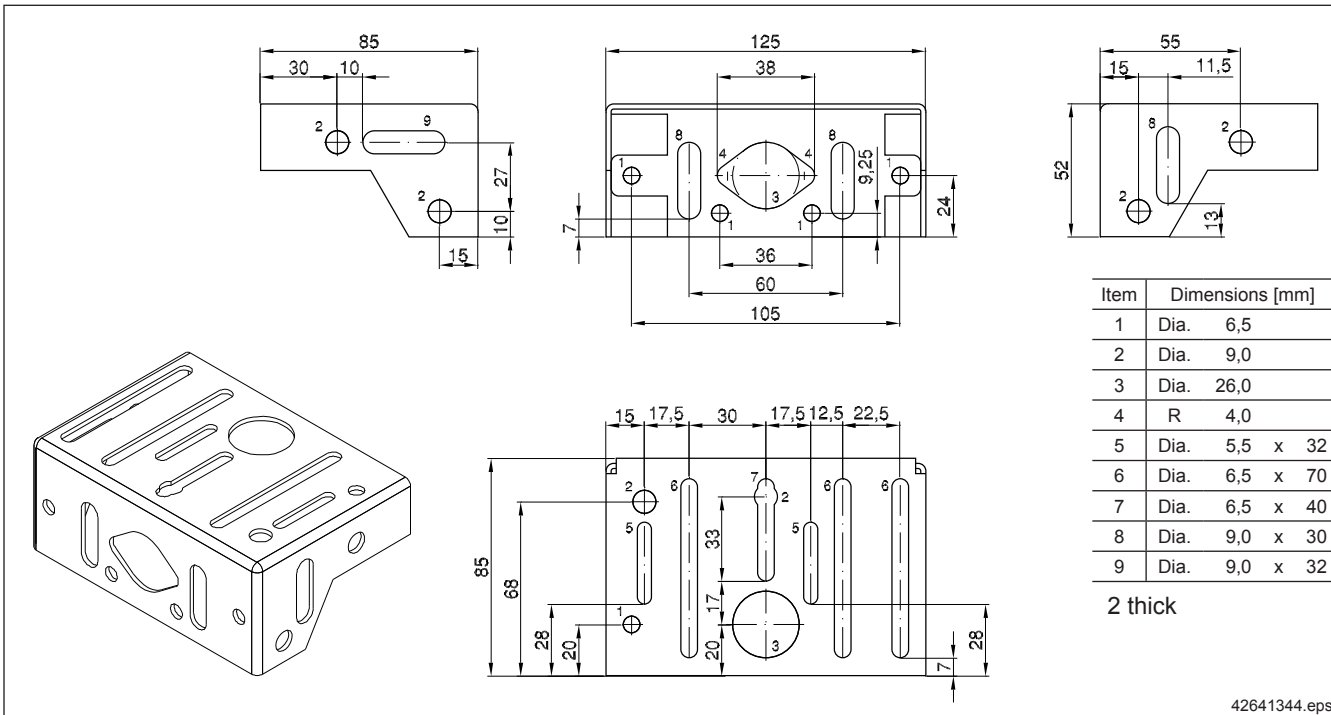
Item	Designation	Weight	Part no.
		[kg]	
89	Attachment bracket	0,07	712 275 47
	M8 x 20 screw set	0,02	712 325 47

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

Finish: galvanized

15.3 Mounting plates

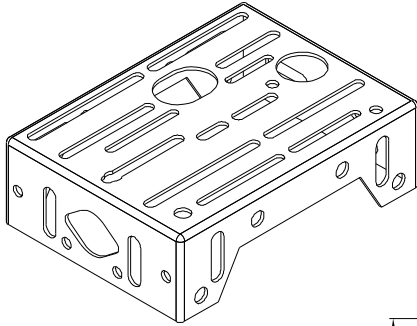
15.3.1 Mounting plate 1 for switch and magnet fittings (Item 95)



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

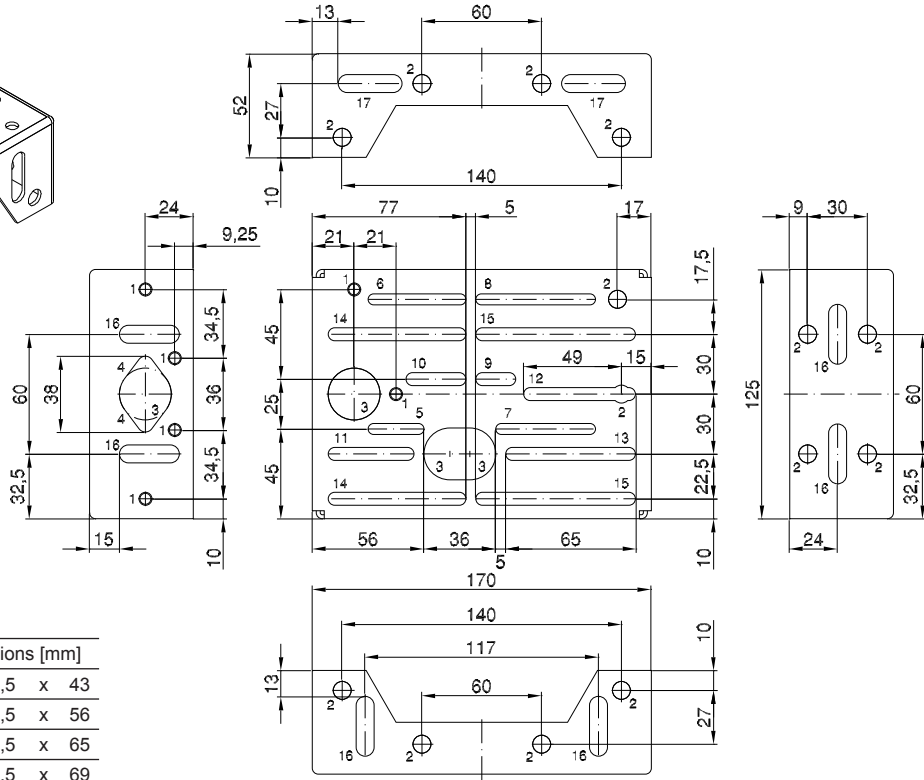
Finish: galvanized

15.3.2 Mounting plate 2 for switch and magnet fittings (Item 95)



2 thick

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

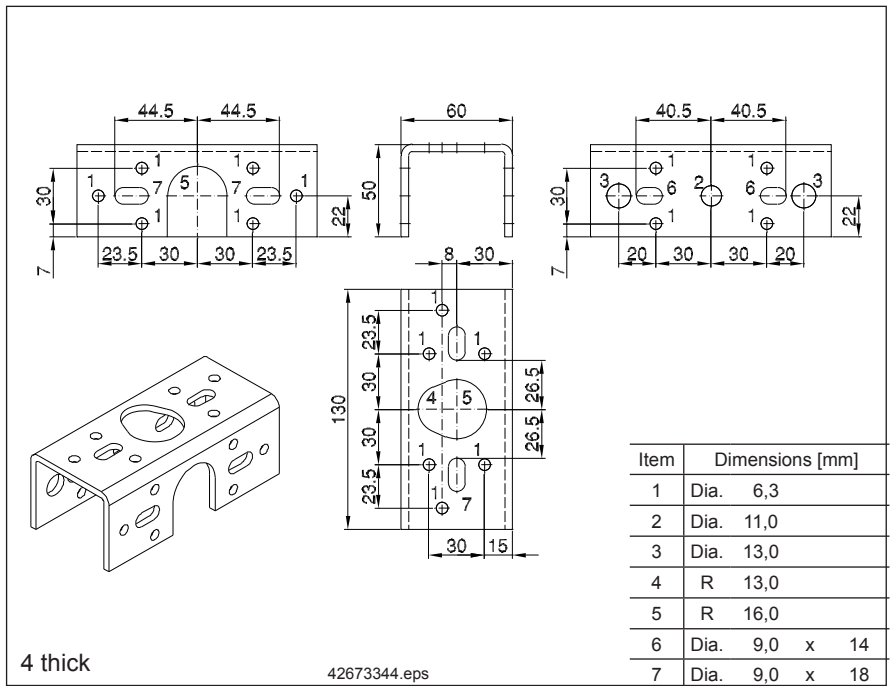


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Item	Designation	Weight [kg]	Part no.
95	Mounting plate 2	0,56	505 754 44

Finish: galvanized

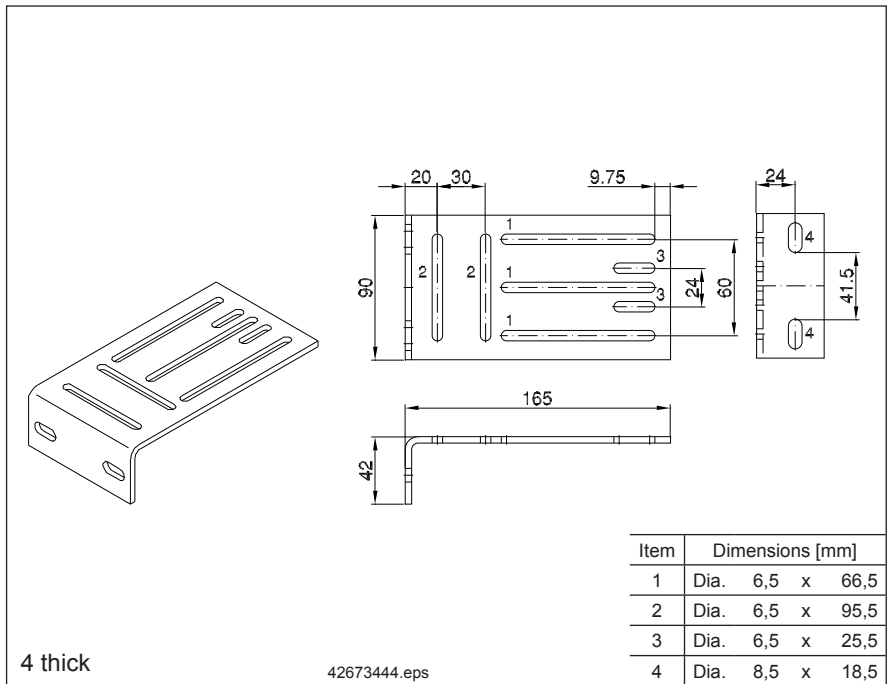
15.3.3 Mounting plate 3
U-plate
(Item 95)



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

Finish: galvanized

15.3.4 Mounting plate 4
L-plate
(Item 95)



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

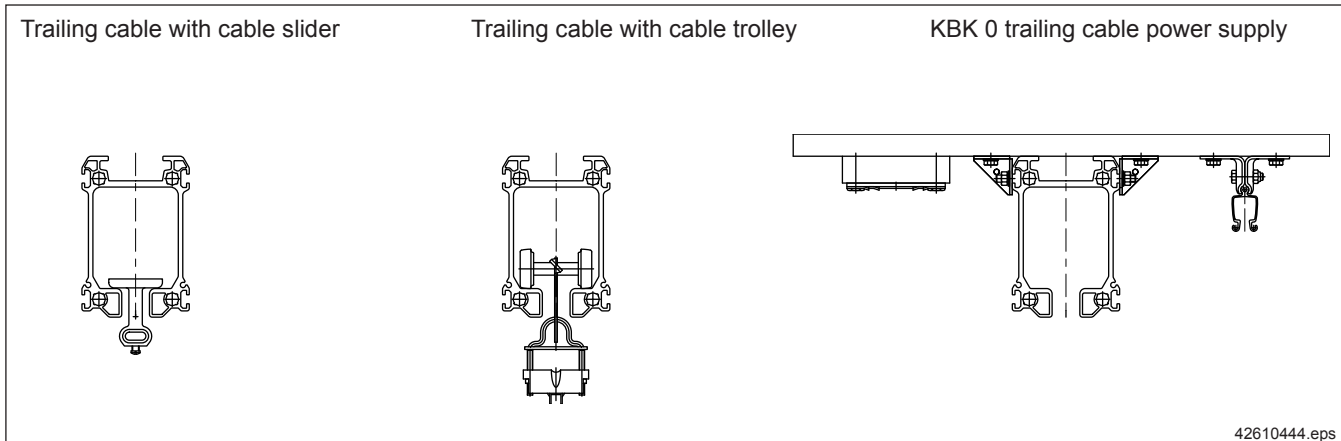
Finish: galvanized

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 Aluline section is the most economical power supply system.
Alternative: Cable trolleys running in KBK 0 rail, fitted to the side of the Aluline section.



Runways

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

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

Cable length

The required cable length is calculated as follows:

Track and crane girder length (m) x 1,2 + length of feeder (m)

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.

Max. trailing cable length with cable sliders: 30 m

Max. trailing cable length with cable trolleys: 50 m

Required number of sliders or trolleys n:

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

Approach dimension

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

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

Two trolleys or cranes on one track

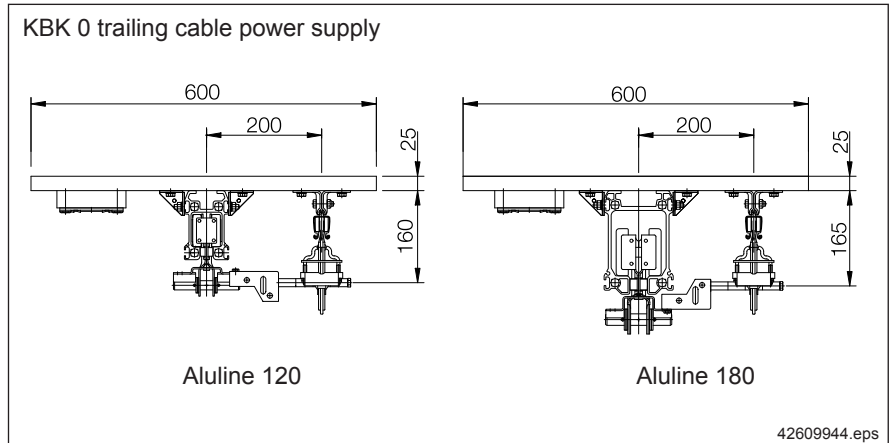
If two hoists operate on one monorail track or two cranes on one runway, power supply via one flat cable for each of them from opposite monorail or runway ends may be provided.

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

More than two trolleys or cranes on one track

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

External KBK 0 trailing cable power supply

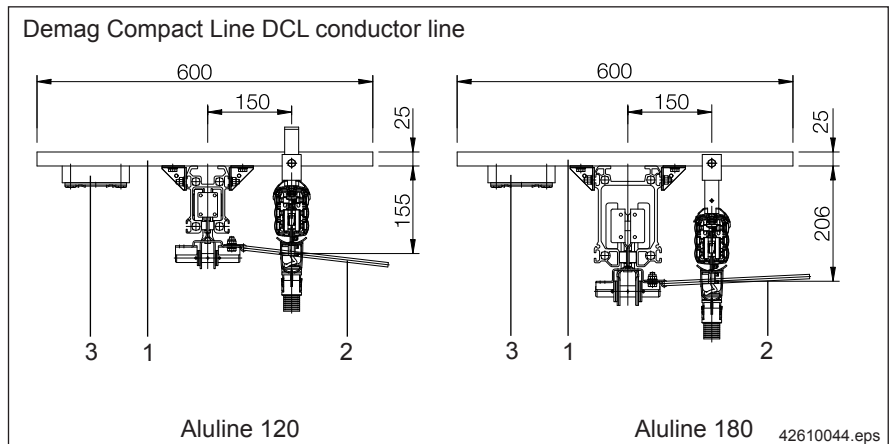


Power supply

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

See technical data sheet 202 617 44 for details.

16.1.2 External DCL Demag Compact Line



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

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

Details see:

Technical data sheet 203 387 44 (Demag Compact Line DCL),

Technical data sheet 203 510 44 (DCL on KBK).

Items required for fitting to Aluline rails

Item	Fitting KBK 0 and DCL to Aluline 120 / Aluline 180	Weight [kg]	Part no.
(1)	C rail fitting 600	1,6	855 099 44
(2)	DCL engaging arm for current collector		Standard drawing ¹⁾
	Engaging arm attachment for KBK 0/120 towing trolley	0,9	855 104 44
	Engaging arm attachment for KBK 0/180 towing trolley	1,1	855 105 44
(3)	C-rail counterweight fitting		Standard drawing ¹⁾

1) See technical data sheet 203 510 44

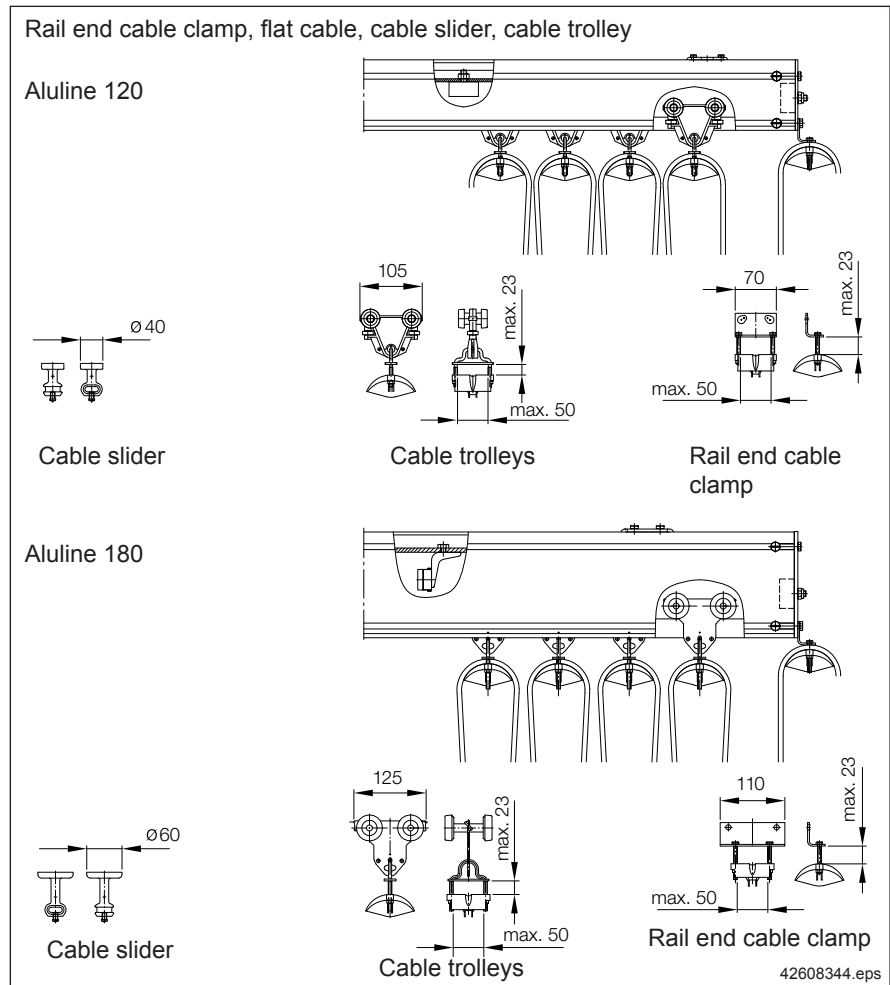
16.1.3 Trailing cable, components and attachments

Rail end cable clamp (item 83)

Flat cable with PE (item 84)

Cable slider (item 85)

Cable trolley (item 86)



Item	Designation	No. of conductors x rated cross-section [mm ²]	External dimension [mm]	Aluline 120		Aluline 180	
				Weight [kg]	Part no.	Weight [kg]	Part no.
83	Rail end cable clamp			0,10	982 114 44	0,20	855 090 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
85	Cable slider	only for flat cable		0,02	855 143 44	0,04	982 325 44
86	Cable trolleys	4 x 1.5		0,22	982 470 44	0,50	855 085 44

Rail end cable clamps are bolted to Aluline 120 or Aluline 180 end caps. This provides strain relief of the flat cable to the terminal box and a favourable fixing point for the cable between the crane girder and track.

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

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

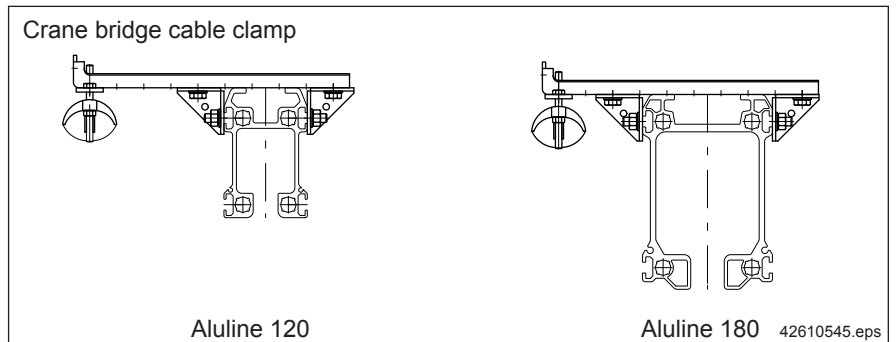
Cable trolleys can be used to support cables, compressed air or water hoses. Additional holes can be drilled for fixing stress-relief strainers.

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

Finish:

- Rail end cable clamp: galvanized
- Cable slider: plain plastic
- Clamping plate: Black plastic
- Cable trolley 120: Black plastic
- Cable trolley 180: galvanized

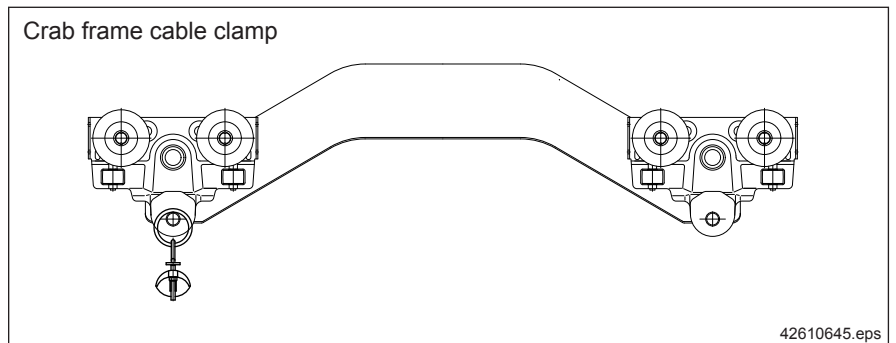
Crane bridge cable clamp (item 80)



Item	Designation	Aluline 120/180	
		Weight [kg]	Part no.
80	Crane bridge cable clamp	0,6	855 106 44

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

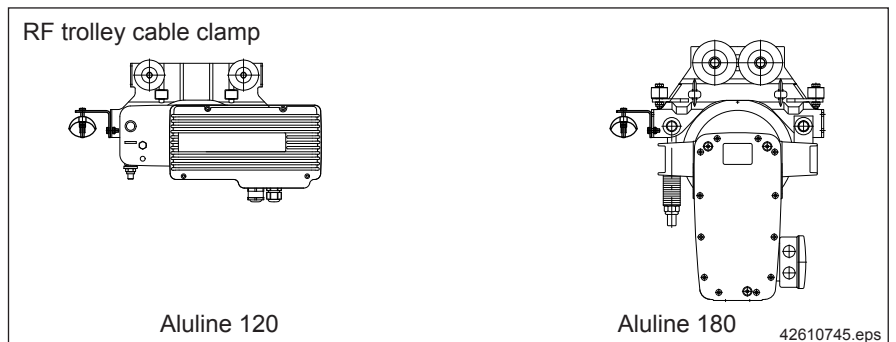
Crab frame cable clamp (item 81)



Item	Designation	Aluline 120/180	
		Weight [kg]	Part no.
81	Crab frame cable clamp	0,1	982 577 44

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

RF trolley cable clamp (item 82)

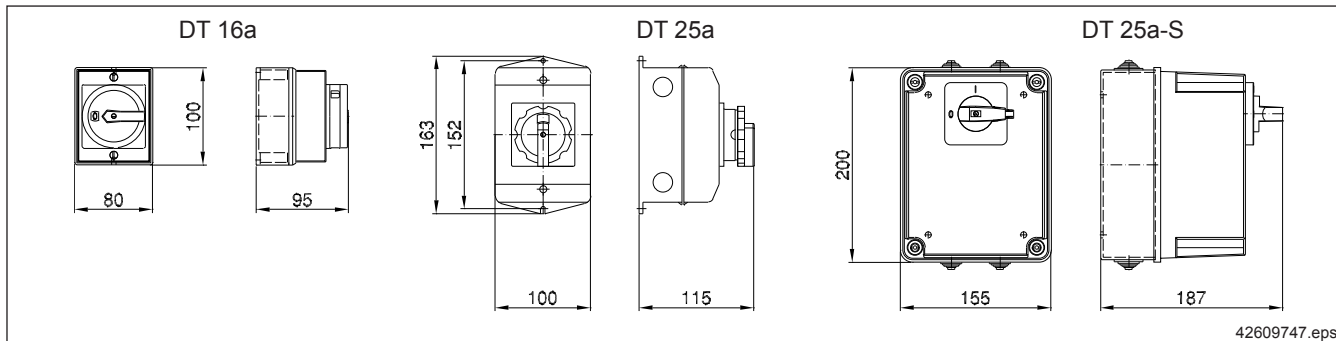


Item	Designation	Aluline 120/180	
		Weight [kg]	Part no.
82	RF trolley cable clamp	0,6	982 578 44

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

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

Power supply



Item	Designation	Voltage [V]	Current [A]	Weight [kg]	Part no.
88	DT 16a	≤ 500	max. 20	0,32	575 479 44
	DT 25a	≤ 690	max. 25	0,40	575 480 44
	DT 25a-S			1,60	473 037 44

Fuse links and inserts for DT 25a-S

Nominal current [A]	D fuse link, delayed action Part no.	D screw-in adapter for fuse insert Part no.
6	451 663 99	504 905 44
10	451 643 44	504 906 44
16	451 644 44	504 907 44
20	451 645 44	504 908 44
25	451 646 44	504 909 44

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

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

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

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

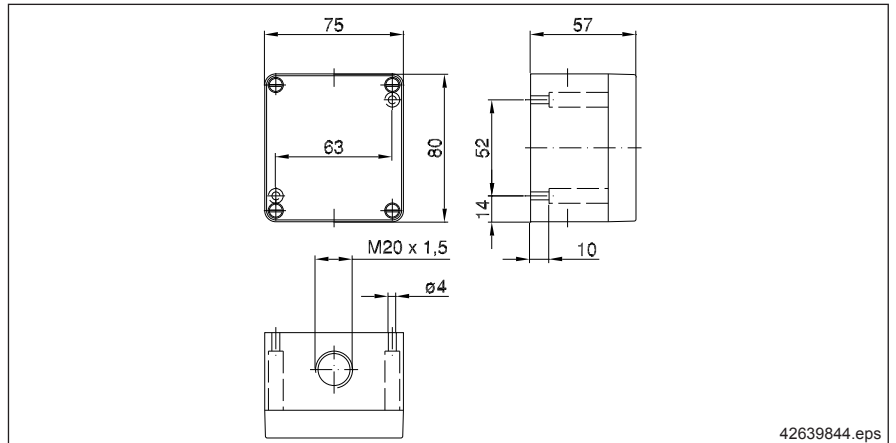
Two M20 x 1,5 cable entries are available. Type of enclosure IP 55.

DT 16a switch-isolator without fuses;

DT 25a switch-isolator without fuses;

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

**16.1.5 Terminal box
(Item 94)**



Power supply

Item	Designation	Weight [kg]	Part no.
94	Terminal box	0,4	504 650 44

for flat cables	Terminal box			Twist-type cable entry gland for	
	Weight [kg]	Part no.	Size	Round cable Part no.	Flat cable Part no.
4 x 1,5 mm ²	0,34	504 650 44	M20 x 1,5	794 947 44	794 923 44
4 x 2,5 mm ²	0,60	575 351 44	M25 (M16, M32)	794 946 44 794 905 44 ¹⁾	794 927 44 794 905 44 ¹⁾

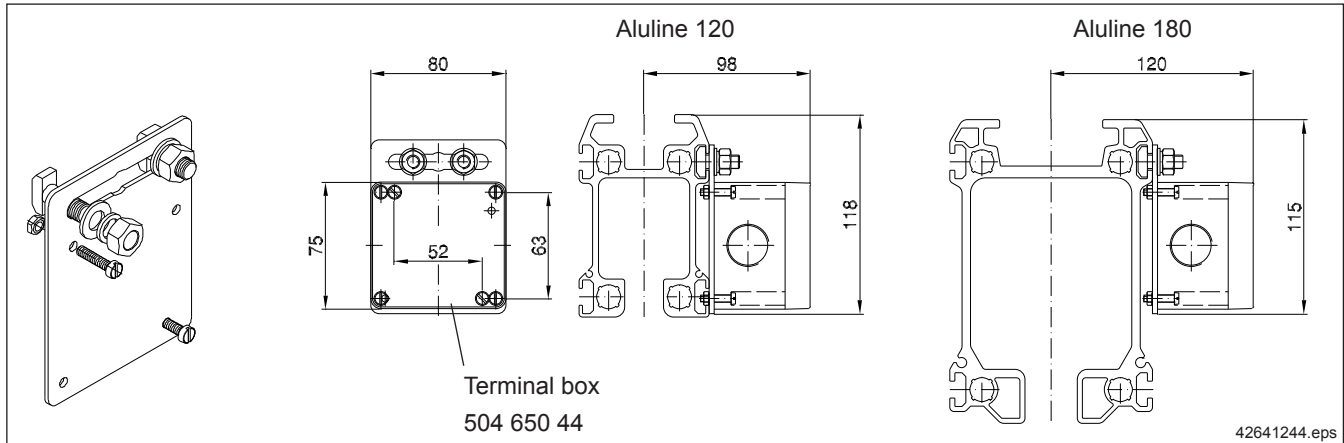
1) Nut

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.

Finish: Aluminium enclosure with 6 modular spring-loaded terminals (grey) up to (2,5 mm²) fitted on mounting rail, RAL 7035 (light grey)

16.1.6 Mounting brackets for switches and terminal boxes

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

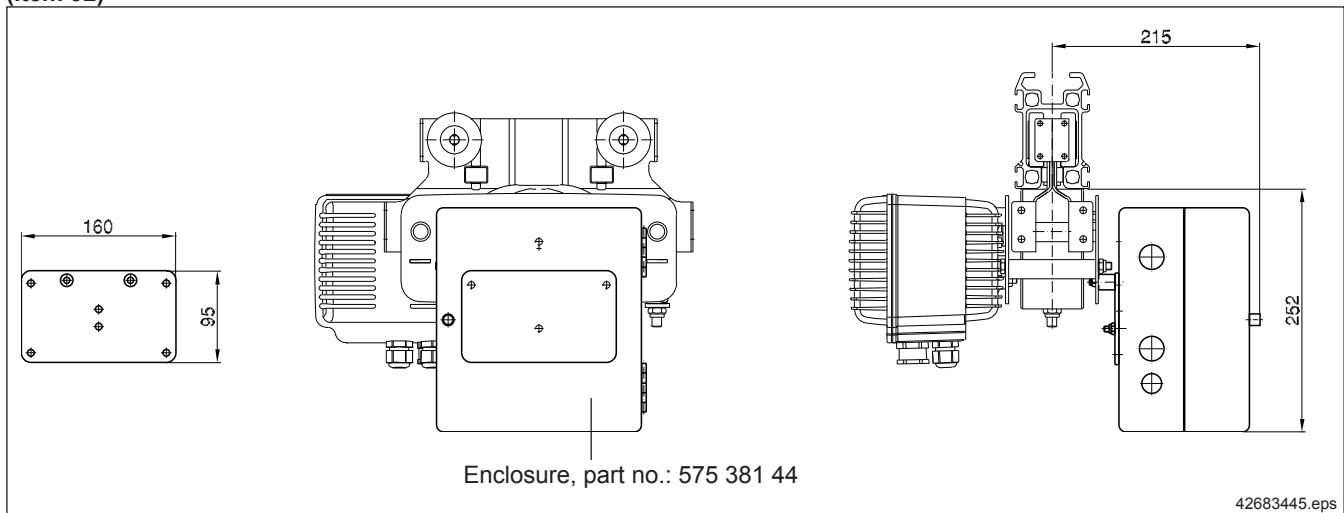


Item	Designation	Weight [kg]	Part no.
92	Mounting bracket for terminal box	0,17	855 150 44

Finish: galvanized

**Mounting bracket for enclosure on
RF 125**

(Item 92)

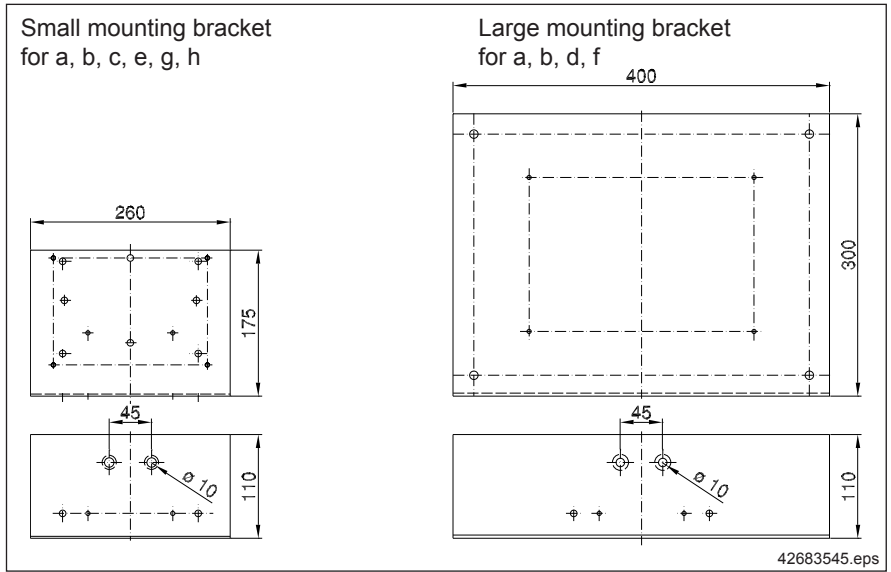


Item	Designation	Weight [kg]	Part no.
92	RF 125 enclosure mounting bracket	0,6	851 270 44

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

Finish: black

**Attachment bracket
(Item 93)**

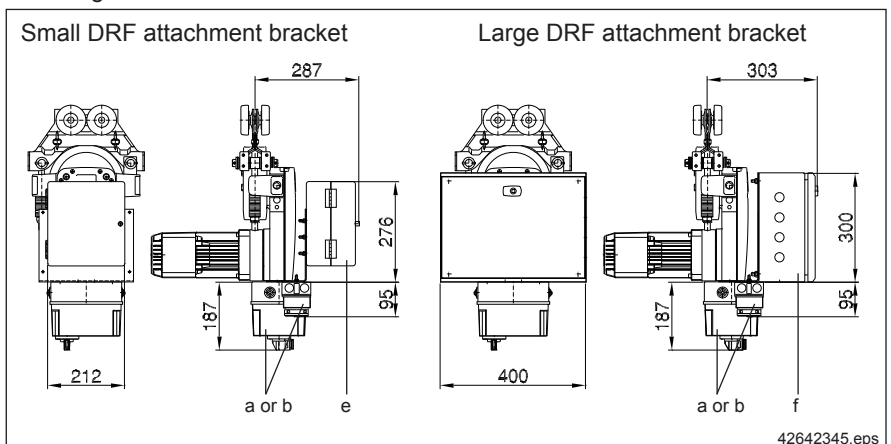


Item	Designation	Weight [kg]	Part no.
93	Small mounting bracket	0,9	851 222 44
	Large mounting bracket	3,9	851 220 44

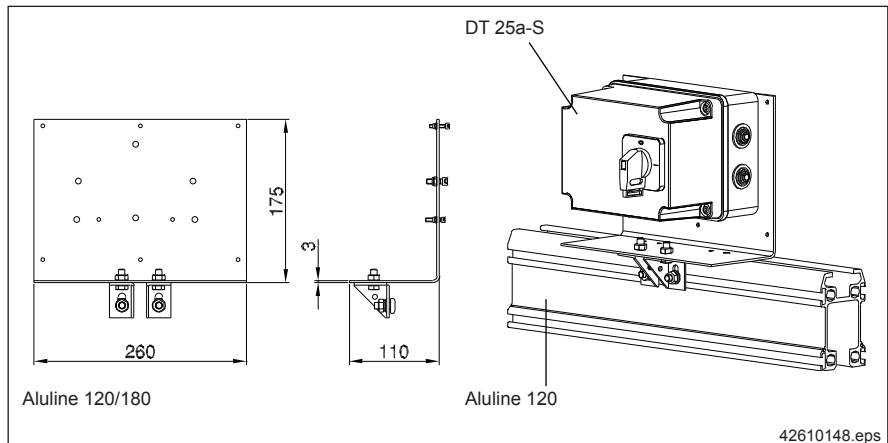
Item	Designation	Part no.		
a	Mains connection/isolating switch	DT 16 a	575 479 44	
		DT 25 a	575 480 44	
		DT 25 a-S	473 037 44	
c	Terminal box	180 x 130 x 75	575 351 44	
d		255 x 180 x 75	575 352 44	
e	Housing	232 x 212 x 137	575 381 44	
	Crane bridge enclosure		772 078 45	
f	Housing	400 x 300 x 155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

Example: fitted to DRF

Finish: galvanized



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

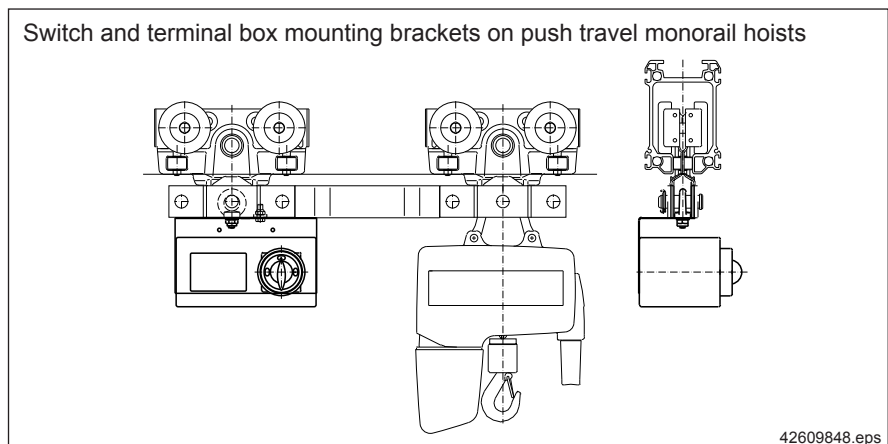


Item	Designation	Weight [kg]	Part no.
90	Bracket for isolator switch	0,7	855 152 44

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

Finish: galvanized

**Switch and terminal box mounting
brackets
(Item 90)**



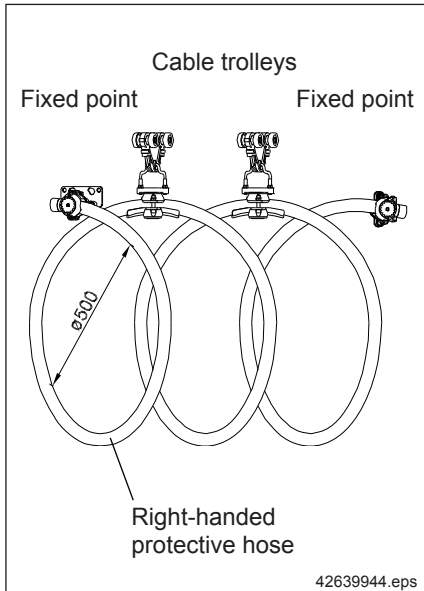
Item	Designation	Weight [kg]	Part no.
90	Switch bracket	0,75	851 223 44

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

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

16.2 Pneumatic power supply

16.2.1 General information



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

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

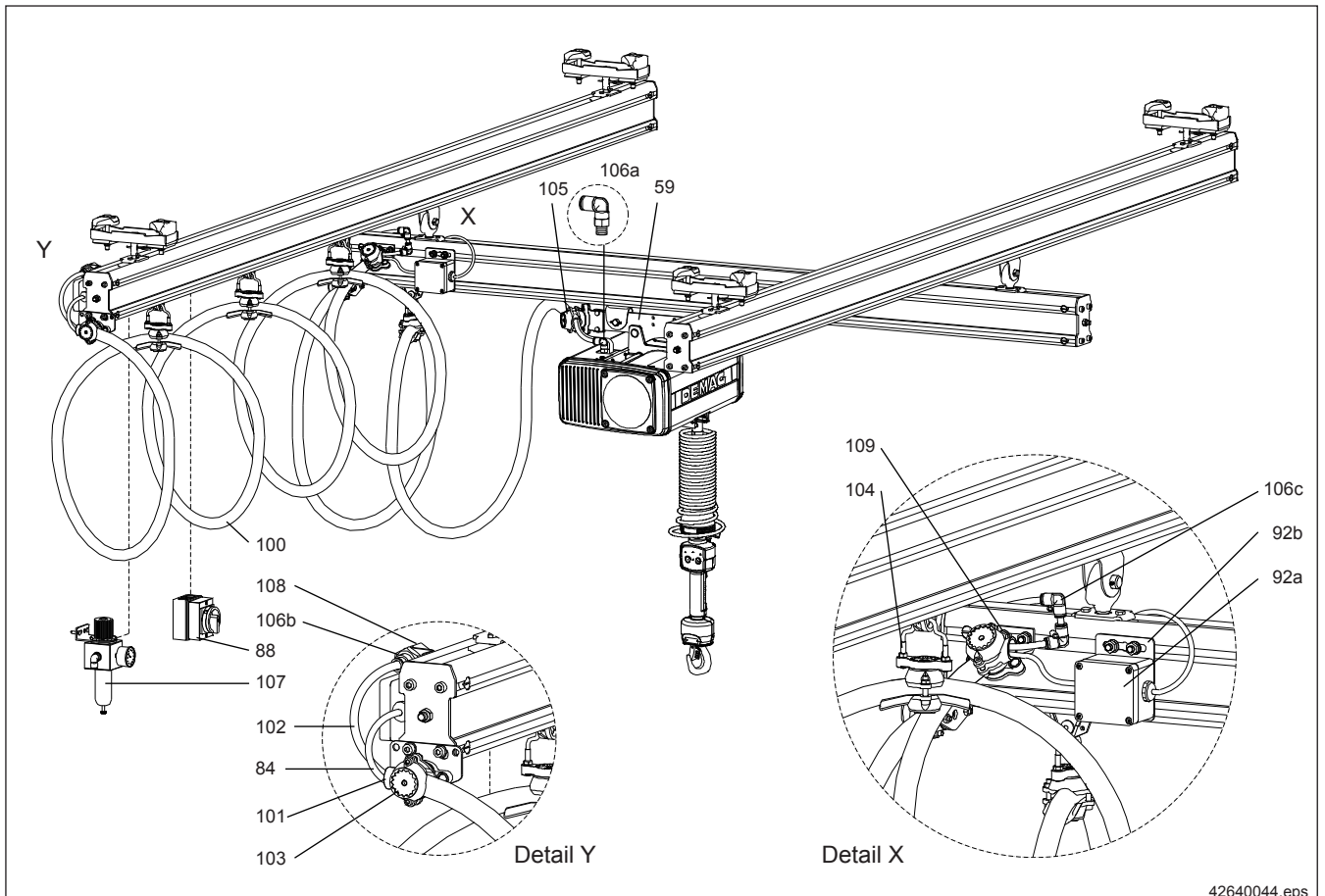
The supply lines are laid in a protective hose and attached to special points of the crane runway and to the crane girder as well as to cable trolleys. The helical protective hose is always right-handed and has a sag of approx. 500 mm.

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

Example:
KBK Aluline 120 (classic) single-girder crane

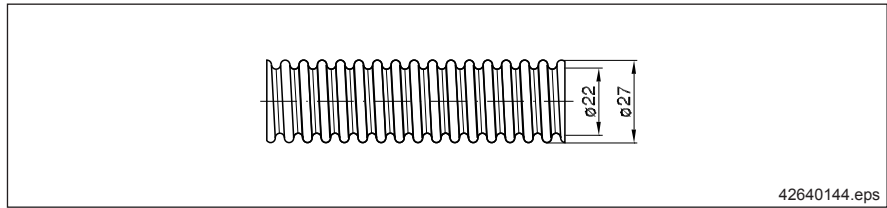
Separation of power supply: Transfer point → crane bridge/crane track
 (Detail X)

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



16.2.2 Components

Protective hose (Item 100)

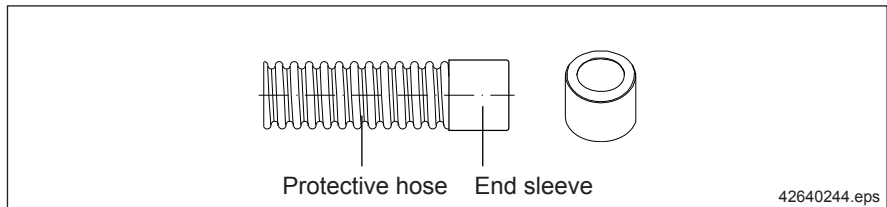


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Item	Designation	Weight [kg/m]	Part no.
100	Protective hose	0,29	343 836 44

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

End sleeve for protective hose (Item 101)

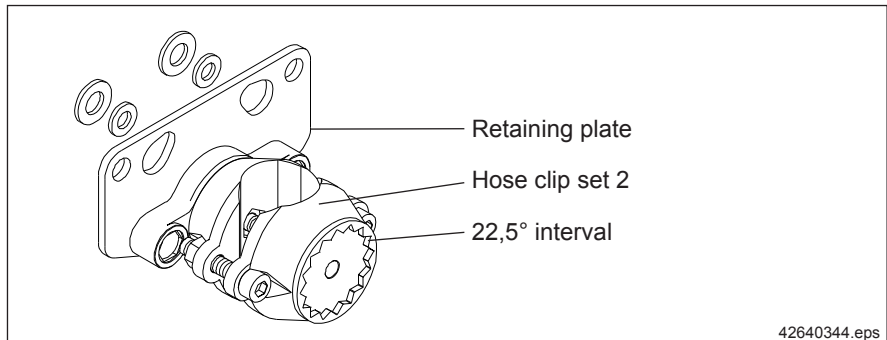


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Item	Designation	Weight [kg]	Part no.
101	End sleeve for protective hose	0,003	343 837 44

Finish: Plastic (grey)

Mounting bracket with hose clip (Item 103)



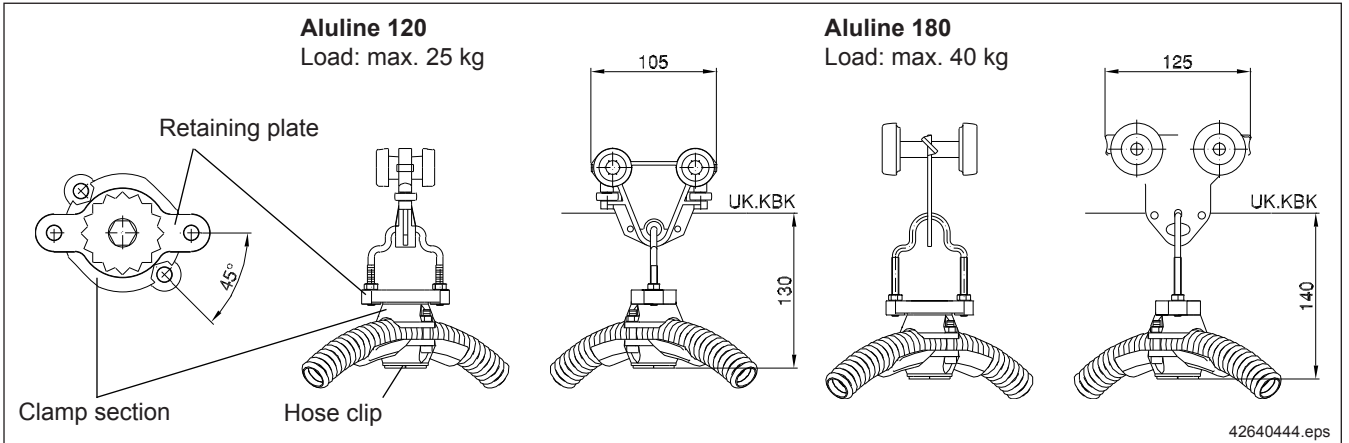
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Item	Designation	Weight [kg]	Part no.
103	Mounting bracket with hose clip	0,27	855 146 44

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

Finish: Retaining plate: galvanized
Hose clip set 2: Black plastic

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



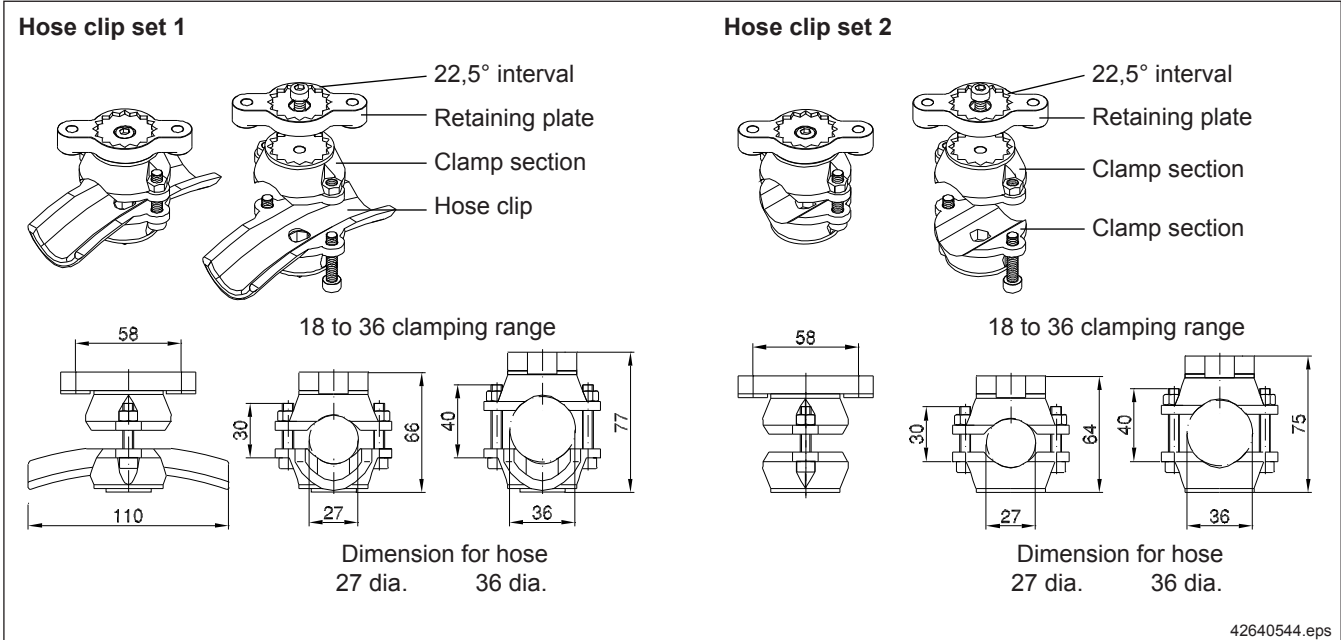
Item	Designation	Size	Weight [kg]	Part no.
104	Cable trolley with hose clip	Aluline 120	0,37	855 148 44
		Aluline 180	0,65	855 149 44

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

Temperature range: -20°C to + 70°C

Finish: Trolley: plastic, black (Aluline 180): galvanized
 Axle with ball bearings: Steel
 Travel rollers: plain plastic
 Hose clip: Black plastic

**Hose clip set
(Item 105)**



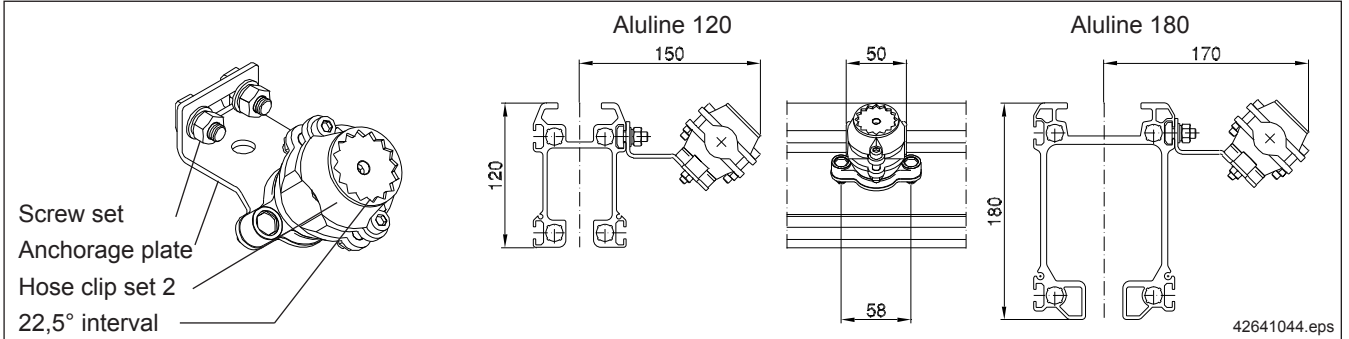
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Item	Designation	Weight [kg]	Part no.
105	Hose clip set 1	0,16	855 135 44
	Hose clip set 2	0,14	855 145 44

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°.

Finish: Black plastic

**Bracket for fixed point AL
(Item 109)**



Power supply

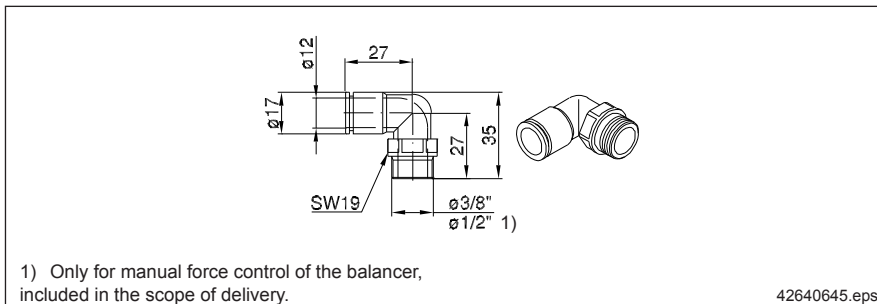
Item	Designation	Weight [kg]	Part no.
109	Bracket for fixed point AL	0,28	855 147 44

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

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

Finish: Fixed point plate: Galvanised steel
Hose clip set 2: Black plastic

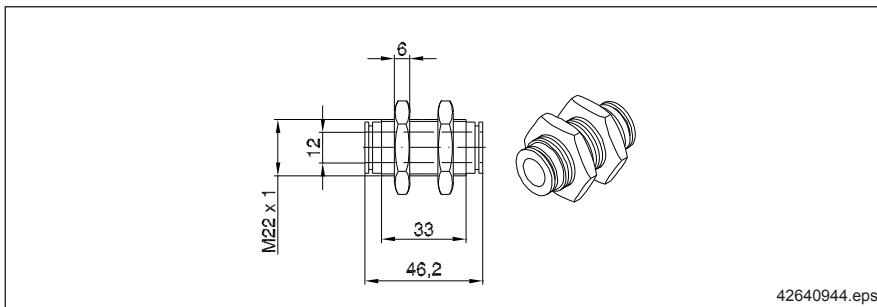
**Angular connection for balancer
(Item 106a)**



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

Finish: Nickle-plated brass

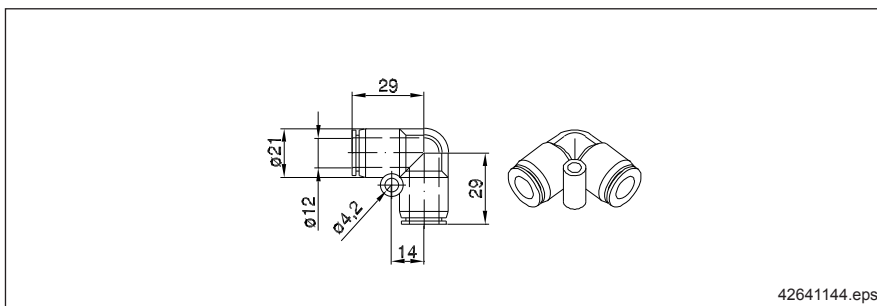
**Bulkhead gland
(Item 106b)**



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

Finish: Nickle-plated brass

**Angle connector
(Item 106c)**

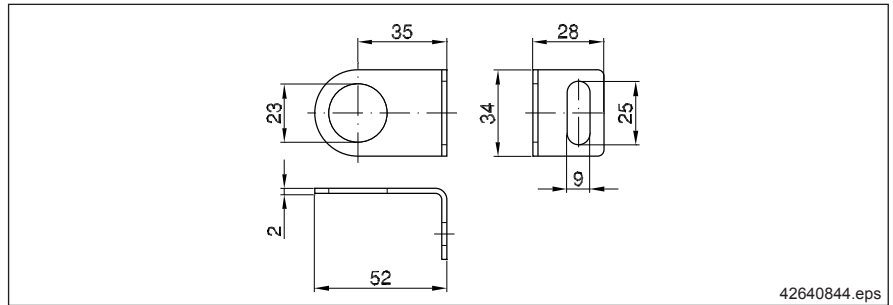


Item	Designation	Weight [kg]	Part no.
106c	Angle connector	0,05	343 835 44

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

Finish: Black plastic

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



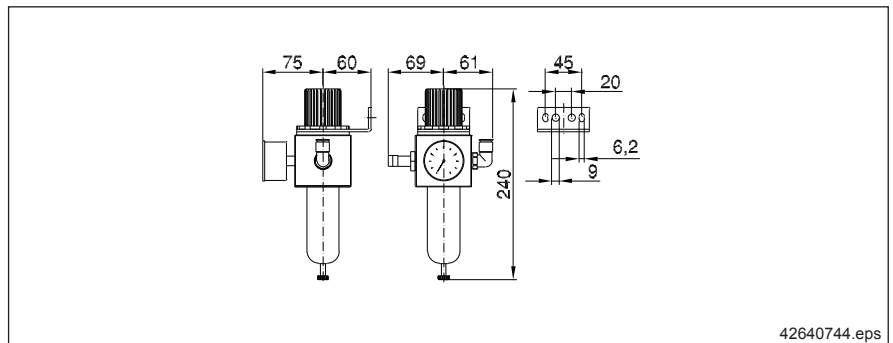
Item	Designation	Weight [kg]	Part no.
108	Angle for bulkhead gland	0,03	984 696 44

Attached with screw set (item 89)

Finish: galvanized

Power supply

**Maintenance unit
(Item 107)**



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

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

**Other components for pneumatic
power supply**

Item	Designation	Design	Weight [kg]	Part no.
59	Load bar for rope balancer D-BP 55/110	RAL 9005 (black)	1,85	984 685 44
84	highly flexible round cable 3G1,5 mm ²	Outside dia. 7,9 mm	0,09 [kg/m]	343 838 44
	highly flexible round cable 5G1,5 mm ²	Outside dia. 9,6 mm	0,14 [kg/m]	343 839 44
88	DT 16a mains connection switch		0,32	895 167 44
89	M8x20 screw set	galvanized	0,02	712 325 47
102	Plastic hose, silver in colour	Outside dia. 12 mm Inside dia. 8 mm	0,08 [kg/m]	343 840 44

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 61000-6-2 harmonised 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 and CSA-tested components available on application.

Important requirements from the standards

1. It must be possible to cut off all phases of the main power supply line by means of one mains switch. This switch must be protected against unauthorized restoration of the power supply.
2. An isolator which can be 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 according to section 17.4.

17.2 KBK standard electrical equipment with DC

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

Control	Control pendant	Travel motion	Power supply on the crane bridge	Lifting / lowering 2 speeds	Cross travel 2 speeds	Long travel 2 speeds	KBK item with	Required cable(s) on				Required number of poles on the crane bridge (PE = protective earth conductor)			
								the crane bridge			the crab				
contactor control	DSC	manual	Trailing cable	O			DC-Pro 1-10 DC-Com 1-10	Showing EB, EHK, ZHK see section 17.3	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	Mains cable DC → E22 Part no. 720 072 45	Control cable DC → E22 Part no. 720 070 45	3+PE	
	DSE-C	electric		O	O		x	1	1				1	1	3+PE
		electric with crane switch contactor		O	O		E20	3	1				1	1	3+PE
				O		O	E28	7		1	1				
	Conductor line	O		O	E28L				1	1				8+PE	
	Trailing cable	O	O	O	E32	6			1	1	1	1		8+PE	
	Conductor line	O	O	O	E32L					1	1	1		8+PE	

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

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

Control	Control pendant	Travel motion	Power supply on the crane bridge	Lifting / lowering infinitely variable	Cross travel infinitely variable	Long travel infinitely variable	KBK item with	Required cable(s) on				Required number of poles on the crane bridge (PE = protective earth conductor)			
								the crane bridge			the crab				
contactor control	DSC-S	manual	Trailing cable	O			DCS-Pro 1-10	Showing EB, EHK, ZHK see section 17.3	4 x 1,5 flat cable 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	Mains cable DC → E22 Part no. 720 072 45	Control cable DC → E22 Part no. 720 070 45	3+PE	
	DSE-10CS	electric		O	O		x	1	1				1	1	3+PE
		electric with crane switch contactor		O	O		E20	3	1				1	1	3+PE
				O		O		7		1	1				
	Conductor line	O		O	1)				1	1				8+PE	
	Trailing cable	O	O	O	6				1	1	1	1		8+PE	
	Conductor line	O	O	O						1	1	1		8+PE	

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

1) on request

Contents

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



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

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

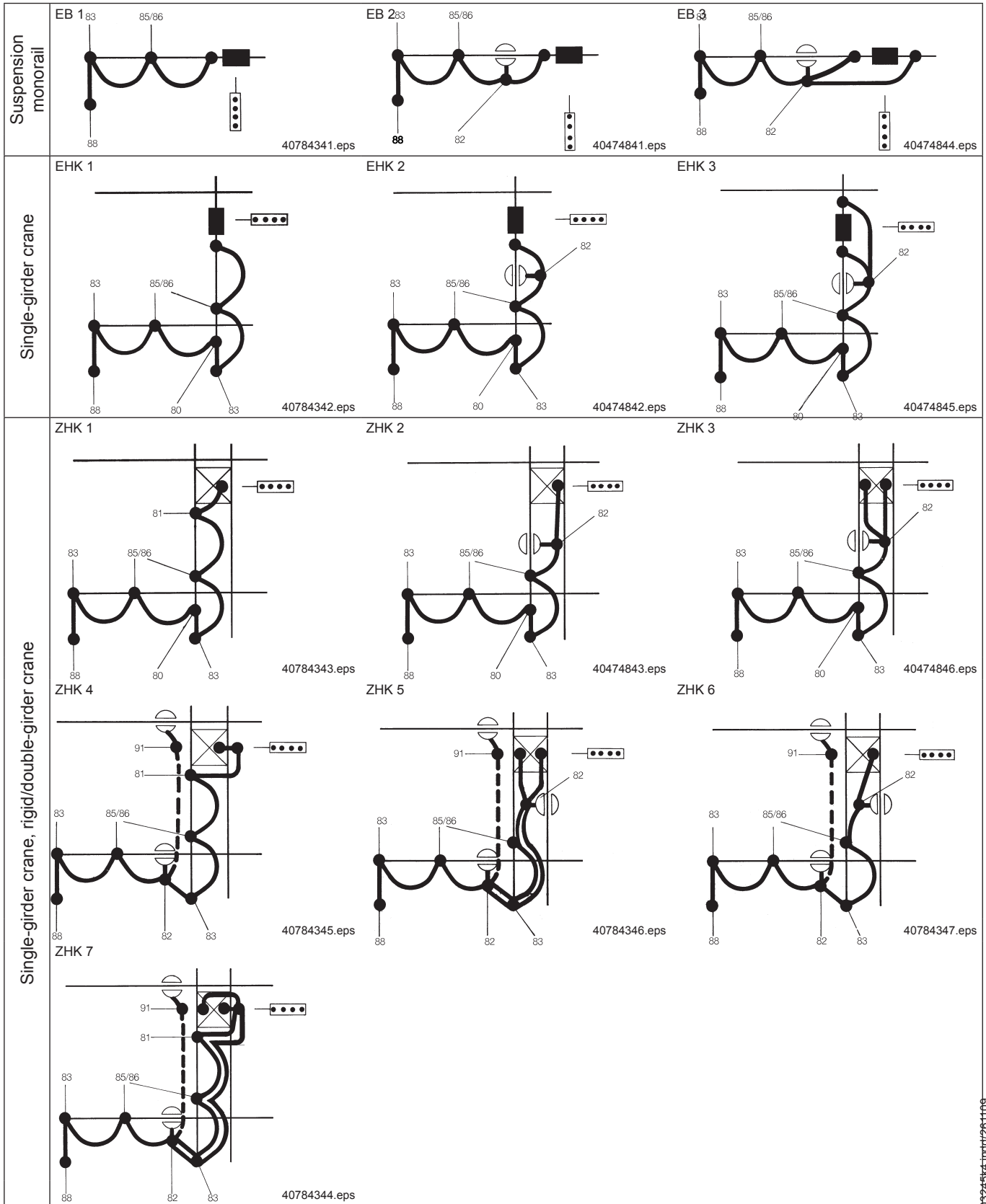
Technical data, installation diagrams and components for electric travel motions for KBK installations with DC chain hoists and conventional drives such as DRF 200, for example, on request.

17.3 Schematic illustrations of cable arrangements and cable clamps

Key to symbols

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

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



17.4 Electrical key values for DC-Pro, DC-Com, DCS-Pro, DCMS-Pro, DCRS-Pro

DC-Pro chain hoist

Mains connection delay fuse links

Size	Motor size	380-415V	220-240V	500-525V	440-480V	220-240V	380-400V	575V	
		50Hz				60Hz			
		[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
DC-Pro 1	ZNK 71 A 8/2	6	6	6	6	6	6	6	
DC-Pro 2	ZNK 71 B 8/2								
DC-Pro 5	ZNK 80 B 8/2		10		10	15	10		
DC-Pro 10	ZNK 100 A 8/2								
DC-Pro 16	ZNK 100 B 8/2	16	-	16	15	-	20	15	
			20	10	25	15	10		
DC-Pro 25	ZNK 100 C 8/2	20	-	16	20	-	25	15	

Supply cables ¹⁾ for 5% voltage drop ΔU and starting current I_A

Size	Motor size	380-415V		220-240V		500-525V		440-480V		220-240V		380-400V		575V	
		50Hz				60Hz									
		[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]
DC-Pro 1	ZNK 71 A 8/2	1,5	100	1,5	89	1,5	100	1,5	100	1,5	76	1,5	100	1,5	100
DC-Pro 2	ZNK 71 B 8/2														
DC-Pro 5	ZNK 80 B 8/2														
DC-Pro 10	ZNK 100 A 8/2	1,5	94	-	34	1,5	61	43	-	-	2,5	45	1,5	36	78
	DC-Pro 10														
DC-Pro 16	ZNK 100 B 8/2	2,5	47	2,5	25	1,5	73	52	2,5	21	1,5	36	2,5	36	90
	DC-Pro 16														
DC-Pro 25	ZNK 100 C 8/2	2,5	47	-	-	1,5	45	2,5	53	-	-	2,5	36	2,5	51

DC-Com chain hoist

Mains connection delay fuse links

Size	Motor size	380-415V	220-240V	500-525V	440-480V	220-240V	380-400V	575V	
		50Hz				60Hz			
		[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
DC-Com 1	ZNK 71 B 8/2	6	6	6	6	6	6	6	
DC-Com 2	ZNK 71 B 8/4								
DC-Com 5	ZNK 80 A 8/4		10		10	10	10		
DC-Com 10	ZNK 100 A 8/2								
DC-Com 10	ZNK 100 B 8/2	16	25	10	16	25	20	16	

Supply cables ¹⁾ for 5% voltage drop ΔU and starting current I_A

Size	Motor size	380-415V		220-240V		500-525V		440-480V		220-240V		380-400V		575V	
		50Hz				60Hz									
		[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]	[mm ²]	[m]
DC-Com 1	ZNK 71 B 8/2	1,5	100	1,5	89	1,5	100	1,5	100	1,5	76	1,5	100	1,5	100
DC-Com 2	ZNK 71 B 8/4														
DC-Com 5	ZNK 80 A 8/4														
DC-Com 10	ZNK 100 A 8/2	1,5	94	-	34	1,5	61	43	-	-	2,5	45	1,5	36	78
	DC-Com 10														
DC-Com 10	ZNK 100 B 8/2	2,5	47	2,5	21	1,5	61	43	2,5	18	1,5	36	2,5	36	59

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

Mains connection delay fuse links

Size	Motor size	380 – 480 V, 50/60 Hz, 3 ~
		[A]
DCS-Pro 1 DCS-Pro 2 DCMS-Pro 1 DCMS-Pro 2 DCRS-Pro 1 DCRS-Pro 2	ZNK 71 B 4	6
DCS-Pro 5	ZNK 80 A 4	
DCS-Pro 10	ZNK 100 A 4	10

Supply cables ¹⁾ for 5% voltage drop ΔU and starting current I_A

Size	Motor size	380-480 V, 50/60 Hz, 3 ~	
		[mm ²]	[m]
DCS-Pro 1 DCS-Pro 2 DCMS-Pro 1 DCMS-Pro 2 DCRS-Pro 1 DCRS-Pro 2	ZNK 71 B 4	1,5	100
DCS-Pro 5	ZNK 80 A 4		
DCS-Pro 10	ZNK 100 A 4		40

Project engineering sheet for KBK installations

Please enclose a sketch.

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

Customer Stage of customer's planning Financial planning for investments <input type="checkbox"/> Tech. <input type="checkbox"/> Prelim. <input type="checkbox"/> Detailed planning Implementation expected _____ <input type="checkbox"/> Invitation to tender <input type="checkbox"/> Order soon to be placed Quotation deadline _____	Project no. Customer no. Customer <hr/> Processed by _____ Date _____ Dept./Sales office _____ Scope of required quotation <input type="checkbox"/> Budget offer negotiated on _____ <input type="checkbox"/> None <input type="checkbox"/> Incl. sketch with _____ <input type="checkbox"/> Load information <input type="checkbox"/> Customer visit <input type="checkbox"/> Detailed quotation <input type="checkbox"/> Telephone contact <input type="checkbox"/> with steelwork <input type="checkbox"/> with erection Delivery deadline _____
Type of installation <input type="checkbox"/> Suspension monorail <input type="checkbox"/> Double-rail track KBK track section _____ <input type="checkbox"/> Single-girder crane <input type="checkbox"/> with latching device KBK crane section _____ KBK track section _____ <input type="checkbox"/> Double-girder crane <input type="checkbox"/> More than 2 crane tracks KBK crane section _____ KBK track section _____	
Technical data SWL _____ kg Average operating time _____ hours/day Track length _____ m Crane length _____ m Crane span dimension _____ m Number of trolleys on one track _____ Load hook distance for several loads _____ mm Number of cranes on one runway _____ Highest hook position above floor _____ m Installation site _____ Type of supporting structure / suspension methods / flange _____ Clear height from floor to bottom edge of supporting structure _____	
Hoist unit Electric chain hoist type _____ Hoist speed v _____ / _____ m/min Hook path _____ m	
Travel speeds Cross travel <input type="checkbox"/> manual <input type="checkbox"/> electric, v = _____ / _____ m/min Crane <input type="checkbox"/> manual <input type="checkbox"/> electric, v = _____ / _____ m/min	
Power supply On crane <input type="checkbox"/> Trailing cable <input type="checkbox"/> Cable sliders <input type="checkbox"/> Cable trolleys <input type="checkbox"/> KBK II-R4 <input type="checkbox"/> KBK II-R5 <input type="checkbox"/> DKK <input type="checkbox"/> DEL <input type="checkbox"/> Continuous <input type="checkbox"/> In sections On track <input type="checkbox"/> Trailing cable <input type="checkbox"/> Cable sliders <input type="checkbox"/> Cable trolleys <input type="checkbox"/> KBK II-R4 <input type="checkbox"/> KBK II-R5 <input type="checkbox"/> DKK <input type="checkbox"/> DEL <input type="checkbox"/> Continuous <input type="checkbox"/> In sections	
Power supply <input type="checkbox"/> Three-phase <input type="checkbox"/> AC Operating voltage _____ V, _____ Hz, Control voltage _____ V	
Control <input type="checkbox"/> from trolley <input type="checkbox"/> from crane <input type="checkbox"/> mobile <input type="checkbox"/> stationary <input type="checkbox"/> direct control <input type="checkbox"/> contactor control	
Additional information (e.g. special ambient conditions) <hr/> Special commercial conditions	

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