

# INSULATED CONDUCTOR SYSTEMS

U 20 – U 30 – U 40



# INSULATED CONDUCTORS U 20 – U 30 – U 40

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## BASIC DESCRIPTION

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### U 20

For cranes, self-propelled monorail carriers, amusement rides – for installations with curves, switches, turntables, special control conductor systems for pickling lines and galvanizing plants

**Pages 5–19**

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### U 30

For bridge and portal crane electrification, heavy monorail systems, amusement rides, construction and maintenance hoists and for high voltage applications up to 10 kV

**Pages 20 – 29**

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### U 40

For heavy cranes and loading bridges, container and transtainer systems, coking machinery, for dockside trench type electrification systems in ports, shipyards and steel mills – for all heavy duty and for high voltage applications up to 10 kV

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## GROUNDING DEVICE

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## TYPICAL INSTALLATIONS

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# INSULATED CONDUCTORS U 20 – U 30 – U 40

## General

VAHLE insulated conductors are designed in accordance to international safety regulations for a multitude of power supply applications. They fully meet VDE 0100 and are finger safe to EN 60529 (VDE 0470, part 1, protection code IP 23). They are UL, SAA and SEV approved.

For current collectors touch protection is only given if carbon brushes are fully entered into the conductors. Conductor installations in the reach of hand, where collectors leave the conductor rails during normal operation, must be protected against accidental touch by the customer e.g. switch-off or separation. This refers to voltages above 25 VAC resp. 60 VDC, only.

The adjacent picture demonstrates that the VDE test finger cannot reach live conductors – finger safety is guaranteed.

For high voltage applications we do recommend our adequate high voltage insulators but applicable international or local safety requirements have to be considered.

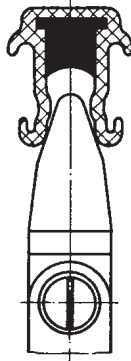
The shrouding which envelops the various conductors is an excellent insulator. Therefore our unipole insulated conductors guarantee utmost safety in operation. |

The ground conductor is identified by international colour coding.

For obvious safety reasons phase and ground collectors are not interchangeable.

Any number of conductors can be accomplished by installing various power rails side by side.

Standard rail sections are 6 m long, shorter lengths to coincide with your runway requirements are available.



## Approvals

**U 20 and U 30:** UL-approval

Please ask in case of order

## Hangers

Support brackets will be prepared in accordance to your local requirements or provided by others considering your runway system configuration.

**U 20:** see page 5 - **U 30:** see page 20 - **U 40:** see page 30.

## Insulators

The insulated conductor rails could be installed with insulators. Through this is the creepage distance longer. In systems with difficult ambient and environmental conditions (high humidity, electroplating shop, chemical industry etc.) are this insulators required.

## Insulating covers

|  | Standard shrouding colour green                         | High temp. shrouding colour grey |
|--|---|----------------------------------|
| <b>Electrical properties:</b><br>dielectric strength<br>DIN 53 481 | 30-40 kV/mm   | 45 kV/mm                         |
| specific resistance<br>DIN 53 482                                  | $5 \times 10^{15}$ Ohm/cm                               | $5 \times 10^{17}$ Ohm/cm        |
| Surface resistance according to IEC 60093                          | $10^{13}$ Ohm   | $10^{15}$ Ohm                    |
| Creep resistance according to IEC 60112/ VDE 0303                  | CTI> 600-2,7  | CTI> 600-2,7                     |
| <b>Mechanical properties:</b><br>flexible strength                 | 75 N/mm <sup>2</sup> ± 10%                              | 95 N/mm <sup>2</sup> ± 10%       |
| tensile strength   | 50 N/mm <sup>2</sup> ± 10%                              | 50 N/mm <sup>2</sup> ± 10%       |
| <b>Temperature resistance</b>                                      | -30 °C thru +55 °C                                      | -30 °C thru +85 °C               |
| flame test proof per DIN 4102 part 1                               | class B1<br>no flaming particles,<br>self extinguishing |                                  |

## Joints

The connection between the conductor rails is made through bolted joints.

For touch protection every joint will be covered through a joint cap. With bigger temperature fluctuation and length above 100 m are expansion sections required (see installation instructions).

## Feed terminals

The feed will be installed between two conductor rails instead of a standard joint. To connect this feed please consider single core cables.

## End caps

The end caps are the touch proof end of the conductor rails.

## Entry funnel and transfer guides

For the use in spurlines, turntables and switches are transfer guides and entry funnels available.

## Isolating sections

Isolating sections are electrical interrupts of the conductor. Under normal operating conditions a cross over with collectors to switch the voltage off or on is only allowed with low power ratings (control current).

For control reasons, feed tracks, repair areas etc. we supply isolating sections.

## Curves

The insulated conductor rails could be bend in horizontal or vertical curves. The rails are depending on type and radius bend in our factory or on site.

## Current collectors

Depend on usage single or double collectors are used.

The mentioned continuous currents are for collectors in standard use with conductor profiles with copper surface. With the AE-conductor rail the collectors of consumers which remain at one place continuously or work under a very low travel speed (e.g. 10/min.) the maximum continuous current is approx. 50% of the mentioned continuous current.

The length of the cable should not extend 3 m if the fuse is not laid out for this load capacity. (See aswell DIN VDE 0100, part 430 and DIN EN 60204)

Note: The a.m. Often occurs in systems with more than one collector)

The supplied connecting cables (H07RN-F) are for the mentioned nominal currents big enough. For the different cable layouts have the reduction factors of DIN VDE 0298 to be considered.

## Safety advice

It must be ensured that the arrangement of the conductor system provides minimum distances (0,5 m) between fixed and mobile parts. (i.e. Between conductor rails, collector trolleys and towing arms) so as to avoid the risk of pinching.

## Chemical resistance for both designs:

Shroudings in the standard design (color green) and in the heat resistant design (color grey) are resistance against mineral oil, fats, caustic soda 25%, caustic soda 50%, concentrated hydrochloric acid; sulfuric acid upto 50%.

**Please note: For use in galvanizing and pickling plants, under aggressive conditions and low voltage applications we would appreciate receiving detailed information, especially of the environmental conditions.**

**For quotations and order processing including Powerail systems with curves, dead sections, turntables, switches etc. we require your drawings or sketches.**

|   |            |            |           |            |
|---|------------|------------|-----------|------------|
|   |            |            |           |            |
| Type  | U 20/50 CE | U 20/50 AC | U 20/50 C | U 20/50 CH |
| Weight kg/m                                   | 0,500      | 0,400      | 0,580     | 0,560      |
| <b>Standard shroud, color green</b>           |            |            |           |            |
| Order- No. phase <sup>(2)</sup>               | 12701 •    | 12702 •    | 12703 •   | 12704 •    |
| Order- No. ground <sup>(2)</sup>              | 12711 •    | 12712 •    | 12713 •   | 12714 •    |
| <b>High temperature shrouding, color gray</b> |            |            |           |            |
| Order- No. phase <sup>(2)</sup>               | 12706 •    | 12707 •    | 12708 •   | 12709 •    |
| Order- No. ground <sup>(2)</sup>              | 12716 •    | 12717 •    | 12718 •   | 12719 •    |

## Engineering data

| Type       | Conductor cross section mm <sup>2</sup> |    |                 | Leakage distance of shroud mm | Max. Voltage <sup>(5)</sup> V | max. continuous ampere capacity A by 35 °C | Resistance <sup>(4)</sup> Ohm/1000 m | Impedanz <sup>(4)</sup> Ohm/1000 m |
|------------|---|----|-----------------|-------------------------------|-------------------------------|--|--------------------------------------|------------------------------------|
|            | Cu                                      | Al | stainless steel |                               |                               |  |                                      |                                    |
| U 20/50 CE | 30                                      |    | 18              | 45                            | 1000                          | 80   | 0,587                                | 0,612                              |
| U 20/50 AC | 18                                      | 30 |                 | 45                            | 1000                          | 120  | 0,483                                | 0,600                              |
| U 20/50 C  | 50                                      |    |                 | 45                            | 1000                          | 210  | 0,376                                | 0,416                              |
| U 20/50 CH | 50                                      |    |                 | 45                            | 1000                          | 210  | 0,376                                | 0,416                              |

### Conductor code

U = Unipole insulated conductor  
 20 = Shrou size  
 50 = Cross sectional area (mm<sup>2</sup>)  
 CE = Copper/stainless steel conductor  
 AC = Aluminium/copper conductor  
 C = Copper conductor  
 CH = Copper conductor with extra deep groove for high speed application and lateral mounting

### Conductor distance:

With insulated hangers: 50 mm  
 With compact hangers 23-26 mm  
 Chemical and electrical values aswell as temperature range see page 4

### Supply lengths:

6 m standard;  
 shorter lengths are available

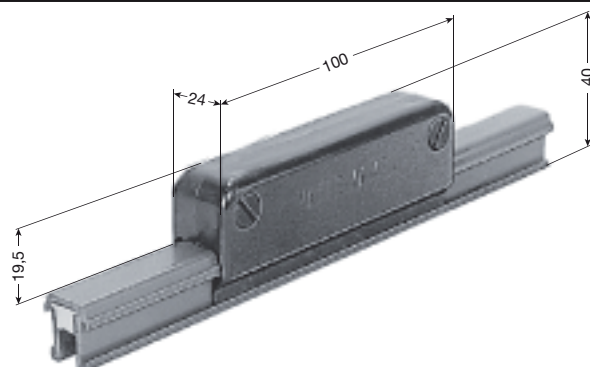
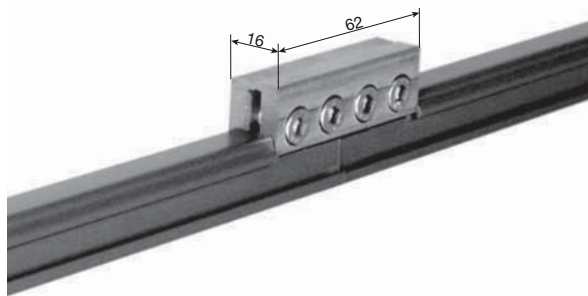
### Support spacing:

– for straight runs and lateral curves: 1000 mm  
 – for horizontal curves  $R_H < 5 m^{(3)}$ : 500 mm  
 – for horizontal curves  $R_H > 5 m$ : 1000 mm

### Bending:

Factory fabricated min. R = 400 mm  
 Field fabrication min. R = 4000 mm

## Rigid joints



| Type                        | for conductor |            |            |            | Weight kg | Order- No. |
|-----------------------------|---------------|------------|------------|------------|-----------|------------|
| UV 20/50                    | U 20/50 AC    | U 20/50 C  | U 20/50 CH | U 20/50 CE | 0,140     | 120 180    |
| UV 20/50 K 4 <sup>(1)</sup> | U 20/50 AC    | U 20/50 CE | U 20/50 CH | U 20/50 CE | 0,140     | 126 504    |

<sup>(1)</sup> Stainless steel hardware

<sup>(2)</sup> The last number of the order-no. Is the single length in meter. Please add 1,2 ... 6 in the end. Short length have to be rounded up.

<sup>(3)</sup> Recommended

<sup>(4)</sup> With frequency of 50 Hz and 20 °C.

<sup>(5)</sup> Not with UL-approval;  $U_{UL} = 600 V$

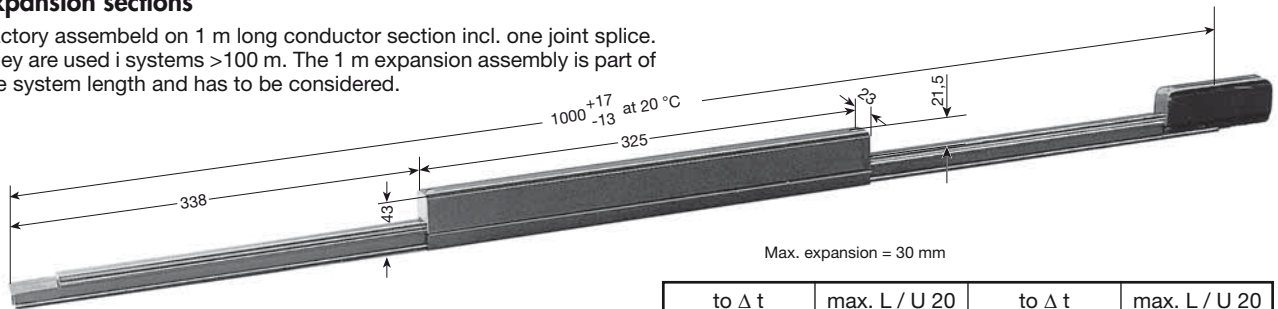




# ACCESSORIES FOR U 20

## Expansion sections

Factory assembled on 1 m long conductor section incl. one joint splice. They are used in systems >100 m. The 1 m expansion assembly is part of the system length and has to be considered.



### Ermittlung der Dehnungsteilstücke

n = Number of UDV (rounded)  
 $n = \frac{L_1}{L}$   
 $L_1$  = Length of assembly minus 100 m  
 $L$  = Expansion capacity max. of UDV (see table)

Standard shrouding, color green

| Type                            | Weight kg | Order- No. |         |
|---------------------------------|-----------|------------|---------|
|                                 |           | phase      | ground  |
| UDV 20/50 CE K 4 <sup>(1)</sup> | 0,622     | 126 514    | 126 515 |
| UDV 20/50 AC K 4 <sup>(1)</sup> | 0,622     | 126 516    | 126 517 |
| UDV 20/50 C K 4 <sup>(1)</sup>  | 1,030     | 126 518    | 126 519 |
| UDV 20/50 CH K 4 <sup>(1)</sup> | 1,020     | 126 520    | 126 521 |

| to Δ t | max. L / U 20 | to Δ t | max. L / U 20 |
|--------|---------------|--------|---------------|
| 20 °C  | 88 m          | 40 °C  | 44 m          |
| 30 °C  | 58 m          | 50 °C  | 35 m          |

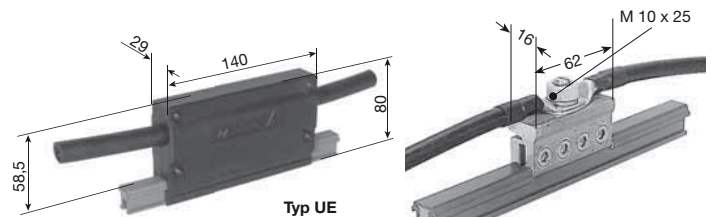
High temperature shrouding, color grey

| Type                            | Weight kg | Order- No. |         |
|---------------------------------|-----------|------------|---------|
|                                 |           | phase      | ground  |
| UDV 20/50 CE K 4 <sup>(1)</sup> | 0,622     | 126 674    | 126 675 |
| UDV 20/50 AC K 4 <sup>(1)</sup> | 0,622     | 126 676    | 126 677 |
| UDV 20/50 C K 4 <sup>(1)</sup>  | 1,030     | 126 678    | 126 679 |
| UDV 20/50 CH K 4 <sup>(1)</sup> | 1,020     | 126 680    | 126 681 |

## Feed terminals

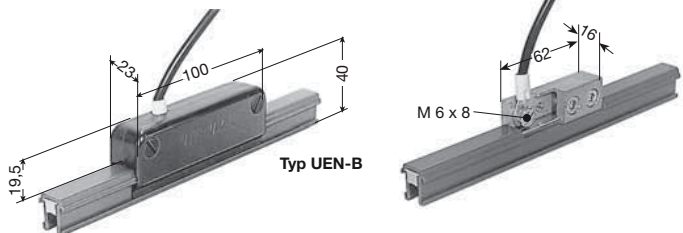
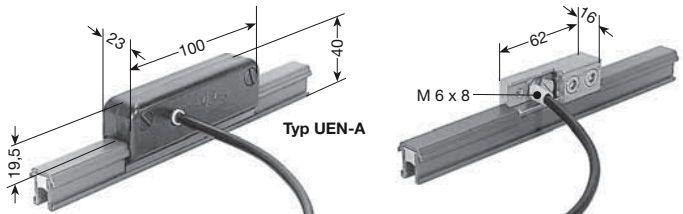
| Type                           | Weight kg | Order- No. |
|--------------------------------|-----------|------------|
| UE 20/50 K4 <sup>(1)</sup>     | 0,290     | 126 522    |
| UE 20/50 K 4 <sup>(1)</sup> -M | 0,290     | 121 459    |

To be used instead of rigid joints  
 Feed cable: 2 of max. 50 mm<sup>2</sup>



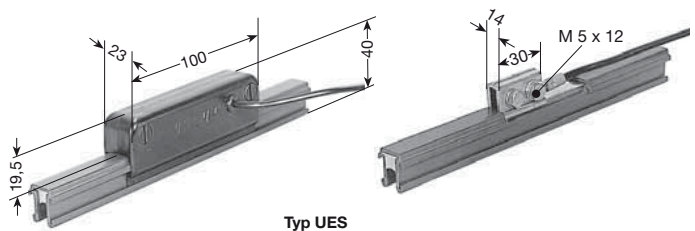
| Type                             | Weight kg | Order- No. |
|----------------------------------|-----------|------------|
| UEN 20/50 K4 <sup>(1)</sup> -A   | 0,120     | 126 526    |
| UEN 20/50 K4 <sup>(1)</sup> -A-M | 0,120     | 121 061    |
| UEN 20/50 K4 <sup>(1)</sup> -B   | 0,120     | 120 116    |
| UEN 20/50 K4 <sup>(1)</sup> -B-M | 0,120     | 121 165    |

Cannot be used as a rigid joint.  
 Feed cable: 1 of max. 6 mm<sup>2</sup>



| Type                         | Weight kg | Order- No. |
|------------------------------|-----------|------------|
| UES 20/50 K 4 <sup>(1)</sup> | 0,060     | 126 530    |

Cannot be used as a rigid joint.  
 Feed cable: 1 of max. 4 mm<sup>2</sup>



## Contact Paste for joints and feeds

100 ml for approx. 200 joints

Order- No. 121 502



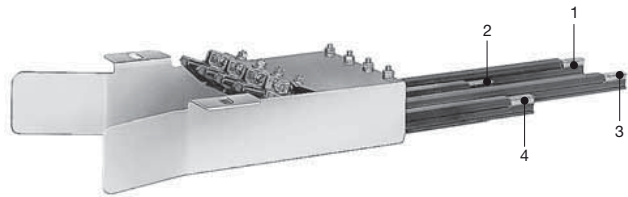
## Transfer funnels

Transfer funnels are for spurlines, switches and turntables required.

With insulated hangers the type EM 20 in 1-6 pole design is used. For the layout of conductor rails in compact hangers is the type EMK 20 in 1-7 pole design available.

The conductor distance with insulated hangers is min. 40 mm and with compact arrangement 23-26 mm.

To prepare a quote please mention rail type, number of poles and position of PE.



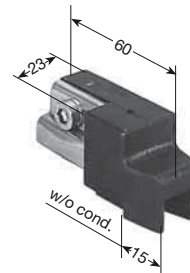
Picture shows Typ EM 20

## Transfer guides

These guides serve for transfer or power interrupting-applications. Max. horizontal and vertical offset:  $\pm 2$  mm; gap between two transfer guides max. 8 mm.

Extra hangers are required and to be ordered separately.

| Type                                 | for conductor            | Weight kg | Order- No. |
|--------------------------------------|--------------------------|-----------|------------|
| <b>US 20/50 CH K 4<sup>(1)</sup></b> | U 20/50 CH               | 0,046     | 120 849    |
| <b>US 20/50 C K 4<sup>(1)</sup></b>  | U 20/50 C                | 0,046     | 120 848    |
| <b>US 20/50 A K 4<sup>(1)</sup></b>  | U 20/50 AC<br>U 20/50 CE | 0,046     | 120 847    |



Transfer guides US 20 are fastened to conductor ends by means of one nylon screw.

## Isolating sections

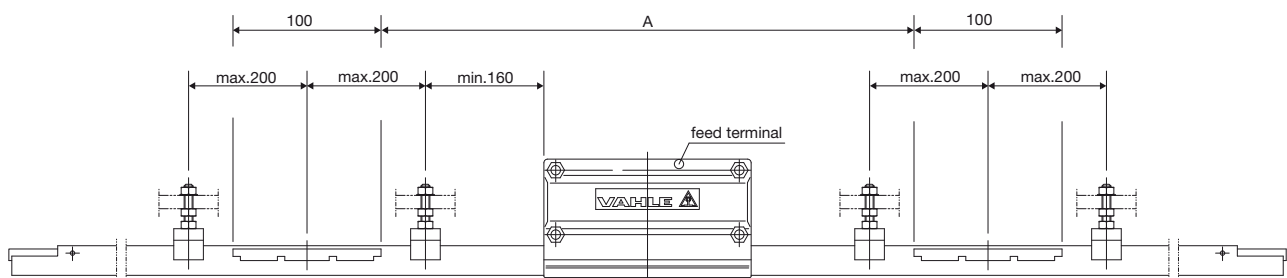
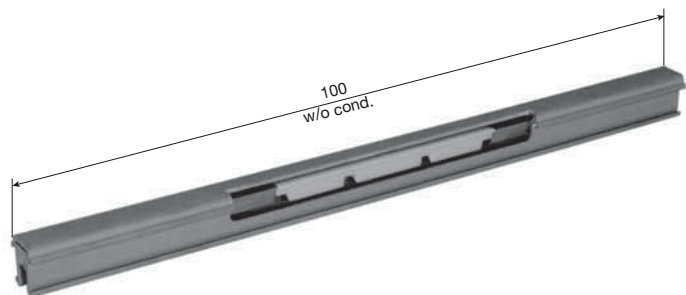
Type M: Factory assembled per system layout

Type L: Loose, incl. 2 locking pins 3 x 10

On both sides a hanger has to be considered.

Use one extra hanger each side, max. 200 mm away for stability.

Collectors, hangers and feeds have to be ordered separately.



To avoid voltage by-pass by carbon brushes and to separate maintenance bays, control and main feed sections, double isolating sections are recommended.

Dim. A depends on type and number of current collectors and stopping distance of the crane.

| Type                   | for conductor            | Weight kg | Order- No. |
|------------------------|--------------------------|-----------|------------|
| <b>IT/U 20/50 CH-M</b> | U 20/50 CH               | 0,005     | 120 950    |
| <b>IT/U 20/50 C-M</b>  | U 20/50 C                | 0,005     | 120 940    |
| <b>IT/U 20/50 A-M</b>  | U 20/50 AC<br>U 20/50 CE | 0,005     | 126 536    |

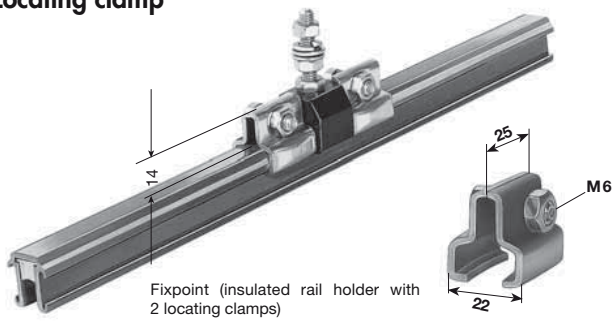
| Type                   | for conductor            | Weight kg | Order- No. |
|------------------------|--------------------------|-----------|------------|
| <b>IT/U 20/50 CH-L</b> | U 20/50 CH               | 0,005     | 120 010    |
| <b>IT/U 20/50 C-L</b>  | U 20/50 C                | 0,005     | 120 009    |
| <b>IT/U 20/50 A-L</b>  | U 20/50 AC<br>U 20/50 CE | 0,005     | 120 008    |

<sup>(1)</sup> Stainless steel hardware



# ACCESSORIES FOR U 20

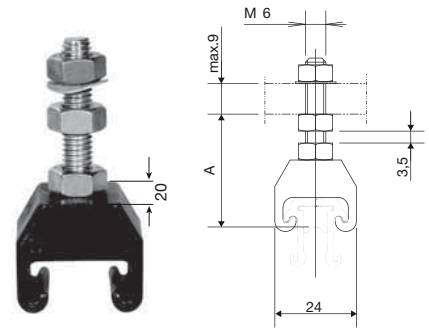
## Locating clamp



| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>USK 20 K 4<sup>(1)</sup></b> | 0,028     | 120 140    |

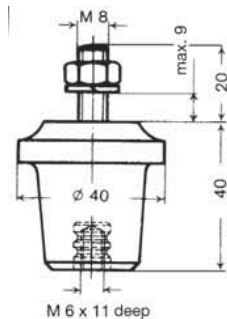
## Insulated hangers<sup>(2)</sup>

| Type             | A  |
|------------------|----|
| <b>U20/50 CH</b> | 33 |
| <b>U20/50 C</b>  | 34 |
| <b>U20/50 AC</b> | 35 |
| <b>U20/50 CE</b> |    |



| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>UAM 20</b>                   | 0,025     | 126 540    |
| <b>UAM 20 K 4<sup>(1)</sup></b> | 0,025     | 126 542    |

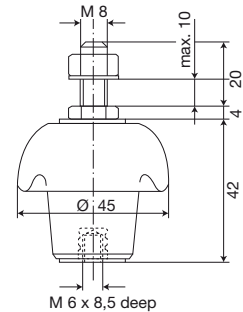
## Insulator<sup>(2)</sup>



Cantilever strength = 3000 N  
Leakage distance = 60 mm

| Type                               | Weight kg | Order- No. |
|------------------------------------|-----------|------------|
| <b>GH 40-M 6</b>                   | 0,075     | 121 060    |
| <b>GH 40-M 6 K 4<sup>(1)</sup></b> | 0,075     | 126 544    |

## Insulator<sup>(2)</sup> for aggressive mediums

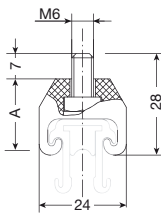


cantilever strength = 1000 N  
Leakage distance = 62 mm

| Type                                | Weight kg | Order- No. |
|-------------------------------------|-----------|------------|
| <b>UIK 42-M 6 K 4<sup>(1)</sup></b> | 0,110     | 120 883    |

## Rail holder for insulators

for conductor rails U20/50 CH, 20/50 C, U20/50 AC and U20/50 CE

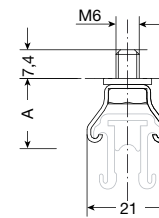


| Type             | A  |
|------------------|----|
| <b>U20/50 CH</b> | 20 |
| <b>U20/50 C</b>  | 21 |
| <b>U20/50 AC</b> | 22 |
| <b>U20/50 CE</b> |    |

Supplied with bolt M 6 x 12

| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>UAK 20</b>                   | 0,010     | 126 546    |
| <b>UAK 20 K 4<sup>(1)</sup></b> | 0,010     | 126 548    |

for conductor rails U 20/50 CH, 20/50 C, U 20/50 AC and U 20/50 CE

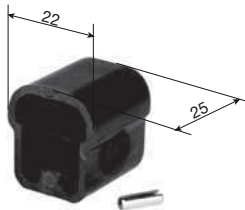


| Type             | A  |
|------------------|----|
| <b>U20/50 CH</b> | 17 |
| <b>U20/50 C</b>  | 18 |
| <b>U20/50 AC</b> | 19 |
| <b>U20/50 CE</b> |    |

Supplied with bolt M 6 x 10 and spring washer

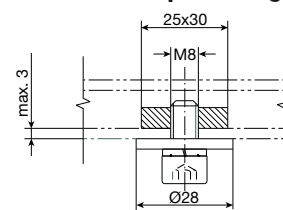
| Type  | Weight kg | Order- No. |
|---|-----------|------------|
| <b>UAS 20 K 4<sup>(1)</sup></b>                 | 0,014     | 126 550    |
| <b>UAS 20 K 4<sup>(1)</sup>-H<sup>(3)</sup></b> | 0,014     | 120 755    |

## End caps incl. Locking pin



| Type           | Weight kg | Order- No. |
|----------------|-----------|------------|
| <b>UK 20-L</b> | 0,010     | 120 120    |
| <b>UK 20-M</b> | 0,010     | 120 987    |

## Securing element for compact hangers KH 20/5....



| Type                          | Weight kg | Order- No. |
|-------------------------------|-----------|------------|
| <b>SE 8</b>                   | 0,055     | 170 677    |
| <b>SE 8 K 4<sup>(1)</sup></b> | 0,055     | 170 955    |

<sup>(1)</sup> Stainless steel hardware

<sup>(2)</sup> For installation in slotted holes use on both sides discs according to DIN 9021.

<sup>(3)</sup> For aggressive mediums



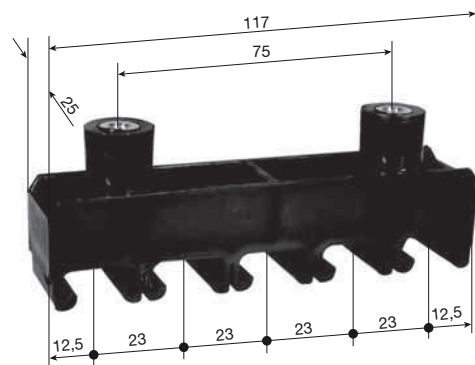
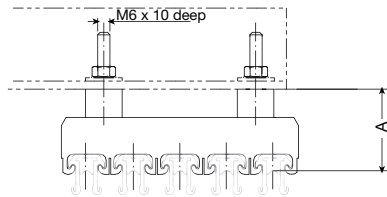


Any number of conductors poles can be assembled with compact hangers.

Can only be used with collectors of type KST. The joints and feeds have to be arranged staggered.

## Compact hangers, 5 poles to be bolted (2)

| Type      | A  |
|-----------|----|
| U20/50 CH | 41 |
| U20/50 C  | 42 |
| U20/50 AC | 43 |
| U20/50 CE | 43 |

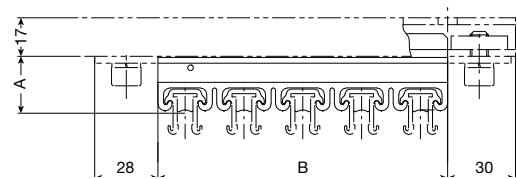
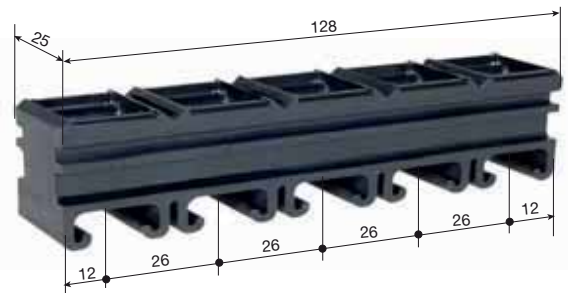


| Type    | Weight kg | Order- No. |
|---------|-----------|------------|
| KA 20/5 | 0,041     | 126 613    |

## Compact hangers for bracket profiles 38/17 G

| Typ       | A  |
|-----------|----|
| U20/50 CH | 23 |
| U20/50 C  | 24 |
| U20/50 AC | 25 |
| U20/50 CE | 25 |

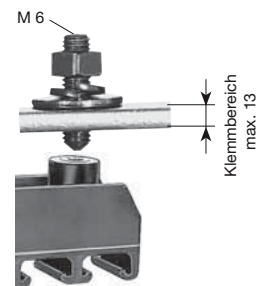
| Type      | B   | Weight kg | Order- No. |
|-----------|-----|-----------|------------|
| KH 20/5-1 | 24  | 0,008     | 120 933    |
| KH 20/5-2 | 50  | 0,018     | 120 934    |
| KH 20/5-3 | 76  | 0,028     | 126 614    |
| KH 20/5-4 | 102 | 0,038     | 126 615    |
| KH 20/5-5 | 128 | 0,048     | 126 616    |



## Attachment hardware for compact hangers, insulated hangers and insulators

for 1 KA 20/5 are 2 pcs. BE 6 required.

| Type                    | Weight kg | Order- No. |
|-------------------------|-----------|------------|
| BE 6                    | 0,015     | 120 406    |
| BE 6 K 4 <sup>(1)</sup> | 0,015     | 120 778    |

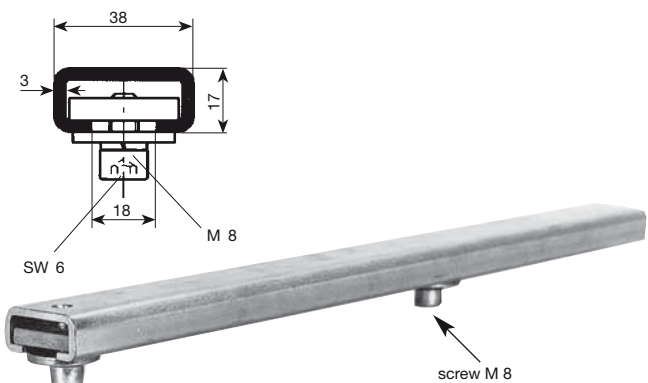


## Bracket profiles 38/17

incl. locking hardware

| Type      | Length mm | max. poles | Weight kg | Order- No. |
|-----------|-----------|------------|-----------|------------|
| HU 20/230 | 230       | 5          | 0,520     | 120 833    |
| HU 20/360 | 360       | 10         | 0,750     | 120 834    |
| HU 20/490 | 490       | 15         | 0,970     | 120 835    |

Longer Bracket profiles on request.



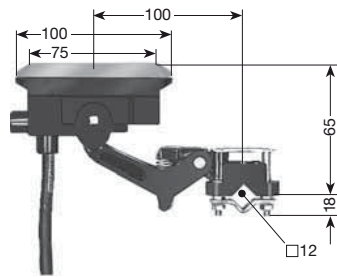
<sup>(1)</sup> Stainless steel hardware.

<sup>(2)</sup> For installation in slotted holes use on both sided discs according to DIN 9021.



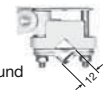
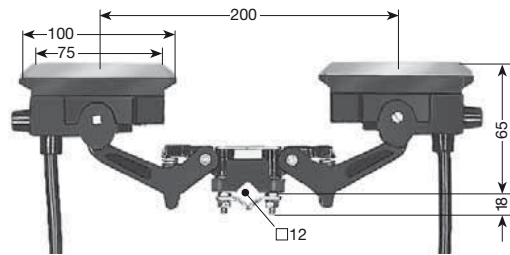
# CURRENT COLLECTORS FOR U 20

## Current collectors



with 2 m connecting cable  
lift and swivel  $\pm 20$  mm  
contact pressure: approx. 9 N

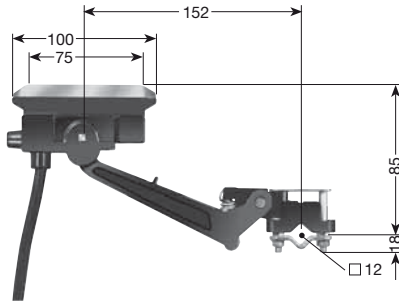
## Double collectors



with 2 x 2 m connecting cable  
lift and swivel  $\pm 20$  mm  
contact pressure: approx. 9 N per Brush

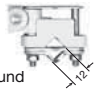
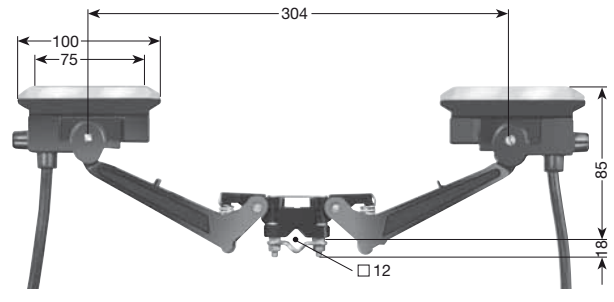
| Type <sup>(1)</sup> | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  | Type <sup>(1)</sup> | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  |
|---------------------|--------------------|------------------|--------------|--------------|----------------|------------------|---------------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                     |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |                     |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>KST 15</b>       | 15                 | 2,5              | 4,4          | 0,256        | 150 891        | 150 892          | <b>KDST 30</b>      | 30                 | 2,5              | 4,4          | 0,471        | 150 897        | 150 898          |
| <b>KST 40</b>       | 40                 | 6,0              | 11,0         | 0,428        | 152 840        | 152 850          | <b>KDST 80</b>      | 80                 | 6,0              | 11,0         | 0,821        | 152 960        | 152 970          |
| <b>KST 60</b>       | 60                 | 10,0             | 12,5         | 0,588        | 153 675        | 153 676          | <b>KDST 120</b>     | 120                | 10,0             | 12,5         | 1,114        | 153 679        | 153 680          |

## Current collectors



with 2 m connecting cable  
lift and swivel  $\pm 40$  mm  
contact pressure: approx. 9 N

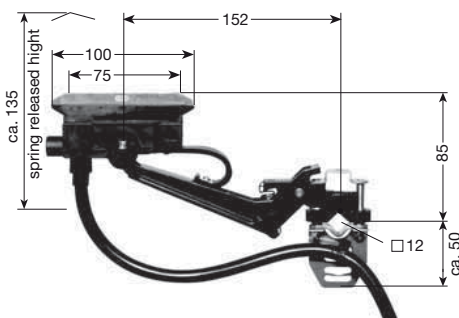
## Double collectors



with 2 x 2 m connecting cable  
lift and swivel  $\pm 40$  mm  
contact pressure: approx. 9 N per brush

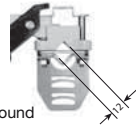
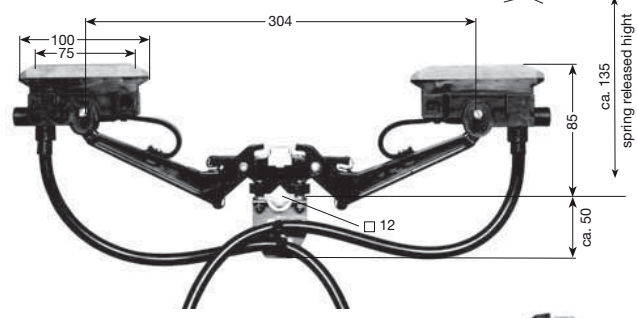
| Type <sup>(1)</sup> | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  | Type <sup>(1)</sup> | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  |
|---------------------|--------------------|------------------|--------------|--------------|----------------|------------------|---------------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                     |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |                     |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>KSTL 15</b>      | 15                 | 2,5              | 4,4          | 0,272        | 150 893        | 150 894          | <b>KDSTL 30</b>     | 30                 | 2,5              | 4,4          | 0,492        | 150 899        | 150 901          |
| <b>KSTL 40</b>      | 40                 | 6,0              | 11,0         | 0,453        | 152 860        | 152 870          | <b>KDSTL 80</b>     | 80                 | 6,0              | 11,0         | 0,822        | 152 980        | 152 990          |
| <b>KSTL 60</b>      | 60                 | 10,0             | 12,5         | 0,591        | 153 677        | 153 678          | <b>KDSTL 120</b>    | 120                | 10,0             | 12,5         | 1,188        | 153 681        | 153 682          |

## Current collectors for transfer funnels EMK 20<sup>(1)</sup>



with 2 m connecting cable  
lift  $\pm 20$  mm  
swivel  $\pm 40$  mm  
contact pressure: approx. 9 N

## Double collectors for transfer funnels EMK 20<sup>(1)</sup>



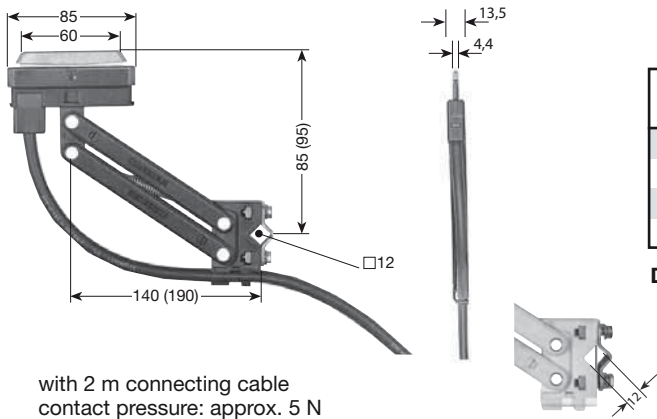
with 2 x 2 m connecting cable  
lift  $\pm 20$  mm  
swivel  $\pm 40$  mm  
contact pressure: approx. 9 N per brush

| Type <sup>(1)</sup> | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  | Type <sup>(1)</sup> | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  |
|---------------------|--------------------|------------------|--------------|--------------|----------------|------------------|---------------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                     |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |                     |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>KSTLU 15</b>     | 15                 | 2,5              | 4,4          | 0,313        | 150 895        | 150 896          | <b>KDSTLU 30</b>    | 30                 | 2,5              | 4,4          | 0,541        | 150 902        | 150 903          |
| <b>KSTLU 40</b>     | 40                 | 6,0              | 11,0         | 0,499        | 153 791        | 153 792          | <b>KDSTLU 80</b>    | 80                 | 6,0              | 11,0         | 0,895        | 153 786        | 153 787          |
| <b>KSTLU 60</b>     | 60                 | 10,0             | 12,5         | 0,652        | 153 793        | 153 794          | <b>KDSTLU 120</b>   | 120                | 10,0             | 12,5         | 1,231        | 153 795        | 153 796          |

(1) Suffix types e.g. KST 15  $\rightarrow$  KST 15 PH Order- No. 150 891  
(2) Collectors locate in unstressed condition automatic to phase center.  
Ampacity while using stainless steel conductors on request.



## Current collectors

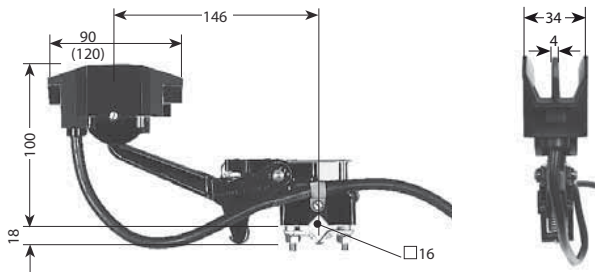


with 2 m connecting cable  
contact pressure: approx. 5 N

| Type           | Am-<br>pacity<br>A | Connecting-Cable |              | lift & swivel<br>mm | Weight<br>kg | Order- No.     |                  |
|----------------|--------------------|------------------|--------------|---------------------|--------------|----------------|------------------|
|                |                    | mm <sup>2</sup>  | ø max/<br>mm |                     |              | phase<br>black | ground<br>yellow |
| <b>KST 30</b>  | 30                 | 2,5              | 5            | ± 20                | 0,240        | 152 085        | 152 086          |
| <b>KST 55</b>  | 55                 | 6,0              | 11           | ± 20                | 0,368        | 154 438        | 154 439          |
| <b>KSTL 30</b> | 30                 | 2,5              | 5            | ± 30                | 0,240        | 152 089        | 152 091          |
| <b>KSTL 55</b> | 55                 | 6,0              | 11           | ± 30                | 0,368        | 154 443        | 154 444          |

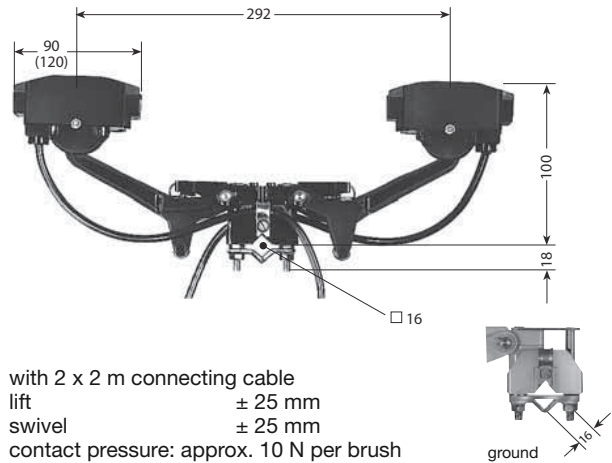
Dimensions in parenthesis for KSTL

## Current collectors<sup>(1)</sup>



with 2 m connecting cable  
lift ± 25 mm  
swivel ± 25 mm  
contact pressure: approx. 10 N

## Double collectors<sup>(1)</sup>



with 2 x 2 m connecting cable  
lift ± 25 mm  
swivel ± 25 mm  
contact pressure: approx. 10 N per brush

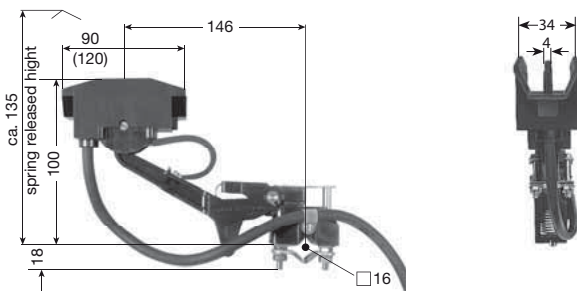
| Type          | Am-<br>pacity<br>A | Connecting-Cable |              | Weight<br>kg | Order- No.     |                  |
|---------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|               |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>UST 40</b> | 40                 | 6                | 11,0         | 0,605        | 120 961        | 120 962          |
| <b>UST 60</b> | 60                 | 10               | 12,5         | 0,875        | 120 963        | 120 964          |

Dimension in parenthesis for UST 60

| Type            | Am-<br>pacity<br>A | Connecting-Cable |              | Weight<br>kg | Order- No.     |                  |
|-----------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                 |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>UDST 80</b>  | 80                 | 6                | 11,0         | 1,100        | 120 965        | 120 966          |
| <b>UDST 120</b> | 120                | 10               | 12,5         | 1,600        | 120 967        | 120 968          |

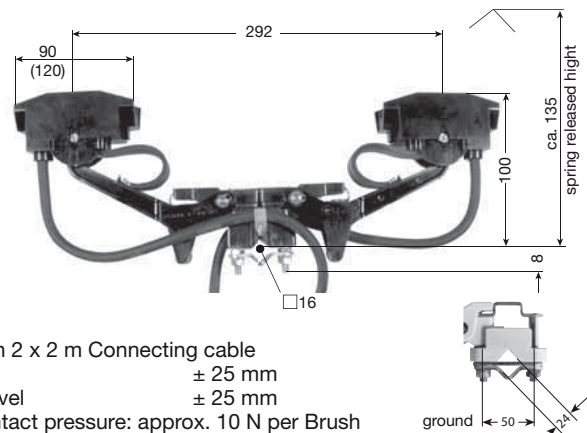
Dimension in parenthesis for UDST 120

## Current collectors for transfer funnels EM<sup>(1)</sup>



with 2 m connecting cable  
lift ± 25 mm  
swivel ± 25 mm  
contact pressure: approx. 10 N

## Double collector for transfer funnels EM<sup>(1)</sup>



with 2 x 2 m Connecting cable  
lift ± 25 mm  
swivel ± 25 mm  
contact pressure: approx. 10 N per Brush

| Type           | Am-<br>pacity<br>A | Connecting-Cable |              | Weight<br>kg | Order- No.     |                  |
|----------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>USTU 40</b> | 40                 | 6                | 11,0         | 0,635        | 120 969        | 120 970          |
| <b>USTU 60</b> | 60                 | 10               | 12,5         | 0,815        | 120 971        | 120 972          |

Dimension in parenthesis for USTU 60

| Type             | Am-<br>pacity<br>A | Connecting-Cable |              | Weight<br>kg | Order- No.     |                  |
|------------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                  |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>UDSTU 80</b>  | 80                 | 6                | 11,0         | 1,160        | 120 973        | 120 974          |
| <b>UDSTU 120</b> | 120                | 10               | 12,5         | 1,550        | 120 975        | 120 976          |

Dimension in parenthesis for UDSTU 120

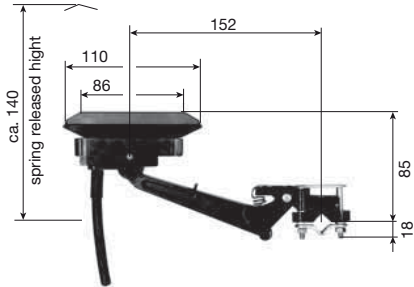
<sup>(1)</sup> Collectors UST -UDST and USTU - UDSTU only for 35 mm phase distance.  
Ampacity while using stainless steel conductors on request.



# CURRENT COLLECTORS FOR U 20

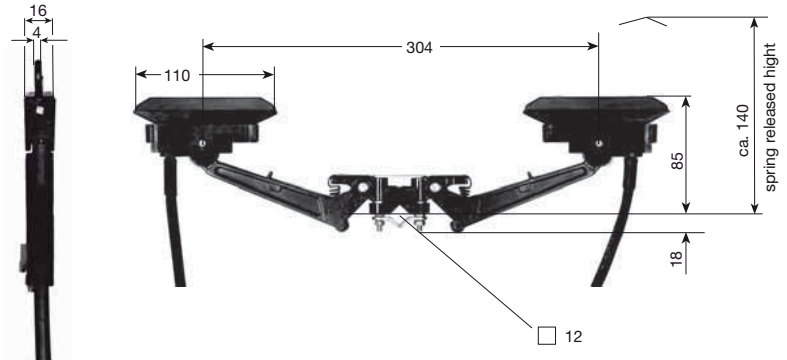
Use in aggressive mediums like pickling plants, galvanizing plants and galvanic systems.

## Current collectors phase<sup>(1)</sup>



with 2 m connecting cable  
lift +30 mm / -40 mm  
swivel  $\pm$  35 mm  
contact pressure: approx. 9 N

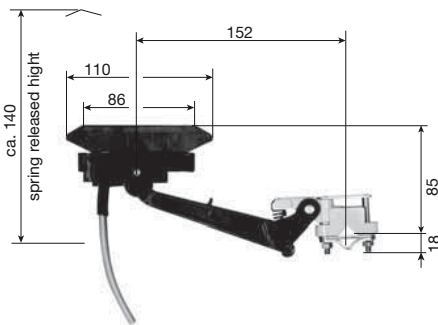
## Double collectors phase<sup>(1)</sup>



with 2 m connecting cable  
lift +30 mm / -40 mm  
swivel  $\pm$  35 mm  
contact pressure: approx. 9 N per brush

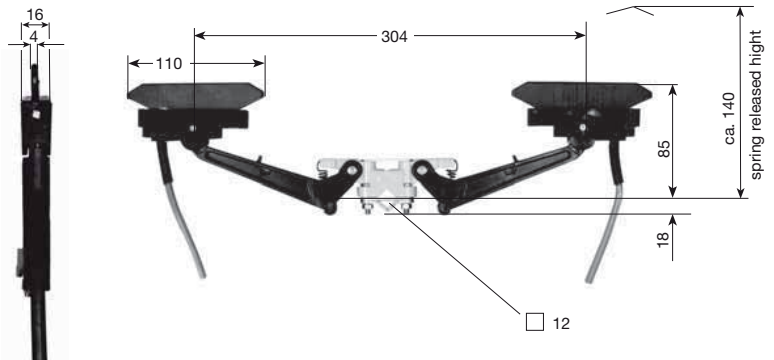
| Type <sup>(1)</sup>   | Am-<br>pacity<br>A | Connecting cable<br>mm <sup>2</sup> $\varnothing$ max/<br>mm |      | Weight<br>kg | Order- No.<br>phase<br>black |
|-----------------------|--------------------|--|------|--------------|------------------------------|
| <b>KSTL 35 VB PH</b>  | 35                 | 6,0  | 11,0 | 0,410        | 121 186                      |
| <b>KDSTL 70 VB PH</b> | 70                 | 6,0  | 11,0 | 0,750        | 121 188                      |

## Current collectors, ground<sup>(2)</sup>

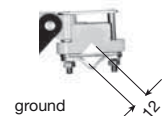


with 2 m connecting cable  
lift +30 mm / -40 mm  
swivel  $\pm$  35 mm  
contact pressure: approx. 9 N

## Double collectors, ground<sup>(2)</sup>



with 2 m connecting cable  
lift +30 mm / -40 mm  
swivel  $\pm$  35 mm  
contact pressure: approx. 9 N per brush

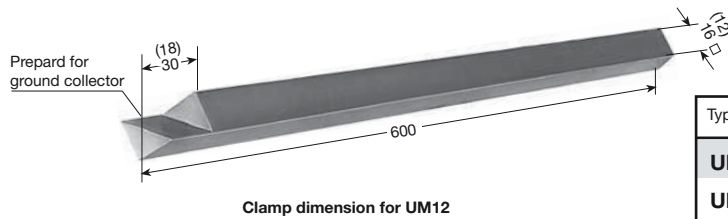


| Type <sup>(1)</sup>  | Am-<br>pacity<br>A | Connecting cable<br>mm <sup>2</sup> $\varnothing$ max/<br>mm |     | Weight<br>kg | Order- No.<br>phase<br>black |
|----------------------|--------------------|--|-----|--------------|------------------------------|
| <b>KSTL 35 V PE</b>  | 35                 | 6,0  | 6,0 | 0,328        | 121 187                      |
| <b>KDSTL 70 V PE</b> | 70                 | 6,0  | 6,0 | 0,554        | 121 189                      |

(1) Phase with touch protection  
(2) PE without touch protection



## Collector bracket for KST and UST



| Type                                       | Weight kg | Order- No. |
|--|-----------|------------|
| <b>UM 12 (for KST)</b>                     | 0,675     | 153 506    |
| <b>UM 12 K4<sup>(1)</sup> (for KST..V)</b> | 0,688     | 121 162    |
| <b>UM 16 (for UST)</b>                     | 1,175     | 126 574    |

With a length above 600 mm for the towing arm a support have to be considered on site to prevent bending or twisting.

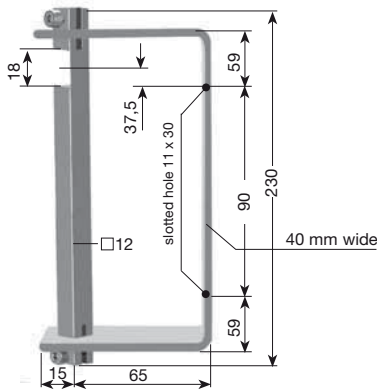
Longer length are available.

## Collector brackets

for current collectors  
KST / KDST see page 10

for current collectors  
KST see page 10

for control collectors  
KST / KDST



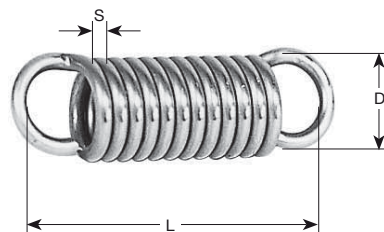
| Type                    | Weight kg | Order- No. |
|-------------------------|-----------|------------|
| <b>UMAS 12 HS-A 200</b> | 0,740     | 121 092    |

| Type                    | Weight kg | Order- No. |
|-------------------------|-----------|------------|
| <b>UMAS 12 HS-B 200</b> | 0,740     | 121 093    |

| Type                  | Weight kg | Order- No. |
|-----------------------|-----------|------------|
| <b>UMAS 12 ST 200</b> | 0,740     | 121 094    |

Suitable for phase distance of max. 55 mm (3 pole + ground).

## Tension springs



| Type         | for current collectors   | Weight kg | S mm | D mm | L mm | Order- No. |
|--------------|--|-----------|------|------|------|------------|
| <b>ZF 3</b>  | KST 15 thru KDST 120   | 0,003     | 1,2  | 10,8 | 28,5 | 153 516    |
| <b>ZF 4</b>  | KSTL 15 thru KDSTL 120<br>and KSTLU 15 thru KDSTLU 120                     | 0,004     | 1,3  | 11,0 | 29,0 | 153 517    |
| <b>ZF 4H</b> | KSTL 35 thru KDSTL 70  | 0,004     | 1,3  | 11,0 | 29,0 | 170 601    |
| <b>ZF 5</b>  | UST 40, USTU 40, UDST 80, UDSTU 80<br>UST 60, USTU 60, UDST 120, UDSTU 120 | 0,007     | 1,5  | 13,8 | 40,0 | 126 585    |

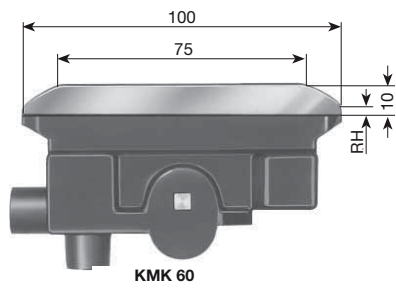
<sup>(1)</sup> Stainless steel hardware.



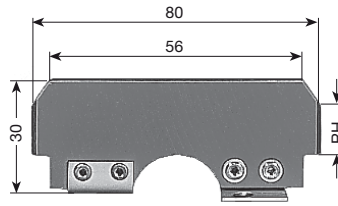


# COLLECTOR COMPONENTS U 20

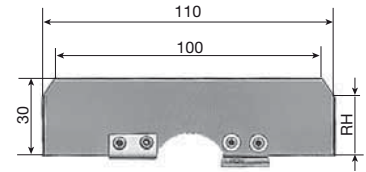
## Copper-graphite brushes



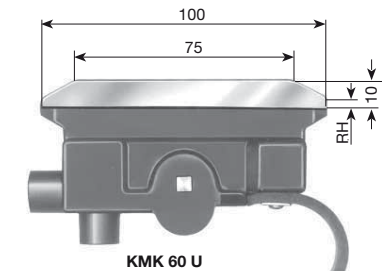
KMK 60



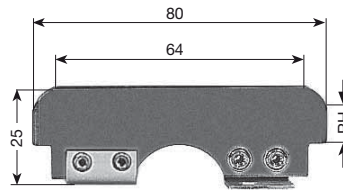
KMU 40



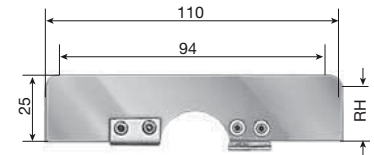
KMU 60



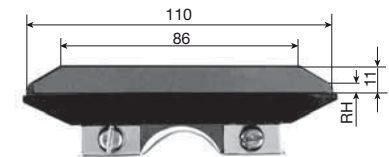
KMK 60 U



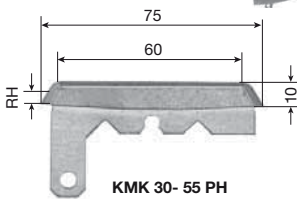
KMU 40 U



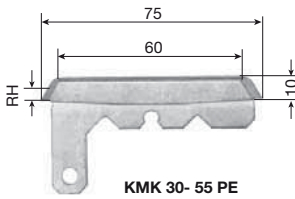
KMU 60 U



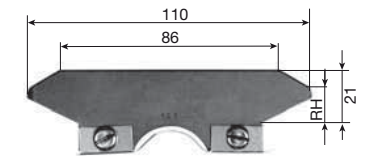
KMK 35 VB



KMK 30- 55 PH



KMK 30- 55 PE



KMK 35 V

Dim H: max. wear for U 20/50 C

| Type                     | for current collectors   | RH mm | Weight kg | Order- No. |
|--------------------------|--|-------|-----------|------------|
| <b>KMK 60</b>            | KST 15, KST 40, KDST 30, KDST 80, KSTL 15, KSTL 40, KDSTL 30, KDSTL 80, KST 60, KDST 120, KSTL 60, KDSTL 120 | 3     | 0,110     | 153 512    |
| <b>KMK 60 U</b>          | KSTLU 15, KSTLU 40, KSTLU 60, KDSTLU 30, KDSTLU 80, KDSTLU 120   | 3     | 0,115     | 153 513    |
| <b>KMU 40</b>            | UST 40, UDST 80  | 12    | 0,060     | 126 579    |
| <b>KMU 40 U</b>          | USTU 40, UDSTU 80  | 12    | 0,050     | 126 696    |
| <b>KMU 60</b>            | UST 60, UDST 120   | 18    | 0,070     | 126 581    |
| <b>KMU 60 U</b>          | USTU 60, UDSTU 120   | 18    | 0,060     | 126 743    |
| <b>KMK 30-55, phase</b>  | KST 30, KST 55, KSTL 30, KSTL 55   | 2     | 0,031     | 154 440    |
| <b>KMK 30-55, ground</b> | KST 30, KST 55, KSTL 30, KSTL 55   | 2     | 0,031     | 154 453    |
| <b>KMK 35 VB, phase</b>  | KSTL 35 VB, KDSTL 70 VB  | 5     | 0,030     | 121 063    |
| <b>KMK 35 V, ground</b>  | KSTL 35 V, KDSTL 70 V  | 14    | 0,030     | 121 062    |

## Cable attachment clamp

for current collectors Type KSTLU, KDSTLU

| Type                     | Weight kg | Order- No. |
|--------------------------|-----------|------------|
| <b>KBK<sup>(1)</sup></b> | 0,030     | 153 519    |





## Collectors of type KST, KSTL, KDST, KDSTL, KSTLU and KDSTLU

| Part-No. | Description   | Weight kg | Order- No.        |
|----------|---|-----------|-------------------|
| 1        | Collector base for KST 15 thru KST 60   | phase     | 153 736           |
| 2        | Collector base for KST 15 thru KST 60   | ground    | 153 737           |
| 3        | Collector base for KDST 30 thru KDST 120 (double arm)                                 | phase     | 153 738           |
| 4        | Collector base for KDST 30 thru KDST 120 (double arm)                                 | ground    | 153 739           |
| 5        | Collector base for KSTL 15 thru KSTL 60   | phase     | 153 740           |
| 6        | Collector base for KSTL 15 thru KSTL 60   | ground    | 153 741           |
| 7        | Collector base for KDSTL 30 thru KDSTL 120 (double arm)                               | phase     | 153 742           |
| 8        | Collector base for KDSTL 30 thru KDSTL 120 (double arm)                               | ground    | 153 743           |
| 9        | Collector base for KSTLU 15 thru KSTLU 60   | phase     | 153 804           |
| 10       | Collector base for KSTLU 15 thru KSTLU 60   | ground    | 153 805           |
| 11       | Collector base for KDSTLU 30 thru KDSTLU 120 (double arm)                             | phase     | 153 806           |
| 12       | Collector base for KDSTLU 30 thru KDSTLU 120 (double arm)                             | ground    | 153 807           |
| 13       | Connecting cable AEA 2,5 PH / AEA-KSTLU-2,5 PH, 2 m long                              | phase     | 151 374 / 156 431 |
|          | Connecting cable AEA 2,5 PH / AEA-KSTLU-2,5 PH, 2 m long                              | ground    | 151 375 / 156 432 |
| 13       | Connecting cable AEA 6 PH / AEA-KSTLU-6 PH, 2 m long                                  | phase     | 153 744 / 156 433 |
|          | Connecting cable AEA 6 PH / AEA-KSTLU-6 PH, 2 m long                                  | ground    | 153 745 / 156 434 |
| 13       | Connecting cable AEA 10 PH / AEA-KSTLU-10 PH, 2 m long                                | phase     | 153 746 / 156 427 |
|          | Connecting cable AEA 10 PE / AEA-KSTLU-10 PH, 2 m long                                | ground    | 153 747 / 156 435 |
| 14       | Rubber spring <sup>(1)</sup> for KSTLU 15, KSTLU 40, KDSTLU 30, KDSTLU 80, KDSTLU 120 | 0,008     | 153 748           |



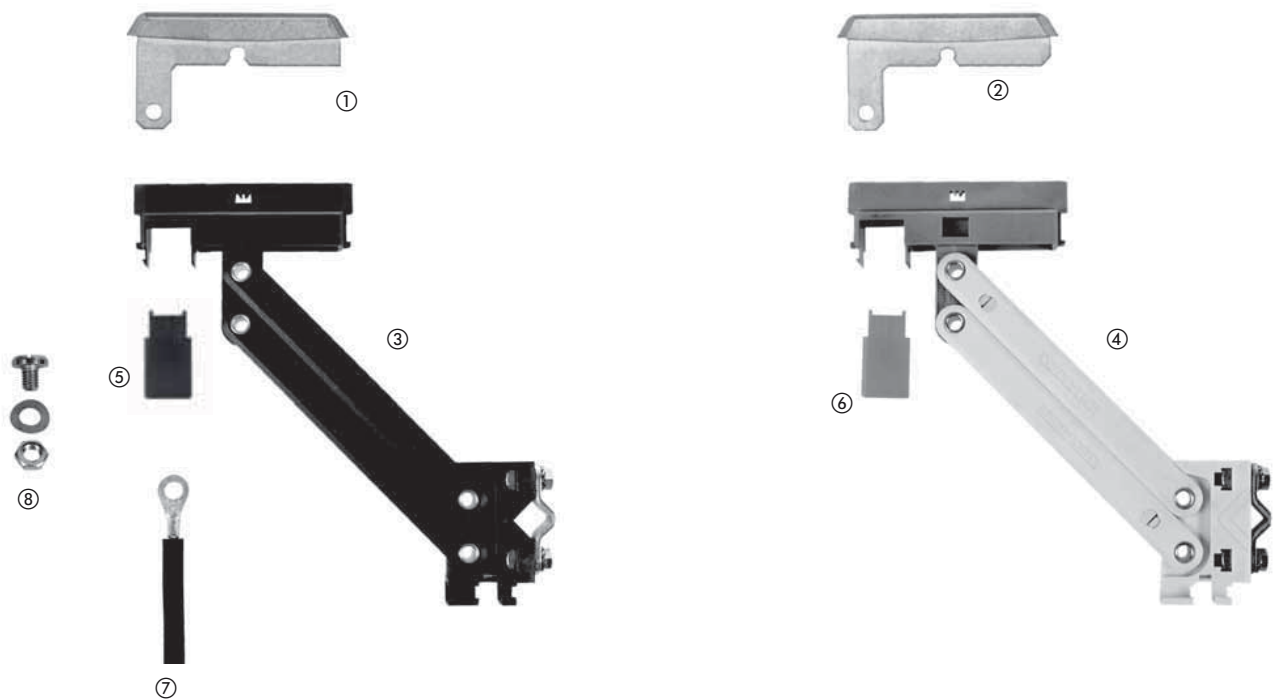
<sup>(1)</sup> Rubber spring will be included when ordering KMK 60 U brush.



# COLLECTOR COMPONENTS FOR U 20

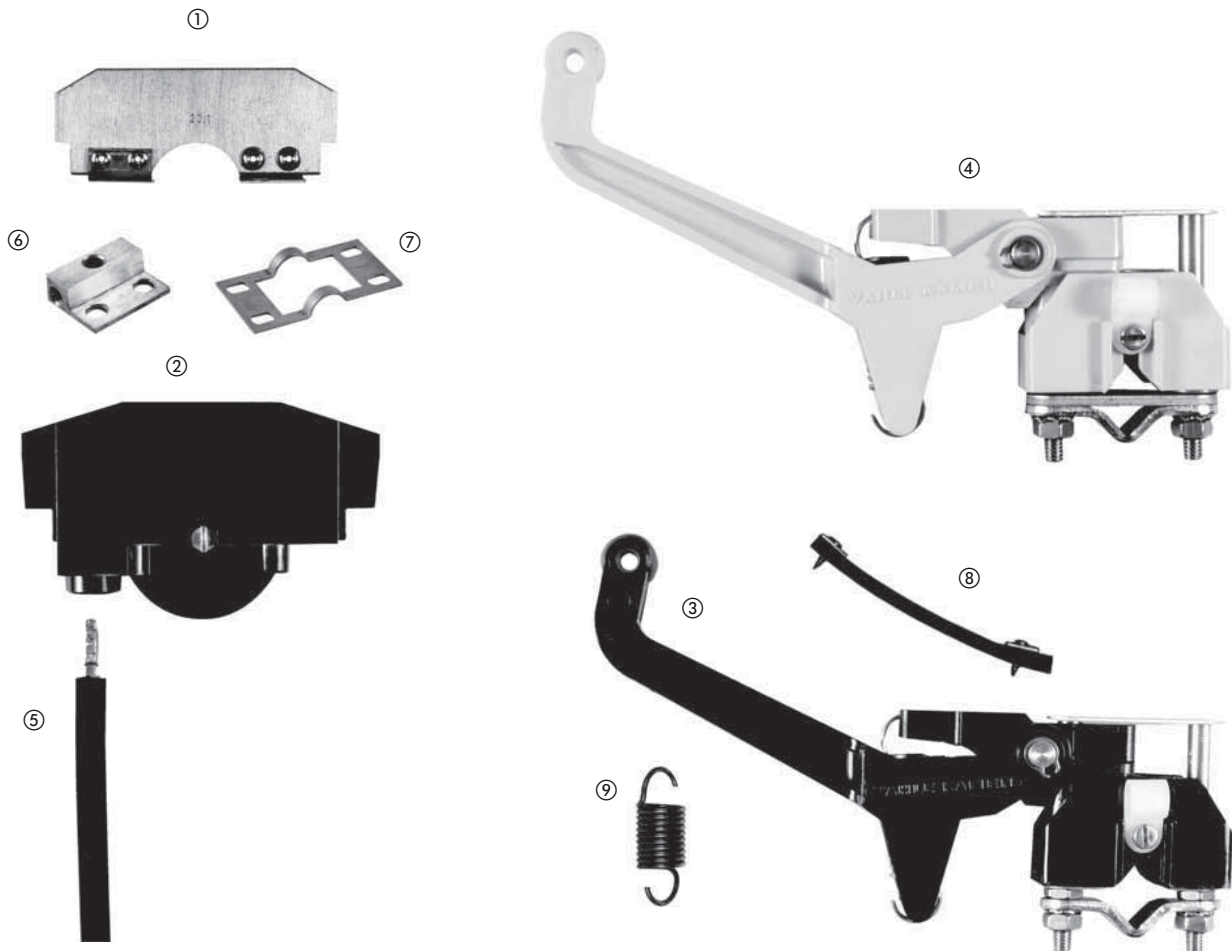
## Collectors of type KST 30-55 upto KSTL 30-55

| Part.-No. | Description                           |                | Weight kg | Order- No. |
|-----------|---------------------------------------|----------------|-----------|------------|
| 1         | Brush                                 | phase          | 0,031     | 154 440    |
| 2         | Brush                                 | ground         | 0,031     | 154 453    |
| 3         | Collector base & arm KST, complete    | phase          | 0,083     | 152 275    |
| 3         | Collector base & arm KST, complete    | phase          | 0,083     | 152 279    |
| 4         | Collector base & arm KST, complete    | ground         | 0,083     | 152 276    |
| 4         | Collector base & arm KST, complete    | ground         | 0,083     | 152 281    |
| 5         | Terminal cap                          | phase (black)  | 0,002     | 152 291    |
| 6         | Terminal cap                          | ground (green) | 0,002     | 152 292    |
| 7         | Connecting cable RKA 2,5 PH, 2 m long | phase          | 0,150     | 154 447    |
|           | Connecting cable RKA 2,5 PH, 2 m long | ground         | 0,150     | 154 448    |
| 7         | Connecting cable RKA 6 PH, 2 m long   | phase          | 0,260     | 154 449    |
|           | Connecting cable RKA 6 PE, 2 m long   | ground         | 0,260     | 154 450    |
| 8         | Terminal bolt                         |                | 0,002     | 152 658    |



## Collectors of type UST and UDST

| Teil-Nr. | Artikel  |        | Weight kg | Order- No. |
|----------|--|--------|-----------|------------|
| 1        | Brush (see page 14)  |        |           |            |
| 2        | Brush holder for UST 40, UDST 80, USTU 40, UDSTU 80                                      |        | 0,050     | 120 949    |
| 2        | Brush holder for UST 60, UDST 120, USTU 60, UDSTU 120                                    |        | 0,070     | 120 941    |
| 3        | Collector base for UST 40, UST 60  | phase  | 0,180     | 126 604    |
| 4        |  | ground |           | 126 605    |
| 3        | Collector base for UDST 80, UDST 120   | phase  | 0,250     | 126 692    |
| 4        |  | ground |           | 126 693    |
| 3        | Collector base for USTU 40, USTU 60  | phase  | 0,180     | 126 606    |
| 4        |  | ground |           | 126 607    |
| 3        | Collector base for UDSTU 80, UDSTU 120   | phase  | 0,250     | 126 694    |
| 4        |  | ground |           | 126 695    |
| 5        | Connecting cable 6 mm <sup>2</sup> , 2 m long, for UST 40, USTU 40, UDST 80, UDSTU 80    | phase  | 0,300     | 120 948    |
|          |  | ground |           | 120 952    |
| 5        | Connecting cable 10 mm <sup>2</sup> , 2 m long, for UST 60, USTU 60, UDST 120, UDSTU 120 | phase  | 0,445     | 120 939    |
|          |  | ground |           | 120943     |
| 6        | Connecting piece   |        | 0,030     | 120 946    |
| 7        | Current bridge   |        | 0,010     | 120 947    |
| 8        | Rubber spring complete for USTU 40, UDSTU 80, USTU 60, UDSTU 120                         |        | 0,012     | 121 617    |
| 9        | Tension spring ZF 5  |        | 0,007     | 126 585    |

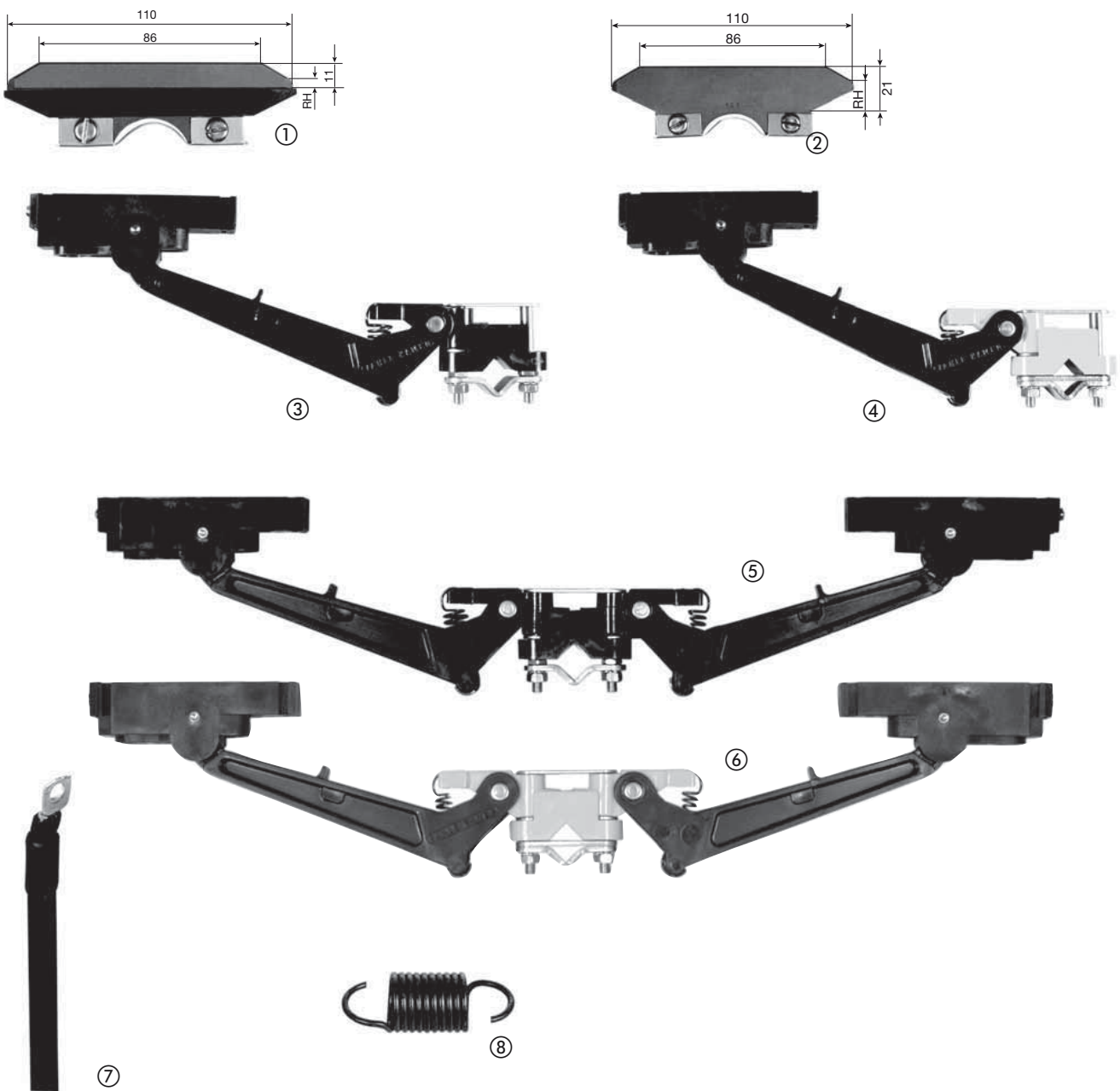




# COLLECTOR COMPONENTS FOR U 20

## Collectors of type KSTL 35 V. and KDSTL 70 V.

| Part.-No. | Description                                      |        | Weight kg | Order- No. |
|-----------|--|--------|-----------|------------|
| 1         | Brush KMK 35 VB                                  | phase  | 0,030     | 121 063    |
| 2         | Brush KMK 35 V                                   | ground | 0,030     | 121 062    |
| 3         | Collector base with brush holder for KSTL 35 VB  | phase  | 0,110     | 121 203    |
| 4         | Collector base with brush holder for KSTL 35 V   | ground | 0,110     | 121 204    |
| 5         | Collector base with brush holder for KDSTL 70 VB | phase  | 0,174     | 121 207    |
| 6         | Collector base with brush holder for KDSTL 70 V  | ground | 0,172     | 121 208    |
| 7         | Connecting cable RKA 6/5                         | phase  | 0,256     | 127 437    |
| 7         | Connecting cable RKA 6/5                         | ground | 0,256     | 127 438    |
| 8         | Tension spring ZF 4 H                            |        | 0,004     | 170 601    |





## Compact configuration, 31 m power supply system, 4 pole + ground, 120 A

|  | Qty. | Description                    | Type   | Order- No.          |          |
|--|------|--------------------------------|--------|---------------------|----------|
|  | 20   | Insulated conductors, 6 m long | phase  | <b>U 20/50 AC</b>   | 127 026  |
|  | 4    | Insulated conductors, 1 m long | phase  | <b>U 20/50 AC</b>   | 127 021  |
|  | 5    | Insulated conductors, 6 m long | ground | <b>U 20/50 AC</b>   | 127 126  |
|  | 1    | Insulated conductor, 1 m long  | ground | <b>U 20/50 AC</b>   | 127 121  |
|  | 25   | Rigid joints                   |        | <b>UV 20/50</b>     | 120 180  |
|  | 5    | Feed terminals                 |        | <b>UE 20/50 K 4</b> | 126 522  |
|  | 10   | Locating clamps                |        | <b>USK 20 K 4</b>   | 120 140  |
|  | 10   | End caps                       |        | <b>UK 20</b>        | 120 120  |
|  | 32   | Compact hangers, 5 pole        |        | <b>KH 20/5-5</b>    | 126 616  |
|  | 32   | Bracket profiles, 230 mm long  |        | <b>HU 20/230</b>    | 120 833  |
|  | 4    | Current collectors             | phase  | <b>KST 40</b>       | 152 840  |
|  | 1    | Current collectors             | ground | <b>KST 40</b>       | 152 850  |
|  | 1    | Collector bracket              |        | <b>UM 12</b>        | 153 5061 |
|  | 1    | Contact paste                  |        |                     | 121 502  |

## Standard configuration, 60 m power supply system, 3 pole + ground, 200 A

|   | Qty. | Description                    | Type   | Order- No.          |         |
|---|------|--------------------------------|--------|---------------------|---------|
| <p>Dimensions in parenthesis include insulators GH 40 with rail holder UAK 20</p> | 30   | Insulated conductors, 6 m long | phase  | <b>U 20/50 C</b>    | 127 036 |
|   | 10   | Insulated conductors, 6 m long | ground | <b>U 20/50 C</b>    | 127 136 |
|   | 36   | Rigid joints                   |        | <b>UV 20/50</b>     | 120 180 |
|   | 4    | Feed terminals                 |        | <b>UE 20/50 K 4</b> | 126 522 |
|   | 8    | Locating clamps                |        | <b>USK 20 K 4</b>   | 120 140 |
|   | 8    | End caps                       |        | <b>UK 20</b>        | 120 120 |
|   | 244  | Insulated hangers              |        | <b>UAM 20</b>       | 126 540 |
|   | 3    | Current collectors             | phase  | <b>UDST 120</b>     | 120 967 |
|   | 1    | Current collectors             | ground | <b>UDST 120</b>     | 120 968 |
|   | 1    | Collector bracket              |        | <b>UM 16</b>        | 126 574 |
|   | 1    | Contact Paste                  |        |                     | 121 502 |



# INSULATED CONDUCTORS U 30

|   |                    |                  |                   |  |
|---|--------------------|------------------|-------------------|--|
|   |                    |                  |                   |  |
| Type  | <b>U 30/120 CE</b> | <b>U 30/75 C</b> | <b>U 30/100 C</b> |  |
| Weight kg/m                                   | 1,440              | 1,100            | 1,360             |  |
| <b>Standard shrouding, color green</b>        |                    |                  |                   |  |
| Order- No. phase <sup>(3)</sup>               | 130 24 •           | 130 28 •         | 130 32 •          |  |
| Order- No. ground <sup>(3)</sup>              | 130 25 •           | 130 29 •         | 130 33 •          |  |
| <b>High temperature shrouding, color grey</b> |                    |                  |                   |  |
| Order- No. phase <sup>(3)</sup>               | 130 26 •           | 130 30 •         | 130 34 •          |  |
| Order- No. ground <sup>(3)</sup>              | 130 27 •           | 130 31 •         | 130 35 •          |  |

|   |                    |                   |                   |                    |
|---|--------------------|-------------------|-------------------|--------------------|
|   |                    |                   |                   |                    |
| Type  | <b>U 30/130 CH</b> | <b>U 30/150 C</b> | <b>U 30/200 C</b> | <b>U 30/200 CH</b> |
| Weight kg/m                                   | 1,540              | 1,780             | 2,180             | 2,180              |
| <b>Standard shrouding, color green</b>        |                    |                   |                   |                    |
| Order- No. phase <sup>(3)</sup>               | 130 36 •           | 130 40 •          | 130 44 •          | 130 48 •           |
| Order- No. ground <sup>(3)</sup>              | 130 37 •           | 130 41 •          | 130 45 •          | 130 49 •           |
| <b>High temperature shrouding, color grey</b> |                    |                   |                   |                    |
| Order- No. phase <sup>(3)</sup>               | 130 38 •           | 130 42 •          | 130 46 •          | 130 50 •           |
| Order- No. ground <sup>(3)</sup>              | 130 39 •           | 130 43 •          | 130 47 •          | 130 51 •           |

## Engineering data

| Type               | Conductor cross section mm <sup>2</sup> |    |       | Leakage distance of shroud mm | max. voltage <sup>(4)</sup> V | max. continuous ampere capacity A at 35° C | Resistance <sup>(1)</sup> Ohm/1000 m | Impedance <sup>(1)</sup> Ohm/1000 m |
|--------------------|---|----|-------|-------------------------------|-------------------------------|--|--------------------------------------|-------------------------------------|
|                    | Cu                                      | Al | Stahl |                               |                               |  |                                      |                                     |
| <b>U 30/120 CE</b> | 100                                     |    | 18    | 100                           | 1000                          | 330  | 0,178                                | 0,222                               |
| <b>U 30/ 75 C</b>  | 75                                      |    |       | 100                           | 1000                          | 280  | 0,238                                | 0,280                               |
| <b>U 30/100 C</b>  | 100                                     |    |       | 105                           | 1000                          | 330  | 0,178                                | 0,264                               |
| <b>U 30/130 CH</b> | 130                                     |    |       | 95                            | 1000                          | 400  | 0,137                                | 0,221                               |
| <b>U 30/150 C</b>  | 150                                     |    |       | 95                            | 1000                          | 440  | 0,126                                | 0,219                               |
| <b>U 30/200 C</b>  | 200                                     |    |       | 90                            | 1000                          | 530  | 0,090                                | 0,195                               |
| <b>U 30/200 CH</b> | 200                                     |    |       | 90                            | 1000                          | 530  | 0,090                                | 0,195                               |

### Conductor Code:

U = Insulated Conductors  
 30 = Shroud Size  
 75-225 = Conductor Cross Sectional Area (mm<sup>2</sup>)  
 CE = Copper/stainless steel conductor  
 C = Copper conductor  
 CH = Copper conductor with extra deep groove for high speed applications

### Application:

for indoor and outdoor

### Supply length:

6 m standard  
 Shorter lengths are available.

### Bending:

factory fabricated on request

### Support spacing:

– for straight runs and lateral curves: 1500 mm  
 – for horizontal curves RH < 10 m<sup>(2)</sup>: 750 mm  
 – for horizontal curves RH > 10 m: 1500 mm

### Heating system:

The conductor Type U 30/75 C can be equipped with heating cable for icing conditions.  
 See page 4 for chemical and electrical properties

<sup>(1)</sup> With 80 mm phase distance, 50 Hz and 20 °C.

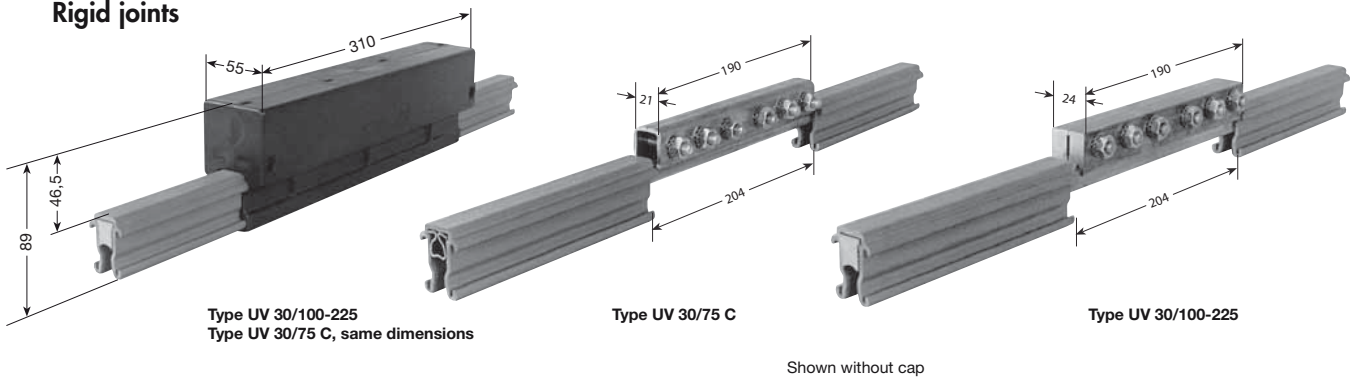
<sup>(2)</sup> Recommended

<sup>(3)</sup> Add last number (1, 2, 3, 4, 5 or 6 m length suffix) in accordance to bars required. Short length have to be rounded up.

<sup>(4)</sup> Not with UL-approval; U<sub>UL</sub>= 600 V



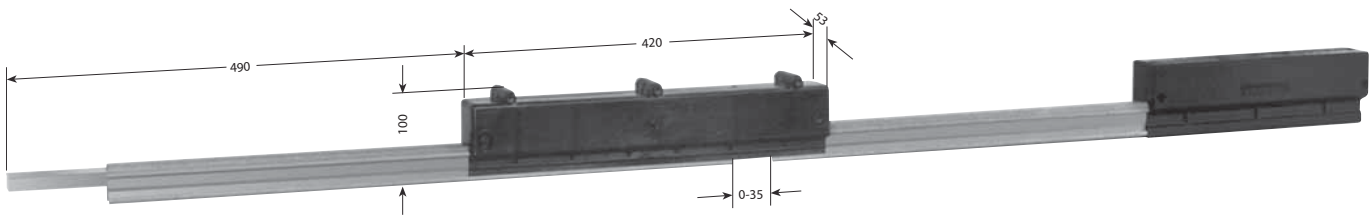
## Rigid joints



| Type                                   | for conductor type                                | Weight kg | Order- No. |
|--|---|-----------|------------|
| <b>UV 30/75 C</b>                      | U 30/75 C   | 0,780     | 130 525    |
| <b>UV 30/75 C K 4<sup>(1)</sup></b>    | U 30/75 C   | 0,780     | 130 526    |
| <b>UV 30/100-225</b>                   | U 30/120 CE, U 30/100 C,                          | 1,180     | 130 527    |
| <b>UV 30/100-225 K 4<sup>(1)</sup></b> | U 30/130 CH, U 30/150 C, U 30/200 C, U 30/200 CH, | 1,180     | 130 528    |

## Expansion sections

consisting of expansion joint with rigid joint installed on a conductor rail of 1.5 m length. They are used in systems >100 m. The 1.5 m expansion assembly is part of the system length and has to be considered. Expansion sections with 70 mm expansion are available.



### Investigation of expansion sections

$n = \frac{L_1}{L}$   
 n = Number of UDV (rounded)  
 L<sub>1</sub> = Length of assembly minus 100 m  
 L = Expansion capacity max. of UDV (see table)

| to Δ t | max. L / U 30 | to Δ t | max. L / U 30 |
|--------|---------------|--------|---------------|
| 20 °C  | 100 m         | 40 °C  | 50 m          |
| 30 °C  | 68 m          | 50 °C  | 40 m          |

### Standard shrouding, color green

| Type                                   | Weight kg | Order- No. |         |
|--|-----------|------------|---------|
|  |           | phase      | ground  |
| <b>UDV 30/120 CE</b>                   | 4,980     | 130 533    | 130 534 |
| <b>UDV 30/ 75 C</b>                    | 4,470     | 130 535    | 130 536 |
| <b>UDV 30/100 C</b>                    | 4,860     | 130 537    | 130 538 |
| <b>UDV 30/130 CH</b>                   | 5,130     | 130 539    | 130 540 |
| <b>UDV 30/150 C</b>                    | 5,490     | 130 541    | 130 542 |
| <b>UDV 30/200 C</b>                    | 6,090     | 130 543    | 130 544 |
| <b>UDV 30/200 CH</b>                   | 6,090     | 130 545    | 130 546 |
| <b>UDV 30/120 CE K 4<sup>(1)</sup></b> | 4,980     | 130 551    | 130 552 |
| <b>UDV 30/ 75 C K 4<sup>(1)</sup></b>  | 4,470     | 130 553    | 130 554 |
| <b>UDV 30/100 C K 4<sup>(1)</sup></b>  | 4,860     | 130 555    | 130 556 |
| <b>UDV 30/130 CH K 4<sup>(1)</sup></b> | 5,130     | 130 557    | 130 558 |
| <b>UDV 30/150 C K 4<sup>(1)</sup></b>  | 5,490     | 130 559    | 130 560 |
| <b>UDV 30/200 C K 4<sup>(1)</sup></b>  | 6,090     | 130 561    | 130 562 |
| <b>UDV 30/200 CH K 4<sup>(1)</sup></b> | 6,090     | 130 563    | 130 564 |

### High temperature shrouding, color grey

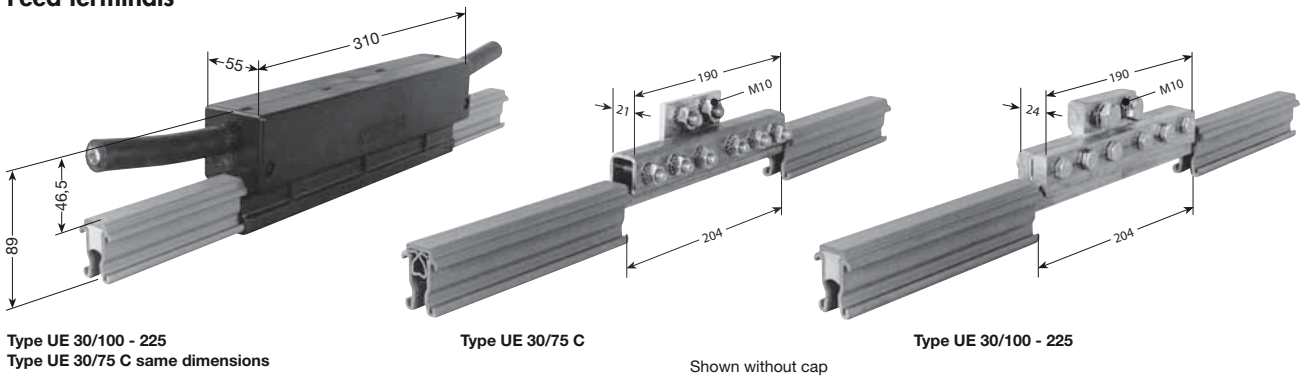
| Type                                   | Weight kg | Order- No. |         |
|--|-----------|------------|---------|
|  |           | phase      | ground  |
| <b>UDV 30/120 CE</b>                   | 4,980     | 130 569    | 130 570 |
| <b>UDV 30/ 75 C</b>                    | 4,470     | 130 571    | 130 572 |
| <b>UDV 30/100 C</b>                    | 4,860     | 130 573    | 130 574 |
| <b>UDV 30/130 CH</b>                   | 5,130     | 130 575    | 130 576 |
| <b>UDV 30/150 C</b>                    | 5,490     | 130 577    | 130 578 |
| <b>UDV 30/200 C</b>                    | 6,090     | 130 579    | 130 580 |
| <b>UDV 30/200 CH</b>                   | 6,090     | 130 581    | 130 582 |
| <b>UDV 30/120 CE K 4<sup>(1)</sup></b> | 4,980     | 130 587    | 130 588 |
| <b>UDV 30/ 75 C K 4<sup>(1)</sup></b>  | 4,470     | 130 589    | 130 590 |
| <b>UDV 30/100 C K 4<sup>(1)</sup></b>  | 4,860     | 130 591    | 130 592 |
| <b>UDV 30/130 CH K 4<sup>(1)</sup></b> | 5,130     | 130 593    | 130 594 |
| <b>UDV 30/150 C K 4<sup>(1)</sup></b>  | 5,490     | 130 595    | 130 596 |
| <b>UDV 30/200 C K 4<sup>(1)</sup></b>  | 6,090     | 130 597    | 130 598 |
| <b>UDV 30/200 CH K 4<sup>(1)</sup></b> | 6,090     | 130 599    | 130 600 |

<sup>(1)</sup> Stainless steel hardware



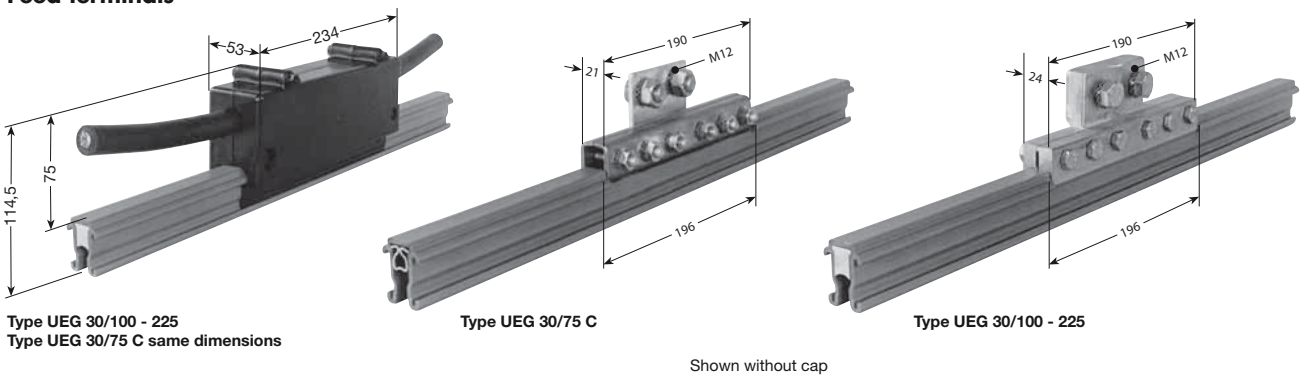
# FEED TERMINALS FOR U 30

## Feed terminals



| Type                                   | Connecting cable max. mm <sup>2</sup> | Weight kg | Order- No. |
|--|---------------------------------------|-----------|------------|
| <b>UE 30/75 C</b>                      | 2 x 70                                | 0,990     | 130 601    |
| <b>UE 30/75 CK 4<sup>(1)</sup></b>     | 2 x 70                                | 0,990     | 130 602    |
| <b>UE 30/100 - 225</b>                 | 2 x 70                                | 1,480     | 130 603    |
| <b>UE 30/100-225 K 4<sup>(1)</sup></b> | 2 x 70                                | 1,480     | 130 604    |

## Feed terminals



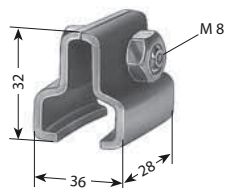
For mid-rail assembly only.

| Type                                    | Connecting max. mm <sup>2</sup> | Weight kg | Order- No. |
|---|---------------------------------|-----------|------------|
| <b>UEG 30/75 C</b>                      | 2 x 95                          | 0,940     | 130 605    |
| <b>UEG 30/75 CK 4<sup>(1)</sup></b>     | 2 x 95                          | 0,940     | 130 606    |
| <b>UEG 30/100-225</b>                   | 2 x 120                         | 1,615     | 130 607    |
| <b>UEG 30/100-225 K 4<sup>(1)</sup></b> | 2 x 120                         | 1,615     | 130 608    |

## Contact paste for joints and feeds

|                           |                    |
|---------------------------|--------------------|
| 100 ml for ca. 200 joints | Order- No. 121 502 |
|---------------------------|--------------------|

## Locating clamp



| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>USK 30 K 4<sup>(1)</sup></b> | 0,065     | 133 537    |

## End caps

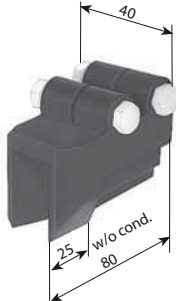
incl. Locking pin



| Type           | Weight kg | Order- No. |
|----------------|-----------|------------|
| <b>UK 30-L</b> | 0,025     | 132 120    |
| <b>UK 30-M</b> | 0,025     | 130 158    |

## Transfer guides

Transfer guides are used for transfer or power interrupting applications.  
 Max. vertical and horizontal offset:  $\pm 4$  mm, max. air gap: 10 mm.  
 Additional hangers are required and have to be ordered separately.



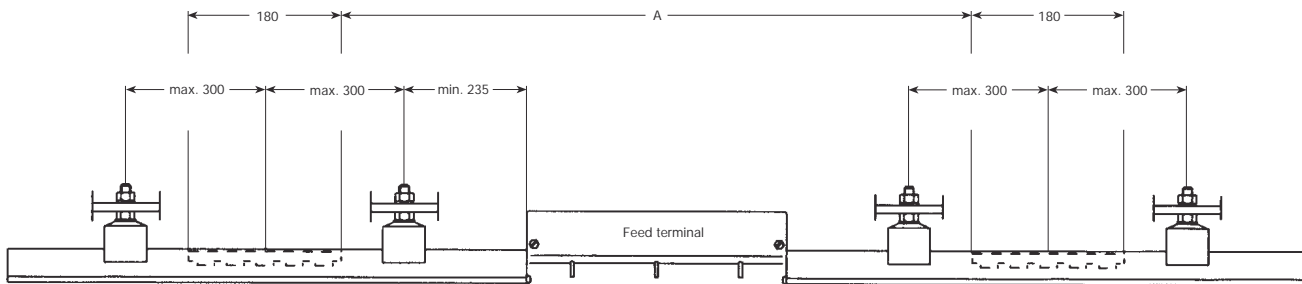
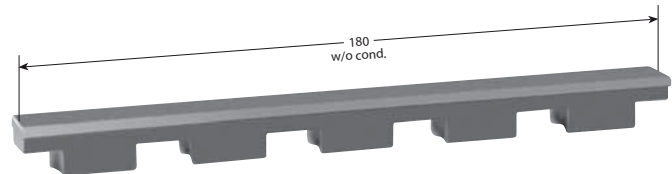
| Type         | Weight kg | Order- No. |
|--------------|-----------|------------|
| US 30/120 CE | 0,090     | 133 587    |
| US 30/ 75 C  | 0,090     | 133 250    |
| US 30/100 C  | 0,090     | 133 260    |
| US 30/130 CH | 0,090     | 133 280    |
| US 30/150 C  | 0,090     | 133 290    |
| US 30/200 C  | 0,090     | 133 300    |
| US 30/200 CH | 0,090     | 133 791    |

Transfer guides US 30 are fastened to conductor ends by means of two screws.

## Isolating sections

Type M: Factory assembled per system layout  
 Type L: Loose, including two locking pins 4 x 18

Position of isolating sections per system layout. Use one extra hanger each side, max. 300 mm away for stability.  
 Rails, hangers & feed terminal to be ordered separately.



To avoid voltage by-pass by carbon brushes and to separate maintenance bays, control and main feed sections, double isolating sections are recommended.

Dim. A depends on type and number of current collectors and stopping distance of the crane.

| Type             | Weight kg | Order- No. |
|------------------|-----------|------------|
| IT/U 30/120 CE-M | 0,021     | 133 588    |
| IT/U 30/ 75 C -M | 0,021     | 133 070    |
| IT/U 30/100 C -M | 0,021     | 133 080    |
| IT/U 30/130 CH-M | 0,021     | 133 100    |
| IT/U 30/150 C -M | 0,021     | 133 110    |
| IT/U 30/200 C -M | 0,021     | 133 120    |
| IT/U 30/200 CH-M | 0,021     | 133 792    |

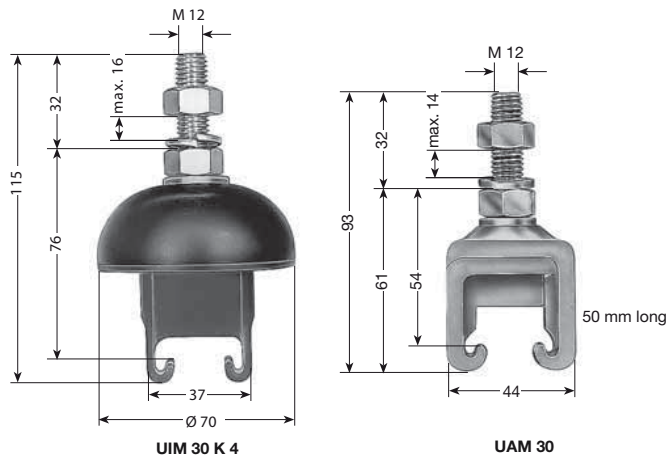
| Type             | Weight kg | Order- No. |
|------------------|-----------|------------|
| IT/U 30/120 CE-L | 0,021     | 132 580    |
| IT/U 30/ 75 C -L | 0,021     | 132 560    |
| IT/U 30/100 C -L | 0,021     | 132 570    |
| IT/U 30/130 CH-L | 0,021     | 132 600    |
| IT/U 30/150 C -L | 0,021     | 132 610    |
| IT/U 30/200 C -L | 0,021     | 132 620    |
| IT/U 30/200 CH-L | 0,021     | 132 640    |





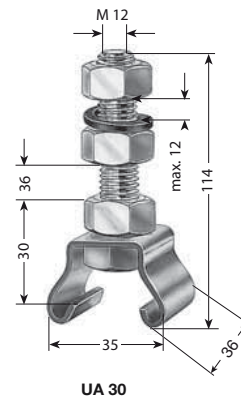
# HANGERS FOR U 30

## Insulated hangers<sup>(2)</sup>



| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>UIM 30 K 4<sup>(1)</sup></b> | 0,160     | 133 768    |
| <b>UAM 30</b>                   | 0,160     | 132 690    |
| <b>UAM 30 K 4<sup>(1)</sup></b> | 0,160     | 132 700    |

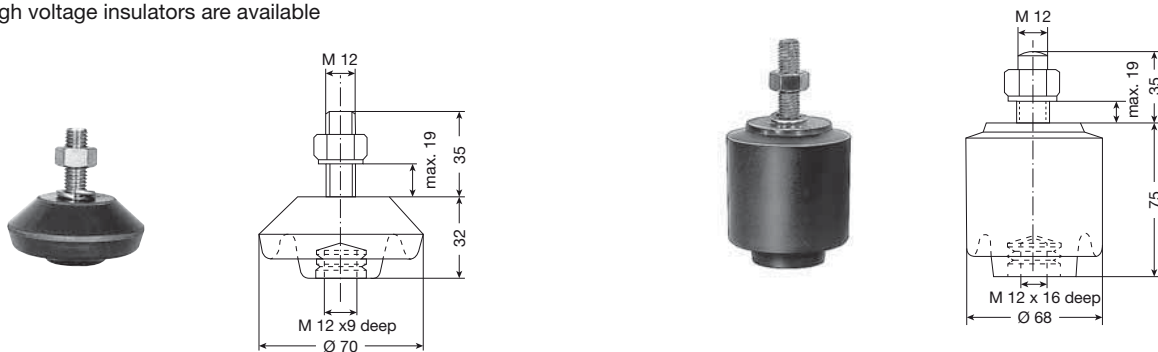
## Hangers<sup>(2)</sup>



| Type                           | Weight kg | Order- No. |
|--------------------------------|-----------|------------|
| <b>UA 30</b>                   | 0,193     | 132 150    |
| <b>UA 30 K 4<sup>(1)</sup></b> | 0,193     | 132 510    |

## Insulators<sup>(2)</sup>

High voltage insulators are available



| Type                                   | Weight kg | Order- No. |
|--|-----------|------------|
| <b>GHH 30 - M 12</b>                   | 0,245     | 130 000    |
| <b>GHH 30 - M 12 K 4<sup>(1)</sup></b> | 0,245     | 130 002    |

Cantilever strength = 4500 N  
Leakage distance = 70 mm

| Type                                   | Weight kg | Order- No. |
|--|-----------|------------|
| <b>GHH 75 - M 12</b>                   | 0,560     | 133 564    |
| <b>GHH 75 - M 12 K 4<sup>(1)</sup></b> | 0,560     | 133 566    |

Cantilever strength = 6500 N  
Leakage distance = 115 mm

## Rail holders

to go with insulators



Supplied with bolt M 12 x 16

| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>UAK 30 K 4<sup>(1)</sup></b> | 0,100     | 133 568    |

| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>UAS 30 K 4<sup>(1)</sup></b> | 0,080     | 132 710    |

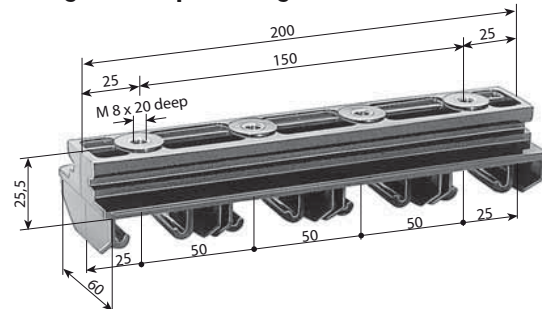
<sup>(1)</sup> Stainless steel hardware

<sup>(2)</sup> For installation in slotted holes use on both sided discs according to DIN 9021.



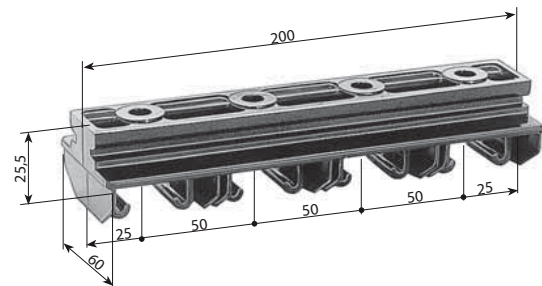
Any number of conductors can be assembled by cutting/combining the compact hangers.  
The joints and feeds have to be arranged staggered.

## Compact hanger, 4 pole for direct bolting



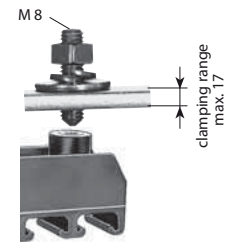
| Type    | Weight kg | Order- No. |
|---------|-----------|------------|
| KA 30/4 | 0,172     | 133 570    |

## Compact hanger, 4 pole to go with bracket 38/17



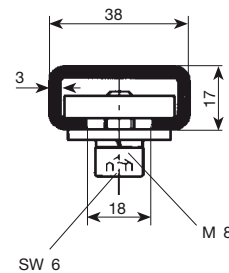
| Type    | Weight kg | Order- No. |
|---------|-----------|------------|
| KH 30/4 | 0,165     | 133 571    |

## Attachment hardware for compact hangers, insulated hangers and insulators



| Type                    | Weight kg | Order- No. |
|-------------------------|-----------|------------|
| BE 8                    | 0,028     | 130 060    |
| BE 8 K 4 <sup>(1)</sup> | 0,028     | 130 111    |

## Bracket profiles 38/17

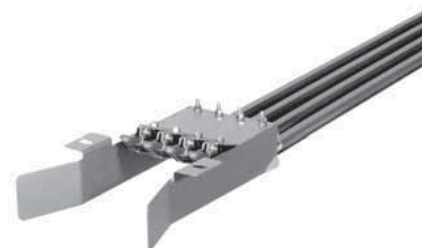


| Type      | Lenght mm | Number of poles | Weight kg | Bestell-Nr. |
|-----------|-----------|-----------------|-----------|-------------|
| HU 30/400 | 400       | 5               | 0,820     | 130 113     |
| HU 30/600 | 600       | 10              | 1,160     | 130 114     |



## Transfer funnel for compact arrangement EMK 30/1-6.

Transfer funnels are for spurlines, switches and turntables required.  
They have a height and lateral tolerance of +/- 25 mm.  
The conductor distance has to be 50 mm.  
Collector types KSTU 140 and KDSTU 280 have to be used.



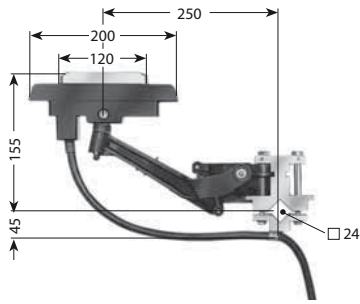
For construction please request drawing.

<sup>(1)</sup> Stainless steel hardware



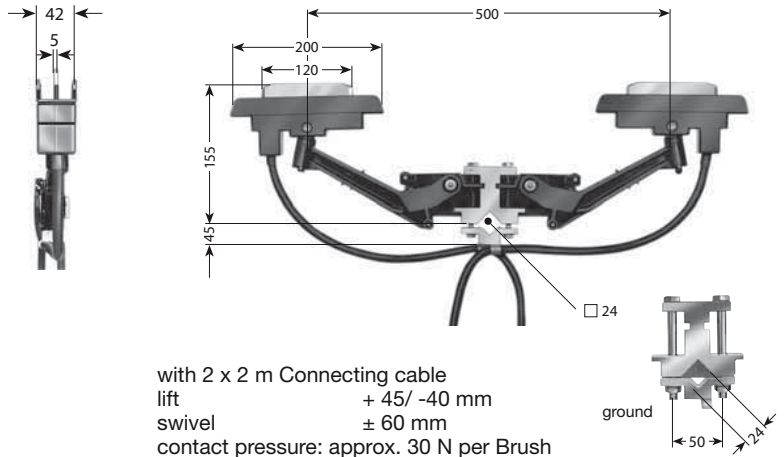
# CURRENT COLLECTORS FOR U 30

## Current collectors



with 2 m Connecting cable  
lift + 45/ -40 mm  
swivel ± 60 mm  
contact pressure: approx. 30 N

## Double collector

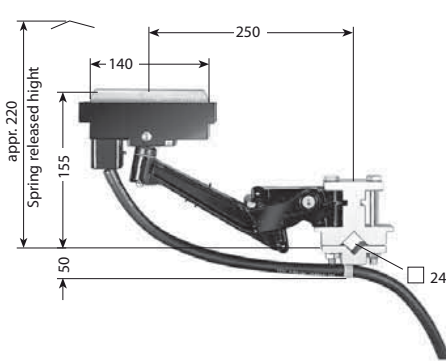


with 2 x 2 m Connecting cable  
lift + 45/ -40 mm  
swivel ± 60 mm  
contact pressure: approx. 30 N per Brush

| Type              | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  | Type               | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  |
|-------------------|--------------------|------------------|--------------|--------------|----------------|------------------|--------------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                   |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |                    |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>KST 100/30</b> | 100                | 16               | 14,5         | 1,724        | 133 938        | 133 939          | <b>KDST 200/30</b> | 200                | 16               | 14,5         | 3,111        | 133 940        | 133 941          |
| <b>KST 125/30</b> | 125                | 25               | 16,5         | 1,960        | 130 863        | 130 864          | <b>KDST 250/30</b> | 250                | 25               | 16,5         | 3,583        | 130 865        | 130 866          |

## Current collectors<sup>(1)</sup>

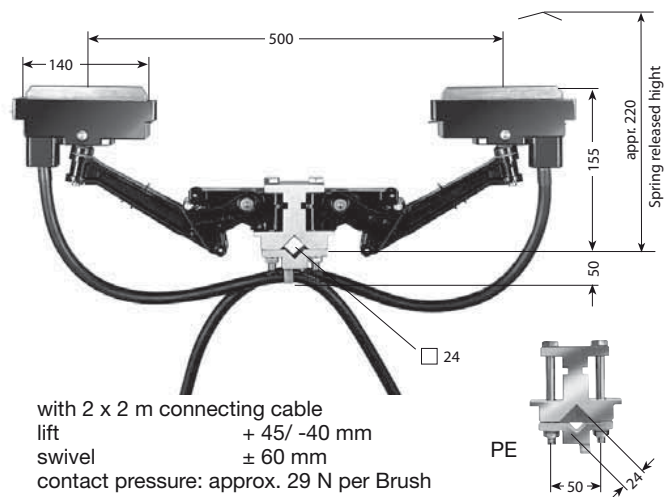
for transfer applications KSTU 140/30



with 2 m connecting cable  
lift + 45/ -40 mm  
swivel ± 60 mm  
contact pressure: approx. 29 N

## Double collectors<sup>(1)</sup>

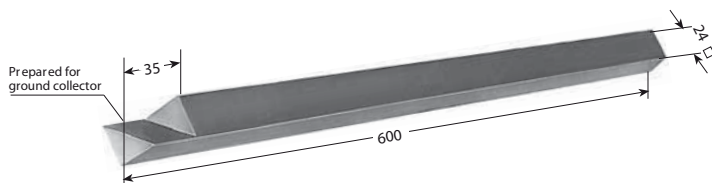
for transfer applications KDSTU 280/30



with 2 x 2 m connecting cable  
lift + 45/ -40 mm  
swivel ± 60 mm  
contact pressure: approx. 29 N per Brush

| Type               | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  | Type                | Am-<br>pacity<br>A | Connecting cable |              | Weight<br>kg | Order- No.     |                  |
|--------------------|--------------------|------------------|--------------|--------------|----------------|------------------|---------------------|--------------------|------------------|--------------|--------------|----------------|------------------|
|                    |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |                     |                    | mm <sup>2</sup>  | ø max/<br>mm |              | phase<br>black | ground<br>yellow |
| <b>KST 140/30</b>  | 140                | 25               | 16,5         | 1,935        | 130 048        | 130 049          | <b>KDST 280/30</b>  | 280                | 25               | 16,5         | 3,395        | 130 052        | 130 053          |
| <b>KSTU 140/30</b> | 140                | 25               | 16,5         | 1,990        | 130 050        | 130 051          | <b>KDSTU 280/30</b> | 280                | 25               | 16,5         | 3,535        | 130 054        | 130 055          |
| <b>KST 175/30</b>  | 175                | 35               | 18,5         | 2,183        | 130 869        | 130 870          | <b>KDST 350/30</b>  | 350                | 35               | 18,5         | 3,891        | 130 873        | 130 874          |
| <b>KSTU 175/30</b> | 175                | 35               | 18,5         | 2,238        | 130 871        | 130 872          | <b>KDSTU 350/30</b> | 350                | 35               | 18,5         | 4,031        | 130 875        | 130 876          |

## Collector bracket



| Type         | Weight kg | Order- No. |
|--------------|-----------|------------|
| <b>UM 24</b> | 2,600     | 175 076    |

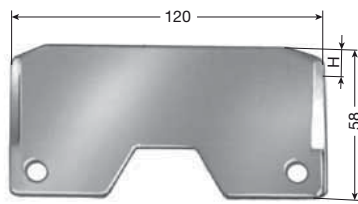
With a length above 600 mm for the towing arm a support have to be considered on site to prevent bending or twisting.

Longer length are available.

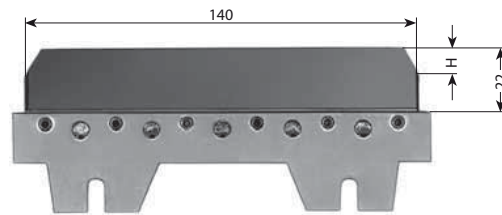
# COLLECTOR COMPONENTS U 30 • EXAMPLE FOR ORDERING



## Copper-graphite brush



**KMK 100/30**

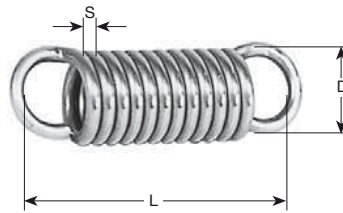


**KMK 140/30**

Dim. H: max. wear for U 30/100 C

| Type              | for collector                                      | H mm | Weight kg | Order- No. |
|-------------------|--|------|-----------|------------|
| <b>KMK 100/30</b> | KST 100/30, KDST 200/30                            | 4    | 0,198     | 130 609    |
| <b>KMK 140/30</b> | KST 140/30, KDST 280/30, KSTU 140/30, KDSTU 280/30 | 5,5  | 0,177     | 133 590    |

## Tension spring



| Type        | for collector   | Weight kg | L mm  | D mm  | S mm | Order- No. |
|-------------|---|-----------|-------|-------|------|------------|
| <b>ZF 6</b> | KST 100/30, KST 140/30, KDST 200/30<br>KST 140/30, KDST 280/30, KSTU 140/30, KDSTU 280/30 | 0,023     | 56,50 | 17,30 | 2,25 | 170 167    |

## Example for ordering 160 m power supply system, 3 pole + ground, 530 A

|  | Qty.             | Description                    | Type                                     | Order- No. |
|--|------------------|--------------------------------|--|------------|
|  | 78               | Insulated conductors, 6 m long | phase <b>U 30/200 C</b>                  | 130 446    |
|  | 3                | Insulated conductors, 1 m long | phase <b>U 30/200 C</b>                  | 130 441    |
|  | 26               | Insulated conductors, 6 m long | ground <b>U 30/100 C<sup>(1)</sup></b>   | 130 336    |
|  | 1                | Insulated conductor, 1 m long  | ground <b>U 30/100 C<sup>(1)</sup></b>   | 130 331    |
|  | 6                | Expansion sections, 1,5 m long | phase <b>UDV 30/200 C</b>                | 130 543    |
|  | 2                | Expansion sections, 1,5 m long | ground <b>UDV 30/100 C<sup>(1)</sup></b> | 130 538    |
|  | 104              | Rigid joints                   | <b>UV 30/100-225</b>                     | 130 527    |
|  | 8                | Feed terminals                 | <b>UE 30/100-225</b>                     | 130 603    |
|  | 24               | Locating clamps                | <b>USK 30 K 4</b>                        | 133 537    |
|  | 8                | End caps                       | <b>UK 30</b>                             | 132 120    |
|  | 432              | Insulated hangers              | <b>UAM 30</b>                            | 132 690    |
|  | 6                | Double collectors, phase       | <b>KDST 280/30</b>                       | 130 052    |
|  | 1 <sup>(1)</sup> | Double collectors, ground      | <b>KDST 280/30</b>                       | 130 053    |
|  | 2                | Collector bracket              | <b>UM 24</b>                             | 175 076    |

Dimensions in parenthesis include insulators GHH 75/UAS 30 with railholder UAK 30 K 4

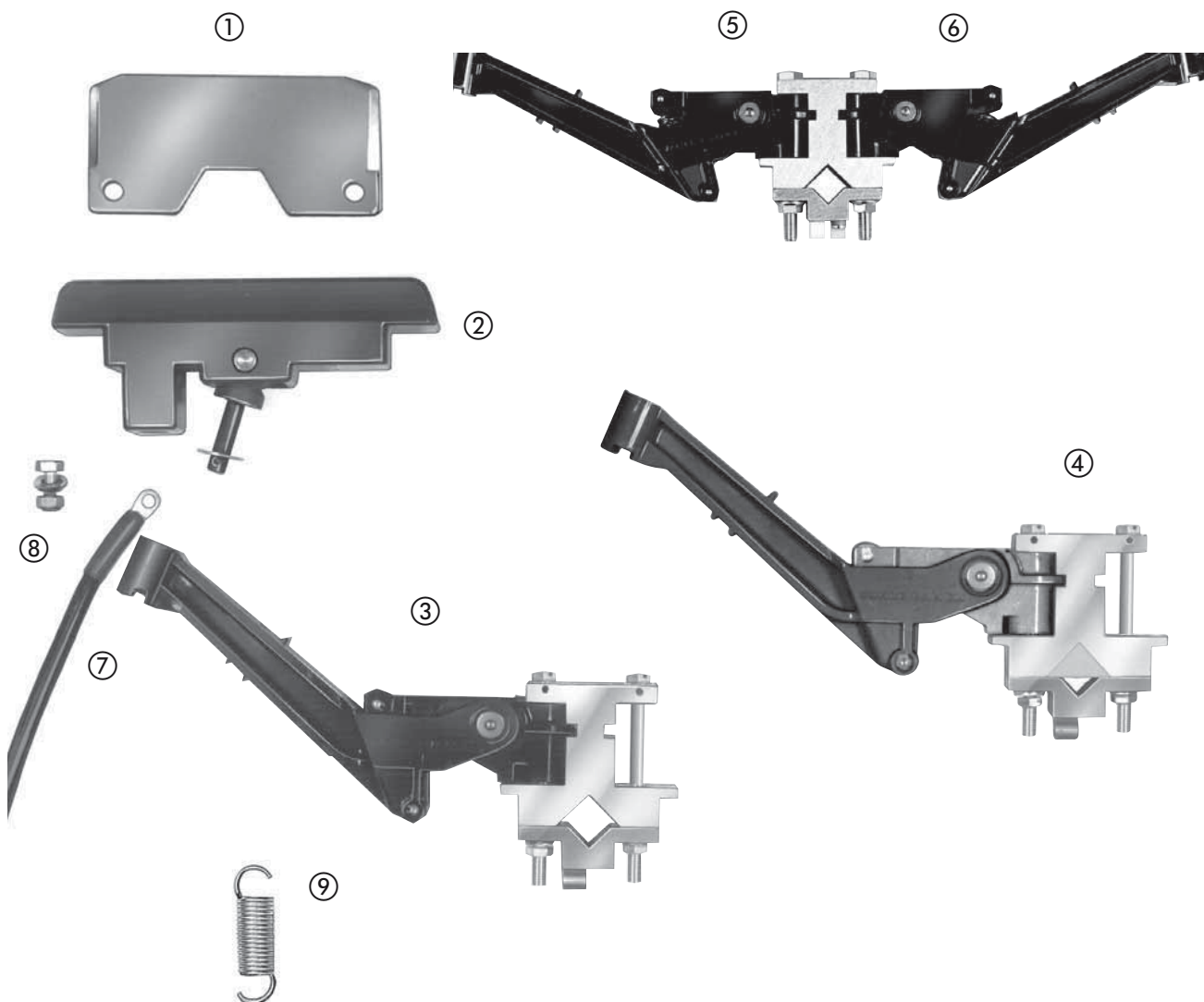
<sup>(1)</sup> Capacity reduces per VDE 0100, part 540



# COLLECTOR COMPONENTS U 30

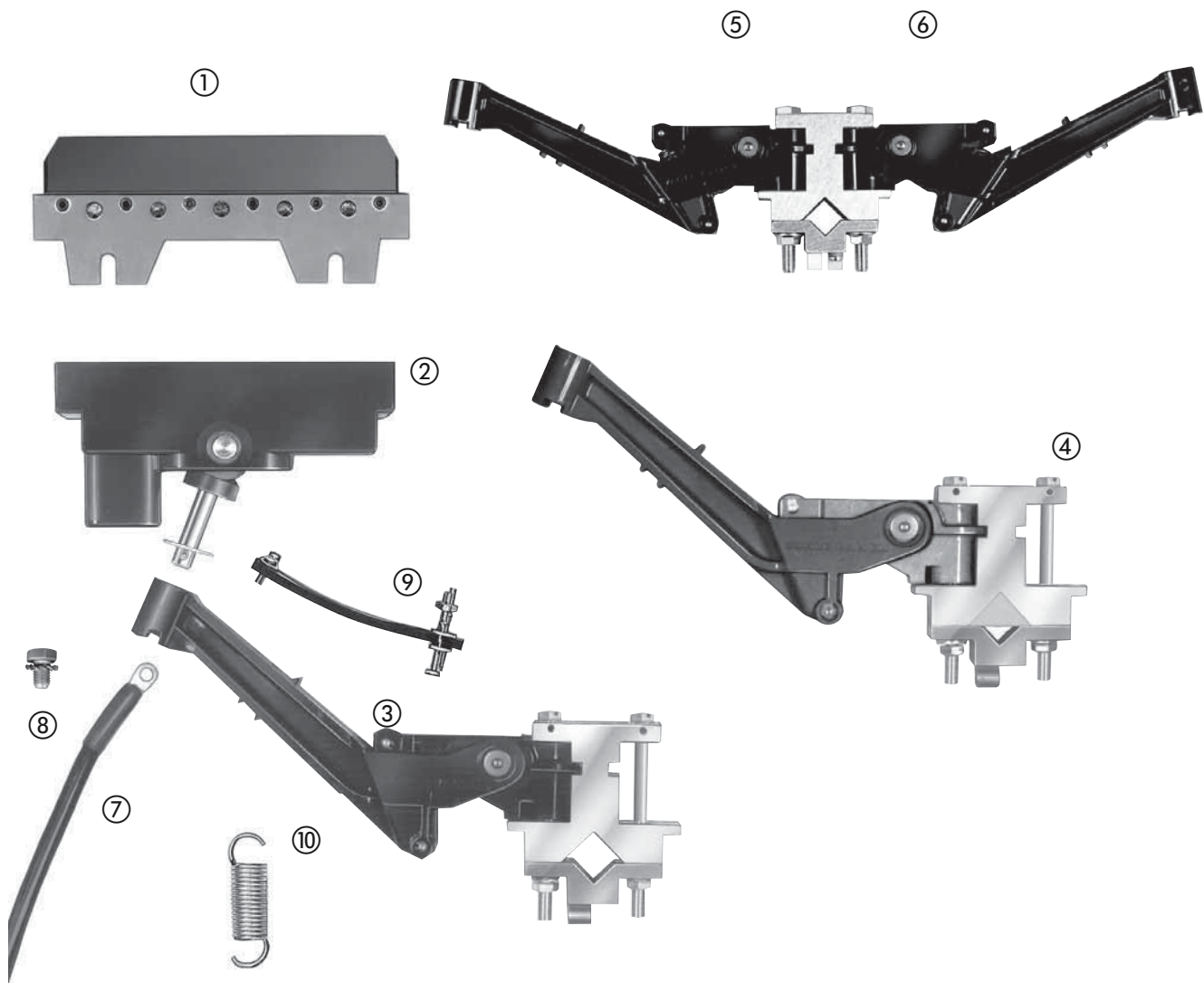
Spare parts for collectors of type KST 100/30 upto KDST 200/30

| Part.-No. | Description                            | Weight kg | Order- No. |
|-----------|--|-----------|------------|
| 1         | Brush (see page 28)                    | -         | -          |
| 2         | Brush holder for KST 100               | 0,195     | 170 338    |
| 3         | Collector base for KST 100             | phase     | 170 338    |
| 4         |  | ground    | 170 340    |
| 5         | Collector base for KDST 200            | phase     | 170 341    |
| 6         |  | ground    | 170 342    |
| 7         | Connecting cable RKA 16/8 PH, 2 m long | 0,887     | 170 343    |
| 8         | Connecting cable RKA 16/8 PE, 2 m long | 0,953     | 170 344    |
| 9         | Terminal bolt M8 x 20 K4               | 0,614     | 170 345    |
|           | Tension spring (see page 27)           | 0,459     | 170 818    |
|           |  | -         | -          |



## Spare parts for collectors of type KST 140/30 upto KDSTU 280/30

| Order- No. |  |                 |       |                    |
|------------|--|-----------------|-------|--------------------|
| 1          | Brush (see page 27)                            |                 | -     | -                  |
| 2          | Brush holder with carbon holder for KST 140    | phase<br>ground | 0,375 | 170 169<br>170 169 |
| 3          | Collector base for KST 140                     | phase           | 0,662 | 170 340            |
| 4          |  | ground          | 0,731 | 170 341            |
| 3          | Collector base for KSTU 140                    | phase           | 0,555 | 170 555            |
| 4          |  | ground          |       | 170 556            |
| 5          | Collector base for KDST 280                    | phase           | 0,887 | 170 342            |
| 6          |  | ground          | 0,953 | 170 343            |
| 5          | Collector base for KDSTU 280                   | phase           | 0,795 | 170 557            |
| 6          |  | ground          |       | 170 558            |
| 7          | Connecting cable RKA 25/8 PH, 2 m long         | phase           | 0,840 | 170 173            |
|            | Connecting cable RKA 25/8 PE, 2 m long         | ground          | 0,600 | 170 174            |
| 7          | Connecting cable RKA 35/8 PH, 2 m long         | phase           | 1,100 | 170 997            |
|            | Connecting cable RKA 35/8 PH, 2 m long         | ground          | 0,800 | 170 998            |
| 8          | Terminal bolt M 8 x 12 K 4                     |                 | 0,010 | 170 871            |
| 9          | Rubber spring complete for KSTU 140, KDSTU 280 |                 | 0,035 | 170 412            |
| 10         | Tension spring (see page 27)                   |                 | -     | -                  |







# INSULATED CONDUCTORS U 40

|   |                   |                   |
|---|-------------------|-------------------|
|   |                   |                   |
| Type  | <b>U 40/200 C</b> | <b>U 40/300 C</b> |
| Weight kg/m                                   | 2,550             | 3,460             |
| <b>Standard shrouding, color green</b>        |                   |                   |
| Order- No. <sup>(1)</sup> phase               | 136 01 •          | 134 34 •          |
| Order- No. <sup>(1)</sup> ground              | 136 15 •          | 136 16 •          |
| <b>High temperature shrouding, color grey</b> |                   |                   |
| Order- No. <sup>(1)</sup> phase               | 136 06 •          | 136 07 •          |
| Order- No. * ground                           | 136 24 •          | 136 25 •          |

|   |                    |                   |
|---|--------------------|-------------------|
|   |                    |                   |
| Type  | <b>U 40/400 CH</b> | <b>U 40/500 C</b> |
| Weight kg/m                                   | 4,360              | 5,240             |
| <b>Standard shrouding, color green</b>        |                    |                   |
| Order- No. <sup>(1)</sup> phase               | 136 04 •           | 134 36 •          |
| Order- No. <sup>(1)</sup> ground              | 136 20 •           | 136 21 •          |
| <b>High temperature shrouding, color grey</b> |                    |                   |
| Order- No. <sup>(1)</sup> phase               | 136 11 •           | 136 12 •          |
| Order- No. <sup>(1)</sup> ground              | 136 29 •           | 136 30 •          |

### Conductor code::

U = Unipole insulated conductor  
 40 = Shroud size  
 200-500 = Conductor cross sectional area (mm<sup>2</sup>)  
 C = Copper conductor  
 CH = Copper conductor with extra deep groove for high speed  
 CHH = See CH plus for heating

### Application:

indoors and outdoors

### Supply lengths:

6 m standard  
 shorter lengths are available.

### Support spacing:

2000 mm

### Heating system:

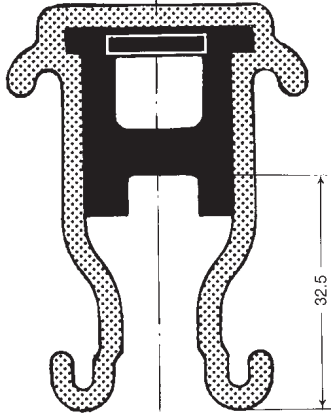
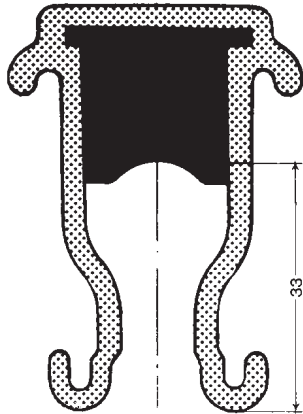
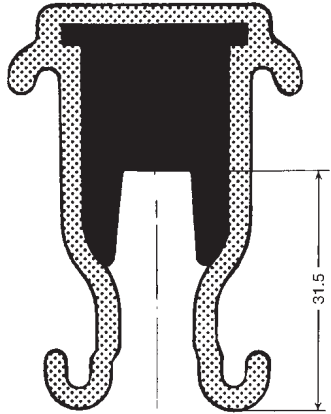
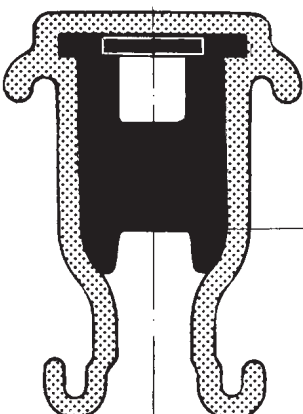
The conductors type U 40/200 C, U 40/300 CH and U 40/500 CHH can be equipped with heating cable for icing conditions.

Factory-fabricated radius bends to your drawings or sketches are available.

See page 4 for electrical and mechanical properties.

# INSULATED CONDUCTORS U 40



|  |  |  |
|--|--|--|
|  |   |   |
|  | <b>U 40/300 CH</b>   | <b>U 40/400 C</b>  |
|  | 3,500  | 4,380  |
|  | 136 02 •<br>136 17 •   | 134 35 •<br>136 19 •   |
|  | 136 08 •<br>136 26 •   | 136 10 •<br>136 28 •   |
|  |  |  |
|  | <b>U 40/500 CH</b>   | <b>U 40/500 CHH</b>  |
|  | 5,250  | 5,000  |
|  | 134 15 •<br>136 22 •   | 136 05 •<br>136 23 •   |
|  | 136 13 •<br>136 31 •   | 136 14 •<br>136 32 •   |

## Engineering data

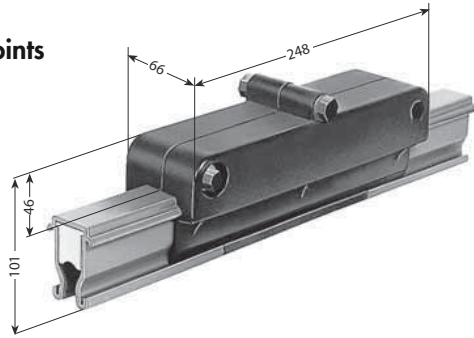
| Conductor Type      | Conductors cross section mm <sup>2</sup> |    | Leakage distance of shroud mm | max. voltage V | max. continuous ampere capacity A at 35 °C | Resistance (R) <sup>(2)</sup> Ohm/1000 m | Impedance <sup>(2)</sup> Ohm/1000 m |
|---------------------|--|----|-------------------------------|----------------|--|--|-------------------------------------|
|                     | Copper                                   | Al |                               |                |  |  |                                     |
| <b>U 40/200 C</b>   | 200                                      |    | 130                           | 1000           | 600  | 0,089                                    | 0,170                               |
| <b>U 40/300 C</b>   | 300                                      |    | 135                           | 1000           | 700  | 0,063                                    | 0,178                               |
| <b>U 40/300 CH</b>  | 300                                      |    | 130                           | 1000           | 700  | 0,063                                    | 0,178                               |
| <b>U 40/400 C</b>   | 400                                      |    | 130                           | 1000           | 860  | 0,047                                    | 0,168                               |
| <b>U 40/400 CH</b>  | 400                                      |    | 130                           | 1000           | 860  | 0,047                                    | 0,168                               |
| <b>U 40/500 C</b>   | 500                                      |    | 125                           | 1000           | 1000                                       | 0,038                                    | 0,161                               |
| <b>U 40/500 CH</b>  | 500                                      |    | 120                           | 1000           | 1000                                       | 0,038                                    | 0,161                               |
| <b>U 40/500 CHH</b> | 500                                      |    | 120                           | 1000           | 1000                                       | 0,038                                    | 0,161                               |

<sup>(2)</sup> With 130 mm phase distance, 50 Hz and 20 °C.

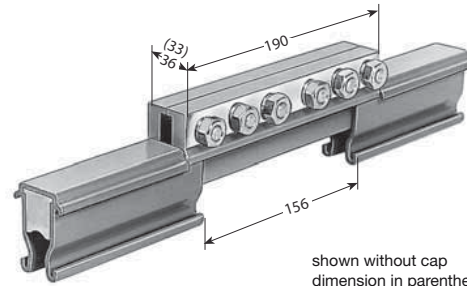


# ACCESSORIES FOR U 40

## Rigid joints



| Type                               | Weight kg | Order- No. |
|------------------------------------|-----------|------------|
| <b>UV 40/200</b>                   | 1,645     | 134 180    |
| <b>UV 40/200 K 4<sup>(1)</sup></b> | 1,645     | 135 140    |

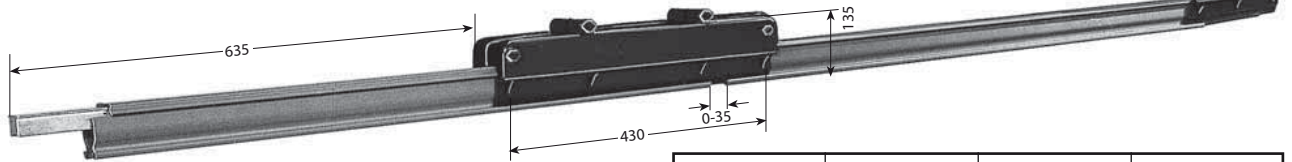


shown without cap  
dimension in parenthesis for UV 40/200

| Type                                   | Weight kg | Order- No. |
|--|-----------|------------|
| <b>UV 40/300-500</b>                   | 1,660     | 135 384    |
| <b>UV 40/300-500 K 4<sup>(1)</sup></b> | 1,660     | 135 385    |

## Expansion sections

consisting of expansion joint with rigid joint installed on a conductor rail of 2 m length. They are used in systems >100 m. The 2 m expansion assembly is part of the system length and has to be considered.



### Investigation of expansion sections

$n = \frac{L_1}{L}$   
 $n$  = Number of UDV (rounded)  
 $L_1$  = Length of assembly minus 100 m  
 $L$  = Expansion capacity max. of UDV (see table)

| to $\Delta t$ | max. L / U 40 | to $\Delta t$ | max. L / U 40 |
|---------------|---------------|---------------|---------------|
| 20° C         | 100 m         | 40° C         | 50 m          |
| 30° C         | 68 m          | 50° C         | 40 m          |

### Standard shrouding, color green

| Type                                    | Weight kg | Order- No. |         |
|---|-----------|------------|---------|
|   |           | phase      | ground  |
| <b>UDV 40/200 C</b>                     | 9,350     | 135 142    | 135 143 |
| <b>UDV 40/300 C</b>                     | 11,170    | 134 690    | 134 700 |
| <b>UDV 40/300 CH</b>                    | 11,250    | 135 144    | 135 145 |
| <b>UDV 40/400 C</b>                     | 13,010    | 134 710    | 134 720 |
| <b>UDV 40/400 CH</b>                    | 12,970    | 135 146    | 135 147 |
| <b>UDV 40/500 C</b>                     | 14,730    | 134 730    | 134 740 |
| <b>UDV 40/500 CH</b>                    | 14,750    | 134 750    | 134 760 |
| <b>UDV 40/500 CHH</b>                   | 14,250    | 135 390    | 135 391 |
| <b>UDV 40/200 C K 4<sup>(1)</sup></b>   | 9,350     | 135 154    | 135 155 |
| <b>UDV 40/300 C K 4<sup>(1)</sup></b>   | 11,170    | 135 156    | 135 157 |
| <b>UDV 40/300 CH K 4<sup>(1)</sup></b>  | 11,250    | 135 148    | 135 149 |
| <b>UDV 40/400 C K 4<sup>(1)</sup></b>   | 13,010    | 135 158    | 135 159 |
| <b>UDV 40/400 CH K 4<sup>(1)</sup></b>  | 12,970    | 135 150    | 135 151 |
| <b>UDV 40/500 C K 4<sup>(1)</sup></b>   | 14,730    | 135 160    | 135 161 |
| <b>UDV 40/500 CH K 4<sup>(1)</sup></b>  | 14,750    | 135 162    | 135 163 |
| <b>UDV 40/500 CHH K 4<sup>(1)</sup></b> | 14,250    | 135 392    | 135 393 |

### High temperature shrouding, color grey

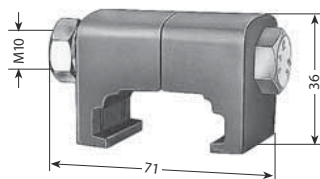
| Type                                    | Weight kg | Order- No. |         |
|---|-----------|------------|---------|
|   |           | phase      | ground  |
| <b>UDV 40/200 C</b>                     | 9,350     | 135 272    | 135 273 |
| <b>UDV 40/300 C</b>                     | 11,170    | 135 274    | 135 275 |
| <b>UDV 40/300 CH</b>                    | 11,250    | 135 276    | 135 277 |
| <b>UDV 40/400 C</b>                     | 13,010    | 135 280    | 135 281 |
| <b>UDV 40/400 CH</b>                    | 12,970    | 135 282    | 135 283 |
| <b>UDV 40/500 C</b>                     | 14,730    | 135 284    | 135 285 |
| <b>UDV 40/500 CH</b>                    | 14,750    | 135 286    | 135 287 |
| <b>UDV 40/500 CHH</b>                   | 14,250    | 135 370    | 135 371 |
| <b>UDV 40/200 C K 4<sup>(1)</sup></b>   | 9,350     | 135 288    | 135 289 |
| <b>UDV 40/300 C K 4<sup>(1)</sup></b>   | 11,170    | 135 290    | 135 291 |
| <b>UDV 40/300 CH K 4<sup>(1)</sup></b>  | 11,250    | 135 292    | 135 293 |
| <b>UDV 40/400 C K 4<sup>(1)</sup></b>   | 13,010    | 135 296    | 135 297 |
| <b>UDV 40/400 CH K 4<sup>(1)</sup></b>  | 12,970    | 135 298    | 135 299 |
| <b>UDV 40/500 C K 4<sup>(1)</sup></b>   | 14,730    | 135 300    | 135 301 |
| <b>UDV 40/500 CH K 4<sup>(1)</sup></b>  | 14,750    | 135 302    | 135 303 |
| <b>UDV 40/500 CHH K 4<sup>(1)</sup></b> | 14,250    | 135 372    | 135 373 |

## Contact Paste for joints and feeds

100 ml for ca. 200 joints

Order- No. 121 502

## Locating clamp



| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>USK 40 K 4<sup>(1)</sup></b> | 0,360     | 134 080    |

## End cap

incl. locking pin

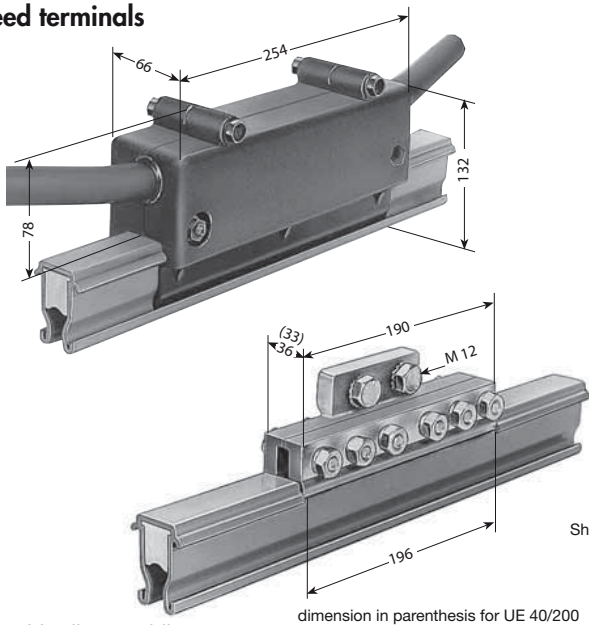


| Type           | Weight kg | Order- No. |
|----------------|-----------|------------|
| <b>UK 40-L</b> | 0,040     | 134 060    |
| <b>UK 40-M</b> | 0,040     | 135 974    |

# FEED TERMINALS FOR U 40



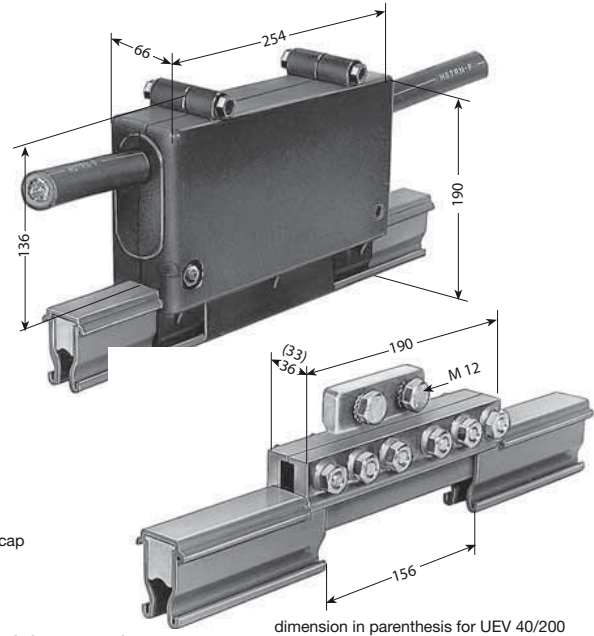
## Feed terminals



for mid-rail assembling

dimension in parenthesis for UE 40/200

| Type                                   | Weight kg | Order- No. |
|--|-----------|------------|
| <b>UE 40/200</b>                       | 2,120     | 134 280    |
| <b>UE 40/200 K 4<sup>(1)</sup></b>     | 2,120     | 135 164    |
| <b>UE 40/300-500</b>                   | 2,130     | 135 386    |
| <b>UE 40/300-500 K 4<sup>(1)</sup></b> | 2,130     | 135 387    |



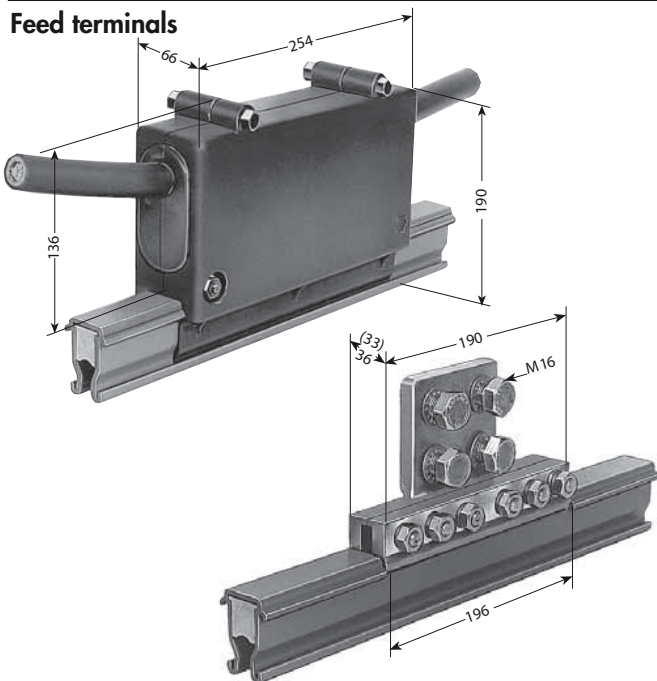
for joint mounting

dimension in parenthesis for UEV 40/200

| Type                                    | Weight kg | Order- No. |
|---|-----------|------------|
| <b>UEV 40/200</b>                       | 2,190     | 135 166    |
| <b>UEV 40/200 K 4<sup>(1)</sup></b>     | 2,190     | 135 168    |
| <b>UEV 40/300-500</b>                   | 2,200     | 135 388    |
| <b>UEV 40/300-500 K 4<sup>(1)</sup></b> | 2,200     | 135 389    |

Feed cables: 2 of max. 95 mm<sup>2</sup>

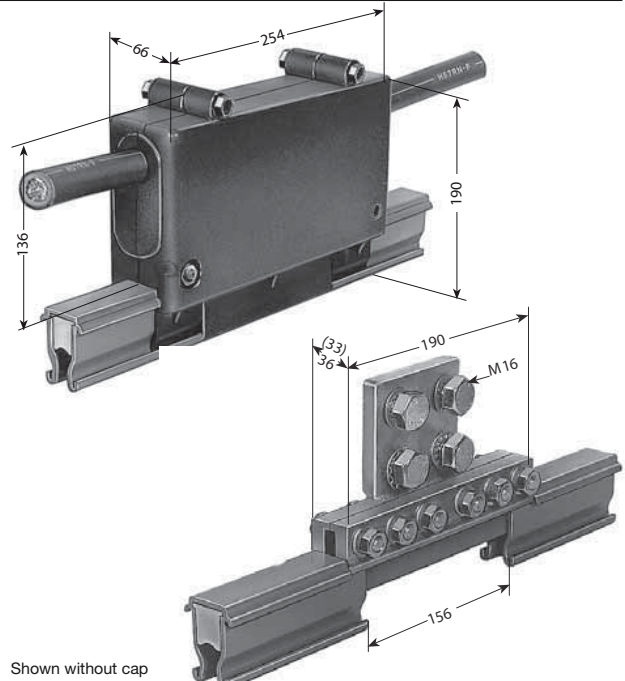
## Feed terminals



for mid-rail assembling

dimension in parenthesis for UEG 40/200

| Type                                    | Weight kg | Order- No. |
|---|-----------|------------|
| <b>UEG 40/200</b>                       | 2,775     | 135 213    |
| <b>UEG 40/200 K 4<sup>(1)</sup></b>     | 2,775     | 135 170    |
| <b>UEG 40/300-500</b>                   | 2,785     | 135 374    |
| <b>UEG 40/300-500 K 4<sup>(1)</sup></b> | 2,785     | 135 375    |



Shown without cap

for joint mounting

dimension in parenthesis for UEVG 40/200

| Type                                     | Weight kg | Order- No. |
|--|-----------|------------|
| <b>UEVG 40/200</b>                       | 2,825     | 135 172    |
| <b>UEVG 40/200 K 4<sup>(1)</sup></b>     | 2,825     | 135 174    |
| <b>UEVG 40/300-500</b>                   | 2,835     | 135 376    |
| <b>UEVG 40/300-500 K 4<sup>(1)</sup></b> | 2,835     | 135 377    |

Feed cables: 4 of max. 150 mm<sup>2</sup>

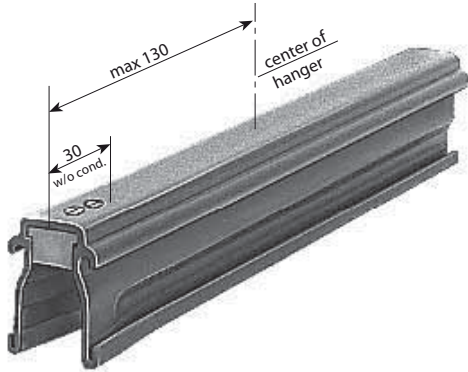
<sup>(1)</sup> Stainless steel hardware



# ACCESSORIES FOR U 40

## Transfer guide

Transfer guides are used for transfer or power-interrupting applications. Max. vertical and horizontal offset:  $\pm 6$  mm, max. air gap: 12 mm. Additional hangers have to be considered and have to be ordered separately.



| Type          | Weight kg | Order- No. |
|---------------|-----------|------------|
| <b>UTI 40</b> | 0,014     | 134 910    |

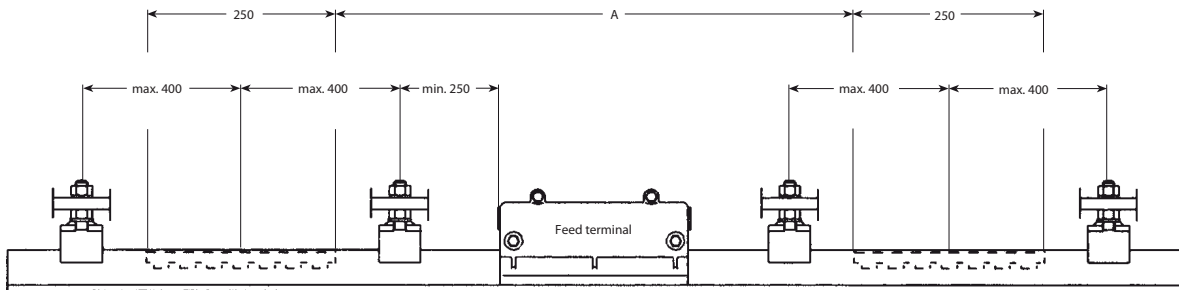
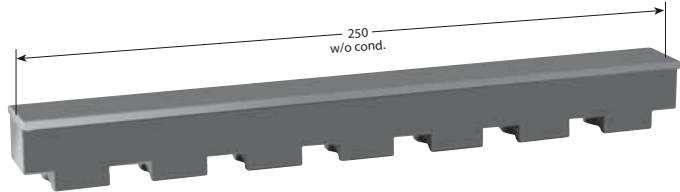
UTI 40 are transfer buttons (bellmouth shaped conductor ends) with integrated isolating piece. They are factory assembled to layout plans.

For separate ordering indicate conductor length and size. The conductor rail has to be ordered separately.

## Isolating sections

Type M: Factory assembled per system layout  
 Type L: Loose, including two locking pins 4 x 8

Position of isolating sections per system layout. Use one extra hanger each side, max. 400 mm away for stability. Rails & hangers to be ordered separately.



To avoid voltage by-pass by carbon brushes and to separate maintenance bays, control and main feed sections, double isolating sections are recommended.

Dim. A depends on type and number of current collectors and stopping distance of the crane.

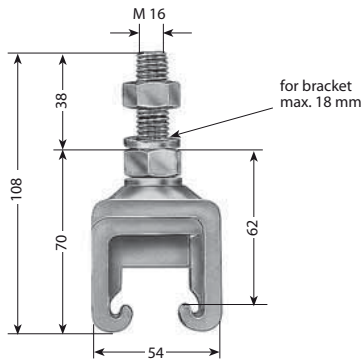
| Type                      | Weight kg | Order- No. |
|---------------------------|-----------|------------|
| <b>IT/U 40/200 C -M</b>   | 0,104     | 135 176    |
| <b>IT/U 40/300 C -M</b>   | 0,104     | 134 790    |
| <b>IT/U 40/300 CH -M</b>  | 0,104     | 135 187    |
| <b>IT/U 40/400 C -M</b>   | 0,104     | 134 800    |
| <b>IT/U 40 400 CH -M</b>  | 0,104     | 135 188    |
| <b>IT/U 40/500 C -M</b>   | 0,104     | 134 810    |
| <b>IT/U 40/500 CH -M</b>  | 0,104     | 134 820    |
| <b>IT/U 40/500 CHH -M</b> | 0,104     | 135 378    |

| Type                      | Weight kg | Order- No. |
|---------------------------|-----------|------------|
| <b>IT/U 40/200 C -L</b>   | 0,104     | 134 210    |
| <b>IT/U 40/300 C -L</b>   | 0,104     | 134 220    |
| <b>IT/U 40/300 CH -L</b>  | 0,104     | 134 230    |
| <b>IT/U 40/400 C -L</b>   | 0,104     | 134 250    |
| <b>IT/U 40 400 CH -L</b>  | 0,104     | 134 260    |
| <b>IT/U 40/500 C -L</b>   | 0,104     | 134 270    |
| <b>IT/U 40/500 CH -L</b>  | 0,104     | 134 370    |
| <b>IT/U 40/500 CHH -L</b> | 0,104     | 134 380    |



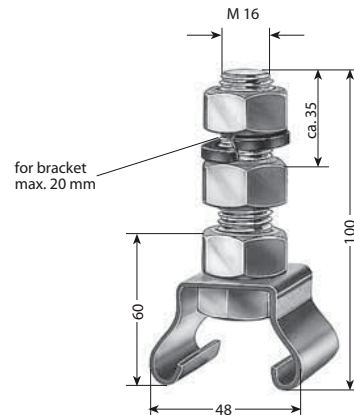


## Insulated hangers



| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>UAM 40</b>                   | 0,285     | 135 040    |
| <b>UAM 40 K 4<sup>(1)</sup></b> | 0,285     | 134 610    |

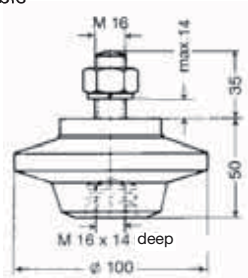
## Hangers



| Type                           | Weight kg | Order- No. |
|--------------------------------|-----------|------------|
| <b>UA 40</b>                   | 0,300     | 134 090    |
| <b>UA 40 K 4<sup>(1)</sup></b> | 0,300     | 134 400    |

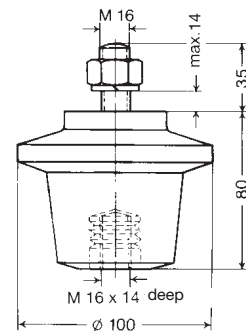
## Insulators

High voltage insulators are available



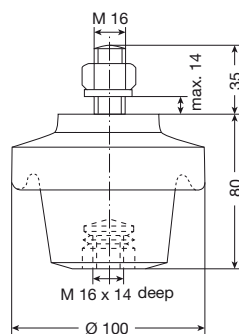
| Type                                | Weight kg | Order- No. |
|-------------------------------------|-----------|------------|
| <b>GH 50-M 16</b>                   | 0,510     | 135 179    |
| <b>GH 50-M 16 K 4<sup>(1)</sup></b> | 0,510     | 135 380    |

Cantilever = 9000 N  
Leakage distance = 80 mm



| Type                                | Weight kg | Order- No. |
|-------------------------------------|-----------|------------|
| <b>GH 80-M 16</b>                   | 0,780     | 135 181    |
| <b>GH 80-M 16 K 4<sup>(1)</sup></b> | 0,780     | 135 382    |

Cantilever = 9500 N  
Leakage distance = 120 mm

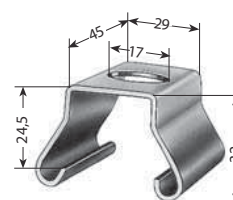


Cantilever = 9500 N  
Leakage distance = 125 mm

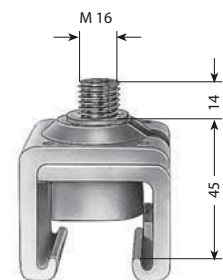
| Type                                 | Weight kg | Order- No. |
|--------------------------------------|-----------|------------|
| <b>GHH 80-M 16</b>                   | 0,870     | 135 875    |
| <b>GHH 80-M 16 K 4<sup>(1)</sup></b> | 0,870     | 135 877    |

## Rail holders

to go with insulators



**UAS**  
Supplied with bolt M 16 x 16  
and spring washer



**UAK**  
Supplied with washer

| Type                            | Weight kg | Order- No. |
|---------------------------------|-----------|------------|
| <b>UAS 40</b>                   | 0,140     | 134 100    |
| <b>UAS 40 K 4<sup>(1)</sup></b> | 0,140     | 134 550    |
| <b>UAK 40</b>                   | 0,170     | 135 183    |
| <b>UAK 40 K 4<sup>(1)</sup></b> | 0,170     | 135 185    |

<sup>(1)</sup> Stainless steel hardware

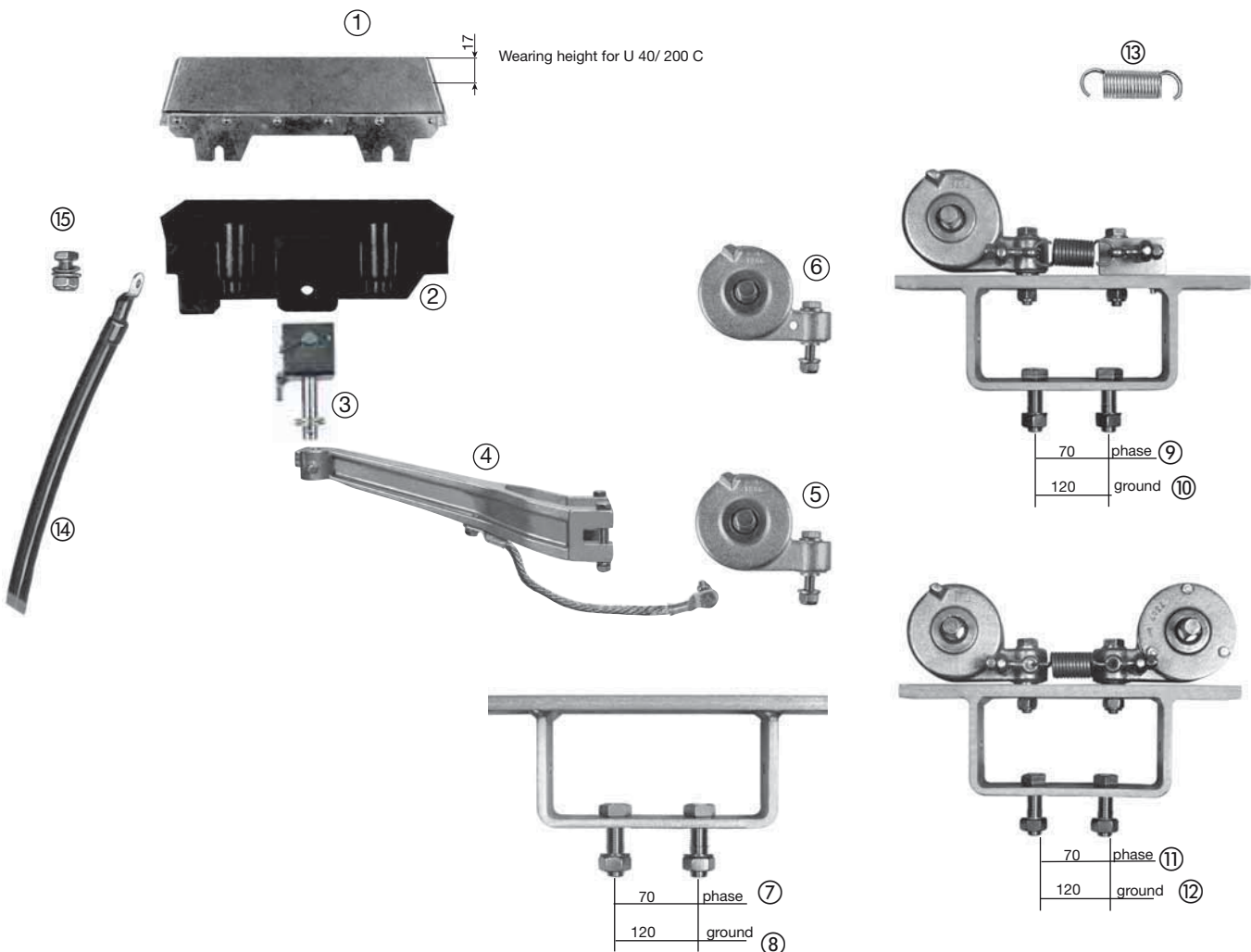






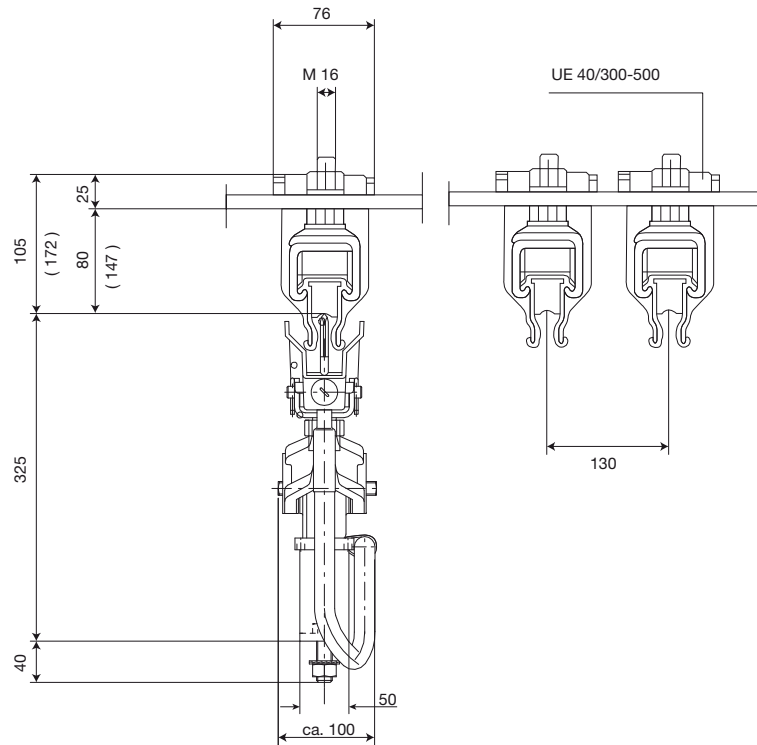
## Spare parts for collectors of type UST 200, UDST 400, USTR 200 and UDSTR 400

| Part.-No. | Description  |        | Gewicht kg | Bestell-Nr. |
|-----------|--|--------|------------|-------------|
| 1         | Brush KMU 200                                      |        | 0,410      | 135 207     |
| 2         | Brush holder                                       |        | 0,730      | 135 206     |
| 3         | Fork link with bolt                                |        | 0,350      | 135 205     |
| 4         | Lever complete                                     |        | 0,750      | 135 204     |
| 5         | Spring housing complete for UST 200 and UDSTR 400  |        | 2,120      | 175 094     |
| 6         | Spring housing complete for USTR 200 and UDSTR 400 |        | 2,110      | 175 562     |
| 7         | Base plate compl.                                  | phase  | 3,080      | 175 095     |
| 8         | Base plate compl.                                  | ground | 3,080      | 175 096     |
| 9         | Lower part for USTR 200                            | phase  | 5,950      | 175 554     |
| 10        | Lower part for USTR 200                            | ground | 5,950      | 175 555     |
| 11        | Lower part for UDSTR 400                           | phase  | 7,610      | 175 556     |
| 12        | Lower part for UDSTR 400                           | ground | 7,610      | 175 557     |
| 13        | Spring for USTR 200 and UDSTR 400                  |        | 0,048      | 175 558     |
| 14        | Connecting cable RKA 50 mm <sup>2</sup> , 2 m      | phase  | 1,340      | 135 208     |
|           | Connecting cable RKA 50 mm <sup>2</sup> , 2 m      | ground | 1,340      | 135 209     |
| 15        | Connecting screw M 8x12 K4                         |        | 0,010      | 170 871     |





## EXAMPLE FOR ORDERING U 40



Dimensions in brackets include insulators type GH 80 with rail holder UAK 40.

### Example for Ordering 250 m power supply system, 3 pole + ground, 1000 A

| Qty. | Description                      | Type   | Order- No.                        |         |
|------|----------------------------------|--------|-----------------------------------|---------|
| 120  | Insulated conductors, 6 m long   | phase  | <b>U 40/500 C</b>                 | 134 366 |
| 3    | Insulated conductors, 2 m long   | phase  | <b>U 40/500 C</b>                 | 134 362 |
| 40   | Insulated conductors, 6 m long   | ground | <b>U 40/300 C<sup>(1)</sup></b>   | 136 126 |
| 1    | Isolierte Stromschiene, 2 m long | ground | <b>U 40/300 C<sup>(1)</sup></b>   | 136 122 |
| 12   | Expansion sections, 2 m long     | phase  | <b>UDV 40/500 C</b>               | 134 730 |
| 4    | Expansion sections, 2 m long     | ground | <b>UDV 40/300 C<sup>(1)</sup></b> | 134 700 |
| 160  | Rigid joints                     |        | <b>UV 40/300-500</b>              | 135 384 |
| 8    | Feed terminals                   |        | <b>UE 40/300-500</b>              | 135 386 |
| 40   | Locating clamps                  |        | <b>USK 40 K 4</b>                 | 134 080 |
| 8    | End caps                         |        | <b>UK 40</b>                      | 134 060 |
| 504  | Insulated hangers                |        | <b>UAM 40</b>                     | 135 040 |
| 6    | Double collectors                | phase  | <b>UDST 400</b>                   | 134 320 |
| 1    | Double collectors                | ground | <b>UDST 400<sup>(1)</sup></b>     | 134 330 |

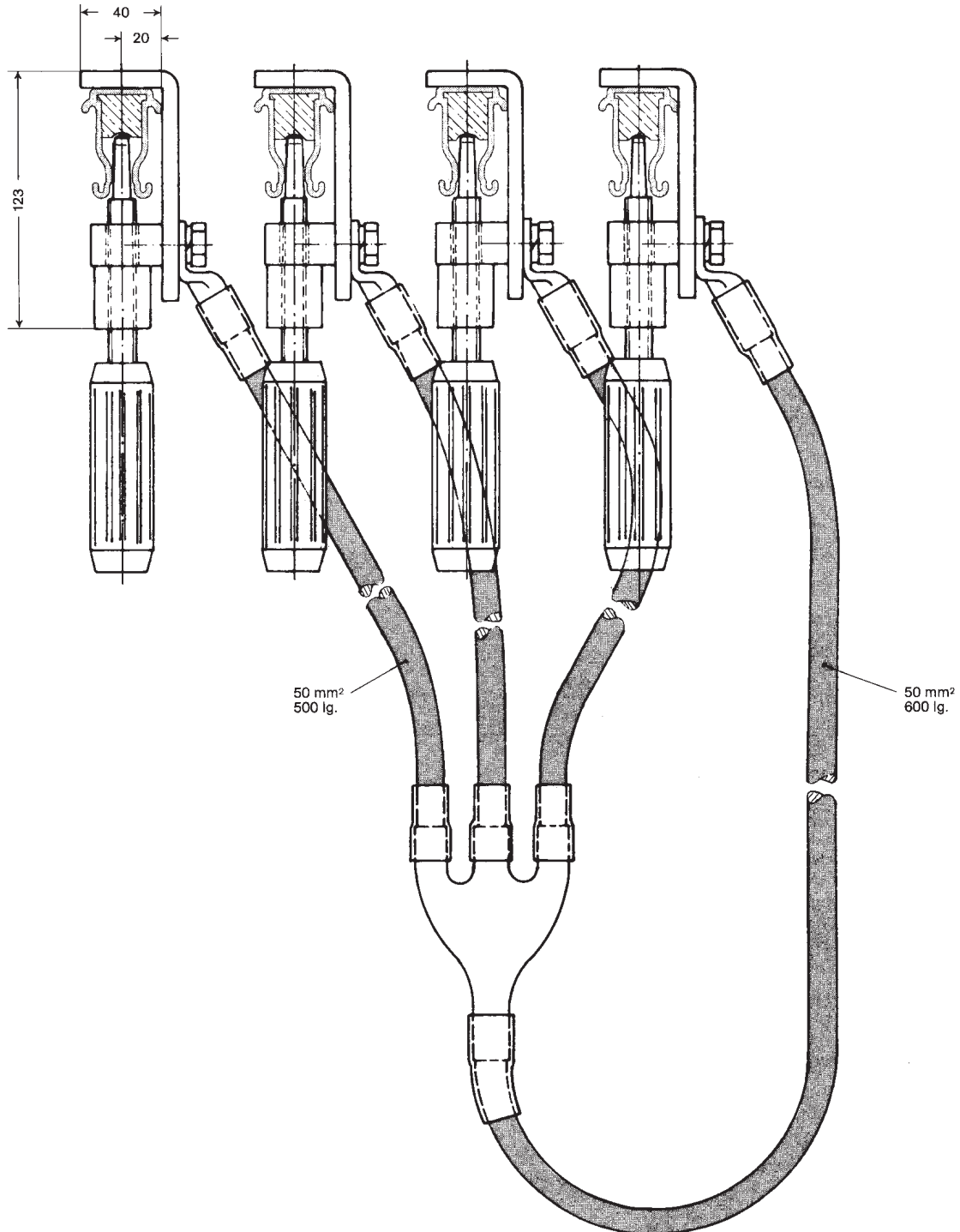
# EARTHING SPIDER SYSTEM



Earthing spider system, 4 pole, for insulated conductors serves for earthing and short-circuiting the phase conductors with the ground conductor in the case of maintenance work.

The system consists of terminal clamps for the conductors and copper wire ropes and is designed for a short-circuit current of max.40 kA.

Earthing spider system cannot be used together with compact conductor arrangement.



| Type       | for for conductor type  | Copper section of wire rope | Order- No. |
|------------|-------------------------|-----------------------------|------------|
| <b>EUK</b> | <b>U 20, U 30, U 40</b> | 50 mm <sup>2</sup>          | 130 035    |



# QUESTIONNAIRE FOR INSULATED CONDUCTOR SYSTEMS<sup>(1)</sup>

Company: \_\_\_\_\_ Date: \_\_\_\_\_  
 Tel: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_ Internet: \_\_\_\_\_

1. Number of powerail systems: \_\_\_\_\_
2. Type of equipment to be powered: \_\_\_\_\_
3. Operating voltage: \_\_\_\_\_ Volts, Frequency: \_\_\_\_\_ Hz  
 Three phase voltage:  AC voltage:  DC voltage:
4. Track length: \_\_\_\_\_
5. Number of conductors: \_\_\_\_\_ (Neutral: \_\_\_\_\_ control: \_\_\_\_\_ ground: \_\_\_\_\_)
6. Mounted position of powerail:  
 Powerail pendant, collector cable facing to the bottom  
 Powerail pendant, collector cable lateral payout <sup>(1)</sup>  
 Support distance m  Other: \_\_\_\_\_
7. Number of consumers per system: \_\_\_\_\_
8. Indoor:  Outdoor:
9. Other operating conditions (humidity, dust, chemical influence etc.) \_\_\_\_\_
10. Ambient temperature: \_\_\_\_\_ °C min. \_\_\_\_\_ °C max.
11. Hall expansion gaps: \_\_\_\_\_ pc. \_\_\_\_\_ max. expansion
12. Position and number of feed points<sup>(1)</sup>: \_\_\_\_\_
13. Position and number of dead sections (e.g. maintenance bays)<sup>(1)</sup> \_\_\_\_\_
14. How will the conductor system be arranged?<sup>(1)</sup>: \_\_\_\_\_
15. Brackets required: yes  no  c/c distance beam / powerail \_\_\_\_\_  
 Flange width of beam \_\_\_\_\_
16. Travel speed (long travel): \_\_\_\_\_ in curves: \_\_\_\_\_ at transfers: \_\_\_\_\_
17. Power consumption of the individual consumers: \_\_\_\_\_
18. Max. Voltage drop from the powerail feed point to the consumer considering starting current:  
 3%  or \_\_\_\_\_ %  referring to nominal voltage.

| Motor data      | Crane 1  |                    |      |                  |                    |                               | Crane 2  |                    |      |                  |                    |                               |
|-----------------|----------|--------------------|------|------------------|--------------------|-------------------------------|----------|--------------------|------|------------------|--------------------|-------------------------------|
|                 | Power kW | Nominal current    |      | Starting current |                    | Type of Motors <sup>(2)</sup> | Power kW | Nominal current    |      | Starting current |                    | Type of Motors <sup>(2)</sup> |
|                 | A        | cos φ <sub>N</sub> | % ED | A                | cos φ <sub>A</sub> |                               | A        | cos φ <sub>N</sub> | % ED | A                | cos φ <sub>A</sub> |                               |
| Hoist motors    |          |                    |      |                  |                    |                               |          |                    |      |                  |                    |                               |
| Auxiliary hoist |          |                    |      |                  |                    |                               |          |                    |      |                  |                    |                               |
| Long travel     |          |                    |      |                  |                    |                               |          |                    |      |                  |                    |                               |
| Cross travel    |          |                    |      |                  |                    |                               |          |                    |      |                  |                    |                               |
|                 |          |                    |      |                  |                    |                               |          |                    |      |                  |                    |                               |

Mark with \* those motors which can run simultaneously.  
 Mark with Δ those motors which can start up simultaneously.

Further remarks: \_\_\_\_\_  
 \_\_\_\_\_

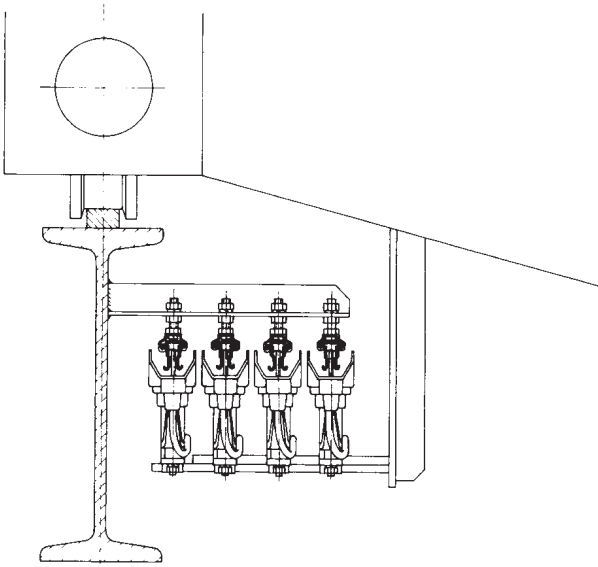
Signature: \_\_\_\_\_

<sup>(1)</sup> Sketch required

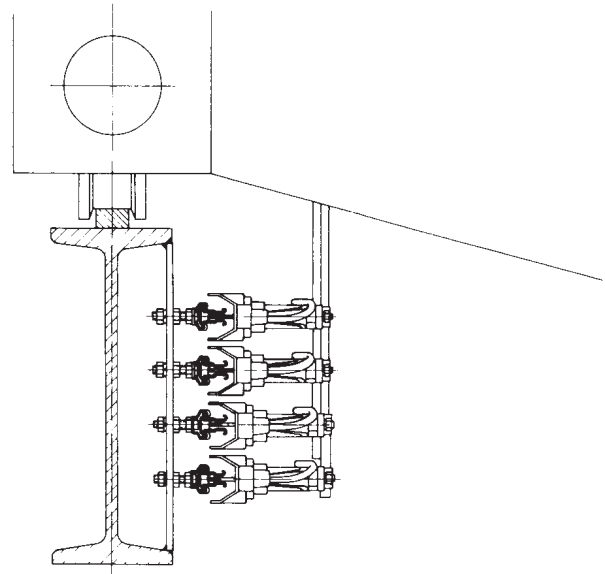
<sup>(2)</sup> Note type of Motor: K for Squirrel cage motor, S for slipring motor, F for frequency controlled motor.

We reserve the right for technical changes due to further developments.

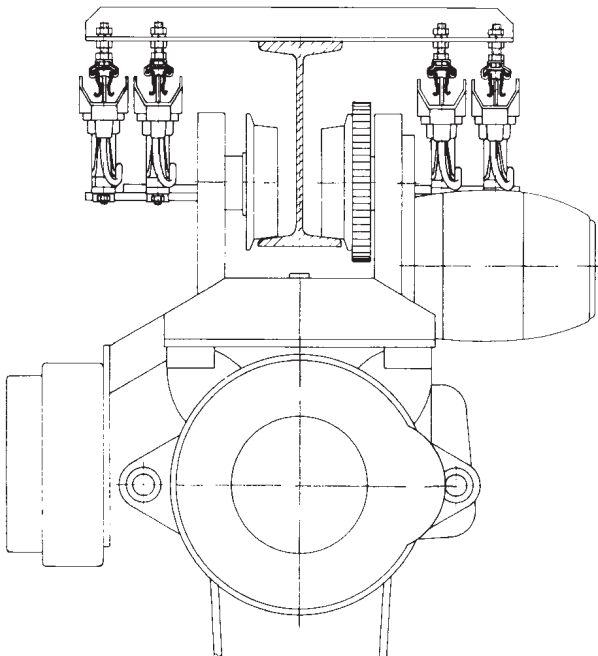
Please copy and fax this questionnaire.



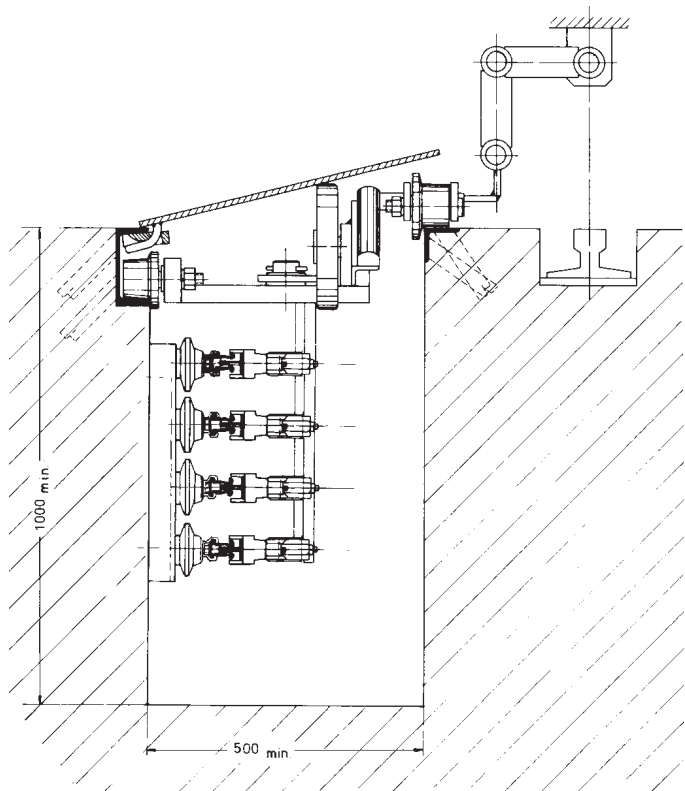
Suspended mounting of 4-pole system.



Lateral arrangement of the conductor rails.  
Lateral arrangement preferably with CH-profiles



Equally balanced conductor arrangement  
for monorail hoist.



Insulated conductors U 30 in VAHLE trench system.





## NOTES

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## Products and Service

Catalog No.

### 1 Open conductor systems

Open conductor systems 1a

### 2 Insulated conductor systems

U 10 2a

FABA 100 2b

U 15 - U 25 - U 35 2c

U 20 - U 30 - U 40 2d

### 3 Compact conductor systems

VKS 10 3a

VKS - VKL 3b

### 4 Enclosed conductor systems

KBSL - KSL 4a

KBH 4b

MKH 4c

LSV - LSVG 4d

### 5 Contactless power supply

Contactless power supply (CPS®) 5a

### 6 Data transmission

VAHLE Powercom® 6a

Slotted Microwave Guide (SMG) 6b

### 7 Positioning systems

VAHLE-APOS® 7a

### 8 Festoon systems and cables

Festoon systems for □- tracks 8a

Festoon systems for flat cables on I- tracks 8b

Festoon systems for round flat cables on I- tracks 8c

Festoon systems for ◇- tracks 8d

Cables 8e

### 9 Reels

Spring operated cable reels 9a

Motor powered cable reels 9b

### 10 Others

Battery charging systems 10a

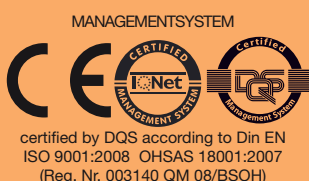
Heavy enclosed conductor systems 10b

Tender 10c

Contact wire 10d

## Assemblies/Commissioning

## Spare parts/Maintenance service



**VAHLE**   
**ELECTRIFICATION SYSTEMS**

## Products and Service

Catalog No.

|  |     |
|--|-----|
| <b>1 Open conductor systems</b>                    |     |
| Open conductor systems                             | 1a  |
| <b>2 Insulated conductor systems</b>               |     |
| U 10   | 2a  |
| FABA 100   | 2b  |
| U 15 - U 25 - U 35                                 | 2c  |
| U 20 - U 30 - U 40                                 | 2d  |
| <b>3 Compact conductor systems</b>                 |     |
| VKS 10   | 3a  |
| VKS - VKL  | 3b  |
| <b>4 Enclosed conductor systems</b>                |     |
| KBSL - KSL   | 4a  |
| KBH  | 4b  |
| MKH  | 4c  |
| LSV - LSVG   | 4d  |
| <b>5 Contactless power supply</b>                  |     |
| Contactless power supply (CPS®)                    | 5a  |
| <b>6 Data transmission</b>                         |     |
| VAHLE Powercom®                                    | 6a  |
| Slotted Microwave Guide (SMG)                      | 6b  |
| <b>7 Positioning systems</b>                       |     |
| VAHLE APOS®  | 7a  |
| <b>8 Festoon systems and cables</b>                |     |
| Festoon systems for □- tracks                      | 8a  |
| Festoon systems for flat cables on I- tracks       | 8b  |
| Festoon systems for round flat cables on I- tracks | 8c  |
| Festoon systems for ◇- tracks                      | 8d  |
| Cables   | 8e  |
| <b>9 Reels</b>                                     |     |
| Spring operated cable reels                        | 9a  |
| Motor powered cable reels                          | 9b  |
| <b>10 Others</b>                                   |     |
| Battery charging systems                           | 10a |
| Heavy enclosed conductor systems                   | 10b |
| Tender   | 10c |
| Contact wire                                       | 10d |

### Assemblies/Commissioning

### Spare parts/Maintenance service



MANAGEMENTSYSTEM  
 certified by DQS according to Din EN  
 ISO 9001:2008 OHSAS 18001:2007  
 (Reg. Nr. 003140 QM 08/BSOH)

**VAHLE**   
**ELECTRIFICATION SYSTEMS**

## Products and Service

Catalog No.

### 1 Open conductor systems

Open conductor systems 1a

### 2 Insulated conductor systems

U 10 2a

FABA 100 2b

U 15 - U 25 - U 35 2c

U 20 - U 30 - U 40 2d

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VKS 10 3a

VKS - VKL 3b

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Slotted Microwave Guide (SMG) 6b

### 7 Positioning systems

VAHLE APOS® 7a

### 8 Festoon systems and cables

Festoon systems for □- tracks 8a

Festoon systems for flat cables on I- tracks 8b

Festoon systems for round flat cables on I- tracks 8c

Festoon systems for ◇- tracks 8d

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### Assemblies/Commissioning

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