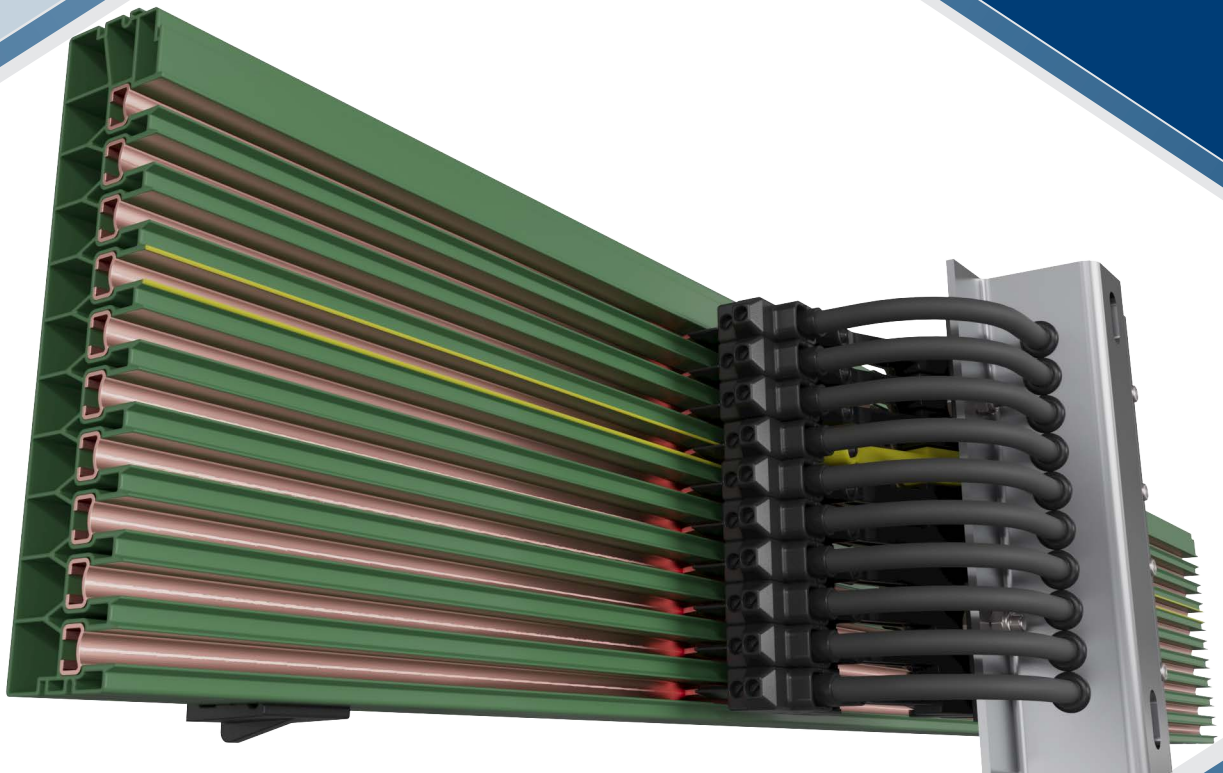




**COMPACT
CONDUCTOR SYSTEMS
VKS10**



YOUR VISION – OUR SOLUTION

3A | EN | Rev.02

COMPACT CONDUCTOR SYSTEM VKS10

CONTENT

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GENERAL

VAHLE's compact conductor system type VKS10 is compact and shock hazard protected safety conductor rails. They consist of a flatformed insulated housing with integrated copper conductors. These conductors are protected according to European standard EN 60529. They comply with accident and VDE regulations in the context of electrical, mechanical and fire safety and are protected to IP 21 standards.

For the collectors the contact protection only applies if the carbons are complete in the conductor. Conductor systems located within arm's reach, and in which the collectors leave the conductor rails during operation, must be provided with protection against contact at the installation site, e. g., with the use of barriers or shutoff switches. This is only necessary for voltages above 25 Volts AC or 60 Volts DC.

The insulated housing accommodates up to 10 conductors. No special finishing work to the rail ends is necessary. The compact design allows direct mounting in runway beams and VAHLE support profiles.

The conductor rail is designed for indoor use only and for hanging and lateral arrangement in straight or curve systems.

PLEASE NOTE

When using extra-low voltages, please submit detailed information with your inquiry, especially with regard to the ambient conditions. In order to process quotations and orders, we require drawings if the conductor system includes curves or rail section isolation. Please use our questionnaire on page 26.

| Electrical properties | VKS10 |
|--|---|
| Max. ampacity | 140 A ⁽¹⁾ |
| Allowed voltage (UL) | 690 V (600 V) |
| Electrical strength DIN 53481 | >25 kV/mm |
| Special electrical strength IEC 60093 | 1 x 10 ¹⁴ Ohm x cm |
| Surface resistance IEC 60093 | 2.1 x 10 ¹³ Ohm |
| Creep resistance IEC 60112 | CTI > 400 |
| Flammability | Flame resistant, self extinguishing, UL 94 V0 |

| Conductor material | Cross section mm ² | Impedance 50 Hz Ohm/1000 m | Resistance Ohm/1000 m | Max. continuous current A |
|--------------------|-------------------------------|----------------------------|-----------------------|---------------------------|
| Copper | 16 | 1.106 | 1.102 | 63 |
| | 25 | 0.728 | 0.723 | 100 |
| | 30 | 0.602 | 0.595 | 120 |
| | 35 | 0.510 | 0.510 | 140 ⁽¹⁾ |

Chemical resistance of the isolating profile at +45 °C ambient temperature

| | |
|----------------------------|-----------|
| Benzine, petroleum, fats | resistant |
| Caustic soda up to 50 % | resistant |
| Hydrochloric acid, concent | resistant |
| Sulfuric acid up to 50 % | resistant |
| UV (Xenon test > 1500) | resistant |

| Water absorption | % |
|------------------|------|
| Max. at 20 °C | 0.06 |

| Ambient temperature range | °C |
|---|--------------------------------|
| Service temperature | -30 up to +55 |
| Max. temperature differences | 50 °C (50 ≤ ΔT) ⁽²⁾ |
| Rail length 6 m | -10 up to +40 |
| Rail length 4 m (deep freeze storage ⁽²⁾) | -30 up to +20 |

(1) 80% duty cycle

(2) Cold store applications on request

(3) By parallel circuit (doubling of cross section) is the impedance and the resistance halved

GENERAL VKS10

USE FOR INDOOR APPLICATIONS

SECTIONS

The insulated housing accommodates up to max. 10 conductors and provides reliable insulation. The standard length is 6 m, shorter lengths can be supplied. The ground conductor rail is identified with continuous yellow marking. The asymmetric design eliminates the possibility of reversing the phases during installation. One fixpoint hanger is required for each conductor section.

JOINTS

The insulated housing sections are connected with joint caps. The conductors are joined with copper plug-in connectors.

FEEDS

Feed units can be supplied as end or line feeds with plastic terminal boxes or as especially flat line feeds for direct single core cable connection. Both line feed types are supplied preassembled on a 1 m conductor rail section. The end feeds are supplied loose and can only be used in conjunction with the VLS line feed.

HANGERS

All sections must be fastened at least twice and the maximum distance between suspension points must not exceed 1.2 m. The hangers are available for the following mounting options:

1. VAHLE support profile (self-locking)
2. C-rail (bolted type)
3. Plain surface (bolted type)

The conductor system can move with the sliding hangers for longitudinal expansion. At the fixpoint it is locked by an additional screw. The distance between two fixpoints is max. 6 m.

ISOLATING SECTIONS

Conductor dead 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).

Conductor dead sections can be mounted at any position of the system. The plastic inserts are pushed into the copper profiles and ensure a smooth transfer of the collector brushes. The length of the isolating section has to consider the total length of the carbon brush and whether the carbon brush must or must not bridge the isolation area.

Attention: Special attention is required for double collectors or collectors switched in parallel. Use double isolating sections where necessary.

CURRENT COLLECTORS

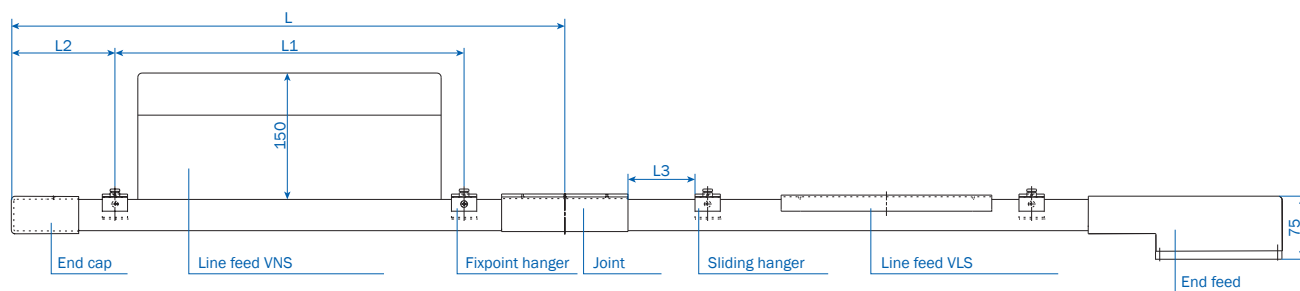
The current collectors are manufactured from impact resistant plastic and stainless steel parts. The current is transmitted by a carbon brush. According to the application, one or more current collectors are required per phase and ground conductor. The current collectors for the ground conductor can be identified by yellow color-coding and are equipped with different fixings to make them not-interchangeable with the phase current collectors. Springs in the current collectors ensure even pressure of the carbon brush against the conductor, thus maintaining reliable contact. The current collectors must be mounted on base plates or rectangular brackets. The length of the current collector cable should not exceed 3 m, if the connected overload protection is not according to the load of this connecting cable. See as well DIN VDE 0100, part 430 and DIN EN 60204-32. (Note: The above mentioned often occurs in systems with more collectors per system.)

The connection cables provided are adequately sized for the specified nominal currents. Reduction factors in accordance with DIN VDE 0298-4 are to be taken into account for various layout methods.

LAYOUT PLAN

We create a custom layout plan for each delivery.

SYSTEM DIAGRAM

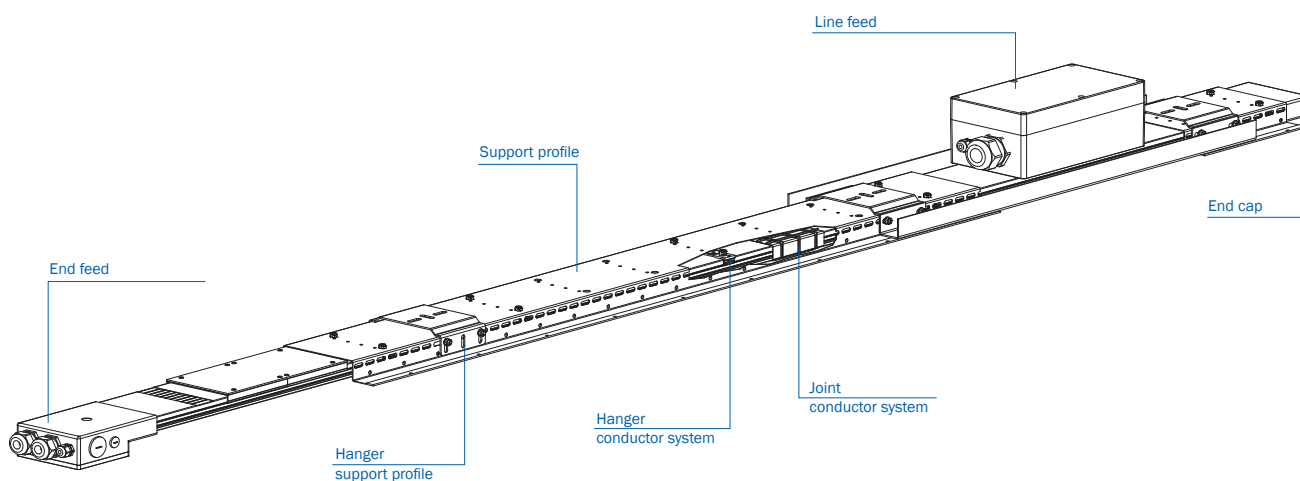
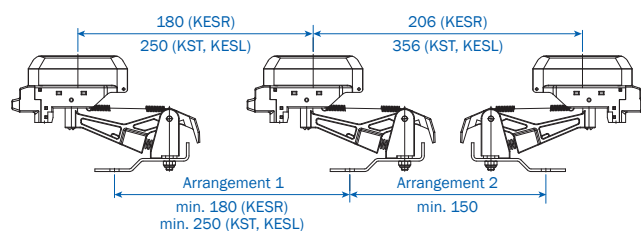


L = Length of conductor section (standard length: 1 m – 6 m, respectively short length)
 L_1 = Support distance for straight runs: max. 1.2 m, in curves 0.6 m
 L_2 = Overhang (max. 350 mm)
 L_3 = Distance to be allowed for conductor system expansion (min. 50 mm)

MAX. HANGER DISTANCE

| Conductor system VKS10 | |
|------------------------|-------|
| In straight runs | 1.2 m |
| In curves | 0.6 m |
| Horizontal | 0.6 m |

| Support profile VTP10 | |
|------------------------|-------|
| On rack uprights | 4.5 m |
| On support posts | 4.0 m |
| Horizontal arrangement | 3.0 m |
| Attached to the wall | 3.0 m |



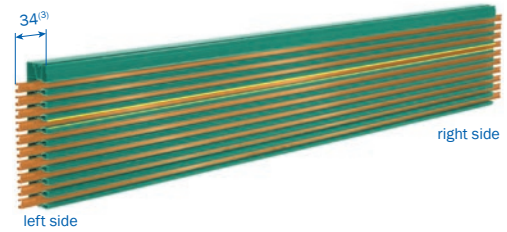
SECTIONS

Standard lengths: 6 m

Cold stores: 4 m

HS = with ground

Attention: Joints to be ordered separately (see page 8)



| Type | Weight kg/m | Max. continuous current at 35 °C A | Nominal voltage ⁽⁵⁾ V | Conductor cross section | | | Number of poles | Order No. |
|----------------------|----------------|---|-------------------------------------|-------------------------|------|-----------------------|--------------------|-----------|
| | | | | L1-L3 | PE | 5 - 10 ⁽⁴⁾ | | |
| VKS10-4/63-....HSA | 2.020 | 63 | 690 | 3x16 | 1x16 | - | 4 | 78099• |
| VKS10-4/100-....HSA | 2.250 | 100 | 690 | 3x25 | 1x16 | - | 4 | 78071• |
| VKS10-4/120-....HSA | 2.359 | 120 | 690 | 3x30 | 1x16 | - | 4 | 78090• |
| VKS10-4/140-....HSA | 2.520 | 140 ⁽¹⁾ | 690 | 3x35 | 1x16 | - | 4 | 78068• |
| VKS10-5/63-....HSA | 2.156 | 63 | 690 | 3x16 | 1x16 | 1x16 | 5 | 78061• |
| VKS10-5/100-....HSA | 2.384 | 100 | 690 | 3x25 | 1x16 | 1x16 | 5 | 78070• |
| VKS10-5/120-....HSA | 2.729 | 120 | 690 | 3x30 | 1x16 | 1x16 | 5 | 78062• |
| VKS10-5/140-....HSA | 2.864 | 140 ⁽¹⁾ | 690 | 3x35 | 1x16 | 1x16 | 5 | 78128• |
| VKS10-6/63-....HSA | 2.300 | 63 | 690 | 3x16 | 1x16 | 2x16 | 6 | 78004• |
| VKS10-6/100-....HSA | 2.540 | 100 | 690 | 3x25 | 1x16 | 2x16 | 6 | 78005• |
| VKS10-6/120-....HSA | 2.640 | 120 | 690 | 3x30 | 1x16 | 2x16 | 6 | 78006• |
| VKS10-6/140-....HSA | 2.810 | 140 ⁽¹⁾ | 690 | 3x35 | 1x16 | 2x16 | 6 | 78007• |
| VKS10-7/63-....HSA | 2.450 | 63 | 690 | 3x16 | 1x16 | 3x16 | 7 | 78003• |
| VKS10-7/100-....HSA | 2.680 | 100 | 690 | 3x25 | 1x16 | 3x16 | 7 | 78008• |
| VKS10-7/120-....HSA | 2.810 | 120 | 690 | 3x30 | 1x16 | 3x16 | 7 | 78009• |
| VKS10-7/140-....HSA | 2.950 | 140 ⁽¹⁾ | 690 | 3x35 | 1x16 | 3x16 | 7 | 78001• |
| VKS10-8/63-....HSA | 2.590 | 63 | 690 | 3x16 | 1x16 | 4x16 | 8 | 78021• |
| VKS10-8/100-....HSA | 2.830 | 100 | 690 | 3x25 | 1x16 | 4x16 | 8 | 78022• |
| VKS10-8/120-....HSA | 2.960 | 120 | 690 | 3x30 | 1x16 | 4x16 | 8 | 78023• |
| VKS10-8/140-....HSA | 3.090 | 140 ⁽¹⁾ | 690 | 3x35 | 1x16 | 4x16 | 8 | 78024• |
| VKS10-9/63-....HSA | 2.740 | 63 | 690 | 3x16 | 1x16 | 5x16 | 9 | 78025• |
| VKS10-9/100-....HSA | 2.970 | 100 | 690 | 3x25 | 1x16 | 5x16 | 9 | 78026• |
| VKS10-9/120-....HSA | 3.110 | 120 | 690 | 3x30 | 1x16 | 5x16 | 9 | 78027• |
| VKS10-9/140-....HSA | 3.240 | 140 ⁽¹⁾ | 690 | 3x35 | 1x16 | 5x16 | 9 | 78028• |
| VKS10-9/200-....HSA | 3.280 | 200 ⁽²⁾ | 690 | 6x25 | 1x25 | 2x16 | 9 | 78014• |
| VKS10-9/240-....HSA | 3.600 | 240 ⁽²⁾ | 690 | 6x30 | 1x30 | 2x16 | 9 | 78013• |
| VKS10-9/280-....HSA | 3.910 | 280 ⁽¹⁾⁽²⁾ | 690 | 6x35 | 1x35 | 2x16 | 9 | 78012• |
| VKS10-10/63-....HSA | 2.880 | 63 | 690 | 3x16 | 1x16 | 6x16 | 10 | 78029• |
| VKS10-10/100-....HSA | 3.110 | 100 | 690 | 3x25 | 1x16 | 6x16 | 10 | 78020• |
| VKS10-10/120-....HSA | 3.250 | 120 | 690 | 3x30 | 1x16 | 6x16 | 10 | 78030• |
| VKS10-10/140-....HSA | 3.380 | 140 ⁽¹⁾ | 690 | 3x35 | 1x16 | 6x16 | 10 | 78031• |
| VKS10-10/200-....HSA | 3.430 | 200 ⁽²⁾ | 690 | 6x25 | 1x25 | 3x16 | 10 | 78010• |
| VKS10-10/240-....HSA | 3.740 | 240 ⁽²⁾ | 690 | 6x30 | 1x30 | 3x16 | 10 | 78011• |
| VKS10-10/280-....HSA | 4.050 | 280 ⁽¹⁾⁽²⁾ | 690 | 6x35 | 1x35 | 3x16 | 10 | 78002• |

(1) At 80 % duty cycle

(2) 2 conductors per phase

(3) Powerail projecting length 34 mm at 20 °C ambient

(4) Consult factory in case of circuits incl. N conductors

(5) Not with UL-approval: $U_{UL} = 600 V$

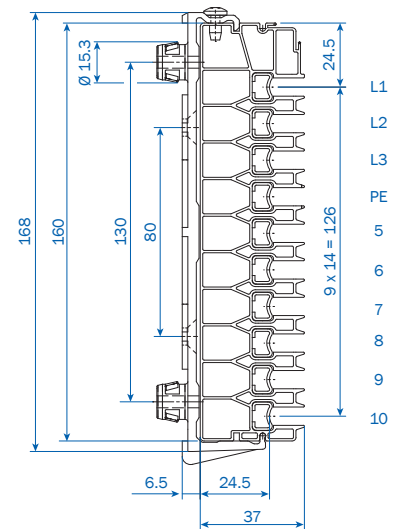
Complete types e.g. VKS10-6/60-2000HSA for 2 m. Order No. 780042

The 4-digit number (in bold) in the type indicates the length of the section in mm.

• The last number of the order specifies the section length.

Please suffix the order number with 1, 2, 3, 4.

POLE CONFIGURATION



| VKS10-4/ 63-140 | VKS10-5/ 63-140 | VKS10-6/ 63-140 | VKS10-7/ 63-140 | VKS10-8/ 63-140 | VKS10-9/ 63-140 | VKS10-9/ 200-280 ⁽¹⁾ | VKS10-10/ 63-140 | VKS10-10/ 200-280 ⁽¹⁾ |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------------------------------|---------------------|-------------------------------------|
| L1 | L1 | L1 | L1 | L1 | L1 | L1 | L1 | L1 |
| L2 | L2 | L2 | L2 | L2 | L2 | L2 | L2 | L2 |
| L3 | L3 | L3 | L3 | L3 | L3 | L3 | L3 | L3 |
| PE | PE | PE | PE | PE | PE | PE | PE | PE |
| free | 5 | 5 | 5 | 5 | 5 | L1 | 5 | L1 |
| free | free | 6 | 6 | 6 | 6 | L2 | 6 | L2 |
| free | free | free | 7 | 7 | 7 | L3 | 7 | L3 |
| free | free | free | free | 8 | 8 | 8 | 8 | 8 |
| free | free | free | free | free | 9 | 9 | 9 | 9 |
| free | free | free | free | free | free | free | 10 | 10 |

(1) 2 conductors per phase

CURVED SECTIONS

Copper cross section min. 25 mm²

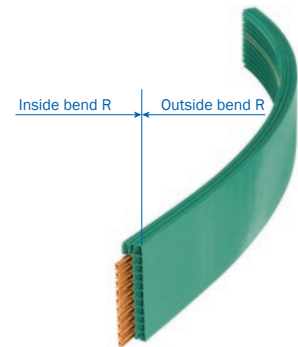
Max. length of bend = 5.3 m

Hanger distance ≈ 0.6 m

Max. angle = 180°

Inside bend = conductors inside

Outside bend = conductors outside (not shown)



Bends are supplied with straight ends, each 250 mm long.

| Type | R mm ⁽¹⁾ | Order No. |
|---|---------------------|-----------|
| Surcharge inside bend lateral (R > 1000) | ≥1000 | 780344 |
| Surcharge outside bend lateral (R > 1500) | ≥1500 | 780345 |

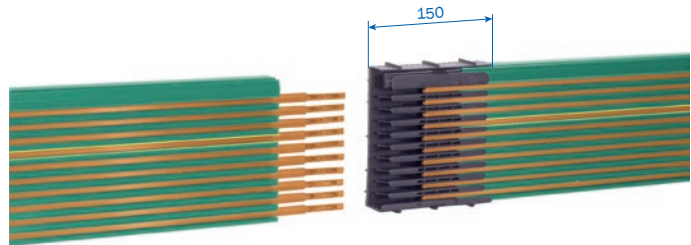
CONNECTING MATERIAL⁽²⁾



Plug-in joint
for 63–100A/120–140 A



Connector cap (plastic)



| Type | Weight kg | Number of poles | Order No. |
|-----------------------------------|-----------|-----------------|-----------|
| VM-SV10-4/63-100 | 0.385 | 4 | 781321 |
| VM-SV10-4/120-140 | 0.385 | 4 | 781323 |
| VM-SV10-5/63-100 | 0.400 | 5 | 781315 |
| VM-SV10-5/120-140 | 0.400 | 5 | 781277 |
| VM-SV10-6/63-100 | 0.415 | 6 | 781150 |
| VM-SV10-6/120-140 | 0.415 | 6 | 781152 |
| VM-SV10-7/63-100 | 0.430 | 7 | 781153 |
| VM-SV10-7/120-140 | 0.430 | 7 | 781155 |
| VM-SV10-8/63-100 | 0.445 | 8 | 781156 |
| VM-SV10-8/120-140 | 0.445 | 8 | 781158 |
| VM-SV10-9/63-100 | 0.460 | 9 | 781159 |
| VM-SV10-9/120-140 | 0.460 | 9 | 781161 |
| VM-SV10-9/200 ⁽³⁾ | 0.460 | 9 | 781162 |
| VM-SV10-9/240-280 ⁽³⁾ | 0.460 | 9 | 781163 |
| VM-SV10-10/63-100 | 0.475 | 10 | 781164 |
| VM-SV10-10/120-140 | 0.475 | 10 | 781166 |
| VM-SV10-10/200 ⁽³⁾ | 0.475 | 10 | 781167 |
| VM-SV10-10/240-280 ⁽³⁾ | 0.475 | 10 | 781168 |

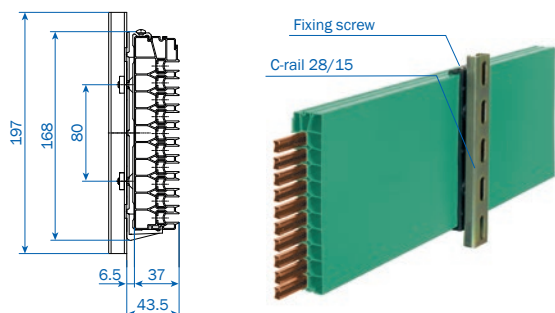
(1) Smaller radius on request

(2) In case of hall expansion joints please consider expansion sections (on request).

(3) Conductor rails connected in parallel

FIXPOINT HANGER

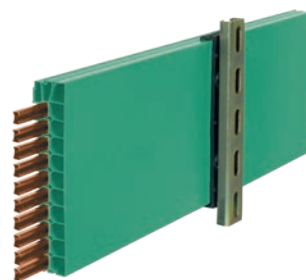
on C-rail consisting of hanger clamp and fixing screw and C-rail



| Type | Weight kg | Order No. |
|-------------|-----------|-----------|
| AH-VEPS10-H | 0.224 | 780007 |

SLIDING HANGER

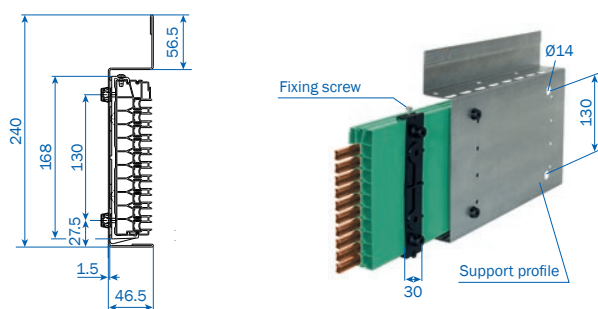
on C-rail consisting of hanger clamp and C-rail



| Type | Weight kg | Order No. |
|------------|-----------|-----------|
| AH-VAS10-H | 0.223 | 780008 |

FIXPOINT HANGER

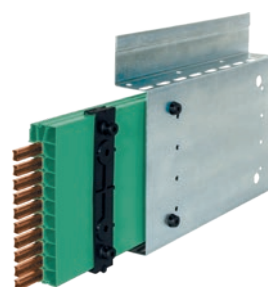
for support profile VTP 10 consisting of hanger and fixing screw



| Type | Weight kg | Order No. |
|---------------|-----------|-----------|
| AH-VEPS10-VTP | 0.033 | 780009 |

SLIDING HANGER

for support profile VTP 10 consisting of hanger clamp

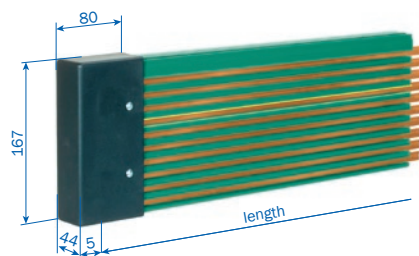


| Type | Weight kg | Order No. |
|--------------|-----------|-----------|
| AH-VAS10-VTP | 0.032 | 780010 |

END CAP

Can be used right or left handed.

Supplied loose as individual part with fixing screws.

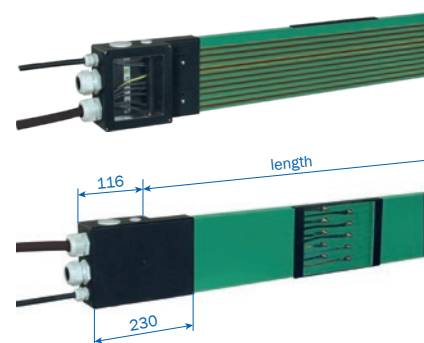


| Type | Weight kg | Order No. |
|-----------|-----------|-----------|
| EK-VES10L | 0.210 | 780004 |

END FEED⁽¹⁾

Terminal box supplied loose,

only in conjunction with line feed VLS⁽²⁾



| Type | Weight kg | Order No. |
|---------------------|-----------|-----------|
| ES-VEKS10-10/63-280 | 0.664 | 780018 |

(1) Cable glands 2x ST-M 40x1.5 for $\varnothing = 19 - 28$ mm
1x ST-M 20x1.5 for $\varnothing = 7 - 13$ mm

(2) Please order VLS line feed separately.

LINE FEEDS

LINE FEED VLS

for direct connection of single core cables

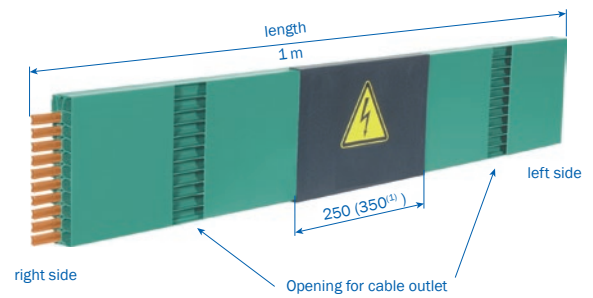
M6 terminal with special cable shoe for single core cables;

35 mm² (up to cable Ø 8.5 mm) for 140 A,

25 mm² (up to cable Ø 8.2 mm) for 100 – 120 A

or feed bolts for 60 A conductor system

1 m section to be ordered separately



| Type | Weight kg | Current A | Number of poles | Order No. |
|------------------------------------|-----------|-----------|-----------------|-----------|
| ES-VLS10-4/63 | 0.217 | 63 | 4 | 781445 |
| ES-VLS10-4/100-120 | 0.382 | 100 – 120 | 4 | 781479 |
| ES-VLS10-4/140 | 0.574 | 140 | 4 | 781478 |
| ES-VLS10-5/63 | 0.230 | 63 | 5 | 780610 |
| ES-VLS10-5/100-120 | 0.426 | 100 – 120 | 5 | 780759 |
| ES-VLS10-5/140 | 0.630 | 140 | 5 | 780745 |
| ES-VLS10-6/63 | 0.217 | 63 | 6 | 780047 |
| ES-VLS10-6/100-120 | 0.382 | 100 – 120 | 6 | 780060 |
| ES-VLS10-6/140 | 0.574 | 140 | 6 | 780187 |
| ES-VLS10-7/63 | 0.230 | 63 | 7 | 780049 |
| ES-VLS10-7/100-120 | 0.426 | 100 – 120 | 7 | 780188 |
| ES-VLS10-7/140 | 0.630 | 140 | 7 | 780189 |
| ES-VLS10-8/63 | 0.243 | 63 | 8 | 780050 |
| ES-VLS10-8/100-120 | 0.470 | 100 – 120 | 8 | 780196 |
| ES-VLS10-8/140 | 0.686 | 140 | 8 | 780198 |
| ES-VLS10-9/63 | 0.256 | 63 | 9 | 780058 |
| ES-VLS10-9/100-120 | 0.514 | 100 – 120 | 9 | 780199 |
| ES-VLS10-9/140 | 0.742 | 140 | 9 | 780191 |
| ES-VLS10-9/200-240 ⁽¹⁾ | 0.744 | 200 – 240 | 9 | 780322 |
| ES-VLS10-9/280 ⁽¹⁾ | 0.828 | 280 | 9 | 780321 |
| ES-VLS10-10/63 | 0.269 | 63 | 10 | 780059 |
| ES-VLS10-10/100-120 | 0.558 | 100 – 120 | 10 | 780192 |
| ES-VLS10-10/140 | 0.798 | 140 | 10 | 780208 |
| ES-VLS10-10/200-240 ⁽¹⁾ | 0.757 | 200 – 240 | 10 | 780318 |
| ES-VLS10-10/280 ⁽¹⁾ | 0.815 | 280 | 10 | 780317 |

(1) Larger cap

LINE FEEDS

LINE FEED VNS

Shown with terminal box

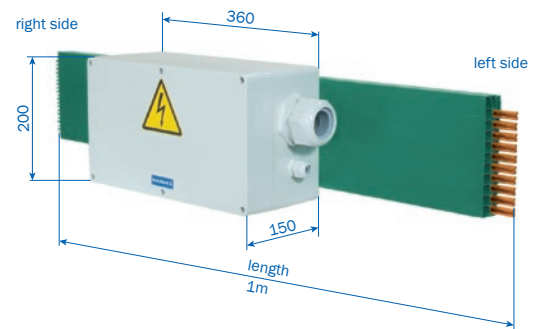
Cable gland: STR-M 63x1.5 for $\varnothing = 28 - 45$

STR-M 20x1.5 for $\varnothing = 5 - 13$

Connecting cable: to be supplied by customer

Cable connection: Main current: M10

Control current: M5



1 m section to be ordered separately.

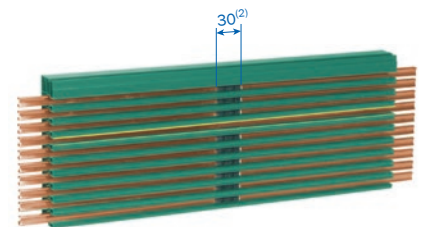
Cable payout left, standard

| Type | Weight kg | Current A | Number of poles | Order No. |
|---------------------|-----------|-----------|-----------------|-----------|
| ES-VNS10-4/63-140 | 2.354 | 63 - 140 | 4 | 780527 |
| ES-VNS10-5/63-140 | 2.580 | 63 - 140 | 5 | 780537 |
| ES-VNS10-6/63-140 | 2.766 | 63 - 140 | 6 | 780327 |
| ES-VNS10-7/63-140 | 2.952 | 63 - 140 | 7 | 780328 |
| ES-VNS10-8/63-140 | 3.138 | 63 - 140 | 8 | 780329 |
| ES-VNS10-9/63-140 | 3.324 | 63 - 140 | 9 | 780330 |
| ES-VNS10-9/200-280 | 2.840 | 200 - 280 | 9 | 780334 |
| ES-VNS10-10/63-140 | 3.510 | 63 - 140 | 10 | 780331 |
| ES-VNS10-10/200-280 | 2.865 | 200 - 280 | 10 | 780332 |

ISOLATING SECTION⁽¹⁾

Specify the position of the isolating sections and the designation of the conductor profiles, which are to be separated, when ordering.

The sections are factory assembled, loose delivery on request.



| Type | Weight kg | Order No. |
|-----------------|-----------|-----------|
| ST-VSTS1/10-63M | 0.004 | 156933 |
| ST-VSTS1/100M | 0.004 | 150150 |
| ST-VSTS1/120M | 0.004 | 151674 |
| ST-VSTS1/140M | 0.004 | 156335 |

(1) For specification of the conductor profile refer to page 6

(2) Length of the conductor dead section (longer dead sections on request).

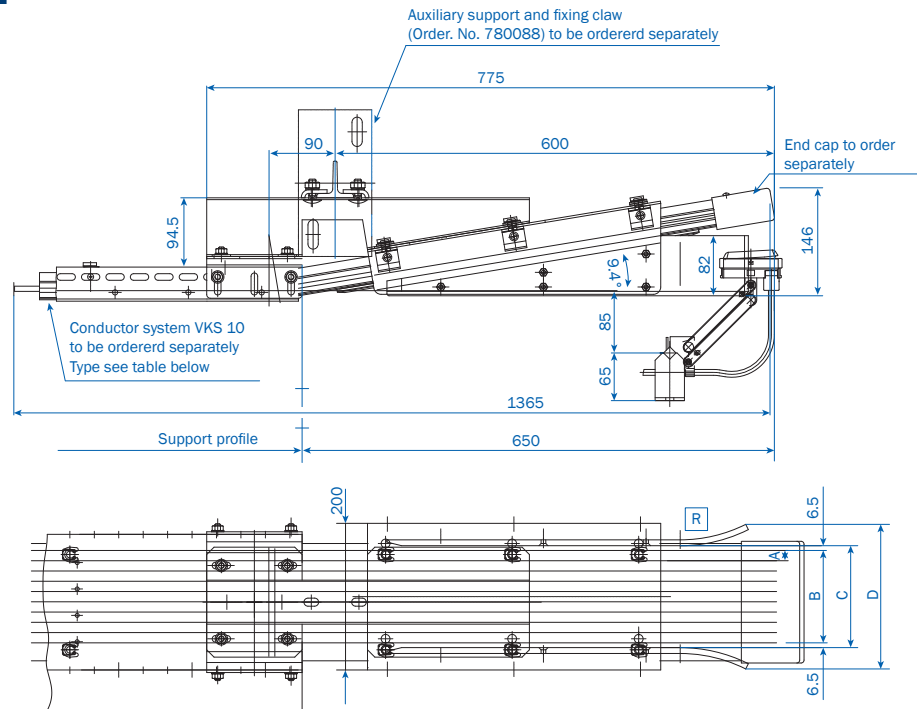
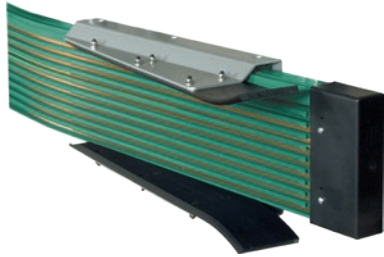
TRANSFER FUNNEL⁽¹⁾

for current collector KSTU 30-63-14

Max. speed $v = 100$ m/min.

Tolerances: $x = \pm 10$ mm

$y = \pm 10$ mm



| Type | Weight kg | A mm | B mm | C mm | D mm | Number of poles | Order No. |
|----------------------------|-----------|------|------|------|------|-----------------|-----------|
| ET-EFTV10-4-KSTU30/63-14L | 7.594 | 14 | 42 | 55 | 109 | 4 | 781441 |
| ET-EFTV10-4-KSTU30/63-14R | 7.594 | 14 | 42 | 55 | 109 | 4 | 781440 |
| ET-EFTV10-5-KSTU30/63-14L | 7.584 | 14 | 56 | 69 | 123 | 5 | 780746 |
| ET-EFTV10-5-KSTU30/63-14R | 7.584 | 14 | 56 | 69 | 123 | 5 | 780747 |
| ET-EFTV10-6-KSTU30/63-14L | 7.574 | 14 | 70 | 83 | 137 | 6 | 780350 |
| ET-EFTV10-6-KSTU30/63-14R | 7.574 | 14 | 70 | 83 | 137 | 6 | 780173 |
| ET-EFTV10-7-KSTU30/63-14L | 7.564 | 14 | 84 | 97 | 151 | 7 | 780349 |
| ET-EFTV10-7-KSTU30/63-14R | 7.564 | 14 | 84 | 97 | 151 | 7 | 780172 |
| ET-EFTV10-8-KSTU30/63-14L | 7.554 | 14 | 98 | 111 | 165 | 8 | 780348 |
| ET-EFTV10-8-KSTU30/63-14R | 7.554 | 14 | 98 | 111 | 165 | 8 | 780171 |
| ET-EFTV10-9-KSTU30/63-14L | 7.554 | 14 | 112 | 125 | 179 | 9 | 780347 |
| ET-EFTV10-9-KSTU30/63-14R | 7.544 | 14 | 112 | 125 | 179 | 9 | 780170 |
| ET-EFTV10-7-KSTU30/63-14L | 7.534 | 14 | 126 | 139 | 193 | 10 | 780346 |
| ET-EFTV10-10-KSTU30/63-14R | 7.534 | 14 | 126 | 139 | 193 | 10 | 780169 |

CONDUCTOR SECTION FOR FUNNEL

(all cross sections 25 mm², length 1365 mm)

| Type | Order No. |
|-------------------------|-----------|
| VKS10-4/100-1365HS02AT | 781442 |
| VKS10-5/100-1365HS02AT | 780743 |
| VKS10-6/100-1365HS02AT | 780247 |
| VKS10-7/100-1365HS02AT | 780248 |
| VKS10-8/100-1365HS02AT | 780249 |
| VKS10-9/100-1365HS02AT | 780250 |
| VKS10-10/100-1365HS02AT | 780257 |

(1) Transfer funnel only in combination with conductor section.

TANGENTIAL ENTRY FUNNEL

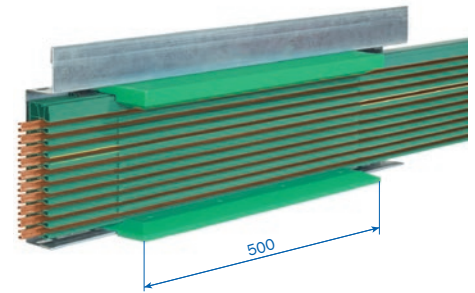
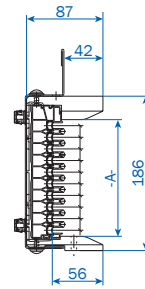
for collector KSTU 30-63

Max. entry speed $v = 100$ m/min.

Copper cross section min. 25 mm^2

Tolerances: $x = \pm 10$ mm

$y = +8$ mm, -7 mm



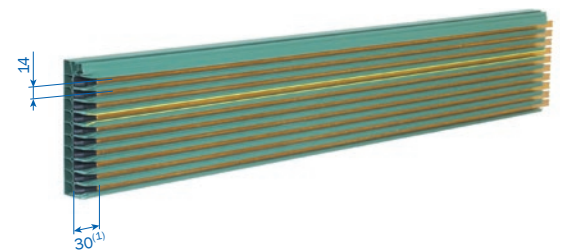
| Type | Weight kg | Dim A | Number of poles | Order No. |
|------------------------|-----------|-------|-----------------|-----------|
| SE-DSEV10-4-KSTU30/63 | 1.888 | 56.5 | 4 | 781453 |
| SE-DSEV10-5-KSTU30/63 | 1.884 | 70.5 | 5 | 781452 |
| SE-DSEV10-6-KSTU30/63 | 1.880 | 84.5 | 6 | 780168 |
| SE-DSEV10-7-KSTU30/63 | 1.876 | 98.5 | 7 | 780167 |
| SE-DSEV10-8-KSTU30/63 | 1.872 | 112.5 | 8 | 780166 |
| SE-DSEV10-9-KSTU30/63 | 1.868 | 126.5 | 9 | 780165 |
| SE-DSEV10-10-KSTU30/63 | 1.575 | 140.5 | 10 | 780164 |

TRANSFER GUIDE VU 10

for cross travel

Max. height- and lateral off-set: ± 2 mm

Max. air gap between the transfer guides: 5 mm



| Type | Assignment from top | Order No. |
|-------------|---------------------|-----------|
| US-VU10-4L | conductor 1 – 4 | 781456 |
| US-VU10-4R | conductor 1 – 4 | 781457 |
| US-VU10-5L | conductor 1 – 5 | 781458 |
| US-VU10-5R | conductor 1 – 5 | 781459 |
| US-VU10-6L | conductor 1 – 6 | 780287 |
| US-VU10-6R | conductor 1 – 6 | 780288 |
| US-VU10-7L | conductor 1 – 7 | 780227 |
| US-VU10-7R | conductor 1 – 7 | 780228 |
| US-VU10-8L | conductor 1 – 8 | 780229 |
| US-VU10-8R | conductor 1 – 8 | 780230 |
| US-VU10-9L | conductor 1 – 9 | 780289 |
| US-VU10-9R | conductor 1 – 9 | 780290 |
| US-VU10-10L | conductor 1 – 10 | 780269 |
| US-VU10-10R | conductor 1 – 10 | 780270 |

(1) Length of the conductor dead section (longer dead sections on request)

COMPACT CURRENT COLLECTORS

COMPACT CURRENT COLLECTOR KESR 32-55

for reverse run

Distance between conductors: 14 mm

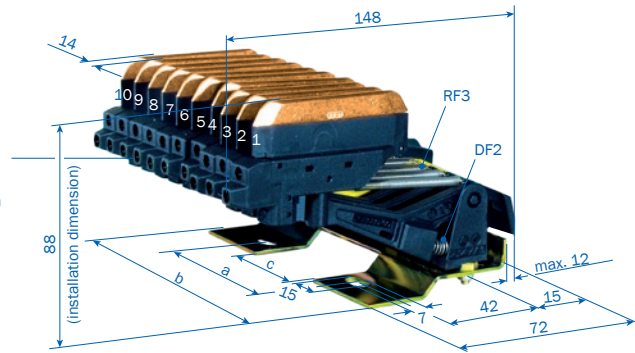
Lift and swivel: ± 15 mm

Contact pressure: approx. 7 N per carbon brush

PE (ground) on No. 4, (other combinations possible)

The ground collector always moves first when entering the conductor system.

Flat plug
6.3 x 0.8
for FLA or
bolted connection



| Max. current | Flat plug | Bolted connection |
|--------------|-----------|-------------------|
| 32 A | FLA 2.5 | AEA 2.5 |
| 40 A | FLA 4.0 | AEA 4.0 |
| 55 A | FLA 6.0 | AEA 6.0 |

KESR-F

for connecting cables with flat plug, see page 19

| Type | Weight kg | a mm | b mm | c mm | Number of poles | Base plate | Order No. | |
|---------------------------------|-----------|------|------|------|-----------------|-----------------------|-----------|-------------|
| SA-KESR32-55F-4-14HS-0-04-04 | 0.480 | 28 | 62 | - | 4 | 4-pole | 143170 | |
| SA-KESR32-55F-5-14HS-0-04-06-06 | 0.540 | 56 | 90 | - | 5 | 6-pole (no. 6 free) | 143373 | |
| SA-KESR32-55F-6-14HS-0-04-06 | 0.600 | 56 | 90 | - | 6 | 6-pole | 143113 | |
| SA-KESR32-55F-7-14HS-0-04-08-08 | 0.660 | 80 | 118 | 53 | 7 | 8-pole (no. 8 free) | 143114 | |
| SA-KESR32-55F-8-14HS-0-04-08 | 0.720 | 80 | 118 | 53 | 8 | 8-pole | 143115 | |
| SA-KESR32-55F-9-14HS-0-04-10-10 | 0.780 | 80 | 146 | 53 | 9 | 10-pole (no. 10 free) | 143116 | |
| SA-KESR32-55F-10-14HS-0-04-10 | 0.840 | 80 | 146 | 53 | 10 | 10-pole | 143117 | |
| Single collector | | | | | | | Phase | PE (ground) |
| SA-KESR32-55F/14...-31-0 | 0.060 | | | | | | 143111 | 143112 |

KESR-S

for connecting cables with bolted connection, see page 19

| Type | Weight kg | a mm | b mm | c mm | Number of poles | Base plate | Order No. | |
|---------------------------------|-----------|------|------|------|-----------------|-----------------------|-----------|-------------|
| SA-KESR32-55S-4-14HS-0-04-04 | 0.504 | 28 | 62 | - | 4 | 4-pole | 142937 | |
| SA-KESR32-55S-5-14HS-0-04-06-06 | 0.570 | 56 | 90 | - | 5 | 6-pole (no. 6 free) | 142938 | |
| SA-KESR32-55S-6-14HS-0-04-06 | 0.636 | 56 | 90 | - | 6 | 6-pole | 142939 | |
| SA-KESR32-55S-7-14HS-0-04-08-08 | 0.702 | 80 | 118 | 53 | 7 | 8-pole (no. 8 free) | 142940 | |
| SA-KESR32-55S-8-14HS-0-04-08 | 0.768 | 80 | 118 | 53 | 8 | 8-pole | 142941 | |
| SA-KESR32-55S-9-14HS-0-04-10-10 | 0.834 | 80 | 146 | 53 | 9 | 10-pole (no. 10 free) | 142942 | |
| SA-KESR32-55S-10-14HS-0-04-10 | 0.890 | 80 | 146 | 53 | 10 | 10-pole | 142943 | |
| Single collector | | | | | | | Phase | PE (ground) |
| SA-KESR32-55S/14...-31-0 | 0.066 | | | | | | 143120 | 143121 |

COMPACT CURRENT COLLECTORS

COMPACT CURRENT COLLECTOR KESR 63S

for reverse run with adapter plate and clamping block

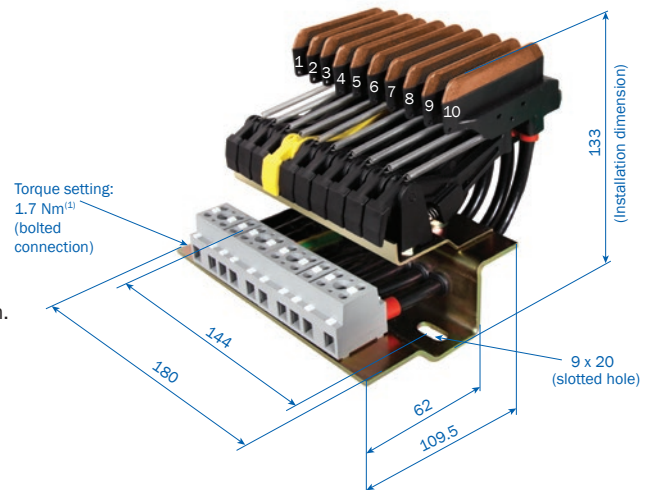
Distance between conductors: 14 mm

Lift and swivel: ± 15 mm

Contact pressure: approx. 7 N per carbon brush

PE (ground) on No. 4, (other combinations possible)

The ground collector always moves first when entering the conductor system.



LEFT HAND VERSION

as shown

Ground on No. 4

| Type | Number of poles | Configuration | Order No. |
|-------------------------------------|-----------------|---------------|-----------|
| SA-KESR63S-4-14-HS-KBL-04-10-01-04 | 4 | 1 - 4 | 781089 |
| SA-KESR63S-5-14-HS-KBL-04-10-01-05 | 5 | 1 - 5 | 781088 |
| SA-KESR63S-6-14-HS-KBL-04-10-01-06 | 6 | 1 - 6 | 781087 |
| SA-KESR63S-7-14-HS-KBL-04-10-01-07 | 7 | 1 - 7 | 781086 |
| SA-KESR63S-8-14-HS-KBL-04-10-01-08 | 8 | 1 - 8 | 781085 |
| SA-KESR63S-9-14-HS-KBL-04-10-01-09 | 9 | 1 - 9 | 781084 |
| SA-KESR63S-10-14-HS-KBL-04-10-01-10 | 10 | 1 - 10 | 781083 |

RIGHT HAND VERSION

Ground on No. 7

| Type | Number of poles | Configuration | Order No. |
|-------------------------------------|-----------------|---------------|-----------|
| SA-KESR63S-4-14-HS-KBR-07-10-01-06 | 4 | 7 - 10 | 781096 |
| SA-KESR63S-5-14-HS-KBR-07-10-06-10 | 5 | 6 - 10 | 781095 |
| SA-KESR63S-6-14-HS-KBR-07-10-05-10 | 6 | 5 - 10 | 781094 |
| SA-KESR63S-7-14-HS-KBR-07-10-04-10 | 7 | 4 - 10 | 781093 |
| SA-KESR63S-8-14-HS-KBR-07-10-03-10 | 8 | 3 - 10 | 781092 |
| SA-KESR63S-9-14-HS-KBR-07-10-02-10 | 9 | 2 - 10 | 781091 |
| SA-KESR63S-10-14-HS-KBR-07-10-01-10 | 10 | 1 - 10 | 781090 |

SPARE PARTS

| Type | Description | Order No. |
|-------------------------|----------------------|-----------|
| SK-MK63S-31-14 | Carbon brush | 780921 |
| SA-KESR32-55S/14PE-31-0 | Current collector PE | 143121 |
| SA-KESR32-55S/14PH-31-0 | Current collector PH | 143120 |

(1) Max. cross section of connecting cable 16 mm² (UL = 10 mm²)

COMPACT CURRENT COLLECTORS

COMPACT CURRENT COLLECTOR KESL 32-63

for reverse run

Distance between conductors: 14 mm

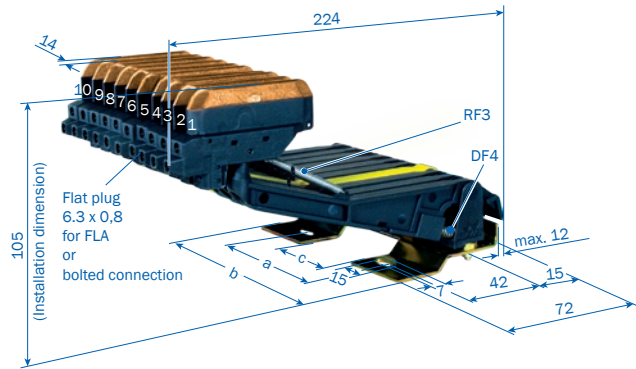
Lift and swivel: ± 30 mm

Contact pressure: approx. 7 N per carbon brush

PE (ground) on No. 4, (other combinations possible)

The ground collector always moves first when entering the conductor system.

| Max. current | Flat plug | Bolted connection |
|--------------|-----------|-------------------|
| 32 A | FLA 2.5 | AEA 2.5 |
| 40 A | FLA 4.0 | AEA 4.0 |
| 55 A | FLA 6.0 | AEA 6.0 |
| 63 A | - | AEA 10.0 |



KESL-F

for connecting cables with flat plug, see page 19.

| Type | Weight kg | a mm | b mm | c mm | Number of poles | Base plate | Order No. | |
|---------------------------------|-----------|------|------|------|-----------------|-----------------------|-----------|--------|
| SA-KESL32-55F-4-14HS-0-04-04 | 0.536 | 28 | 62 | - | 4 | 4-pole | 143152 | |
| SA-KESL32-55F-5-14HS-0-04-06-06 | 0.612 | 56 | 90 | - | 5 | 6-pole (no. 6 free) | 781257 | |
| SA-KESL32-55F-6-14HS-0-04-06 | 0.688 | 56 | 90 | - | 6 | 6-pole | 142883 | |
| SA-KESL32-55F-7-14HS-0-04-08-08 | 0.764 | 80 | 118 | 53 | 7 | 8-pole (no. 8 free) | 142884 | |
| SA-KESL32-55F-8-14HS-0-04-08 | 0.840 | 80 | 118 | 53 | 8 | 8-pole | 142885 | |
| SA-KESL32-55F-9-14HS-0-04-10-10 | 0.916 | 80 | 146 | 53 | 9 | 10-pole (no. 10 free) | 142886 | |
| SA-KESL32-55F-10-14HS-0-04-10 | 0.992 | 80 | 146 | 53 | 10 | 10-pole | 142887 | |
| Single collector | | | | | | | Phase | PE |
| SA-KESL32-55F/14...-31-0 | 0.076 | | | | | | 142881 | 142882 |

KESL-S

for connecting cables with bolted connection, see page 19.

| Type | Weight kg | a mm | b mm | c mm | Number of poles | Base plate | Order No. | |
|---------------------------------|-----------|------|------|------|-----------------|-----------------------|-----------|--------|
| SA-KESL32-63S-4-14HS-0-04-04 | 0.553 | 28 | 62 | - | 4 | 4-pole | 143539 | |
| SA-KESL32-63S-5-14HS-0-04-06-06 | 0.637 | 56 | 90 | - | 5 | 6-pole (no. 6 free) | 143354 | |
| SA-KESL32-63S-6-14HS-0-04-06 | 0.721 | 56 | 90 | - | 6 | 6-pole | 142888 | |
| SA-KESL32-63S-7-14HS-0-04-08-08 | 0.803 | 80 | 118 | 53 | 7 | 8-pole (no. 8 free) | 142889 | |
| SA-KESL32-63S-8-14HS-0-04-08 | 0.885 | 80 | 118 | 53 | 8 | 8-pole | 142890 | |
| SA-KESL32-63S-9-14HS-0-04-10-10 | 0.967 | 80 | 146 | 53 | 9 | 10-pole (no. 10 free) | 142891 | |
| SA-KESL32-63S-10-14HS-0-04-10 | 1.049 | 80 | 146 | 53 | 10 | 10-pole | 142892 | |
| Single collector | | | | | | | Phase | PE |
| SA-KESL32-63S/14...-31-0 | 0.084 | | | | | | 168395 | 142880 |

COMPACT CURRENT COLLECTORS

COMPACT CURRENT COLLECTOR KESL63S

for reverse run with adapter plate and clamping block

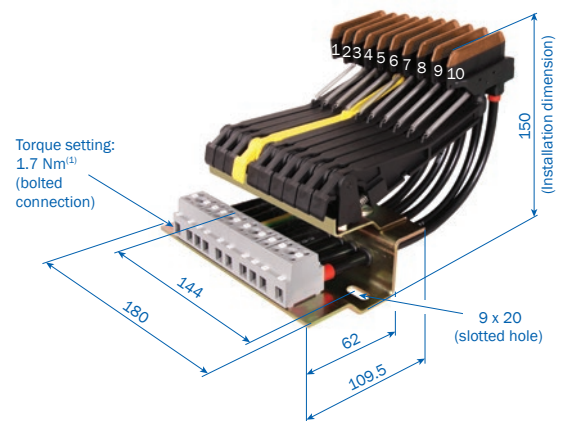
Distance between conductors: 14 mm

Lift and swivel: ± 30 mm

Contact pressure: approx. 7 N per carbon brush

PE (ground) on No. 4, (other combinations possible)

The ground collector always moves first when entering the conductor system.



LEFT HAND VERSION

as shown

Ground on No. 4

| Type | Number of poles | Configuration | Order No. |
|-------------------------------------|-----------------|---------------|-----------|
| SA-KESL63S-4-14-HS-KBL-04-10-01-04 | 4 | 1 - 4 | 781075 |
| SA-KESL63S-5-14-HS-KBL-04-10-01-05 | 5 | 1 - 5 | 781074 |
| SA-KESL63S-6-14-HS-KBL-04-10-01-06 | 6 | 1 - 6 | 781073 |
| SA-KESL63S-7-14-HS-KBL-04-10-01-07 | 7 | 1 - 7 | 781072 |
| SA-KESL63S-8-14-HS-KBL-04-10-01-08 | 8 | 1 - 8 | 781071 |
| SA-KESL63S-9-14-HS-KBL-04-10-01-09 | 9 | 1 - 9 | 781070 |
| SA-KESL63S-10-14-HS-KBL-04-10-01-10 | 10 | 1 - 10 | 781069 |

RIGHT HAND VERSION

Ground on No. 7

| Type | Number of poles | Configuration | Order No. |
|-------------------------------------|-----------------|---------------|-----------|
| SA-KESL63S-4-14-HS-KBR-07-10-06-10 | 4 | 7 - 10 | 781082 |
| SA-KESL63S-5-14-HS-KBR-07-10-05-10 | 5 | 6 - 10 | 781081 |
| SA-KESL63S-6-14-HS-KBR-07-10-05-10 | 6 | 5 - 10 | 781080 |
| SA-KESL63S-7-14-HS-KBR-07-10-04-10 | 7 | 4 - 10 | 781079 |
| SA-KESL63S-8-14-HS-KBR-07-10-03-10 | 8 | 3 - 10 | 781078 |
| SA-KESL63S-9-14-HS-KBR-07-10-02-10 | 9 | 2 - 10 | 781077 |
| SA-KESL63S-10-14-HS-KBR-07-10-01-10 | 10 | 1 - 10 | 781076 |

SPARE PARTS

| Type | Description | Order No. |
|-------------------------|----------------------|-----------|
| SK-MK63S-31-14 | Carbon brush | 780921 |
| SA-KESL32-63S/14PE-31-0 | Current collector PE | 142880 |
| SA-KESL32-63S/14PH-31-0 | Current collector PH | 168395 |

(1) Max. cross section of connecting cable 16 mm² (UL = 10 mm²)

SINGLE CURRENT COLLECTOR

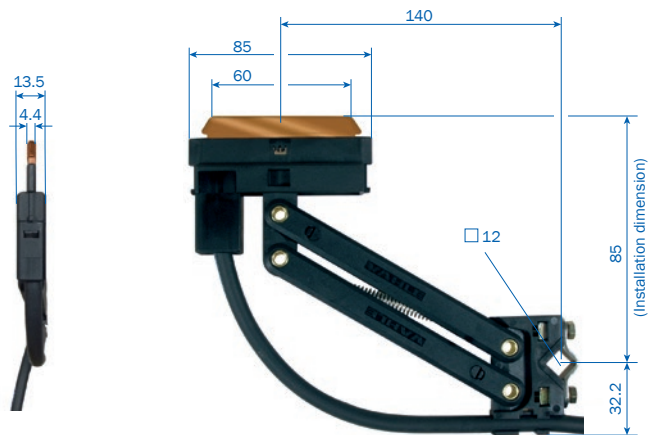
CURRENT COLLECTOR KST

for reverse run

incl. 2 connecting cable

Lift and swivel: ± 20 mm

Contact pressure: approx. 5 N



| Type | Weight kg | Current A | Connection cable | | Order No. | |
|---------------------|-----------|-----------|----------------------|--------------|-------------|---------------|
| | | | A in mm ² | d max. in mm | Phase black | Ground yellow |
| SA-KST30PE-04A-2000 | 0.240 | 30 | 2.50 | 5 | - | 152086 |
| SA-KST30PH-04C-2000 | 0.240 | 30 | 2.50 | 5 | 152085 | - |
| SA-KST55PE-04D-2000 | 0.368 | 55 | 6.00 | 11 | - | 154439 |
| SA-KST55PH-04C-2000 | 0.368 | 55 | 6.00 | 11 | 154438 | - |
| SA-KST63PE-2000 | 0.394 | 63 | 10.00 | 9 | - | 156792 |
| SA-KST63PH-2000 | 0.394 | 63 | 10.00 | 9 | 156791 | - |

CURRENT COLLECTOR KSTU

for reverse run

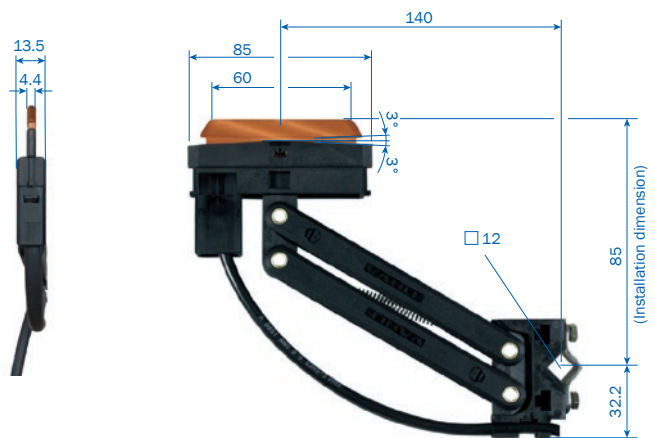
for funnels and tangential entry funnels (multi systems)

incl. 2 connecting cable

Lift and swivel: ± 20 mm

(in funnels 10 mm to all sides)

Contact pressure: approx. 5 N



| Type | Weight kg | Current A | Connection cable | | Order No. | |
|-------------------------|-----------|-----------|----------------------|--------------|-------------|---------------|
| | | | A in mm ² | d max. in mm | Phase black | Ground yellow |
| SA-KSTU30/14PE-04A-2000 | 0.240 | 30 | 2.50 | 5 | - | 168364 |
| SA-KSTU30/14PH-04A-2000 | 0.240 | 30 | 2.50 | 5 | 168363 | - |
| SA-KSTU55/14PE-04D-2000 | 0.368 | 55 | 6.00 | 11 | - | 168362 |
| SA-KSTU55/14PH-04A-2000 | 0.368 | 55 | 6.00 | 11 | 168361 | - |
| SA-KSTU63/14PE-04D-2000 | 0.394 | 63 | 10.00 | 9 | - | 148019 |
| SA-KSTU63/14PH-04A-2000 | 0.394 | 63 | 10.00 | 9 | 148018 | - |

CONNECTING CABLES

CONNECTING CABLE FLA

Highly flexible, for current collectors with flat plug „F“

Note allocation to the current collectors

Length: 1 m incl. flat plug 6.3x0.8

Longer connecting length available

Temperature range: 0 °C to +70 °C



| Type | Weight kg | A in mm ² | d max. in Ø mm | Order No. | |
|------------------|-----------|----------------------|----------------|-------------|---------------|
| | | | | Phase black | Ground yellow |
| AL-FLA2,5PE1-6,3 | 0.080 | 2.50 | 4.00 | - | 165050 |
| AL-FLA2,5PH1-6,3 | 0.080 | 2.50 | 4.00 | 165049 | - |
| AL-FLA4PE1-6,3 | 0.100 | 4.00 | 6.00 | - | 165052 |
| AL-FLA4PH1-6,3 | 0.100 | 4.00 | 6.00 | 165051 | - |
| AL-FLA6PE1-6,3 | 0.150 | 6.00 | 7.00 | - | 166369 |
| AL-FLA6PH1-6,3 | 0.150 | 6.00 | 7.00 | 166368 | - |

CONNECTING CABLE AEA

Highly flexible, for current collectors with bolted connection „S“

Length: 1 m

Longer connecting length available

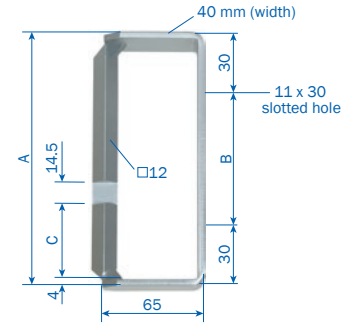
Temperature range: -15 °C to +70 °C



| Type | Weight kg | A in mm ² | d max. in Ø mm | Order No. | |
|---------------------------|-----------|----------------------|----------------|-------------|---------------|
| | | | | Phase black | Ground yellow |
| AL-AEA2,5PE-32-3,7-1000-D | 0.038 | 2.50 | 4.00 | - | 143079 |
| AL-AEA2,5PH-32-4-1000-A | 0.038 | 2.50 | 4.00 | 143080 | - |
| AL-AEA4PE-40-4,4-1000-D | 0.063 | 4.00 | 5.50 | - | 143077 |
| AL-AEA4PH-40-5,6-1000-A | 0.063 | 4.00 | 5.50 | 143078 | - |
| AL-AEA6PE-55-5,5-1000-D | 0.085 | 6.00 | 6.00 | - | 143075 |
| AL-AEA6PH-55-5,9-1000-A | 0.085 | 6.00 | 6.00 | 143076 | - |
| AL-AEA10PE-63-8,2-1000-D | 0.160 | 10.00 | 9.00 | - | 143073 |
| AL-AEA10PH-63-8,4-1000-A | 0.160 | 10.00 | 9.00 | 143074 | - |

TOWING ARM

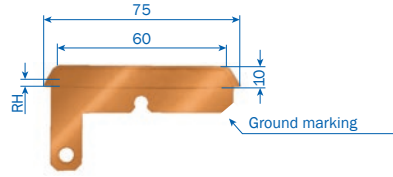
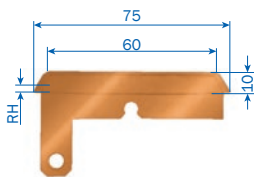
for current collectors KST 30-63 (page 18).



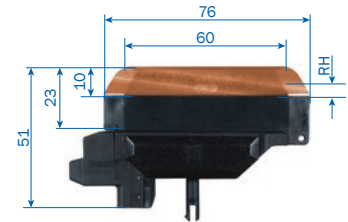
Version „R“ shown with ground

| Type | Weight kg | A mm | B mm | C mm | Order No. |
|--------------------------|-----------|------|------|------|-----------|
| MN-UMAA12HS-B-4-14L-80 | 0.33 | 80 | 20 | 50 | 781444 |
| MN-UMAA12HS-B-4-14R-80 | 0.33 | 80 | 20 | 50 | 781443 |
| MN-UMAA12HS-B-5-14L-94 | 0.36 | 94 | 34 | 50 | 780186 |
| MN-UMAA12HS-B-5-14R-94 | 0.36 | 94 | 34 | 50 | 780185 |
| MN-UMAA12HS-B-6-14L-108 | 0.39 | 108 | 48 | 50 | 780184 |
| MN-UMAA12HS-B-6-14R-108 | 0.39 | 108 | 48 | 50 | 780183 |
| MN-UMAA12HS-B-7-14-122 | 0.42 | 122 | 62 | 50 | 780181 |
| MN-UMAA12HS-B-8-14L-136 | 0.46 | 136 | 76 | 50 | 780180 |
| MN-UMAA12HS-B-8-14R-136 | 0.46 | 136 | 76 | 50 | 780179 |
| MN-UMAA12HS-B-9-14L-150 | 0.49 | 150 | 90 | 50 | 780178 |
| MN-UMAA12HS-B-9-14R-150 | 0.49 | 150 | 90 | 50 | 780177 |
| MN-UMAA12HS-B-10-14L-164 | 0.52 | 164 | 104 | 50 | 780176 |
| MN-UMAA12HS-B-10-14R-164 | 0.52 | 164 | 104 | 50 | 780175 |

CARBON BRUSHES



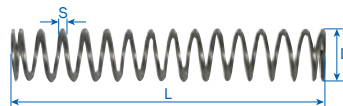
SK-KMK30-55-04-PE



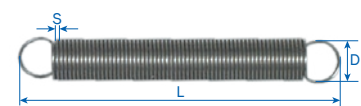
SK-MK55PH/PE

| Type | Weight kg | RH mm | For current collector | Carbon brush thickness mm | Order No. |
|-------------------|-----------|-------|------------------------------|---------------------------|-----------|
| SK-KMK30-63-04-PH | 0.031 | 4.00 | KST 30-KST 63 and KSTU 30-63 | 4.40 | 154440 |
| SK-KMK30-63-04-PE | 0.031 | 4.00 | KST 30-KST 63 and KSTU 30-63 | 4.40 | 154453 |
| SK-MK55F-31-14 | 0.040 | 3.50 | KESR 32-55F and KESL 32-55F | 4.20 | 780920 |
| SK-MK63S-31-14 | 0.046 | 3.50 | KESR 32-63S and KESL 32-63S | 4.20 | 780921 |

SPRINGS



Pressure spring DF



Tension spring RF

| Type | For current collector | S mm | D mm | L mm | Order No. |
|------|-------------------------|------|------|-------|-----------|
| DF2 | KESR 32-63 | 0.90 | 7.70 | 43.00 | 153848 |
| RF3 | KESR 32-55 KESL 32-63 | 0.40 | 4.40 | 31.00 | 153849 |
| DF4 | KESL 32-63 | 1.10 | 6.40 | 41.00 | 157312 |

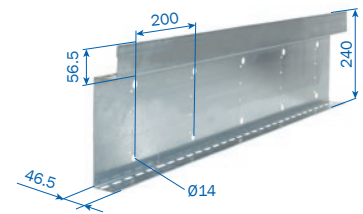
SPARE PARTS AND ACCESSORIES

SPARE PARTS VKS10

| Type | Description | Order No. |
|---------------------|--|-----------|
| VK-SV10 | Connector cap | 780137 |
| VM-STV63-VKS10 | Plug-in joint (10 – 60A) | 780807 |
| VM-STV100-120-VKS10 | Plug-in joint (100 – 120A) | 780808 |
| VM-STV140-VKS10 | Plug-in joint (140A) | 780028 |
| ES-AB-VLS10/200-280 | Connection bolts, complete for VLS 10 / 60 + 200-280 | 780138 |
| ES-AB-VLS10/63-280 | Connection bolts, complete for VLS 10 / 100-140 | 780130 |
| ES-AB-VNS10/63-280 | Connection bolts, complete for VNS 10 / 60-280 | 780139 |
| KL-DSEV10 | Plastic glue for tangential funnel DSEV 10 | 780280 |

SUPPORT PROFILE

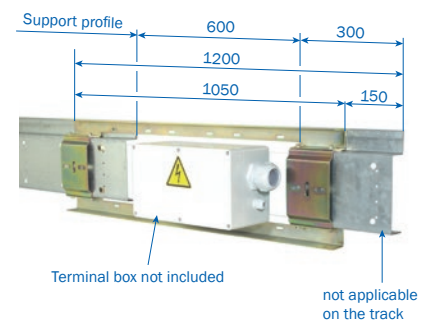
Length: 6 m



| Type | Weight kg/m | Order No. |
|------------|-------------|-----------|
| VTP10-6000 | 4.300 | 781006 |

ATTACHMENT SUPPORT PROFILE VTP 10

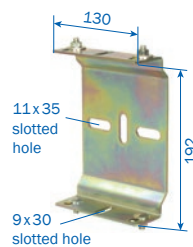
for feed VNS 10, VLS 10



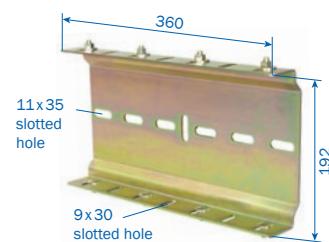
| Type | Description | Order No. |
|---------------|-----------------------------------|-----------|
| VTPB1050-ESAE | Version for initial / end section | 780100 |
| VTPB1050-ESST | Version on the track | 780098 |

HRL JOINTS

Only as single component otherwise included in the attachment material of the support profile (page 23)



HRL joint



HRL connector

| Type | Weight kg | Description | Order No. |
|------------|-----------|---------------|-----------|
| VTPV10 | 2.398 | HRL joint | 781000 |
| VTPA10-130 | 0.878 | HRL connector | 781007 |

HRL AUXILIARY SUPPORT

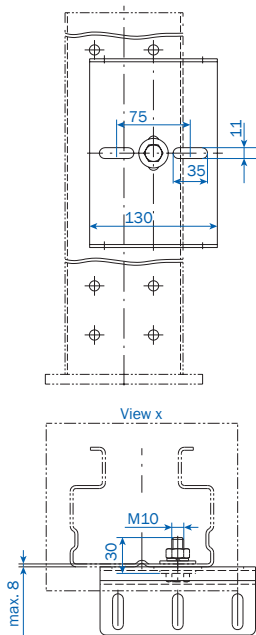
Length: 500 mm
incl. fixing material



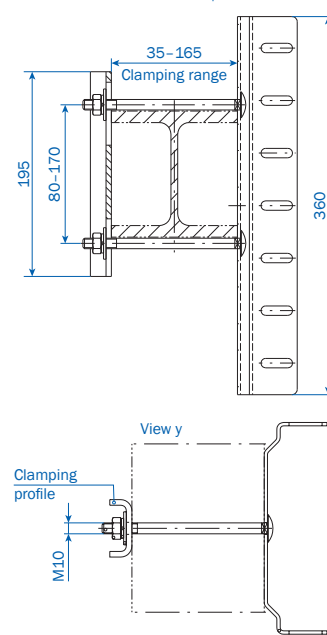
| Type | Weight kg | Order No. |
|-------------|-----------|-----------|
| HRL-HSE-500 | 1.894 | 781677 |

SUPPORT PROFILE ATTACHMENTS

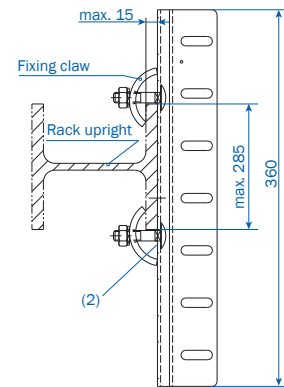
1 VTPB-P x



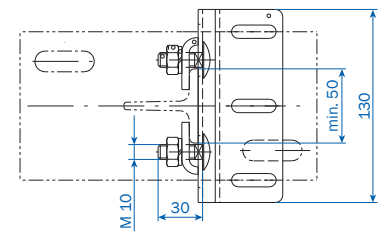
2 VTPB-35-165 y



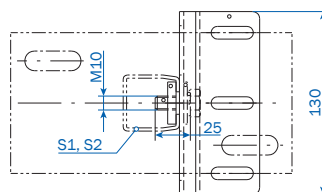
3 VTPB-SPR



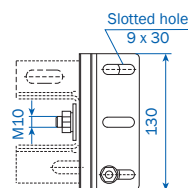
4 VTPB 130-SPW



5 VTPB 130-S1/2



6 VTPB 130-HST



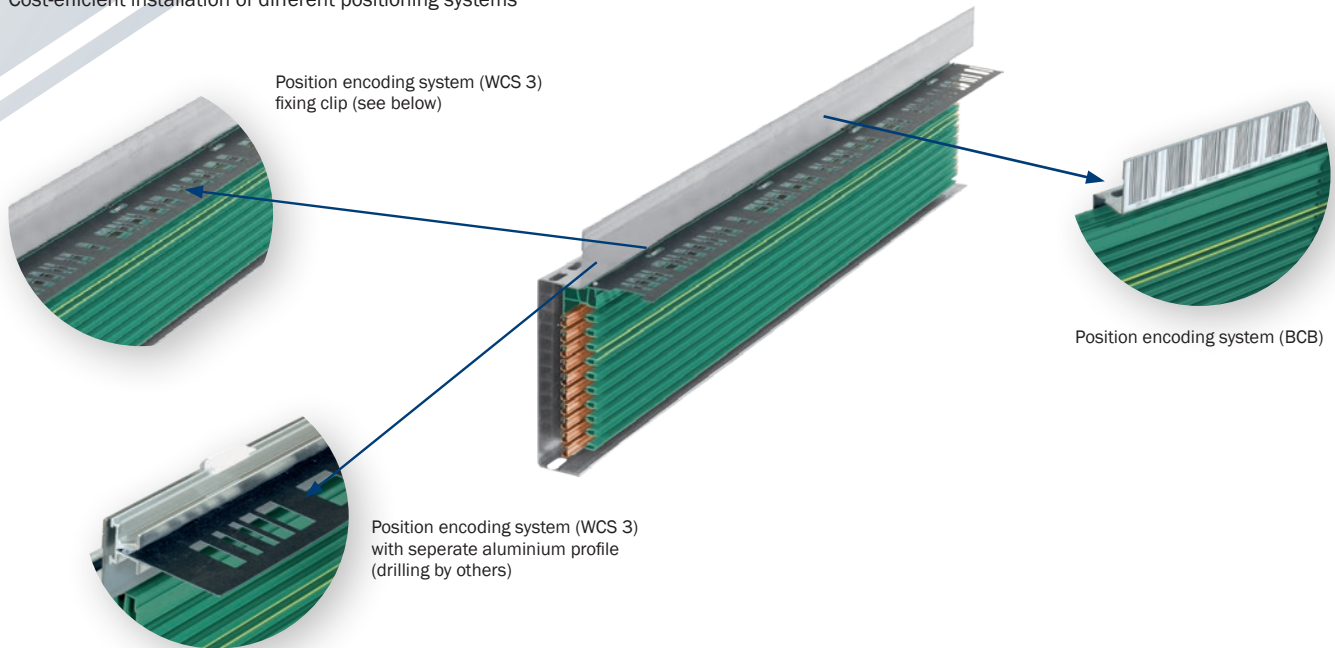
| Type ⁽¹⁾ | Weight kg | Clamping range mm | Figure | Order No. |
|---------------------|-----------|-------------------|--------|-----------|
| VTPB130-P-30 | 0.938 | max. 8 | 1 | 780147 |
| VTPB360-SPR | 2.674 | max. 15 | 3 | 780149 |
| VTPB130-SPW | 1.066 | max. 6 | 4 | 780148 |
| VTPB360-35-45 | 3.054 | 35 - 45 | 2 | 780150 |
| VTPB360-45-55 | 3.062 | 45 - 55 | 2 | 780151 |
| VTPB360-55-65 | 3.076 | 55 - 65 | 2 | 780152 |
| VTPB360-65-75 | 3.084 | 65 - 75 | 2 | 780153 |
| VTPB360-75-85 | 3.096 | 75 - 85 | 2 | 780154 |
| VTPB360-85-95 | 3.102 | 85 - 95 | 2 | 780155 |
| VTPB360-90-105 | 3.110 | 90 - 105 | 2 | 780156 |
| VTPB360-100-115 | 3.118 | 100 - 115 | 2 | 780157 |
| VTPB360-110-125 | 3.132 | 110 - 125 | 2 | 780158 |
| VTPB360-120-135 | 3.144 | 120 - 135 | 2 | 780159 |
| VTPB360-130-145 | 3.152 | 130 - 145 | 2 | 780160 |
| VTPB360-140-155 | 3.164 | 140 - 155 | 2 | 780161 |
| VTPB360-150-165 | 3.712 | 150 - 165 | 2 | 780162 |
| VTPB130-S1/2 | 0.944 | max. 8 | 5 | 780163 |
| VTPB130-HST | 0.922 | max. 8 | 6 | 781678 |

(1) Bigger clamping range on request

(2) Locking torque of the round-head screw M10, MA = 18 Nm

POSITIONING SYSTEMS

Cost-efficient installation of different positioning systems



EARTHING OF THE CODE RAIL

Connect the WCS code rail at least every 30 m to the potential of the system of low resistance.

| Type | Weight kg | Order No. |
|----------------|-----------|-----------|
| PS-WCS3-EVTP10 | 0.026 | 302160 |

FIXING CLIP

for laminate band

Fixing distance 0.2 m



| Type | Weight kg | Order No. |
|-------------|-----------|-----------|
| PS-WCS3-BKK | 0.002 | 780193 |

POSITION ENCODING BAND

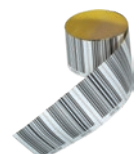
Fixing distance 0.2 m



WCS⁽¹⁾



1x per conductor section



BCB⁽²⁾

| Type | Weight kg | Description | Order No. |
|-----------------|-----------|--|-----------|
| PS-WCS3-CS70-L2 | 0.040 | Plastic laminate band with special perforation (WCS 3) | 302106 |
| PS-WCS3-FPK | 0.001 | Screws for fixation | 780140 |
| PS-BCB-50 | 0.015 | Barcode band (BCB) | 302107 |

(1) Max. travel length 327 m

(2) Max. travel length 10.000 m

INSTALLATION TOOLS

JOINT CAP ASSEMBLY TOOL

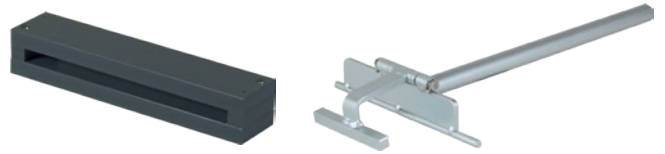
for use with support profile



| Type | Weight kg | Order No. |
|---------|-----------|-----------|
| MZ-MGVK | 0.350 | 780070 |

COPPER CONNECTOR MOUNTING LEVER

for use with support profile



| Type | Weight kg | Order No. |
|---------|-----------|-----------|
| MZ-MGVS | 1.50 | 780090 |

INSTALLATION COMB

Set for VKS10

To adjust the air gap at the joint



| Type | Weight kg | Order No. |
|-------|-----------|-----------|
| MZ-MK | 0.230 | 781112 |

QUESTIONNAIRE

Company: _____ Date: _____

Phone: _____ Fax: _____

Email: _____ Website: _____

1. Number of conductor system installations: _____
2. Type of equipment to be powered: _____
3. Operating voltage: _____ Volt Frequency: _____ Hz
 Three-phase voltage AC voltage DC voltage
4. Track length: _____
5. Number of conductors: _____ neutral: _____ control: _____ ground: _____
6. Mounted position of conductor system:
 Conductor system pendant, collector cable facing to the bottom Conductor system pendant, lateral payout of conductor cable⁽¹⁾
 Support distance _____ m (max. 2 m) Other: _____
7. Number of consumers per system: _____
8. Indoor system Outdoor system
9. Other operating conditions (humidity, dust, chemical influence, etc.) _____
10. Ambient temperature: _____ °C min. _____ °C max.
11. Hall expansion joints _____ pieces _____ expansion max.
12. Position and number of feeding points⁽¹⁾: _____
13. Position and number of isolating sections (e. g. for maintenance)⁽¹⁾: _____
14. How will the conductor be arranged?⁽¹⁾: _____
15. Brackets required: Yes No c/c distance beam/conductor system: _____
16. Travel speed: _____ m/min. in curves: _____ m/min. at transfers: _____ m/min.
17. Max. voltage drop from the conductor system feed point to the consumer considering starting current. _____
18. Power consumption of the individual consumer loads: _____

| Motor data | Crane 1 | | | | | | Crane 2 | | | | | | | |
|-----------------|----------|-----------------|--------------------|--------|------------------|--------------------|-------------------------------|----------|-----------------|--------------------|--------|------------------|--------------------|-------------------------------|
| | Power kW | Nominal current | | | Starting current | | Type of motors ⁽²⁾ | Power kW | Nominal current | | | Starting current | | Type of motors ⁽²⁾ |
| | | A | cos φ _N | % duty | A | cos φ _A | | | A | cos φ _N | % duty | A | cos φ _A | |
| 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: _____

(1) For curved tracks, conductor system with isolating sections etc., we require sketches to enable us to prepare a quotation
 (2) Use: K for squirrel cage motor, S for slipring motor, F for frequency controlled motor
 We reserve all rights to make alterations in the interests of further development
 Please copy and fill in the questionnaire.



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@vahleinc

