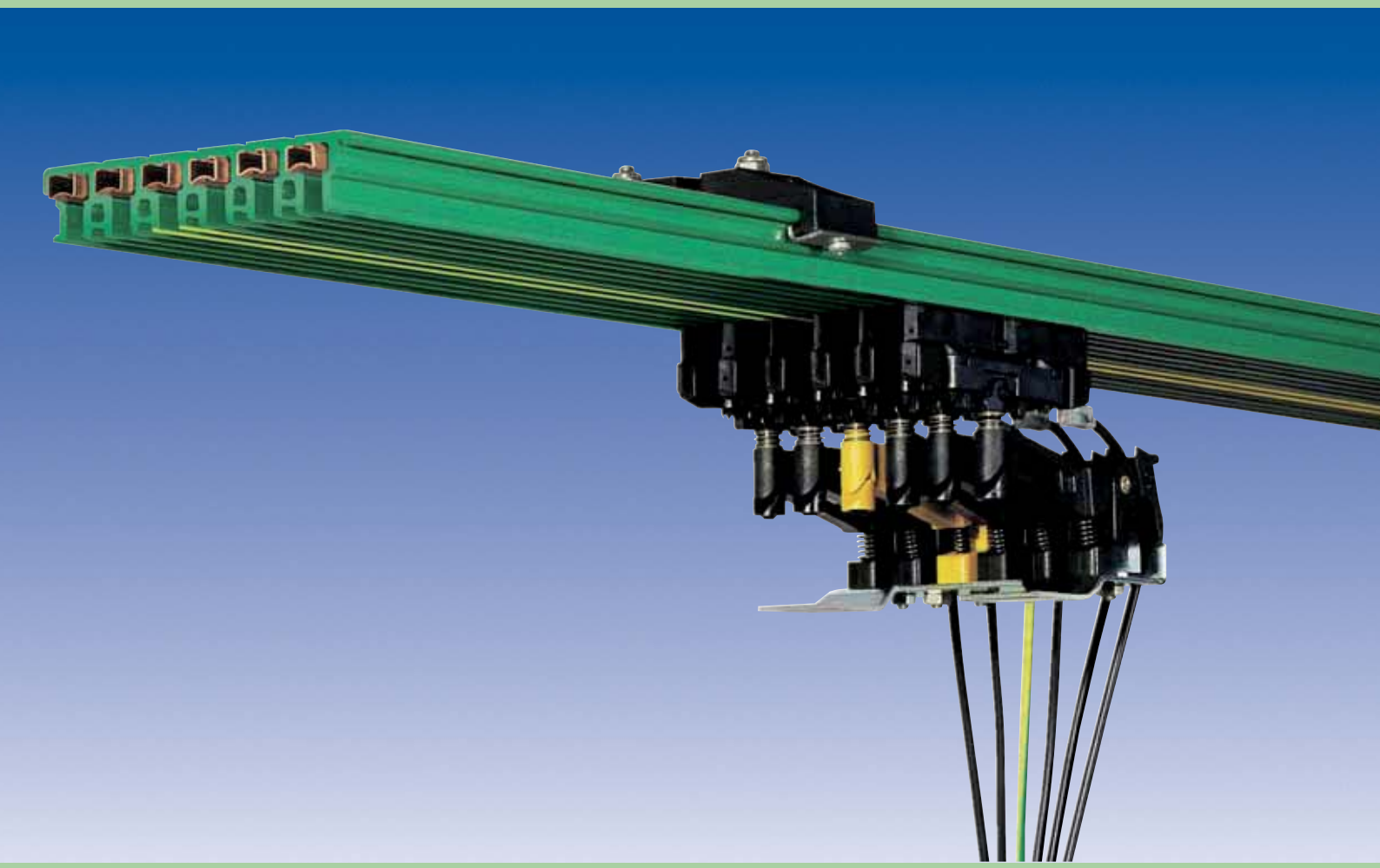


COMPACT CONDUCTOR SYSTEMS

VKS - VKL

VAHLE
ELECTRIFICATION SYSTEMS

Electrical Properties:

		VKS	VKL
Ampacity:	=	140 A(3)	30 A
Allowed voltage	=	690 V(4)	400 V
Electrical strength according to DIN 53481	=	>25 kV/mm	
Special electricel strength according to IEC 60093	=	1 x 10^{16} Ohmx cm	
Surface resistance according to IEC 60093	=	2,1 x 10^{15} Ohm	
Creep resistance according to IEC 60112	=	CTI > 400	

Flame test proof per DIN 4102 part 1, class B1, no flaming particles, self extinguishing

Conductor	copper				unit
Cross sectiont	16	25	30	35	mm^2
Impedance at 50 Hz	1,107	0,730	0,603	0,520	Ohm/ 1000 m
Resistance	1,102	0,723	0,595	0,510	Ohm/ 1000 m

Mechanical properties:

Flexible strength = 74-85 N/mm^2
Tensile strength = 44-55 N/mm^2

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

Benzine, petroleum, fats	resistant
Caustic soda upto 50%	resistant
Hydrochloric acid, concentrated	resistant
Sulfuric acid upto 50%	resistant

Water absorption: max. at 100 °C = 1%
max. at 20 °C = 0,06%

Temperature resistance:
from -20 °C(2) upto + 55 °C with a rail length upto 4 m
from 0° C(2) upto +40 °C with a rail length > 4 m

Please consult factory for galvanizing plants, pickling lines, other aggressive or deep freeze ambients, as well as low voltage and data transmission applications, indicating special environmental conditions.
To speed up quotations and order processing, we would appreciate receiving your drawings or sketches for powerail systems with curves, dead sections, turntables, switches, etc.
Please use our questionnaire, page 29 and 30.

(1) Please enclose the Questionnaire to your inguiry.
(2) Consult factory for use below 0° C (32° F) [deep freeze housing].
(3) 80 % ED
(4) Not with UL-approval; U_{UL} = 600 V

VAHLE Powerails VKS and VKL are space saving conductor systems, designed to prevent any accidental contact and hazard to personnel and are test finger proof to regulations VDE 0470, part 1 (EN 60529), protection code IP 21.

Collectors are proof against accidental touch only when fully entered into powerail.

Powerail installations within reach of hand require a special protection on the part of operator against accidental touch of current collectors which are leaving the powerail (e.g. locking or cut-off the power).
This is applicable for voltages above 25 V AC respectively 60 V DC.
The creeping distance between the conductors of the VKS-conductor is 30 mm.

The different plastic housings hold from 3 to 6 copper or stainless steel conductors. Multiple conductor systems can be easily designed by combining several plastic housings.
The minimal space required allows the systems to be integrated in the crane or hoist track or in other special runway profiles.
The minimal required space allows a direct layout in rail tracks or special track profiles.
The VKS & VKL Powerail can be used for indoor and roof-over (rain protected) applications. They can be installed with lateral or suspended mounting and straight or curved tracks are available.

Approvals (VKS):
UL-approval.

VKS Powerail Systems

are designed for safe mobile power feeding of:

Hoists, Monorail Systems, Stacker Cranes, Machine Tools, Production and Testing Lines, also for Sliding Switches, Turntables, Hoisting Stations, Transfers, and many other Applications, incl. Data and Signal Transmission.

Housing

The well insulating plastic housing holds 3-6 conductors. 4 and 6 m standard lengths and shorter sections to coincide with your runway requirements are available. The asymmetrical housing avoids phase reversing. The ground conductor is identified by the international yellow colour coding.

Joints:

The plastic sections are connected with plastic joint caps, the conductors with spring-loaded copper connectors.

Feed Sets:

End feeds or line feeds with terminal boxes are available, also low mounting line feeds for cable connection. Line feeds come factory assembled on 1 m long Powerail sections. End feeds come unassembled without any Powerail section.

Hangers:

All sections are to be fixed from at least 1 hanger and the maximum permissible support centres of 1 m (with double collectors 0.8 m) must be adhered to (see page 5). The hangers are equipped
with M 6 bolts & hardware and can be mounted directly to hanger brackets, monorail tracks or special runway profiles.
The Powerail sections are snapped into the hangers. Sliding hangers allow free movement of the Powerail to compensate for temperature variations. Fixpoint hangers with tapping screw from anchor points (see installation procedure).
For this we have to consider a max. distance of 4 m between 2 fixpoints.

Standard Support Brackets:

Support brackets for easy installation are available, (see page 25).

Collectors:

The collectors have a continuous rating of 20 A up to 120 A. One collector is required for each phase and earth conductor. The ground collectors have a yellow colour and different attachments to avoid interchangeability with phase collectors.

The collectors have spring loaded carbon brushes for a constant positive contact with the conductors.

Collectors are to be mounted onto towing plates or are to be attached to the moving equipment by means of towing brackets type UM. Systems with transfers, switches, turntables, etc. require 2 single collectors or one double collector per conductor.

The length of the collector cable may not exceed 3 m if the added overcurrent protection device is not designed for the load capacity of this cable. Please refer also to regulations VDE 0100, part 430 and EN 60204-32.

(Note: this might happen in case of several collectors running in one system).

The provided connecting cables are sufficient for the stated nominal currents. For the different laying procedures the reductions factors according to DIN VDE 0298-4 have to be considered.

Conductor Dead 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 isolating section has to consider the total length of carbon brush and whether carbon brush must or must not bridge the isolating area.
Special attention is required for double collectors or collectors switched in parallel. Use double isolating sections where necessary.

Selection of conductors

in accordance to ampere load and environmental conditions:

VKS .../ 60 copper conductor for power and control system and data transmission

.../100 copper conductor for power and control system

.../120 copper conductor for power and control system

.../140 copper conductor for power and control system

Several combinations of cross sections are possible for one conductor type.

VKL Powerail Systems

are designed for small current loads and serve for the power supply of light cranes and for control current systems. The VKL Powerail can also be used for Hoists, Jib Cranes, Power Tools, Machine Tools, electrically operated Gates, Testing Lines, and other Applications.

Housing:

The plastic housing holds up to 5 conductors. The ground conductor is identified by international yellow colour code. 4 m standard lengths and shorter sections to coincide with your runway requirements are available.

The straight sections are restricted as follows:
1.Max. system length: L=100 m
2.From the curve to system end: max. L = 50 m
3.Between 2 cruves: max. L = 15 m

Couplings:

The mechanical jointing of the Powerail housing is done by means of a two-piece plastic joint cap. The conductors get spring-loaded copper connectors.
The ends of each section are milled in to provide the required creepage distance. End caps, fixed with screws, can be installed to every section.

Feed Terminals

End feeds and line feeds with terminal boxes are available. They are factory assembled on 1 m Powerail sections.

Feeds:

The feeds are available as end or line feeds. They are mounted on a 1 m section.

Supports:

All sections must be fixed at min. 2 points, at which the maximum support distance of 1000 mm must be kept. The support hanger consists of a pvc part with a fixing screw and is arranged as a sliding hanger. The fixpoint in the middle of the system consists of a hanger with a locating clamp on each side of the hanger.

Brackets:

To support the conductor rail to the crane track mounting brackets available (see page 25).

Collectors:

The glider type collectors are guided at the PVC housing. They are supplied with 1 m long connecting cable. Longer cables are available upon request. The carbon brushes have a continuous current capacity of 10 A (15 A at 60 % intermittent duty). Use two collectors for higher ratings. The towing arm is the mechanical flexible connection between collector and moving equipment.

The length of the collector cable should not exeed 3 m if the installed fuse is not suitable for the cross section of this connecting cable. (Please note: This is often the fact if more than one collector is used in the system)

Safety advice It must be ensured that the arrangement of the conductor system provides minimum distances (0.5 m) between fixed and mobile plant parts (i.e. Between conductor rails, collector trolleys and towing arms) so as to avoid the risk of pinching.

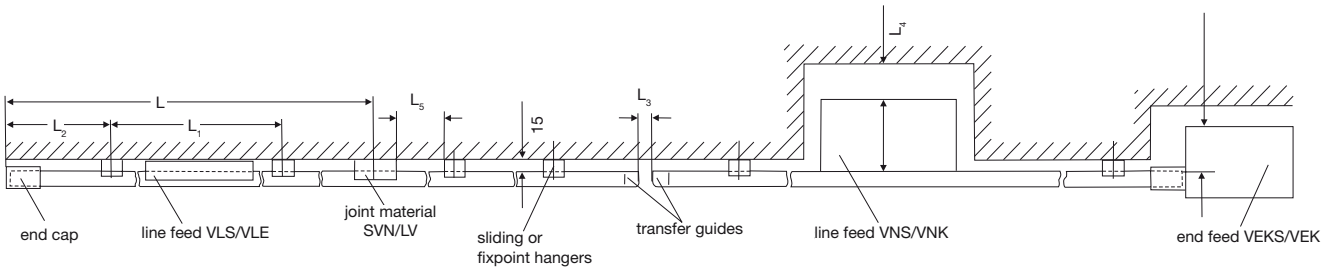
Dead sections:

Dead sections for control lines can be installed according to your instructions.

Electronic layout support:

Please use our electronic layout software.

1. Scheme



L = powerail section (1 m, 2 m, 3 m, 4 m or cut to suit the system)
L1 = support spacing for straight runs max. 1 m
for curved runs max. 0,5 m
L2 = extending length (max. 200 mm)
L3 = air gap for transfers, e. g. switches and
dropout sections (3 - 5 mm)
L4 = space to remove feed box cover, if applicable
L5 = clearance for expansion of powerail (min. 50 mm for VKS; 150 mm for VKL).

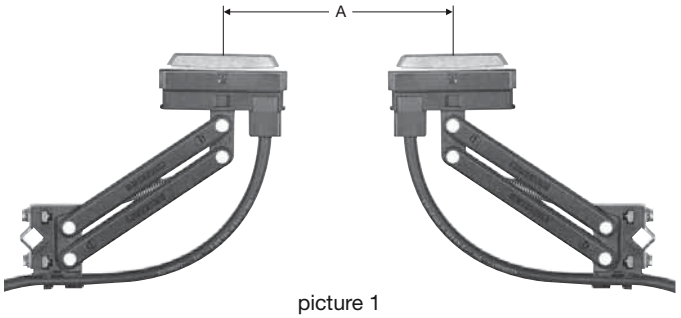
2. Symbols in layout plans

	VKS	VKL
Track	–	–
Powerail	VKS	VKL
Joint material	SVN	–
Joint material	–	LV
Fixpoint hanger	VEPS	VEP
Sliding hanger	VAS	VA
End cap	VES	VE
End feed, power	VEKS	VEK
End feed, control	VEKS	VEK

	VKS	VKL
Line feed, power	VNS	VNK
Line feed, control	VNS	VNK
Line feed, power and control	VLS	VLE
Transfer guide, straight	VU	–
Transfer guide, oblique	VUS	–
Transfer funnel	VEM	–
Expansion section	DVKS	–
Isolating assembly	VSTS	VST

3. Max. Support spacing

Type		for straight runs	for curved runs
VKS		1000 mm	500 mm
	at KSTU 30, 55 (photo 1)	800 mm	400 mm
VKL		1000 mm	500 mm



picture 1

A < 300 mm Support spacing 0,8 m
A > 300 mm Support spacing 1,0 m

Straight sections

Standard length 4 and 6 m.[5]

Attention: Joint material to be ordered separately (see page 8). LH RH

Type	Number of con-ductors	**Continuous Ampere Rating A at 35 °C**	Nominal voltage[5] V	Voltage drop per 100 m at full rating V	Minimum Clearence mm	Conductor Cross Section[4] mm² NL / 1,2	PE / 3
VKS 3/ 60 HS	3	**60**	690	11,5	7	2x16	1x16
VKS 3/ 60 SS	3	**60**	690	11,5	7	2x16	1x16
VKS 3/100 HS	3	**100**	690	12,6	7	2x25	1x25
VKS 3/100 SS	3	**100**	690	12,6	7	2x25	1x25
VKS 3/120 HS	3	**120**	690	12,5	7	2x30	1x30
VKS 3/120 SS	3	**120**	690	12,5	7	2x30	1x30
VKS 3/140 HS	3	**140[2]**	690	11,3	7	2x35	1x35
VKS 3/140 SS	3	**140[2]**	690	11,3	7	2x35	1x35

Straight sections

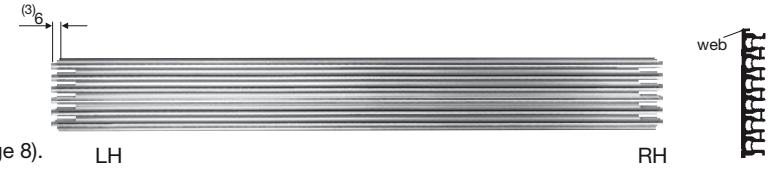
Standard length 4 and 6 m.[5]

Attention: Joint material to be ordered separately (see page 8). LH RH

Type	Number of con-ductors	**Continuous Ampere Rating A at 35 °C**	Nominal voltage[5] V	Voltage drop per 100 m at full rating V	Minimum Clearence mm	Conductor Cross Section[4] mm² L1-L3 / 1-3	PE / 4
VKS 4/ 60 HS	4	**60**	690	11,5	7	3x16	1x16
VKS 4/ 60 SS	4	**60**	690	11,5	7	3x16	1x16
VKS 4/100 HS	4	**100**	690	12,6	7	3x25	1x16
VKS 4/100 SS	4	**100**	690	12,6	7	3x25	1x16
VKS 4/120 HS	4	**120**	690	12,5	7	3x30	1x16
VKS 4/120 SS	4	**120**	690	12,5	7	3x30	1x16
VKS 4/140 HS	4	**140[2]**	690	11,3	7	3x35	1x16
VKS 4/140 SS	4	**140[2]**	690	11,3	7	3x35	1x16

Straight sections

Standard length 4 and 6 m.[5]

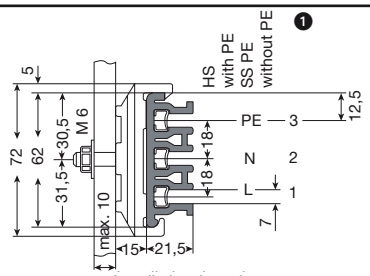


Attention: Joint material to be ordered separately (see page 8). LH RH

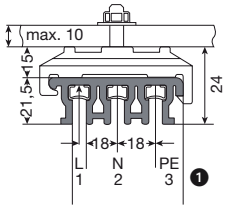
Type	Number of con-ductors	**Continuous Ampere Rating A at 35 °C**	Nominal voltage[5] V	Voltage drop per 100 m at full rating V	Minimum Clearence mm	Conductor Cross Section[4] mm² L1-L3 / 1-3	PE 7 4	1,2 / 5,6
VKS 5/ 60 HS[1]	5	**60**	690	11,5	7	3x16	1x16	1x16
VKS 5/ 60 SS[1]	5	**60**	690	11,5	7	3x16	1x16	1x16
VKS 5/100 HS[1]	5	**100**	690	12,6	7	3x25	1x16	1x16
VKS 5/100 SS[1]	5	**100**	690	12,6	7	3x25	1x16	1x16
VKS 5/120 HS[1]	5	**120**	690	12,5	7	3x30	1x16	1x16
VKS 5/120 SS[1]	5	**120**	690	12,5	7	3x30	1x16	1x16
VKS 5/140 HS[1]	5	**140[2]**	690	11,3	7	3x35	1x16	1x16
VKS 5/140 SS[1]	5	**140[2]**	690	11,3	7	3x35	1x16	1x16
VKS 6/ 60 HS	6	**60**	690	11,5	7	3x16	1x16	2x16
VKS 6/ 60 SS	6	**60**	690	11,5	7	3x16	1x16	2x16
VKS 6/100 HS	6	**100**	690	12,6	7	3x25	1x16	2x16
VKS 6/100 SS	6	**100**	690	12,6	7	3x25	1x16	2x16
VKS 6/120 HS	6	**120**	690	12,5	7	3x30	1x16	2x16
VKS 6/120 SS	6	**120**	690	12,5	7	3x30	1x16	2x16
VKS 6/140 HS	6	**140[2]**	690	11,3	7	3x35	1x16	2x16
VKS 6/140 SS	6	**140[2]**	690	11,3	7	3x35	1x16	2x16

(1) VKS 5 eliminates conductor number 6; plastic housing however identical to VKS 6.
(2) 80% ED
(3) Section is superseded at 20° C UT.
(4) Same cross section at PE (ground) when used for control line. Other conductor combinations are possible.
(5) Not with UL-approval; U_{UL}= 600 V

	Conductor Material	Weight kg/m	Order-No.
	Cu	1,221	153 89•
	Cu	1,221	153 94•
	Cu	1,454	153 90•
	Cu	1,454	153 95•
	Cu	1,589	153 91•
	Cu	1,589	153 96•
	Cu	1,724	154 96•
	Cu	1,724	156 08•

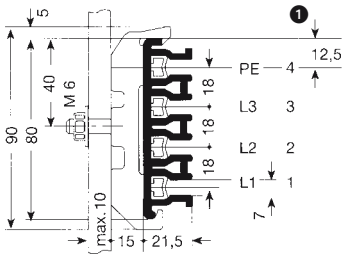


Installation: lateral

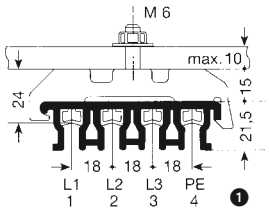


Installation: horizontal

	Conductor Material	Weight kg/m	Order-No.
	Cu	1,459	153 99•
	Cu	1,459	154 04•
	Cu	1,693	154 00•
	Cu	1,693	154 05•
	Cu	1,828	154 01•
	Cu	1,828	154 06•
	Cu	1,956	154 31•
	Cu	1,956	156 54•

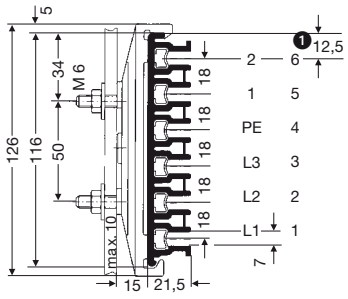


Installation: lateral

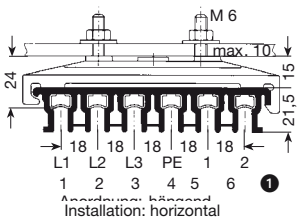


Installation: horizontal

	Conductor Material	Weight kg/m	Order-No.
	Cu	2,058	154 09•
	Cu	2,058	154 14•
	Cu	2,292	154 10•
	Cu	2,292	154 15•
	Cu	2,427	154 11•
	Cu	2,427	154 16•
	Cu	2,549	154 87•
	Cu	2,549	156 55•
	Cu	2,202	154 19•
	Cu	2,202	154 24•
	Cu	2,436	154 20•
	Cu	2,436	154 25•
	Cu	2,571	154 21•
	Cu	2,571	154 26•
	Cu	2,693	152 60•
	Cu	2,693	156 56•



Installation: lateral



Installation: horizontal

❶ Marking refers to control lines.

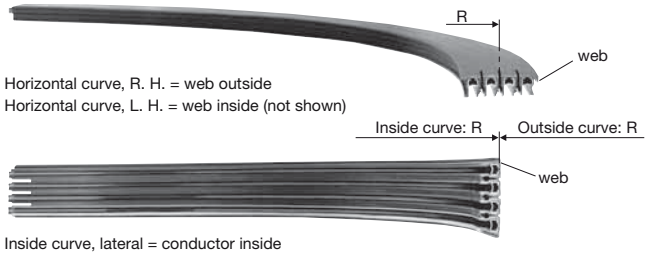
(5) For supply lengths above 4 m refer to restricted ambient temperature (page 2).

•For full type designation add length suffix of Powerail Section, e. g. VKS 4/120-2 **HS** for Order-No. 154 012. Other sections to coincide with your runway requirements are made up from the next larger straight length.

Curved sections[1]

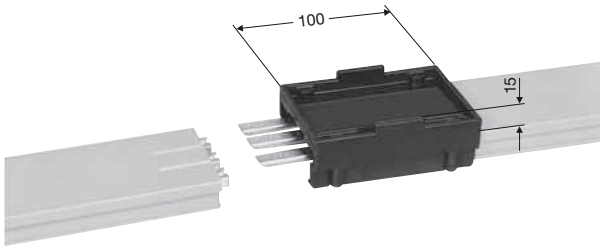
per your layout drawing

max. L = 3.6 m, support spacing ~ 500 mm, max. angle 180°



	R mm	Surcharge Order-No. **VKS 3**
Horizontal curve, R. H.	400 – 900	150 385
Horizontal curve, L. H.	400 – 900	150 386
Horizontal curve, R. H.	> 900	153 120
Horizontal curve, L. H.	> 900	153 130
Inside curve, lateral	200 – 800	150 387
Inside curve, lateral	> 800	153 040
Outside curve, lateral	200 – 800	150 388
Outside curve, lateral	> 800	153 050

Joint Material



Type	Poles	Weight kg	Order-No.
SVN 3/ 10 - 100	3	0,112	156 533
SVN 3/120 - 140	3	0,112	156 534

Curved sections[1]

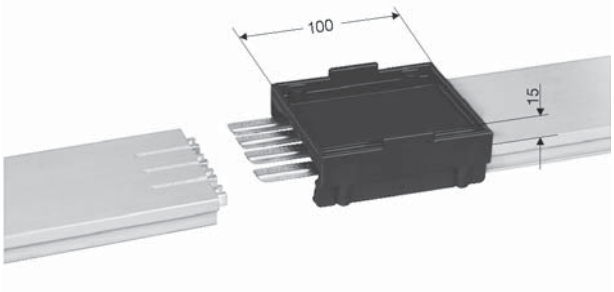
per your layout drawing

max. L = 3,60 m, support spacing ~ 500 mm, max. angle 180°

Configuration as shown above

	R mm	Surcharge Order-No. **VKS 4**
Horizontal curve, R. H.	400 – 900	150 389
Horizontal curve, L. H.	400 – 900	150 391
Horizontal curve, R. H.	> 900	153 717
Horizontal curve, L. H.	> 900	150 110
Inside curve, lateral	200 – 800	150 392
Inside curve, lateral	> 800	153 718
Outside curve, lateral	200 – 800	150 393
Outside curve, lateral	> 800	150 100

Joint Material



Type	Poles	Weight kg	Order-No.
SVN 4/ 10 - 100	4	0,136	156 535
SVN 4/120 - 140	4	0,136	156 536

Curved sections[1]

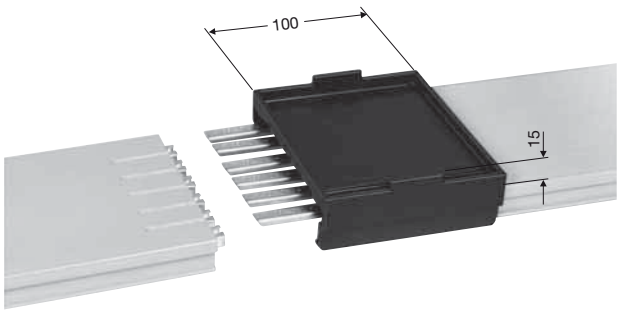
per your layout drawing

max. L = 3,60 m, support spacing ~ 500 mm, max. angle 180°

Configuration as shown above

	R mm	Surcharge Order-No. **VKS 5**	Surcharge Order-No. **VKS 6**
Horizontal curve, R. H.	400 – 900	150 394	150 398
Horizontal curve, L. H.	400 – 900	150 395	150 399
Horizontal curve, R. H.	> 900	153 719	153 721
Horizontal curve, L. H.	> 900	152 090	152 110
Inside curve, lateral	200 – 800	150 396	150 401
Inside curve, lateral	> 800	153 720	153 722
Outside curve, lateral	200 – 800	150 397	150 402
Outside curve, lateral	> 800	152 080	152 100

Joint Material

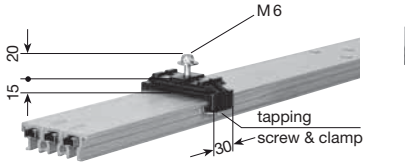


Type	Poles	Weight kg	Order-No.
SVN 5/ 10 - 100	5	0,180	156 537
SVN 5/120 - 140	5	0,180	156 538
SVN 6/ 10 - 100	6	0,194	156 539
SVN 6/120 - 140	6	0,194	156 540

[1] Curved sections will be factory prepared with a 100 mm straight section on both ends. Horizontal curves with more than 90 degrees should be divided in two or more sections.

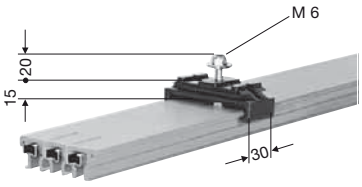
Fixpoint hanger[1]

with tapping screw & clamp



Type	Weight kg	Order-No.
VEPS 3	0,042	153 070

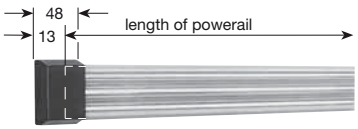
Sliding hanger[1]



Type	Weight kg	Order-No.
VAS 3	0,036	153 060

End cap[2]

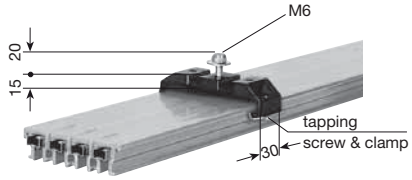
suitable L. H. and R. H.



Type	Weight kg	Order-No.
VES 3 - L	0,033	153 080
VES 3 - M	0,033	152 023

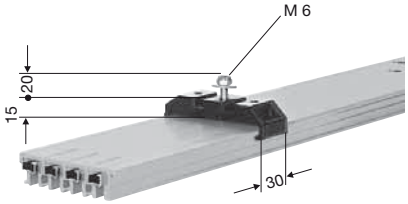
Fixpoint hanger[1]

with tapping screw & clamp



Type	Weight kg	Order-No.
VEPS 4	0,046	150 120

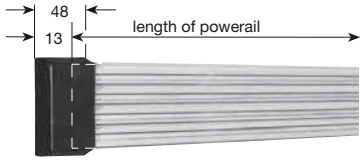
Sliding hanger[1]



Type	Weight kg	Order-No.
VAS 4	0,040	150 130

End cap[2]

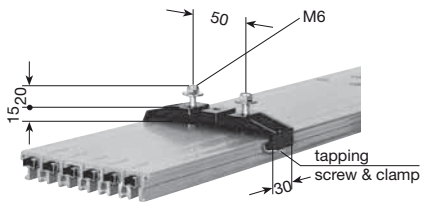
suitable L. H. and R. H.



Type	Weight kg	Order-No.
VES 4 - L	0,039	150 140
VES 4 - M	0,039	152 022

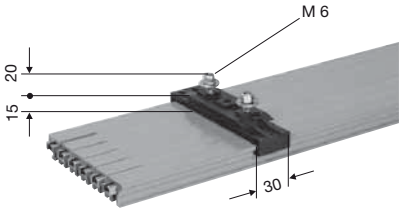
Fixpoint hanger[1]

with tapping screw & clamp



Type	Weight kg	Order-No.
VEPS 6	0,062	152 120

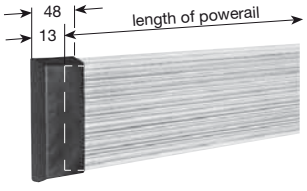
Sliding hanger[1]



Type	Weight kg	Bestell-Nr
VAS 6	0,056	152 130

End cap[2]

suitable L. H. and R. H.



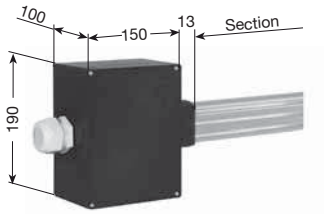
Type	Weight kg	Order-No.
VES 6 - L	0,051	152 140
VES 6 - M	0,051	152 021

[1] Complete with hardware (bolts, nuts, spring washers). Support spacing see page 5.

[2] L = loose; c/w hardware
M= Factory assembled

End feed[1]

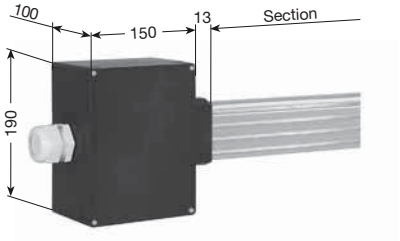
Terminal box with terminal clamps



Type	Cable gland[2]	Ampacity A	Weight kg	Order-No.
VEKS 3/10 - 120 L	ST-M 40 x 1,5	10 - 120	1,150	156 422
Surcharge for assembling				156 423

End feed[1]

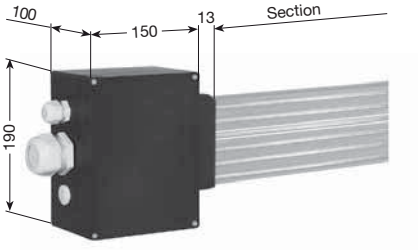
Terminal box with terminal clamps



Type	Cable gland[2]	Ampacity A	Weight kg	Order-No.
VEKS 4/10 - 120 L	ST-M 40 x 1,5	10 - 120	1,230	156 421
Surcharge for assembling				156 423

End feed[1]

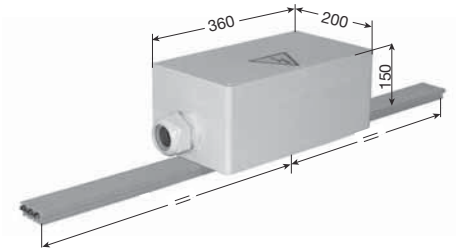
Terminal box with terminal clamps



Type	Cable gland[2]	Ampacity A	Weight kg	Order-No.
VEKS 5/10 - 120 L	ST-M 40 x 1.5 ST-M 20 x 1,5	10 - 120	1.380	156 420
VEKS 6/10 - 120 L	ST-M 40 x 1,5 ST-M 20 x 1,5	10 - 120	1,460	156 419
Surcharge for assembling				156 423

(1) End feeds loose as components. Sections are to be ordered separately (see page 7).
(2) Cable gland ST - M40 x 1,5 for Ø = 19-28 mm
ST - M20 x 1,5 for Ø= 7-13 mm
Terminal cross section Phase = 35 mm^2
PE = 35 mm^2

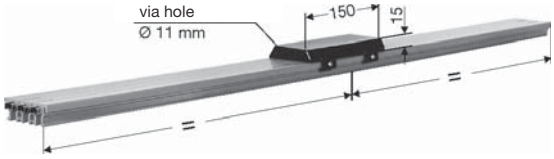
Line Feed[1]



Type [2]	Cable gland[2]	Ampacity A	Weight kg	Order-No.
VNS 3/10-140	STR-M63 x 1,5	10-140	1,876	157 147

Line Feed[1]

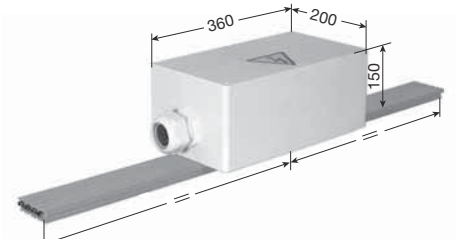
without cable connection; cable by others terminal bolt M 6.



Connecting cable have to be provided by customer.

Type[2]	Lug mm²	Ampacity A	Weight kg	Order-No.
VLS 3/ 10-60	-	10-60	0,071	156 948
VLS 3/100-120[3]	25	100-120	0,137	156 944
VLS 3/140[3]	35	140	0,173	156 958

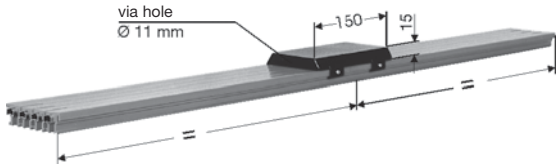
Line Feed[1]



Type [2]	Cable-gland[2]	Ampacity A	Weight kg	Order-No.
VNS 4/10-140	STR-M63 x 1,5	10-140	1,982	157 146

Line Feed[1]

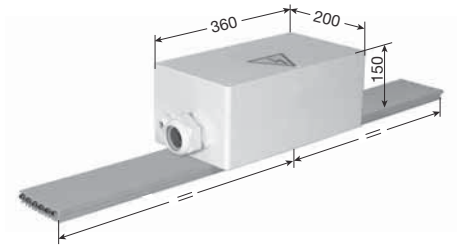
without cable connection; cable by others terminal bolt M 6.



Connecting cable have to be provided by customer.

Type[2]	Lug mm²	Ampacity A	Weight kg	Order-No.
VLS 4/ 10-60	-	10-60	0,091	156 947
VLS 4/100-120[3]	25	100-120	0,179	156 943
VLS 4/140[3]	35	140	0,227	156 957

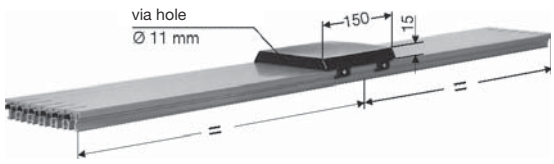
Line Feed[1]



Type[2]	Cable gland[2]	Ampacity A	Weight kg	Order-No.
VNS 5/10-140	STR-M63 x 1,5 STR-M20 x 1,5	10-140	2,080	157 145
VNS 6/10-140	STR-M63 x 1,5 STR-M20 x 1,5	10-140	2,200	157 144

Line Feed[1)]

without cable connection; cable by others terminal bolt M 6.



Connecting cable have to be provided by customer.

Type[2]	Lug mm²	Ampacity A	Weight kg	Order-No.
VLS 5/ 10-60	-	10-60	0,115	156 946
VLS 5/100-120[3]	25	100-120	0,225	156 942
VLS 5/140[3]	35	140	0,285	156 956
VLS 6/ 10-60	-	10-60	0,123	156 945
VLS 6/100-120[3]	25	100-120	0,255	156 941
VLS 6/140[3]	35	140	0,327	156 955

(1) Line feeds will be normaly installed on 1 m sections. This sections have to be ordered seperatly. (see page 6).
Connecting cable by customer.

(2) Cable gland STR - M63 x 1,5 for Ø= 28-45 mm
STR - M20 x 1,5 for Ø= 5-13 mm
Cable connection main: M10
control M5

(3) Cable connection with attached special cabel lugs for single cores 35 mm² (upto conductor-Ø 8,5 mm) for 140 A, 25 mm² (upto conductor-Ø 8,2 mm) for 100-120 A

TRANSFER GUIDES VKS

Transfer guide[1]

for transfers, switches, spur lines
max. horizontal and vertical offset ± 2 mm
Application: – straight cuts
– oblique cuts, lateral

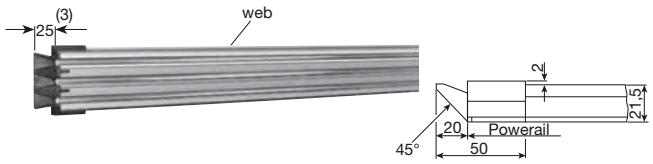


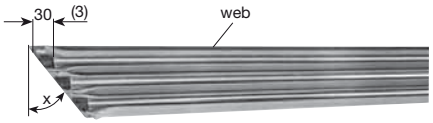
Photo shows L. H. version

Type	Order-No. L. H. version	Order-No. R. H. version
VU 3 S-M	150 191	150 192
VU 3 S-L	150 188	

M = factory assembled
[2] L = loose delivery as a single component, complete with accessories

Transfer guide oblique cut[1]

for switches and turntables prepared per your layout drawings.
Application: oblique cuts, horizontal



IP 21 up to x = 45°

Photo shows L. H. version

Type	Order-No. L. H. version	Order-No. R. H. version
VUS 3 H	150 410	150 420

Transfer guide[1]

for transfers, switches, spur lines
max. horizontal and vertical offset ± 2 mm
Application: straight cuts

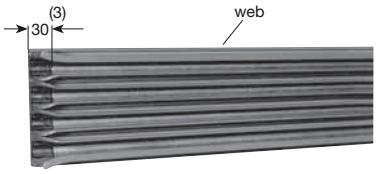
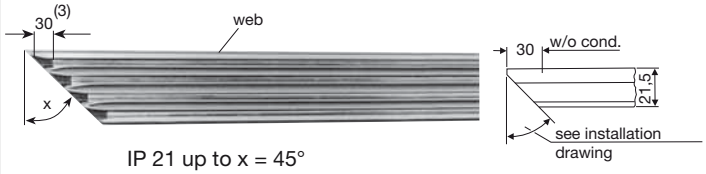


Photo shows L. H. version

Type	Order-No. L. H. version	Order-No. R. H. version
VU 4	150 160	150 390

Transfer guide oblique cut[1]

for switches and turntables prepared per your layout drawings.
Application: oblique cuts, horizontal and lateral



IP 21 up to x = 45°

Photo shows L. H. version

Type	Order-No. L. H. version	Order-No. R. H. version
VUS 4 H	150 170	150 400
VUS 4 S	153 564	153 565

H = for horizontal mounting
S = for lateral mounting (see page 6 and 7)

Transfer guide[1]

for transfers, switches, spur lines
max. horizontal and vertical offset ± 2 mm
Application: straight cuts
oblique cuts, lateral

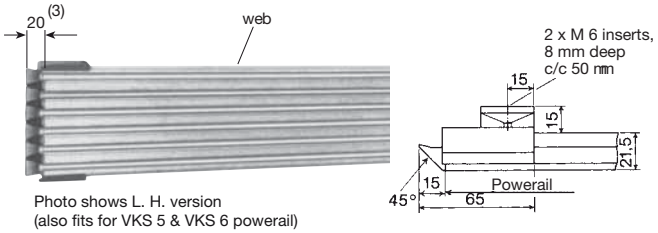


Photo shows L. H. version
(also fits for VKS 5 & VKS 6 powerail)

Type	Order-No. L. H. version	Order-No. R. H. version
VU 6 S-M	153 801	153 802
VU 6 S-L	150 215	

M = factory assembled
[2] L = loose delivery as a single component, complete with accessories

Transfer guide oblique cut[1]

for switches and turntables prepared per your layout drawings.
Application: oblique cuts, horizontal

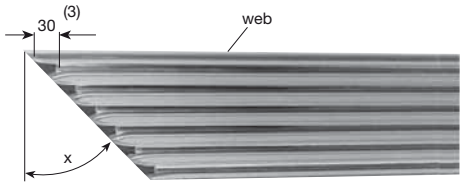


Photo shows L. H. version

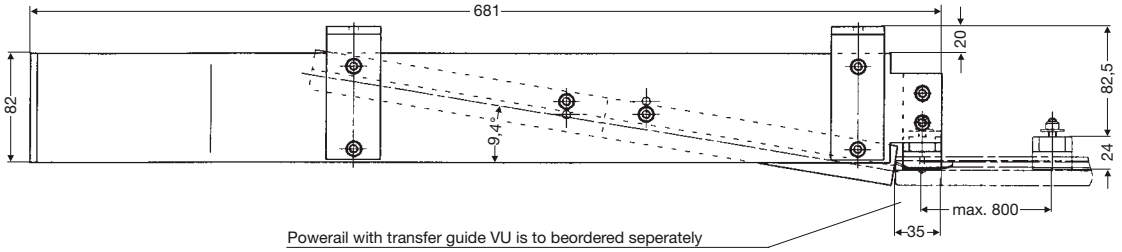
IP 21 up to x = 45°

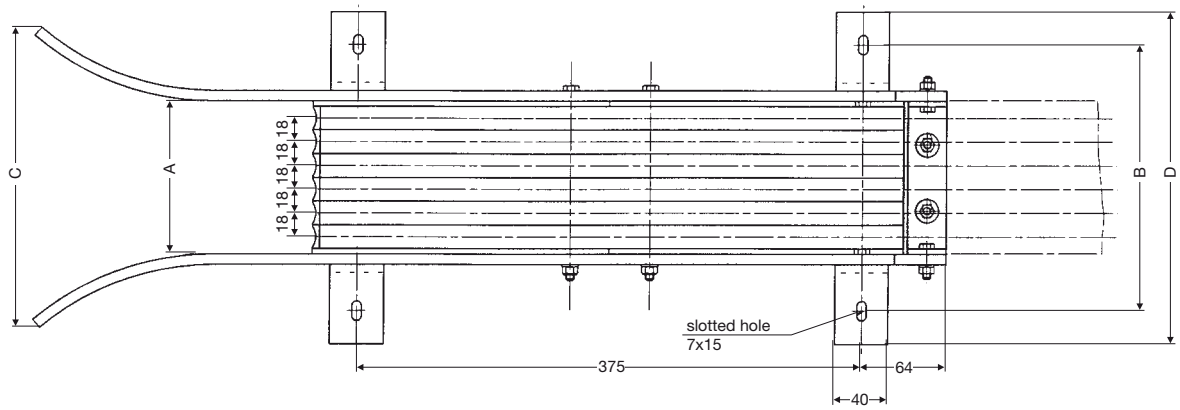
Type	Order-No. L. H. version	Order-No. R. H. version
VUS 5 H	152 170	152 300
VUS 6 H	152 310	152 320

[1] Photos show transfer guides being integrated in or attached to a powerail section. These sections are to be ordered as a part of the system. Other entry/exit chutes are available. Consult factory.
[2] Preparation of Powerail ends by others, following attached instructions.
[3] w/o conductors

Transfer funnels for KSTU 30/55

for max. Speed v = 100 m/Min.[2]





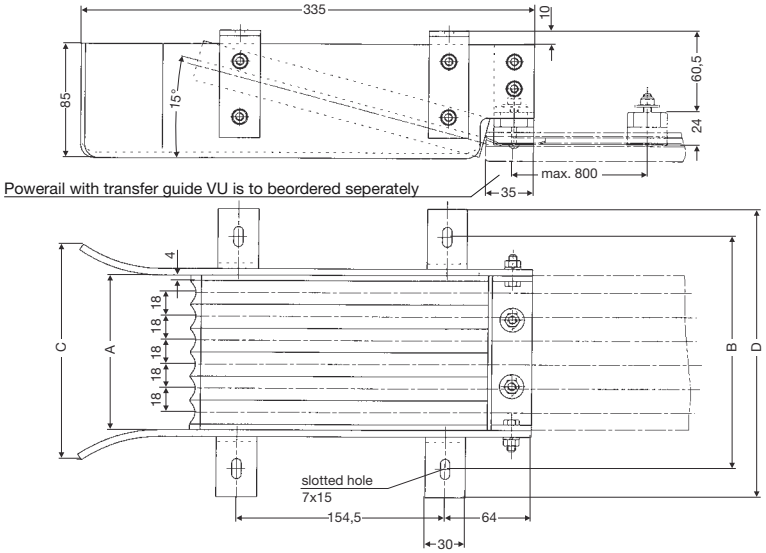
Type	A mm	B mm	C mm	D mm	Weight kg	Order-No.	VU…L[1]	VU…R[1]
EFT V3 - KSTU	62	148	175	198	3,140	156 144	150 370	150 380
EFT V4 - KSTU	80	166	193	216	3,320	156 145	150 160	150 390
EFT V6 - KSTU	116	202	229	252	3,680	156 146	152 280	152 290

(1) Powerail section must be factory prepared.
Order separately for left hand VU…L, for right hand VU…R.

(2) Higher speeds on request.

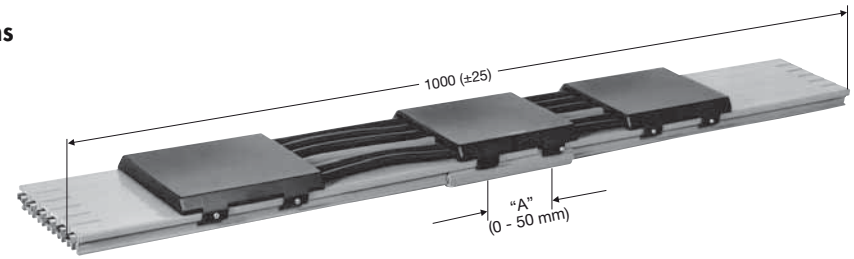
Transfer funnels for KSFU 25[1]

for max. speed v = 100 m/Min.[2]



Type	A mm	B mm	C mm	D mm	Weight kg	Order-No.	VU…L[1]	VU…R[1]
EFT V3 - KSFU 25	62	120	108	162	1,400	153 337	150 370	150 380
EFT V4 - KSFU 25	80	138	126	180	1,520	153 336	150 160	150 390
EFT V5 - KSFU 25	98	156	144	198	1,640	156 132	152 160	152 270
EFT V6 - KSFU 25	116	174	162	216	1,760	153 335	152 280	152 290

Expansion sections



Type[3]	Weight kg	Order-No. (w/ PE) **HS**	Order-No. (w/o PE) **SS**	Type[3]	Weight kg	Order-No. (w/ PE) **HS**	Order-No. (w/o PE) **SS**
DVKS 3/ 60	1,900	153 230	153 240	**DVKS 5/ 60**	3,266	152 340	152 380
DVKS 3/100	2,090	153 250	150 551	**DVKS 5/100**	3,586	152 350	150 554
DVKS 3/120	2,215	153 623	150 552	**DVKS 5/120**	3,811	153 633	150 555
DVKS 3/140	2,346	156 588	156 589	**DVKS 5/140**	4,030	156 596	156 597
DVKS 4/ 60	2,412	150 480	150 510	**DVKS 6/ 60**	3,582	152 360	152 390
DVKS 4/100	2,662	150 490	150 516	**DVKS 6/100**	3,962	152 370	150 556
DVKS 4/120	2,852	153 628	150 553	**DVKS 6/120**	4,242	153 638	150 557
DVKS 4/140	3,027	156 590	156 595	**DVKS 6/140**	4,504	156 598	156 599

Application

Expansion sections are required to compensate for expansion and contraction in system expansion gaps (building or track).

The expansion capacity is 50 mm. More tolerance require more than one VKS expansion section.

They do not interrupt electrical power, so there is no need for an extra feeding. Expansion joints do not influence the voltage drop of a system.

Mounting

The expansion section is installed in the center between two fix points in the building/track expansion gap area.

The gap dimension “A” equals the gap of the building/track. See adjacent Fig. 1.

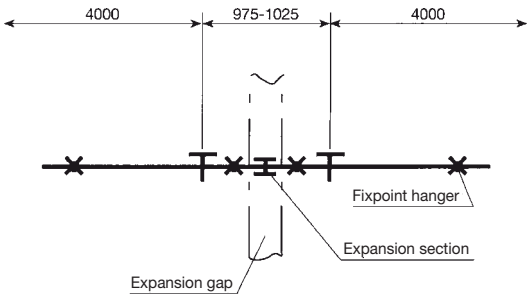


Fig. 1

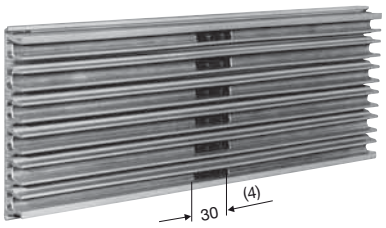
(1) Powerail section must be factory prepared.
Order separately for left hand VU…L, or for right hand VU…R.

(2) Higher speeds on request.

(3) Suffix types e. g. DVKS 3/10 with PE → DVKS 3/60 **HS** Order-No. 153 230.

Conductor dead section for control signals

(1) Position of the conductor dead section and item number of the conductor profile which has to be seperated have to be advised by ordering.

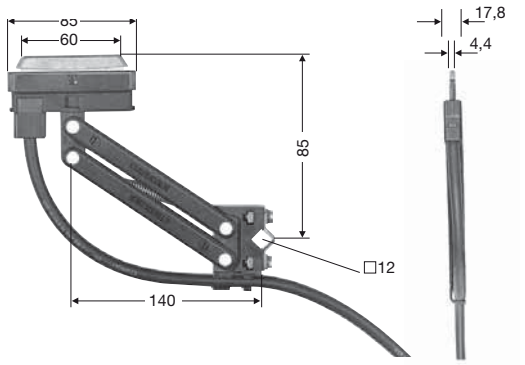


Type	Order-No.	Colour
VSTS 1/10-60 M	156 933	black
VSTS 1/100 M	150 150	black
VSTS 1/120 M	151 674	black
VSTS 1/140 M	156 335	black

M = factory assembled

Collector

with 2 m connecting cable; contact pressure: ~ 5 N



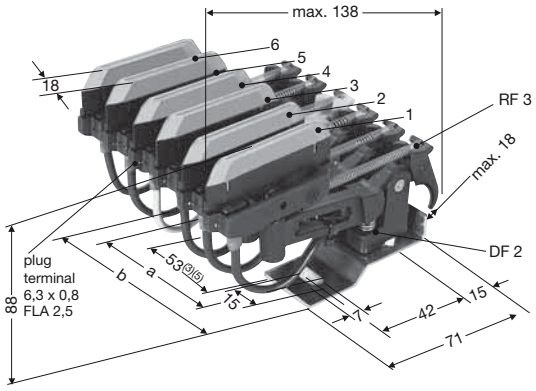
Type(2)	Am-pacity A	Conncting cable A/ mm²	d max/ mm	lift & swivel mm	Weight kg	Order-No. phase - PH	ground PE
KSTU 30(3)	30	2,50	5	± 20	0,240	152 087	152 088
KSTU 55(3)	55	6,00	11	± 20	0,368	154 441	154 442

For double arrangement of current collectors and support spacing for Powerail see page 5.

Compact collector

with 1 m connecting cable for transfer funnel EFT V... -KSFU 25
(in funnel area ±10 to all sides)

Phase distance 18 mm
Lift and swivel
Deflection ± 15 mm
Contact pressure:
approx. 3,5 N per carbon
PE on No. 4, with 3-poles on No. 3
other arrangements possible
PE is first contact while entering conductor rail



Dimensions of base plate see KSF 25

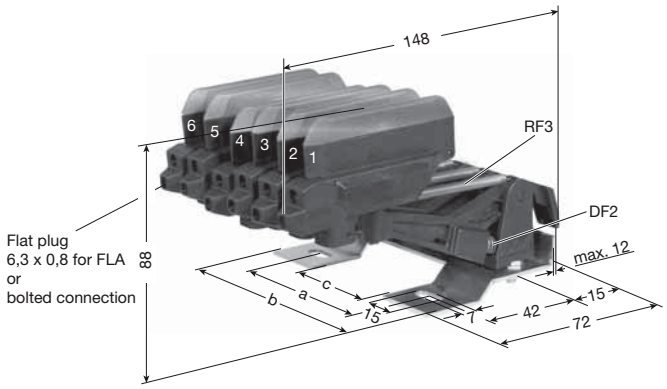
Type(2)	Poles	a(2) mm	b(2) mm	Weight kg	Order-No. with PE **HS**	w/o PE **ST**
KSFU 25-2	2	18	43	0,182	155 050	155 059
KSFU 25-3	3	54	79	0,295	155 051	155 060
KSFU 25-4	4	54	79	0,352	155 052	155 061
KSFU 25-5	5	80	115	0,460	155 053	155 062
KSFU 25-6	6	80	115	0,517	155 054	155 063
Separately available:					PH	ground
Collector **KSFU 25**					155 025	155 026

(1) Description of conductor profiles see page 6.
(2) Types to be completed e.g. KSTU 30 → KSTU 30 PH Order-No. 152 087
(3) Collectors for transfer funnel EFT V…– KSTU. In funnel area ± 15 mm to all sides.
(4) Length of the currentless track (longer designs on request)
(5) Only with 5 and 6-pole version.

Compact collector KESR 32-55
Two-way conveying

max. ampacity: 1 flat plug connection
32 A – FLA 2,5
40 A – FLA 4,0
55 A – FLA 6,0

Phase distance 18 mm
Lift and swivel
Deflection ± 15 mm
Contact pressure:
approx. 3,5 N per carbon
PE on No. 4, with 3-poles on No. 3
other arrangements possible
PE is first contact while entering conductor rail



Choice of connecting cable see page 18

KESR 32-55 F (Flat plug connection)

Type (1)	Poles	a(2) mm	b(2) mm	c(2) mm	Weight kg	Base plate	Order-No. with PE **HS**	Order-No. w/o PE **ST**
KESR 32-55 F- 3-18	3	54	79	-	0,393	4-poles (Nr. 4 = free)	157 285	157 290
KESR 32-55 F- 4-18	4	54	79	-	0,457	4-poles	157 286	157 291
KESR 32-55 F- 5-18	5	80	115	53	0,521	6-poles (Nr. 6 = free)	157 287	157 292
KESR 32-55 F- 6-18	6	80	115	53	0,585	6-poles	157 288	157 293
Separately available:							PH	ground
Collector **KESR 32-55 F/18**							157 274	157 275

KESR 32-55 S (Bolted connection)

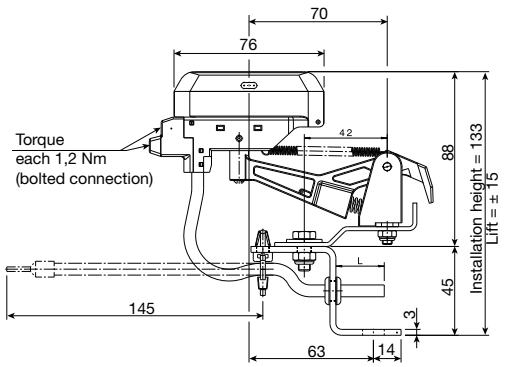
Typ(1)	Poles	a(2) mm	b(2) mm	c(2) mm	Weight kg	Base plate	Order-No. with PE **HS**	Order-No. w/o PE **ST**
KESR 32-55 S- 3-18	3	54	79	-	0,405	4-poles (Nr. 4 = free)	157 220	157 225
KESR 32-55 S- 4-18	4	54	79	-	0,476	4-poles	157 221	157 226
KESR 32-55 S- 5-18	5	80	115	53	0,547	6-poles (Nr. 6 = free)	157 222	157 227
KESR 32-55 S- 6-18	6	80	115	53	0,618	6-poles	157 223	157 228
Separately available:							PH	ground
Collector **KESR 32-55 S/18**							157 294	157 295

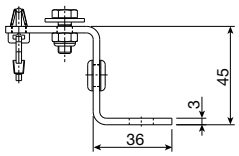
max. ampacity: 1 bolted connection
32 A – AEA 2,5
40 A – AEA 4,0
55 A – AEA 6,0

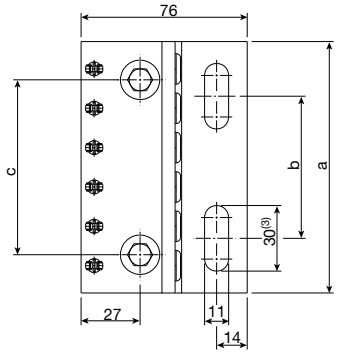
Adaptor for compact collectors

Type(1)	Poles	a(2) mm	b(2) mm	c(2) mm	Weight kg	Order-No.
AD4 - KESR/KESL	4	79	35	54	0,210	157 368
AD6 - KESR/KESL	6	115	65	80	0,310	157 367
AD8 - KESR/KESL	8	151	100	120	0,410	157 432

Ready assembled collectors incl.
Adaptor on request.





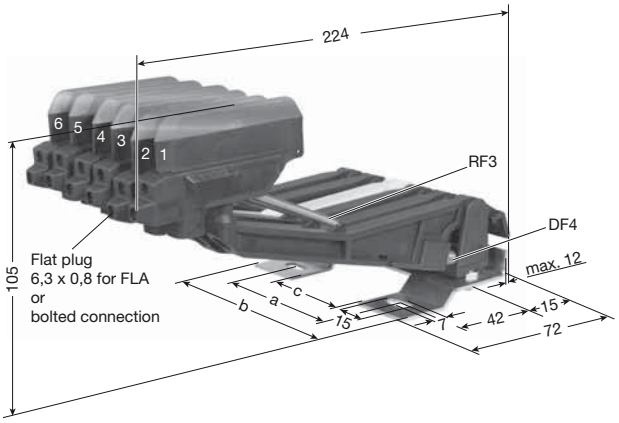


(1) Types to be completed e.g. KESR 32-55 S-4-18 with PE → KESR 32-55 S-4-18 **HS** Order-No. 157 221.
(2) Base plate with KESR and KSFU 25 allways with 2-, 4-, 6- or 8-poles.
Collector 3-poles: Base plate 4-poles, 4th pole free. Collector 5-poles: Base plate 6-poles, 6th pole free.
Collector 7-poles: Base plate 8-poles, 5th pole free.

Compact collector KESL 32-55
Two-way conveying

max. ampacity: 1 flat plug connection
32 A – FLA 2,5
40 A – FLA 4,0
55 A – FLA 6,0

Phase distance 18 mm
Lift and swivel
Deflection ± 30 mm
Contact pressure:
approx. 7 N per carbon
PE on No. 4, with 3-poles on No. 3
other arrangements possible
PE is first contact while entering
conductor rail



KESL 32-55 F (Flat plug connection)

Choice of connecting cable see page 18

Type(1)	Poles	a(2) mm	b(2) mm	c(2) mm	Weight kg	Base plate	Order-No. with PE **HS**	Order-No. w/o PE **ST**
KESL 32-55 F- 3-18	3	54	79	-	0,438	4-poles (Nr. 4 = free)	157 199	157 300
KESL 32-55 F- 4-18	4	54	79	-	0,517	4-poles	157 200	157 301
KESL 32-55 F- 5-18	5	80	115	53	0,596	6-poles (Nr. 6 = free)	157 201	157 302
KESL 32-55 F- 6-18	6	80	115	53	0,675	6-poles	157 202	157 303
Separately available:							PH	ground
Collector **KESL 32-55 F/18**							157 188	157 189

KESL 32-63 S (Bolted connection)

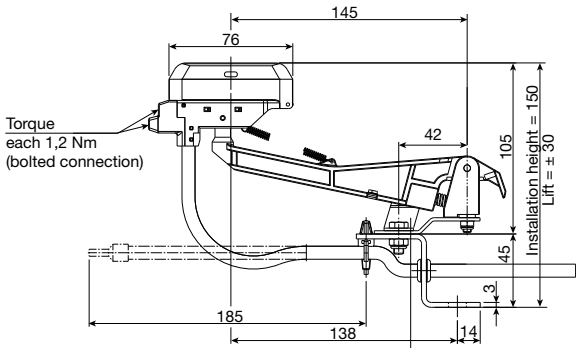
Typ(1)	Poles	a(2) mm	b(2) mm	c(2) mm	Weight kg	Base plate	Order-No. with PE **HS**	Order-No. w/o PE **ST**
KESL 32-63 S- 3-18	3	54	79	-	0,451	4-poles (Nr. 4 = free)	157 190	157 296
KESL 32-63 S- 4-18	4	54	79	-	0,537	4-poles	157 191	157 297
KESL 32-63 S- 5-18	5	80	115	53	0,623	6-poles (Nr. 6 = free)	157 192	157 298
KESL 32-63 S- 6-18	6	80	115	53	0,709	6-poles	157 193	157 299
Separately available:							PH	ground
Collector **KESL 32-63 S/18**							157 186	157 187

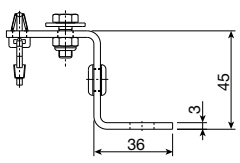
max. ampacity: 1 bolted connection
32 A – AEA 2,5
40 A – AEA 4,0
55 A – AEA 6,0
63 A - AEA 10,0

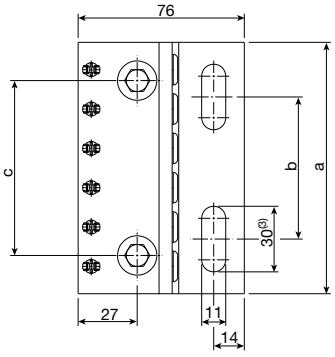
Adaptor for compact collectors

Typ(1)	Poles	a(2) mm	b(2) mm	c(2) mm	Weight kg	Order-No.
AD4 - KESR/KESL	4	79	35	54	0,210	157 368
AD6 - KESR/KESL	6	115	65	80	0,310	157 367
AD8 - KESR/KESL	8	151	100	120	0,410	157 432

Ready assembled collectors incl.
Adaptor on request.







(1) Types to be completed e.g. 32/63 with PE and bolted connection → KESL 32-63 S-4-18 **HS** Order-No. 157 191.
(2) Base plate with KESL and KSFU 25 allways with 2-, 4-, 6- or 8-poles.
Collector 3-poles: Base plate 4th pole free. Collector 5-poles: Base plate 6th pole free.
Collector 7-poles: Base plate 8th pole free.
(3) 25 at AD4 - KESR/KESL

ACCESSORIES FOR COLLECTOR VKS

Connecting cable FLA,

high flexible for collectors.

(Arrangement to the different collector types according to page 16 and 17)

Operating conditions -15 °C upto 70 °C

Length = 1 m with Flat plug 6,3 x 0,8
Longer connection cables available.

Table 1

Type	Cross section mm²	Outer-Ø mm	Weight kg	Order-No. Phase black	Order-No. PE green/yellow
FLA 2,5	2,50	4,00	0,080	165 049	165 050
FLA 4	4,00	6,00	0,100	165 051	165 052
FLA 6	6,00	7,00	0,150	166 368	166 369

Connecting cable AEA,

high flexible for collectors
Operating conditions: -15°C upto 70°C

Length: 1 m
Longer connection cables available.

Table 2

Type	Cross section mm²	Outer-Ø mm	Weight kg	Order-No. Phase black	Order-No. PE green/yellow
AEA 2,5	2,50	4,00	0,038	143 080	143 079
AEA 4,0	4,00	5,50	0,063	143 078	143 077
AEA 6,0	6,00	6,00	0,085	143 076	143 075
AEA 10,0	10,00	8,50	0,160	143 074	143 073

Flat plug bush, single

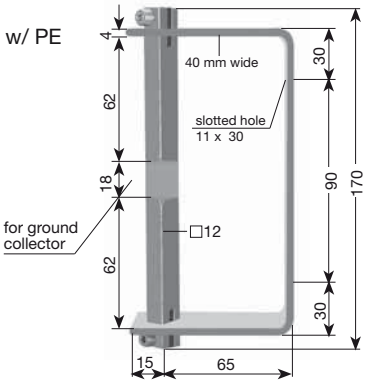
Type	for cable cross section mm²	Order.-No.
FH 2,5	2,50	165 120
FH 4-6	4,00 + 6,00	165 121

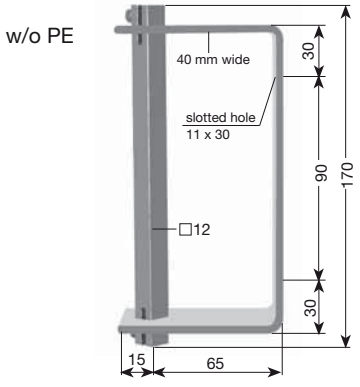
Length: 1 m with flat plug 6,3 x 0.8
Longer connection cables available

Towing arm

For current collectors
KSTU 30-55 see page 15

for control collectors
KSTU 30-55 see page 15

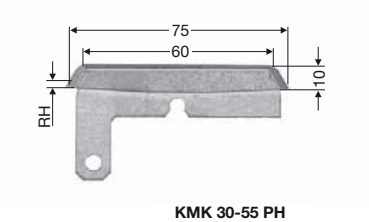




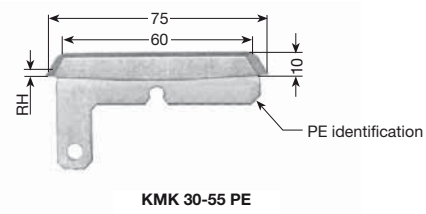
Type	Weight kg	Order-No.
UMAS 12 HS-B	0,600	152 232

Type	Weight kg	Order-No.
UMAS 12 ST	0,600	152 234

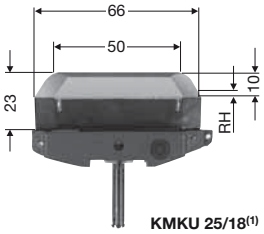
Brushes



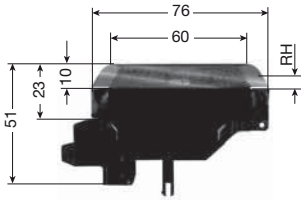
KMK 30-55 PH



KMK 30-55 PE



KMKU 25/18(1)



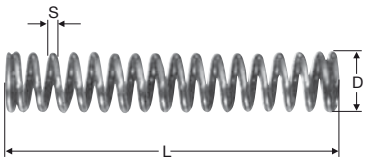
MK 55, MK 63

Dimension RH = allowed rest height

Type	for collectors	Thickness of brush	RH mm	Weight kg	Order-No.
KMK 30-55 PH	KSTU 30-55	4,40 mm	4,00	0,031	154 440
KMK 30-55 PE	KSTU 30-55	4,40 mm	4,00	0,034	154 453
KMKU 25/18	KSFU 25	4,20 mm	3,50	0,035	155 002
MK 55 F/18.28	KESR 32-55 F, KESL 32-55 F	4,20 mm	3,50	0,044	157 308
MK 63 S/18.28	KESR 32-55 S, KESL 32-63 S	4.20 mm	3,50	0,049	157 309

(1) 18 mm wide.

Springs



Pressure spring DF
Guiding spring GF

Tension spring ZF/RF

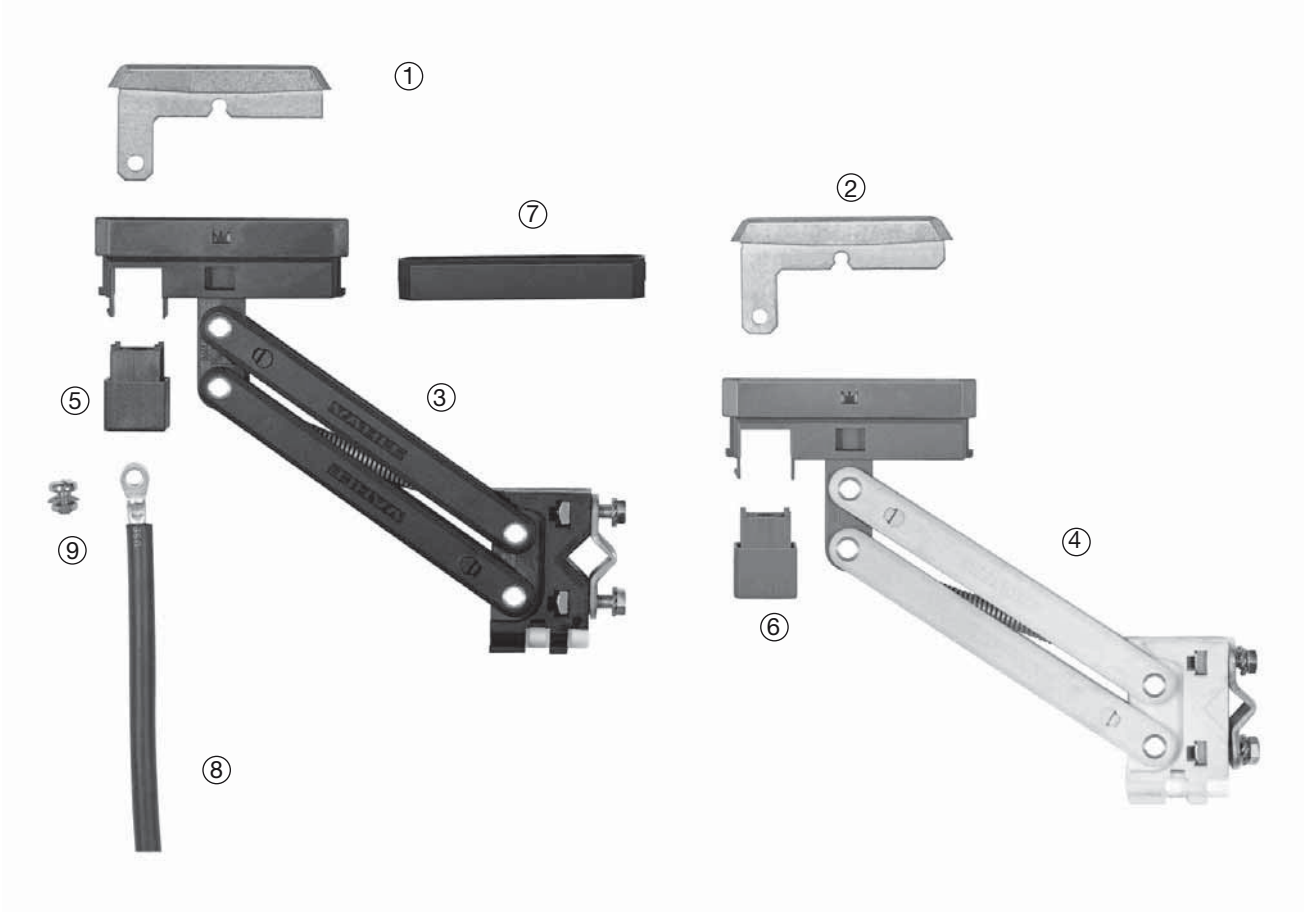
Type	for collectors	S mm	D mm	L mm	Order-No.
DF 2	KESR 32-55	0,90	7,70	43,00	153 848
RF 3	KSFU 25, KESR 32-55, KESL 32-63	0,40	4,40	31,00	153 849
DF 4	KESL 32-63	1,10	6,40	41,00	157 312

Spare parts

Type	Order-No.
Joint cap for VKS 3	152 012
Joint cap for VKS 4	152 013
Joint cap for VKS 5 and 6	152 014
Plug-in connector (1pole, copper) for VKS…/10 - 100 A	153 803
Plug-in connector (1 pole, copper, tin plated) for VKS…/120 - 140 A	152 672
Insulating piece for sectionalizing (1 pole) for VSTS 1/10 - 60 L	156 934
Insulating piece for sectionalizing (1 pole) for VSTS 1/10 - 100 L	150 419
Insulating piece for sectionalizing (1 pole) for VSTS 1/120 L	151 669
Insulating piece for sectionalizing (1 pole) for VSTS 1/140 L	156 336
Feed terminal, (1 pole) for line feed VNS	151 774
Feed terminal, (1 pole) for line feed VLS	153 603

Stromabnehmer KSTU 30-55

Teil-Nr.	Description		Weight kg	Order-No.
1	Brush	phase PH	0,031	154 440
2	Brush	ground PE	0,031	154 453
3	Collector arm KSTU, complete	phase PH	0,083	152 275
4	Collector arm KSTU, complete	ground PE	0,083	152 276
5	Cover cap	phase PH (black)	0,002	152 291
6	Cover cap	ground PE (green)	0,002	152 292
7	Distance spacer for KSTU 30-55		0,003	152 293
8	Connecting cable RKA 2,5 PH, 2 m long Connecting cable RKA 2,5 PE, 2 m long	phase PH ground PE	0,150 0,150	154 447 154 448
8	Connecting cable RKA 6 PH, 2 m long Connecting cable RKA 6 PE, 2 m long	phase PH ground PE	0,260 0,260	154 449 154 450
9	Connecting screw		0,002	152 658



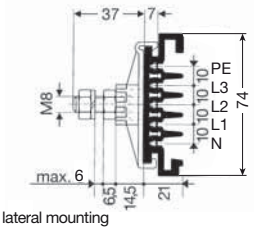
Straight sections

Standard section 4 m
Support spacing 1000 mm
Max. system length 100 m

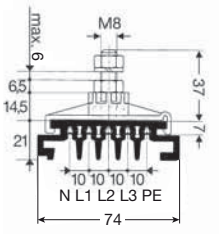
HS w/ PE
SS w/o PE

Type	Poles	Ampere rating continuous A	Voltage rating max. V	Voltage drop per 100 m at full rating V	Minimum clearance mm	Copper cross section (per conductor) mm^2	Weight kg / m	Order-No.
VKL 3/30 HS	3	30	400	10,3	15	9	1,104	281 19•
VKL 3/30 SS	3	30	400	10,3	15	9	1,104	281 20•
VKL 4/30 HS	4	30	400	10,3	5,5	9	1,180	281 21•
VKL 4/30 SS	4	30	400	10,3	5,5	9	1,180	281 22•
VKL 5/30 HS	5	30	400	10,3	5,5	9	1,256	281 23•
VKL 5/30 SS	5	30	400	10,3	5,5	9	1,256	281 24•

5-poles ↓	4-poles ↓	3-poles ↓	5-poles ↓	4-poles ↓	3-poles ↓
Power HS			**Control SS**		
PE	PE	PE	1	1	1
L3	L3		2	2	
L2	L2	L	3	3	3
L1	L1		4	4	
N		N	5		5



lateral mounting



suspended mounting

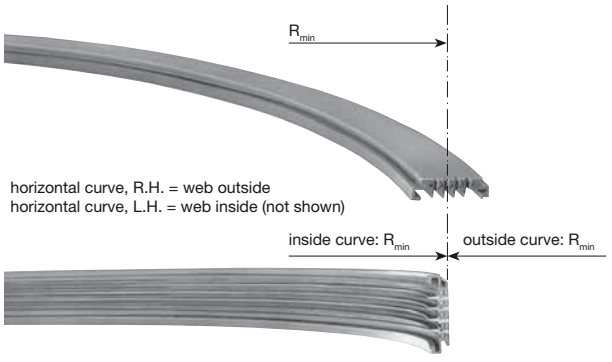
- Suffix types e. g. **2 m** VKL 4/30 w/ PE → VKL 4/30 - **2 HS** Order-No. 281 212.
  Shorter sections are made up from the next larger standard length.

Curved sections[1]

max. L = 3.60 m, support spacing ~ 500 mm

according to your layout drawing

	R_{min} mm	Surcharge Order-No. **VKL**
Horizontal curve, R.H.	600	280 510
Horizontal curve, L.H.	600	280 100
Inside curve, lateral	600	280 520
Outside curve, lateral	400	280 090

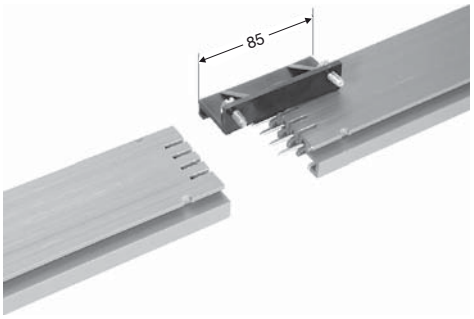


horizontal curve, R.H. = web outside
horizontal curve, L.H. = web inside (not shown)

inside curve, lateral = conductors inside
outside curve, lateral = conductors outside (not shown)

(1) Curves with less than 2000 mm radius will be factory prepared with a 100 mm straight section on both ends – for easy connection. Horizontal curves with more than 90 degrees should be divided in two or more sections.

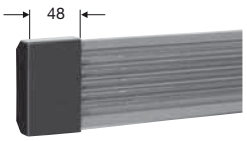
Joint Material



Type	No. of conductors	Weight kg	Order-No.
LV 3	3	0,082	281 250
LV 4	4	0,084	281 251
LV 5	5	0,086	281 252

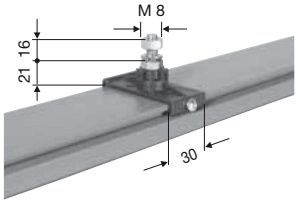
End cap

suitable for left hand and right hand installation



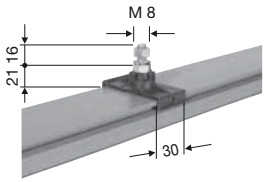
Type	Weight kg	Order-No.
VE	0,040	280 160

Fixpoint hanger



Type	Weight kg	Order-No.
VEP	0,053	281 470

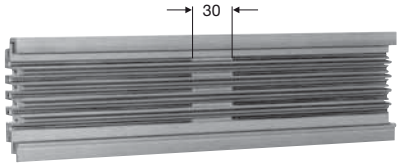
Sliding hanger



Type	Weight kg	Order-No.
VA	0,050	281 438

Conductor dead section for control signals[2]

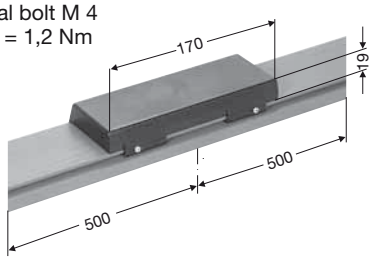
Please indicate where and which conductors are to be interrupted.



Type	Order-No.
VST 1	280 200
VST 2	280 210
VST 3	280 220
VST 4	280 230
VST 5	280 240

Line feed[1]

for direct cable connection
max. cable outer Ø 16.5 mm,
max. cable-cross-section 4 mm^2
terminal bolt M 4
torque = 1,2 Nm



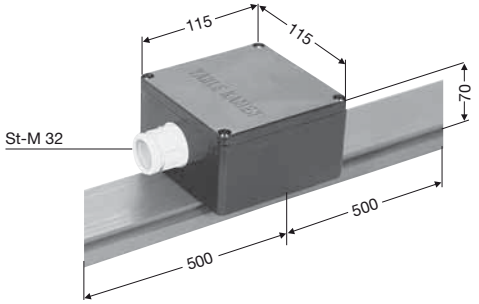
Connecting cable has to be provided by customer.

Type[3]	A	Weight kg	Order-No. (w/ PE) **HS**	Order-No. w/o PE) **SS**
VLE 3/30	30	1,740	281 325	281 326
VLE 4/30	30	1,900	281 327	281 328
VLE 5/30	30	2,065	281 329	281 330

(1) The Line feeds come ready assembled on 1 m Powerail sections. Cable by others.
(2) Terminal markings see page 23.
(3) Suffix types e. g. VLE 3/30 w/ PE → VLE 3/30 **HS** Order-No. 281 325.

Line feed[1]

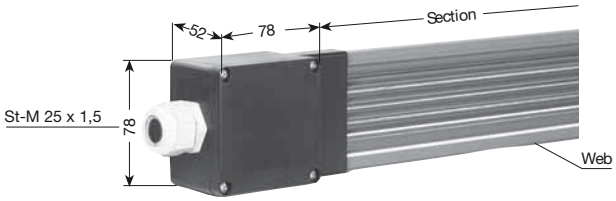
with terminal box for connecting cable 4 mm²
terminal bolt M 4 – Torque = 1,2 Nm



Type[2]	A	Weight kg	Order-No. w/ PE **HS**	Order-No. w/o PE **SS**
VNK 3/30	30	1,750	281 331	281 332
VNK 4/30	30	1,950	281 333	281 334
VNK 5/30	30	2,100	281 335	281 336

End feed, loose

cable gland to 4 mm²

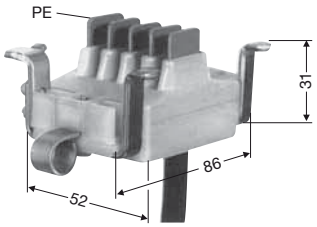


Installation left or right possible for power and control

Type[2]	A	Weight kg	Order-No.
VEK 3-5	30	0,140	281 436

Current collector VSR

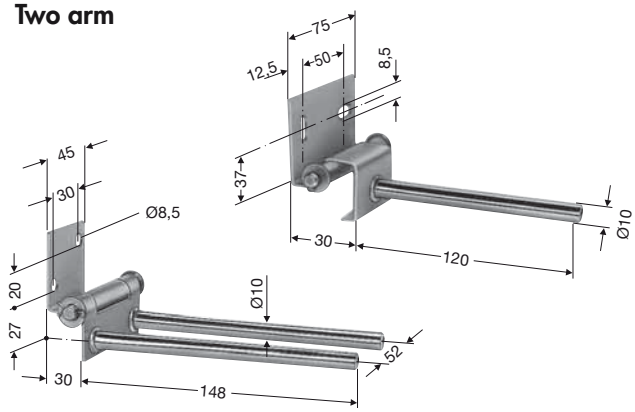
for straight and curved runs
travelling speed: 60 m/min. in curves
120 m/min. for straight runs
carbon brushes not replacable.



connecting cable: 1,5 mm² (1 m long)

Type[2]	A	No. of poles	Weight kg	Order-No. w/ PE **HS**	Order-No. w/o PE **ST**
VSR 3/10	10	3	0,330	280 250	281 172
VSR 4/10	10	4	0,360	280 260	281 171
VSR 5/10	10	5	0,420	280 270	281 189

Two arm

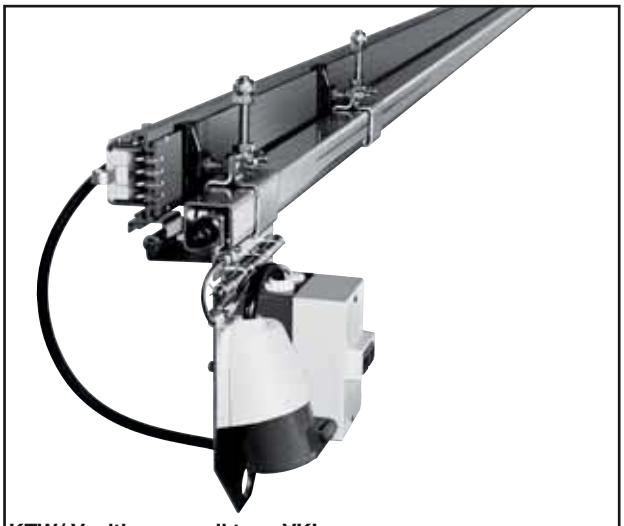


Type	Weight kg	Order-No.
VM for single collectors	0,190	280 310
AM for double collectors (2 x VSR)	0,225	280 640

VAHLE KTW/V-System

These systems are unique to feed electric tools, such as drilling machines, grinders, screw drivers etc. along assembly lines or above work benches in any type of plant.
No power cables on the floor to cause accidents and no obstruction to personnel by trailing cables.
Containers or baskets carrying bolts and nuts or other hardware for the assembling work can also be supported from and pushed along the carrier rail.
The KTW-Systems comprise a galvanized C-track taking the carrier trolleys or other hook-up elements, and the plastic- Enclosed Powerail with 3 to 6 conductors of 30 to 200 Amp. capacity.
Carrier rail and Powerail are attached to common brackets which serve as suspension structure.
The Collector has a mechanical towing arm connection to the Carrier Trolley and the pick-up cable will feed into a plug and socket system or circuit breaker unit. These units as per customer's choice are mounted to the attachment plate of the carrier trolley. The elements can be factory assembled by us or field mounted.

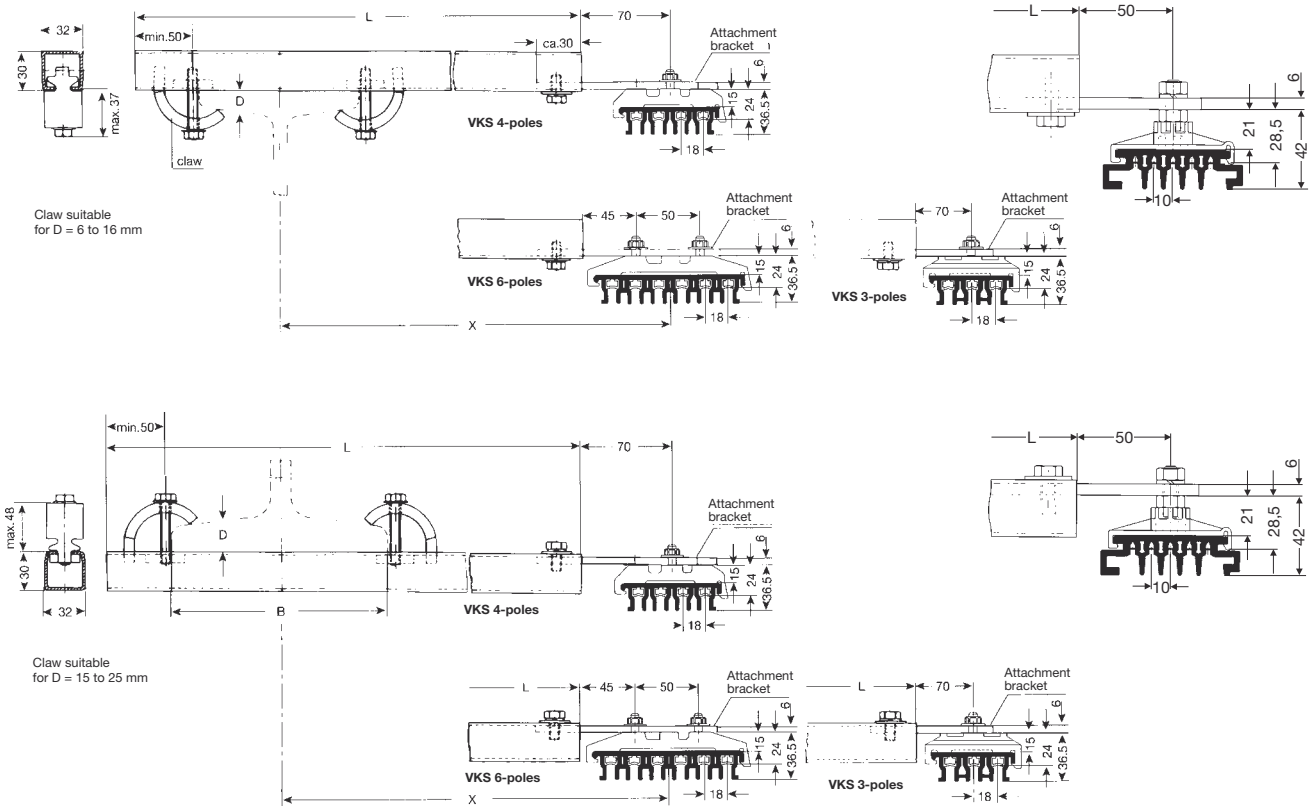
Ask for more details. Further literature on KTW-systems is available.



KTW/ V with powerail type VKL

[1] End feed comes loose in components. Powerail section is to be ordered separately (see Page 23).
[2] Suffix types e. g. VNK 3/30 w/ PE → VNK 3/30 **HS** Order-No. 281 331.

Brackets



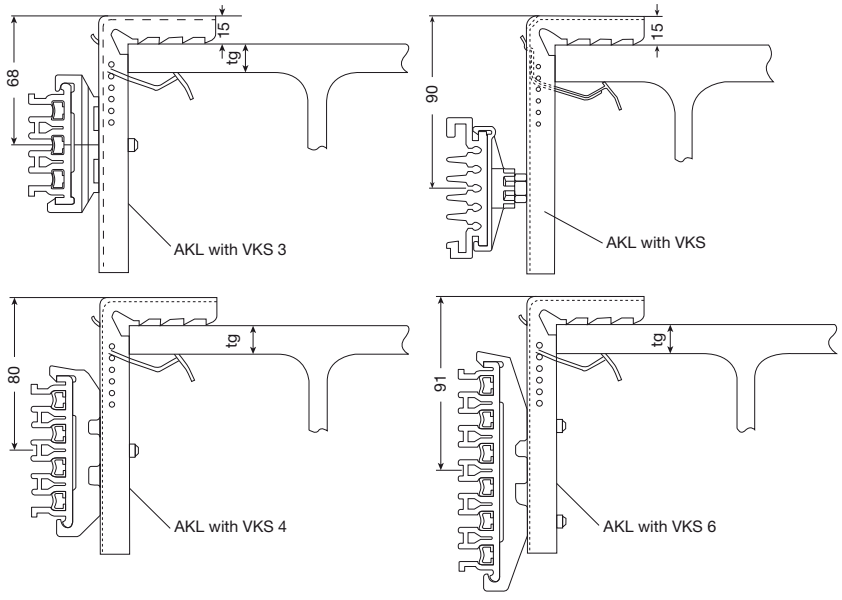
Attention! Make sure that hoist wheels of monorail systems have enough clearance.

C-rail of HKV is identical to type S 1, cat. 8 a

Hangers to be ordered separately

The corresponding beam width (B_{max}) could be enlarged by a reduction of X.

Type[1]	X mm	L mm	B_{max} mm	Weight kg	Order-No. VKS	Order-No. VKL
HK... 200	200	300	90	0,920	150 600	280 550
HK... 250	250	350	180	0,970	150 610	280 560
HK... 300	300	400	230	1,020	150 620	280 570
HK... 400	400	500	230	1,120	150 630	280 580
HK... 500	500	600	230	1,220	150 640	280 590
HK... 600	600	700	230	1,320	150 650	280 600
HK... 700	700	800	230	1,420	150 660	280 610
HK... 750	750	850	230	1,470	150 670	280 620
HK... 800	800	900	230	1,560	150 680	280 630



Snap-on brackets

Snap-on brackets facilitate installation of Powerails on flat flange beams IPE, IPB, IPPBI and IPBv.
They are adjustable to suit beam flange dimensions (tg) of up to 43 mm.

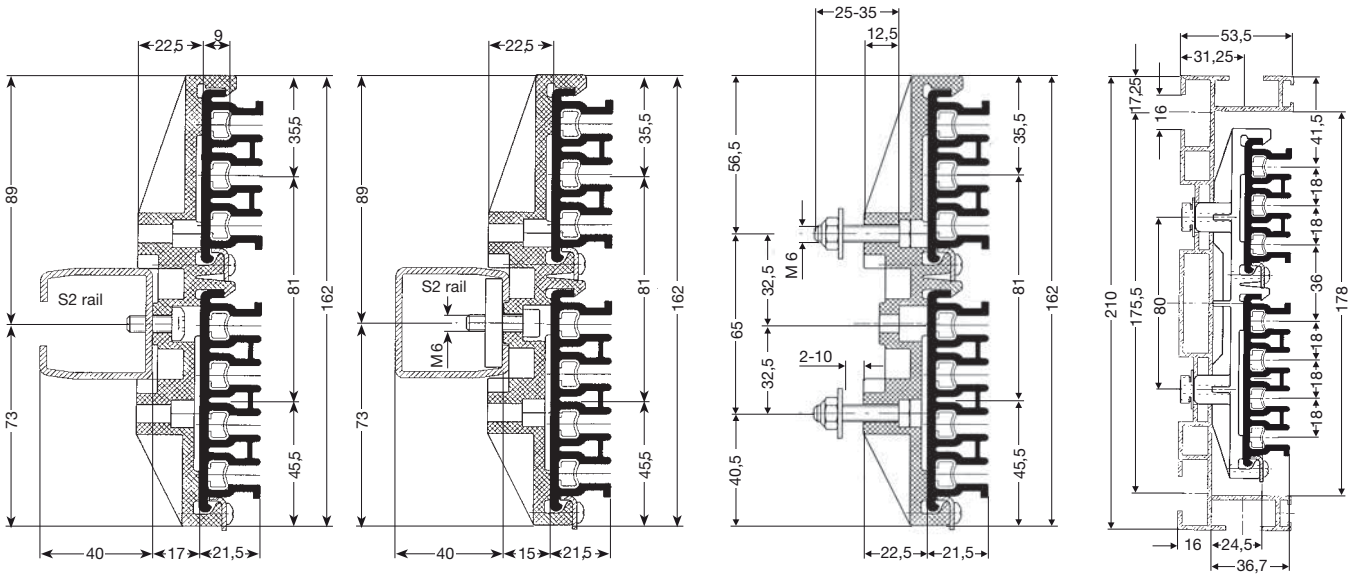
Type	AKL		
Beam flange tg/mm	8-13	14-19	20-25
	26-31	32-37	38-43
Weight/kg	0,184		
Order-No.	151 925		

Hangers for powerail to be ordered separately.

[1]Please complete Types p. e. for VKS → HKVKS 200
for VKL → HKVKL 200

Fixpoint hanger VEPS and Sliding hanger VAS

This system combines a VKS 4-pole and VKS 3-pole Powerail in a common hanger clamp. Possible fixing methods are shown below. All available VKS 4-pole and VKS 3-pole Powerails can be combined. All standard components of VKS Powerails cn be used. Restrictions apply to line feeds VNS, end feeds VEKS, transfers and towing arms (consult factory for these components).

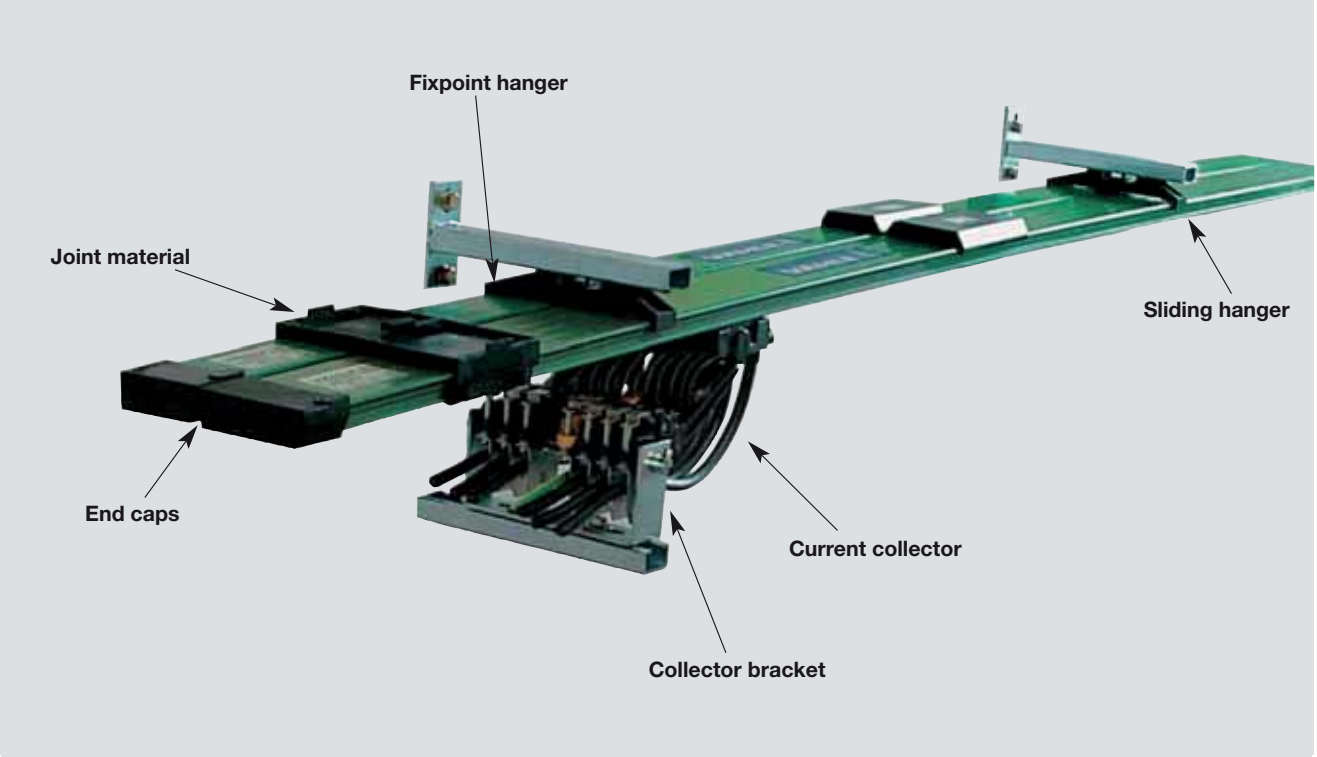


Type	Wght. kg	Order-No.
VEPS 4/3 SF M 6x16	0,100	156 114
VAS 4/3 SF M 6x16	0,080	156 115

Type	Wght. kg	Order-No.
VEPS 4/3 GP M 6	0,121	156 116
VAS 4/3 GP M 6	0,101	156 117

Type	Wght. kg	Order-No.
VEPS 4/3 M 6 x 35	0,119	156 772
VAS 4/3 M 6 x 35	0,099	156 089

Type	Wght. kg	Order-No.
VEPS 4/3 - GS	0,061	156 439
VAS 4/3 - GS	0,053	156 440

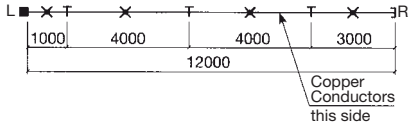


Straight track with end feed[1]

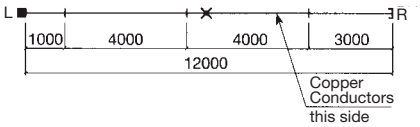
12 m VKS 3/100 HS; 12 m VKL 3/30 HS

L = left side
R = right side

Layout VKS:



Layout VKL:



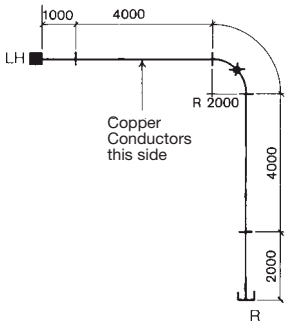
Qty	Description	Type	Order.-No.	Qty	Type	Order-No.
2	Powerails, 4 m long	**VKS 3/100-4 HS**	153 904	2	**VKL 3/30-4 HS**	281 194
1	Powerail, 3 m long	**VKS 3/100-3 HS**	153 903	1	**VKL 3/30-3 HS**	281 193
1	Powerail, 1 m long	**VKS 3/100-1 HS**	153 901	1	**VKL 3/30-1 HS**	281 191
3	Joint material	**SVN 3/10-100**	156 533	3	**LV 3**	281 250
4	Fixpoint hanger	**VEPS 3**	153 070	1	**VEP**	281 470
10	Sliding hangers	**VAS 3**	153 060	10	**VA**	281 438
1	End cap	**VES 3**	153 080	1	**VE**	280 160
1	End feed	**VEKS 3/10-120 L**	156 422	1	**VEK 3-5**	281 436
1	Collector	**KESR 32-55F-3-18 HS**	157 285	1	**VSR 3/10 HS**	280 250
–	Tow arm	**–**	–	1	**VM**	280 310
14	Support bracket	**HKVKS 300**	150 620	14	**HKVKL 300**	280 570

Curved track with end feed[1]

14,142 m VKL 5/30 HS

L = left side
R = right side

Qty	Description	Type	Order-No.
2	Powerails, 4 m long	**VKL 5/30-4 HS**	281 234
1	Powerail, 2 m long	**VKL 5/30-2 HS**	281 232
1	Powerail, 4 m long for inside curve lateral 90°; R = 2000 mm; L = 3,142 m	**VKL 5/30-4 HS**	281 234
1	Bending surcharge for inside curve lateral		280 520
4	Joint material	**LV 5**	281 252
1	Fixpoint hanger	**VEP**	281 470
15	Sliding hangers	**VA**	281 438
1	End cap	**VE**	280 160
1	End feed, 1 m long	**VEK 3-5**	281 436
1	Collector	**VSR 5/10 HS**	280 270
1	Tow arm	**VM**	280 310

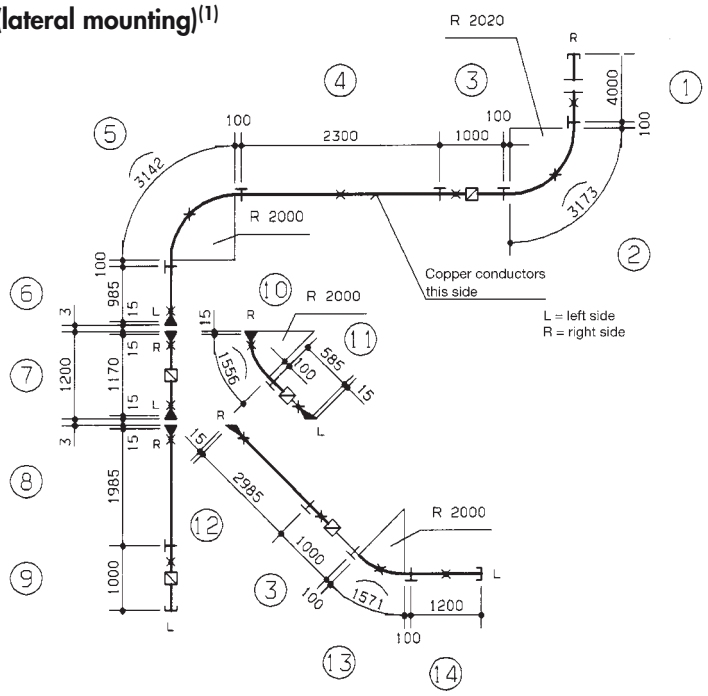


[1] Layout symbols see page 5.

EXAMPLE FOR ORDERING VKS

Curved track with switch (lateral mounting)[1]

27,857 m VKS 6/60 HS



Qty	Description	Type	Order-No.	Position
1	Powerail, 4 m long	**VKS 6/60-4 HS**	154 194	①
2	Powerails, 3 m long cut to: 1 x 2,985 m 1 x 2,300 m	**VKS 6/60-3 HS**	154 193	⑫ ④
3	Powerails, 2 m long cut to: 1 x 1,985 m 1 x 1,200 m 1 x 1,170 m	**VKS 6/60-2 HS**	154 192	⑧ ⑭ ⑦
3	Powerails, 1 m long	**VKS 6/60-1 HS**	154 191	③ ⑨
2	Powerails, 1 m long cut to: 1 x 0,985 m 1 x 0,585 m	**VKS 6/60-1 HS**	154 191	⑥ ⑪
2	Powerails, 4 m long 1 x for outside curve 90°; R = 2020 mm; L = 3,373 m 1 x for inside curve 90°; R = 2000 mm; L = 3,342 m	**VKS 6/60-4 HS**	154 194	② ⑤
2	Powerails, 2 m long 1 x for outside curve ~ 45°; R = 2000 mm; L = 1,656 m 1 x for inside curve 45°; R = 2000 mm; L = 1,771 m	**VKS 6/60-2 HS**	154 192	⑩ ⑬
1	Bending surcharge (outside curve)		152 100	
3	Bending surcharge (inside curve)		153 722	
10	Joint material	**SVN 6/10-100**	156 539	
16	Fixpoint hangers	**VEPS 6**	152 120	
22	Sliding hangers	**VAS 6**	152 130	
3	End caps on above position 1, 9, 14	**VES 6-M**	152 021	
3	Line feeds, 1 m long	**VLS 6/60 HS**	150 240	③ ⑨
2	Line feeds installed on items 3, 7, 9, 11	**VLS 6/60 HS**	156 945	
3	transfer guides, left installed on items 6, 7, 11	**VU 6 S-M**	153 801	
4	Transfer guides, right installed on items 7, 8, 10, 12	**VU 6 S-M**	153 802	
1	Compact collector, Ground on No. 3	**KESR 32-55S-6-18 HS**	157 223	

[1] Layout symbols see page 5

QUESTIONNAIRE FOR VKS AND VKL

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 (1)
   - ☐ 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(1): _____
13. Position and number of dead sections (e.g. maintenance bays)(1) _____
14. How will the conductor system be arranged?(1): _____
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 (2)	Power KW	Nominal current			Starting current		Type of–Motors(2)
		A	cos φ_N	% ED	A	cos φ_A			A	cos φ_N	% ED	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) Sketch required
(2) 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.

Catalog No. 3b/E 2010

Products and Service

MANAGEMENTSYSTEM

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

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