

POWERRAIL ENCLOSED CONDUCTOR SYSTEM

VKS 10



POWERRAIL ENCLOSED CONDUCTORS VKS 10

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General

VAHLE Powerail Enclosed Conductors type VKS 10 are compact and shock hazard protected safety powerails. They consist of a flat-formed 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 IP21 standards. Collectors are proof against touch only when fully entered into the powerail.

Powerail installations within reach of hand require a special protection on the part of the operator against accidental touch of current collectors which are leaving the powerail (e.g. locking or cut-off the power).

This is only applicable for voltages above 25 V AC respectively 60 V 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 powerail is only suitable for indoor installations and lateral positioning.

UL approved (Underwriter's Laboratories).

Product development in cooperation with the company TGW, Wels, Austria

Powerail electrical values:

VKS 10

max. continuous current	= 140 A ⁽²⁾
Permitted operating voltage (UL)	= 690 V (600 V)
Dielectric strength in accord. with DIN 53481	= 30-40 kV/mm
Specific resistance in acc. with DIN 53482	= 5×10^{15} Ohm/cm
Surface resistivity DIN 53482	= 10^{13} Ohm
Leakage resistance in acc. with IEC 112/VDE 0303	= CTI 600-1.1
Combustibility in acc. with DIN 4102, part 1: Class B1, flame retardant, self-extinguishing.	

Chemical resistance of the insulated housing

Petrol, mineral oil, greases	resistant
Caustic soda up to 50 %	resistant
Hydrochloric acid, concentrated	resistant
Sulfuric acid up to 50 %	resistant

Water absorption: max. at 20 °C = 0.06%

Ambient temperature:

from -30 °C to + 55 °C
 Max. temperature differences: 50 °C ($50 \leq \Delta T$)⁽³⁾
 from -10 °C to + 55 °C with supply length of > 4 m
 from -30 °C bis + 20 °C with supply length = 4 m

Conductor material	Copper				Units
	16	25	30	35	
Cross section					mm ²
Impedance at 50 Hz	1,106	0,728	0,602	0,518	Ohm/1000 m
Resistance	1,102	0,723	0,595	0,510	Ohm/1000 m
Ampacity	60	100	120	140 ⁽²⁾	Amp

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 powerail system includes with curves or rail section isolation

Please use our questionnaire on pages 18 and 19

⁽¹⁾ Please submit with your inquiry!

⁽²⁾ 80% duty cycle

⁽³⁾ Cold store applications on request



VKS-10 Powerail

Area of application: Indoor installation

Mounting position: lateral only

Sections:

The insulated housing accommodates up to 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.

Joints:

The insulated housing sections are connected with joint caps, the conductors are joined with copper push-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 powerail section.

The end feeds are supplied loose and can only be used in conjunction with the VLS line feed.

Hangers:

The maximum distance between suspension points must not exceed 1.2 m. The hangers are available for the following mounting options:

- for assembly in VAHLE support profile (self-locking)
- for assembly in c-rail (bolted type)
- for assembly to plain surface (bolted type)

The powerail can move with the sliding hangers for longitudinal expansion. One fixpoint hanger is required for each powerail section.

Powerail section isolators:

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.

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 rust-free metal parts. The current is transmitted by a carbon brush. According to the application, one or more current collectors are required per phase and per ground conductor. The current collectors for the ground conductor are color-coded yellow and are equipped with different fixings to make them non-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 connection cables provided (H07 RN-F) are adequately sized for the specified nominal current. Reduction factors in accordance with DIN VDE 0298-4 are to be taken into account for various layout methods.

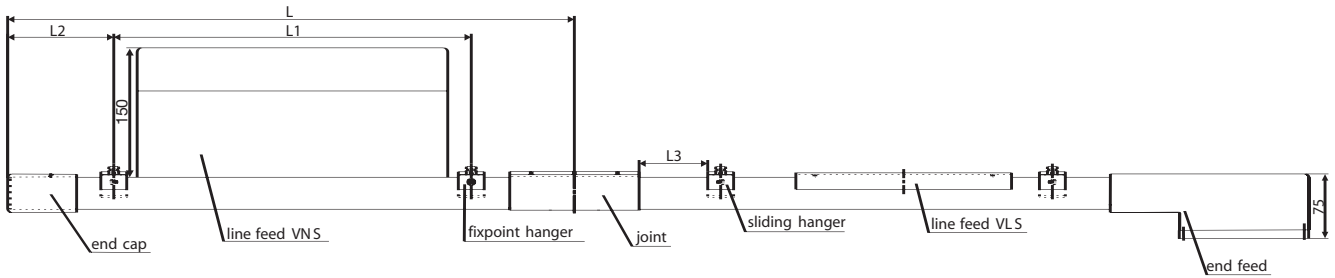
Risk of pinching

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.



PLANNING GUIDE VKS 10

1. System diagram



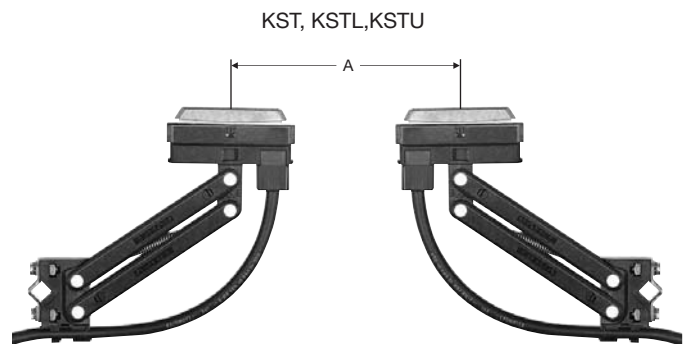
L = length of powerail section
 L₁ = distance for straight runs: max. 1.2 m
 in curves: max. 0.6 m
 L₂ = overhang (max. 200 mm)
 L₃ = distance, to be allowed for powerail expansion (min. 50 mm)

2. Symbols used in installation drawing

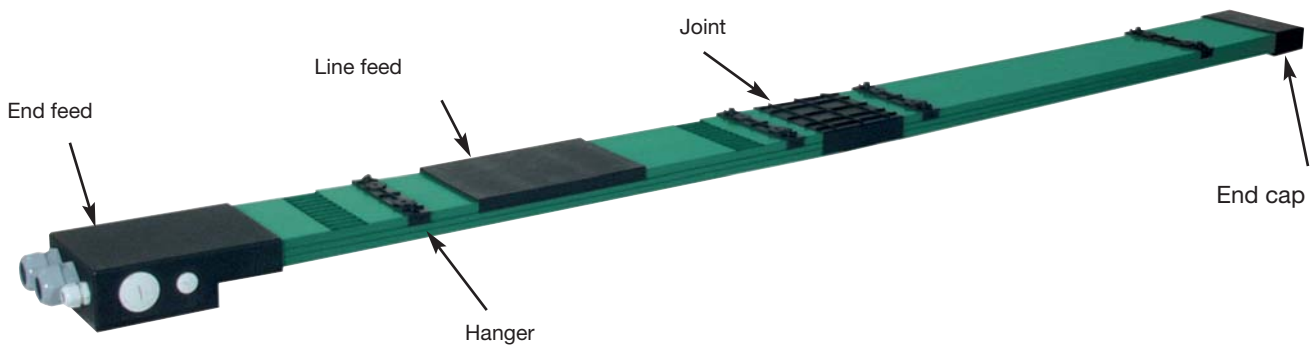
Symbol	Description	VKS 10
---	Runway	-
—	Powerail	VKS 10
— T —	Joint	SV
— X —	Fixpoint hanger	VEPS
— ● —	Sliding hanger	VAS
— F —	End cap	VES
— ■ —	End feed	VEKS
— ■ —	Line feed	VLS, VNS
— ■ —	Section isolator	VSTS
— F —	Transfer funnel	EFT- V10

3. Max. hanger distance

- a) Powerail VKS 10
 - in straight runs 1.2 m
 - in curves 0.6 m
- b) support profile VTP 10
 - on rack uprights 4.5 m
 - on support posts 4.0 m



A > 250 mm KST, KSTL, KSTU
 A > 150 mm KESR



Lateral mounting only



VKS 10 in high bay warehouses

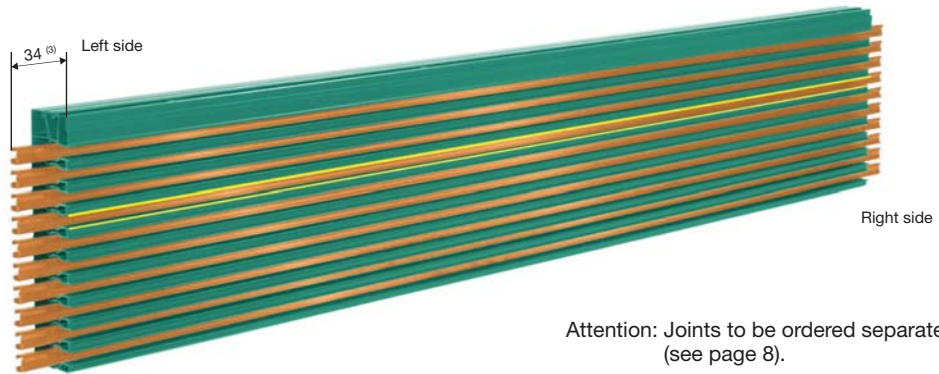




TECHNICAL DATA VKS 10

Sections

Standard lengths: 6 m
Cold stores: 4 m



HS= with ground (PE)

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

Type	No. of Conductors	Max. continuous current A at 35 °C	Max. voltage V	Conductor cross section mm ²			Conductor material	weight kg/m	Order no.
				L1-L3	Ground	5-10 ⁽⁴⁾			
VKS 10-6/ 60-6 HS	6	60	690	3 x 16	1 x 16	2 x 16	Cu	2.30	780 04•
VKS 10-6/100-6 HS	6	100	690	3 x 25	1 x 16	2 x 16	Cu	2.54	780 05•
VKS 10-6/120-6 HS	6	120	690	3 x 30	1 x 16	2 x 16	Cu	2.64	780 06•
VKS 10-6/140-6 HS	6	140 ⁽¹⁾	690	3 x 35	1 x 16	2 x 16	Cu	2.81	780 07•
VKS 10-7/ 60-6 HS	7	60	690	3 x 16	1 x 16	3 x 16	Cu	2.45	780 03•
VKS 10-7/100-6 HS	7	100	690	3 x 25	1 x 16	3 x 16	Cu	2.68	780 08•
VKS 10-7/120-6 HS	7	120	690	3 x 30	1 x 16	3 x 16	Cu	2.81	780 09•
VKS 10-7/140-6 HS	7	140 ⁽¹⁾	690	3 x 35	1 x 16	3 x 16	Cu	2.95	780 01•
VKS 10-8/ 60-6 HS	8	60	690	3 x 16	1 x 16	4 x 16	Cu	2.59	780 21•
VKS 10-8/100-6 HS	8	100	690	3 x 25	1 x 16	4 x 16	Cu	2.83	780 22•
VKS 10-8/120-6 HS	8	120	690	3 x 30	1 x 16	4 x 16	Cu	2.96	780 23•
VKS 10-8/140-6 HS	8	140 ⁽¹⁾	690	3 x 35	1 x 16	4 x 16	Cu	3.09	780 24•
VKS 10-9/ 60-6 HS	9	60	690	3 x 16	1 x 16	5 x 16	Cu	2.74	780 25•
VKS 10-9/100-6 HS	9	100	690	3 x 25	1 x 16	5 x 16	Cu	2.97	780 26•
VKS 10-9/120-6 HS	9	120	690	3 x 30	1 x 16	5 x 16	Cu	3.11	780 27•
VKS 10-9/140-6 HS	9	140 ⁽¹⁾	690	3 x 35	1 x 16	5 x 16	Cu	3.24	780 28•
VKS 10-9/200-6 HS	9	200 ⁽²⁾	690	6 x 25	1 x 25	2 x 16	Cu	3.28	780 14•
VKS 10-9/240-6 HS	9	240 ⁽²⁾	690	6 x 30	1 x 30	2 x 16	Cu	3.60	780 13•
VKS 10-9/280-6 HS	9	280 ^{(1) (2)}	690	6 x 35	1 x 35	2 x 16	Cu	3.91	780 12•
VKS 10-10/ 60-6 HS	10	60	690	3 x 16	1 x 16	6 x 16	Cu	2.88	780 29•
VKS 10-10/100-6 HS	10	100	690	3 x 25	1 x 16	6 x 16	Cu	3.11	780 20•
VKS 10-10/120-6 HS	10	120	690	3 x 30	1 x 16	6 x 16	Cu	3.25	780 30•
VKS 10-10/140-6 HS	10	140 ⁽¹⁾	690	3 x 35	1 x 16	6 x 16	Cu	3.38	780 31•
VKS 10-10/200-6 HS	10	200 ⁽²⁾	690	6 x 25	1 x 25	3 x 16	Cu	3.43	780 10•
VKS 10-10/240-6 HS	10	240 ⁽²⁾	690	6 x 30	1 x 30	3 x 16	Cu	3.74	780 11•
VKS 10-10/280-6 HS	10	280 ^{(1) (2)}	690	6 x 35	1 x 35	3 x 16	Cu	4.05	780 02•

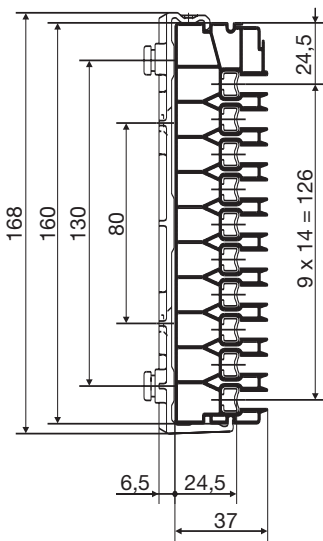
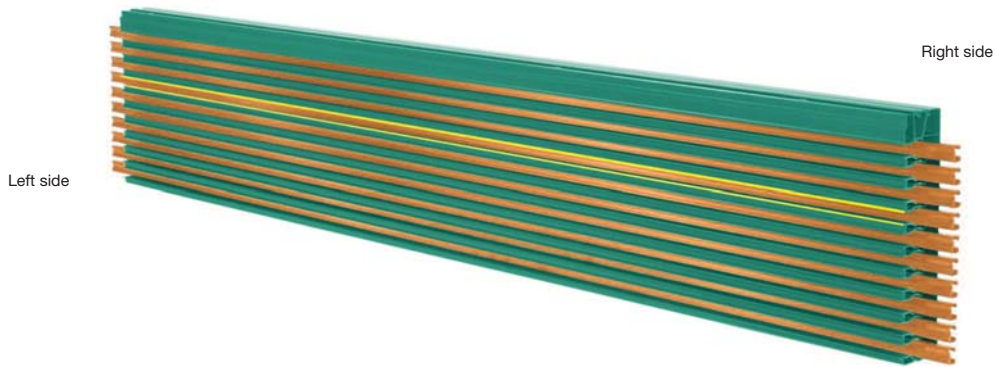
⁽¹⁾ At 80% duty cycle

⁽²⁾ 2 conductors per phase.

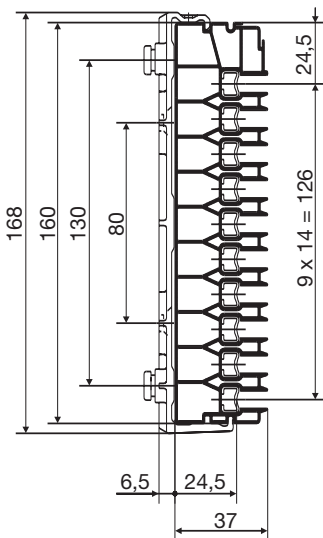
⁽³⁾ Powerail projecting length 34 mm at 20 °C ambient.

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

• Supplement type designations, e.g. **2 m** VKS 10-6/60 with PE (ground)
→ VKS 10-6/60 - **2 HS** Order no. 780042.



VKS 10-6/ 60-140	VKS 10-7/ 60-140	VKS 10-8/ 60-140
L1	L1	L1
L2	L2	L2
L3	L3	L3
PE (ground)	PE (ground)	PE (ground)
5	5	5
6	6	6
Free	7	7
Free	Free	8
Free	Free	Free
Free	Free	Free



VKS 10-9/ 60-140	VKS 10-9/ 200-280	VKS 10-10/ 60-140	VKS 10-10/200-280
L1	L1	L1	L1
L2	L2	L2	L2
L3	L3	L3	L3
PE (ground)	PE	PE (ground)	PE (ground)
5	5	L1	
6	L2	6	L2
7	L3	7	L3
8	8	8	8
9	9	9	9
Free	Free	10	10

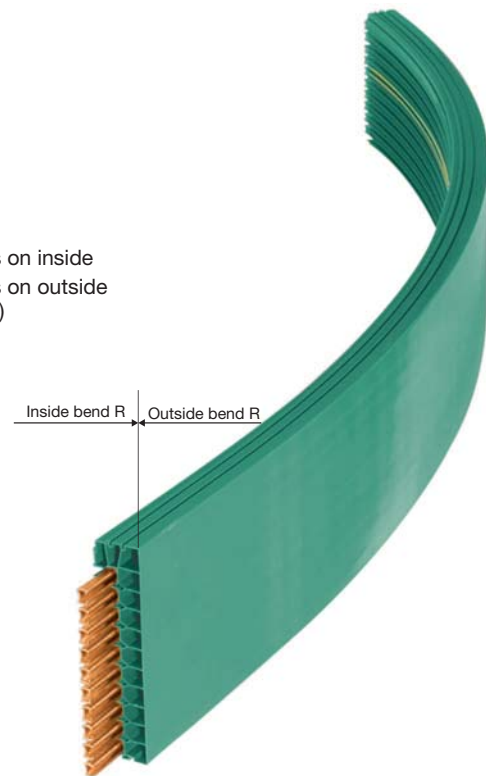


CURVED SECTIONS AND JOINTS VKS 10

Curved sections

vertical in accordance with your design drawings

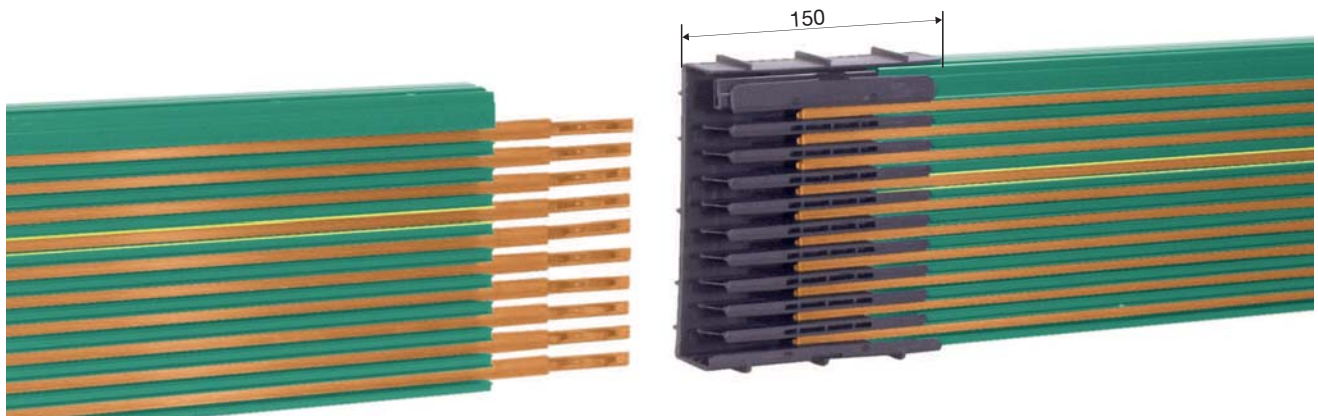
- Max. length of bend = 5.3 m
- Hanger distance ≈ 0.6 m
- Max. angle = 180°
- Inside bend = conductors on inside
- Outside bend = conductors on outside (not shown)



Bends are supplied with straight ends, each 200 mm long.

Type	R mm	Order no.
Inside bend (as shown)	> 1000	780 344
Outside bend	> 1000	780 345

Joints

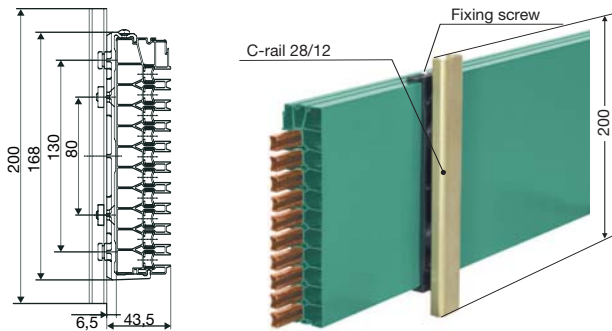


Type	No. of conductors	weight kg	Order no.
SV 10- 6/ 60-100	6	0.371	780 037
SV 10- 6/120-140	6	0.371	780 038
SV 10- 7/ 60-100	7	0.387	780 017
SV 10- 7/120-140	7	0.387	780 000
SV 10- 8/ 60-100	8	0.403	780 333
SV 10- 8/120-140	8	0.403	780 335
SV 10- 9/ 60-100 ⁽¹⁾	9	0.419	780 029
SV 10- 9/120-140	9	0.419	780 337
SV 10- 9/240-280	9	0.419	780 030
SV 10-10/ 60-100 ⁽¹⁾	10	0.435	780 039
SV 10-10/120-140	10	0.435	780 195
SV 10-10/240-280	10	0.435	780 001

FIXPOINT HANGERS, SLIDING HANGERS, END CAPS, END FEEDS VKS 10

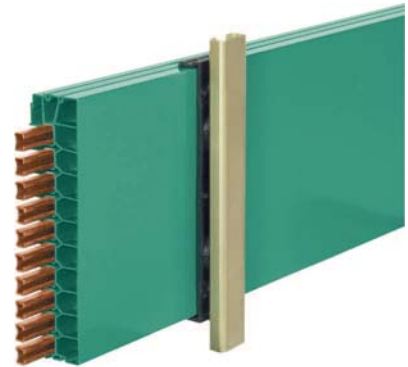


Fixpoint hanger on C-rail
consisting of hanger clamp and fixing screw



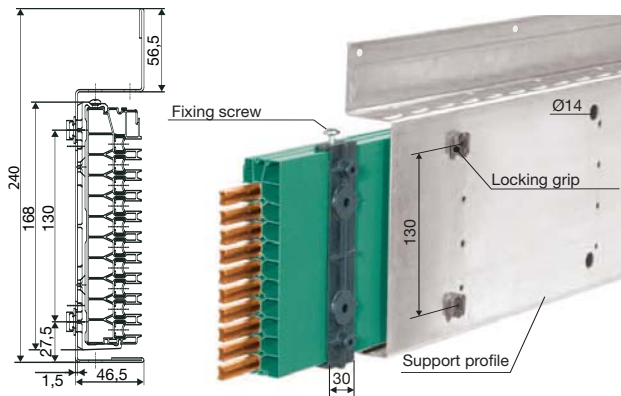
Type	weight kg	Order no.
VEPS 10-H	0.224	780 007

Sliding hanger on C-rail
consisting of hanger clamp



Type	weight kg	Order no.
VAS 10-H	0.223	780 008

Fixpoint hanger for support profile VTP 10
consisting of hanger and fixing screw



Type	weight kg	Order no.
VEPS 10-VTP	0.033	780 009

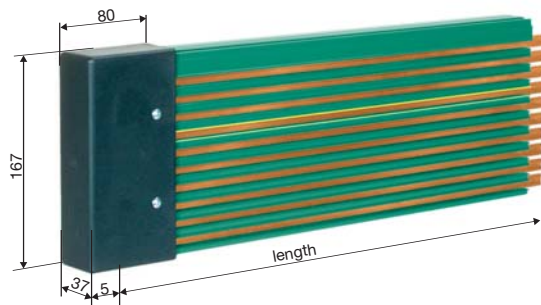
Sliding hanger for support profile VTP 10
consisting of hanger clamp



Type	weight kg	Order no.
VAS 10-VTP	0.032	780 010

End cap

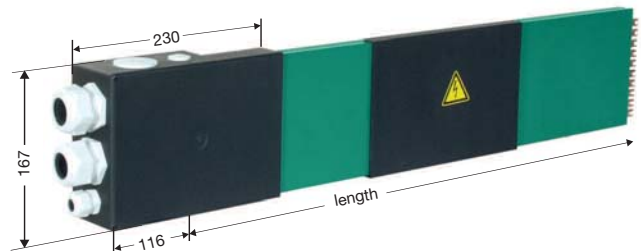
Can be used right or left handed.
Supplied loose as individual part with fixing screws.



Type	weight kg	Order no.
VES 10 L	0.210	780 004

End feed⁽¹⁾

Terminal box supplied loose,
only in conjunction with line feed VLS⁽²⁾



Type	weight kg	Order no.
VEKS 10- 6- 10/60-280	0.664	780 018

⁽¹⁾ Cable glands, 2 x ST-M 40 x 1.5 for D = 19-28 mm
1 x ST-M 20 x 1.5 for D = 7-13 mm

⁽²⁾ Please order VLS line feed separately.



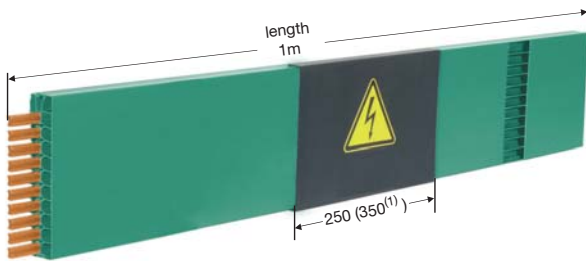
LINE FEED VKS 10

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 A- 125 A,
 16 mm² (up to cable Ø 6,5 mm) for 100 A,
 or feed bolts for 60 A powerail

1 m section to be ordered separately.



Type	No. of conductors	Current capacity A	weight kg	Order no.
VLS 10- 6/ 60	6	60	0,217	780 047
VLS 10- 6/100-120	6	100-120	0,382	780 060
VLS 10- 6/140	6	140	0,574	780 187
VLS 10- 7/ 60	7	60	0,230	780 049
VLS 10- 7/100-120	7	100-120	0,426	780 188
VLS 10- 7/140	7	140	0,630	780 189
VLS 10- 8/ 60	8	60	0,243	780 050
VLS 10- 8/100-120	8	100-120	0,470	780 196
VLS 10- 8/140	8	140	0,686	780 198
VLS 10- 9/ 60	9	60	0,256	780 058
VLS 10- 9/100-120	9	100-120	0,514	780 199
VLS 10- 9/140	9	140	0,742	780 191
VLS 10- 9/200-240 R*	9	200-240	0,744	780 320
VLS 10- 9/200-240 L*	9	200-240	0,744	780 322
VLS 10- 9/280 R*	9	280	0,828	780 319
VLS 10- 9/280 L*	9	280	0,828	780 321
VLS 10-10/ 60	10	60	0,269	780 059
VLS 10-10/100-120	10	100-120	0,558	780 192
VLS 10-10/140	10	140	0,798	780 208
VLS 10-10/200-240 R*	10	200-240	0,757	780 210
VLS 10-10/200-240 L*	10	200-240	0,757	780 318
VLS 10-10/280 R*	10	280	0,815	780 209
VLS 10-10/280 L*	10	280	0,815	780 317

R = Right-hand cable entry
 L = Left-hand cable entry

Line feed VNS

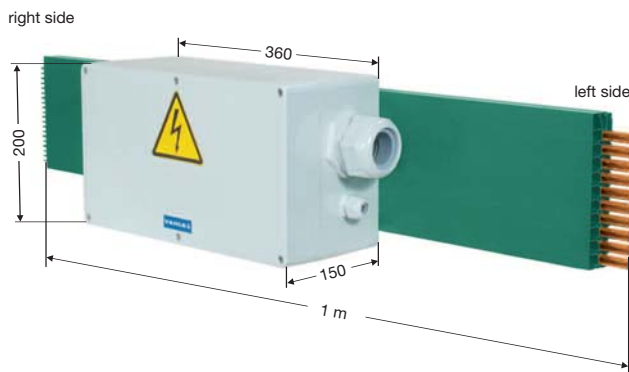
with terminal box

Cable gland: STR - M63 x 1,5 for Ø = 34-45
 STR - M20 x 1,5 for Ø = 7-13

Connection cable to be supplied by customer

Cable connection: Main current: M10
 Control current: M6

1 m section to be ordered separately.

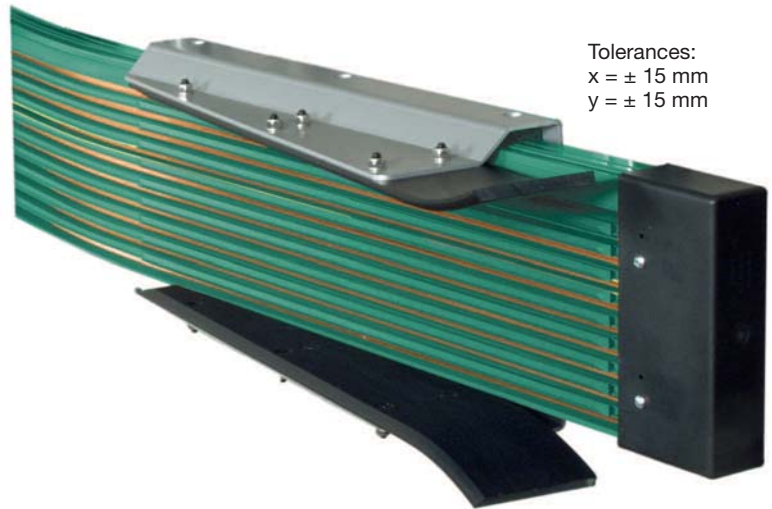


Type	No. of poles	Current capacity A	weight kg	Order no.
VNS 10- 6/ 60-140	6	60-140	2,766	780 327
VNS 10- 7/ 60-140	7	60-140	2,952	780 328
VNS 10- 8/ 60-140	8	60-140	3,138	780 329
VNS 10- 9/ 60-140	9	60-140	3,324	780 330
VNS 10- 9/200-280	9	200-280	2,840	780 334
VNS 10-10/ 60-140	10	60-140	3,510	780 331
VNS 10-10/200-280	10	200-280	2,865	780 332

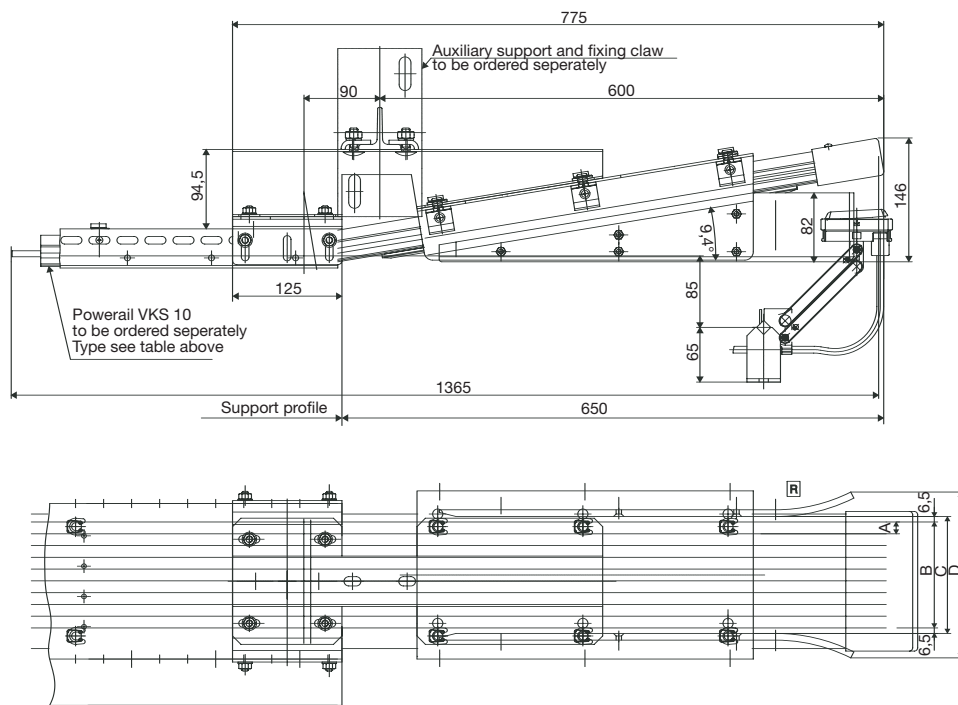
Transfer funnel ⁽¹⁾ for current collector KSTU 30-55/14
 max. speed $v = 100$ m/min.

Conductor rails for funnels (all cross sections 25 mm^2 , length 1365 mm)

Type	Order no.
No. of conductors 6	780 247
No. of conductors 7	780 248
No. of conductors 8	780 249
No. of conductors 9	780 250
No. of conductors 10	780 257



Tolerances:
 $x = \pm 15 \text{ mm}$
 $y = \pm 15 \text{ mm}$



Type	No. of conductors	A mm	B mm	C mm	D mm	E mm	weight kg	Order no.
EFTV 10- 6-KSTU 30/55 - 14 L	6	14	70	83	137	64	7.574	780 350
EFTV 10- 6-KSTU 30/55 - 14 R	6	14	70	83	137	64	7.574	780 173
EFTV 10- 7-KSTU 30/55 - 14 L	7	14	84	97	151	50	7.564	780 349
EFTV 10- 7-KSTU 30/55 - 14 R	7	14	84	97	151	50	7.564	780 172
EFTV 10- 8-KSTU 30/55 - 14 L	8	14	98	111	165	36	7.554	780 348
EFTV 10- 8-KSTU 30/55 - 14 R	8	14	98	111	165	36	7.554	780 171
EFTV 10- 9-KSTU 30/55 - 14 L	9	14	112	125	179	22	7.544	780 347
EFTV 10- 9-KSTU 30/55 - 14 R	9	14	112	125	179	22	7.544	780 170
EFTV 10-10-KSTU 30/55 - 14 L	10	14	126	139	193	6	7.534	780 346
EFTV 10-10-KSTU 30/55 - 14 R	10	14	126	139	193	6	7.534	780 169

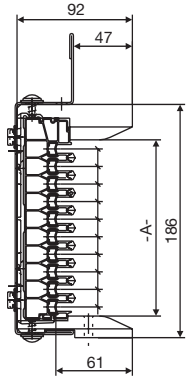
⁽¹⁾ Transfer funnel only in combination with powerail section. Higher speeds on request.



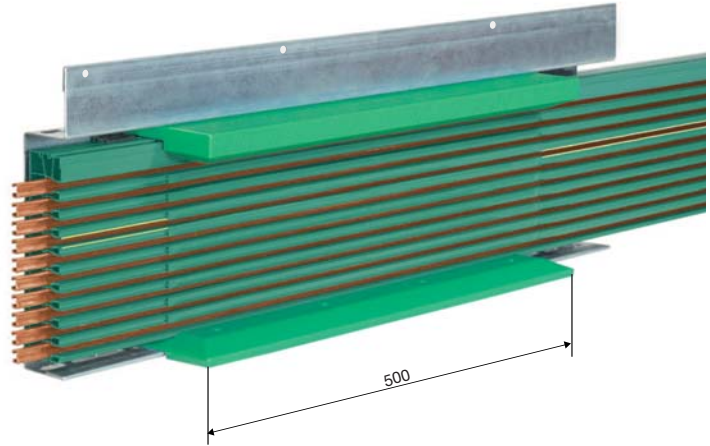
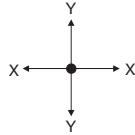
TANGENTIAL ENTRY FUNNEL, POWERAIL SECTION ISOLATION VKS 10

Tangential funnel for current collector KSTU ☺

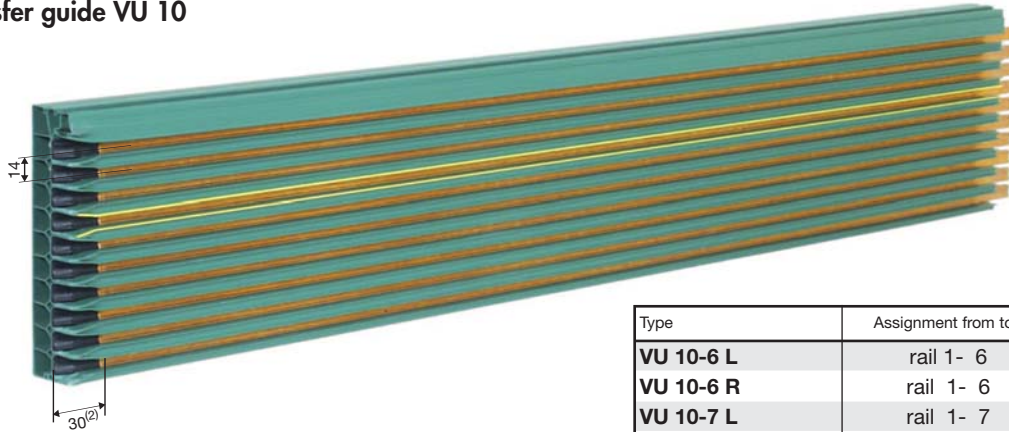
max. entry speed $v = 100$ m/min.



Tolerances:
 $x = \pm 10$ mm
 $y = +8$ mm, -7 mm



Transfer guide VU 10



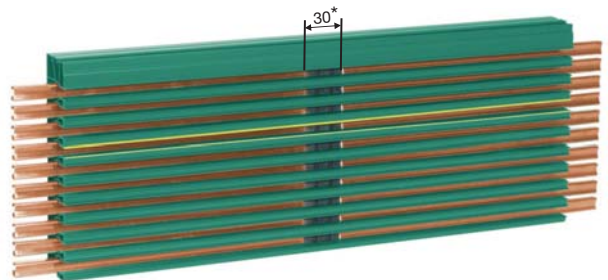
Type	Assignment from top	Order no.
VU 10-6 L	rail 1- 6	780 287
VU 10-6 R	rail 1- 6	780 288
VU 10-7 L	rail 1- 7	780 227
VU 10-7 R	rail 1- 7	780 228
VU 10-8 L	rail 1- 8	780 229
VU 10-8 R	rail 1- 8	780 230
VU 10-9 L	rail 1- 9	780 289
VU 10-9 R	rail 1- 9	780 290
VU 10-10 L	rail 1-10	780 269
VU 10-10 R	rail 1-10	780 270

Powerail section isolation⁽¹⁾

The position of the isolating sections are to be identified in the order.

Type	weight kg	Order no.
VSTS 1/10-60 M	0,004	156 933
VSTS 1/10-60 L	0,004	156 934
VSTS 1/ 100 M	0,004	150 150
VSTS 1/ 100 L	0,004	150 419
VSTS 1/ 120 M	0,004	151 674
VSTS 1/ 120 L	0,004	151 669
VSTS 1/ 140 M	0,004	156 335
VSTS 1/ 140 L	0,004	156 336

M = factory assembled; L = supplied loose



⁽¹⁾ For specification of the powerail profile see page 6

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

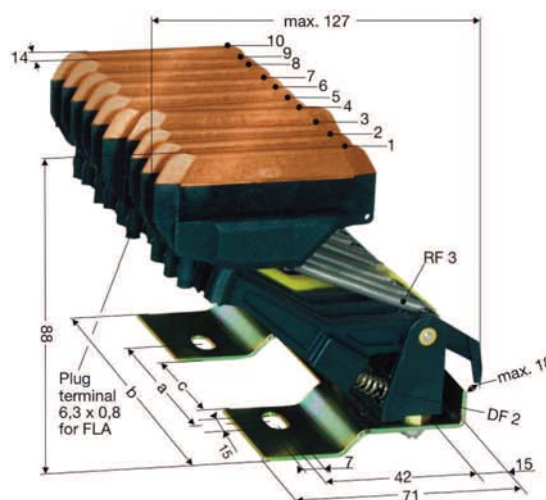


Compact current collector KESR 32/55

Distance between conductors: 14 mm
 max. current: 1 flat plug-in connector 32 A FLA 2,5
 40 A FLA 4,0
 55 A FLA 6,0

Lift and swivel ± 15 mm
 Contact pressure: approx. 3.5 N per carbon brush
 PE (ground) on no. 4 other combinations possible
 The ground collector always moves first when entering or exiting the powerail.

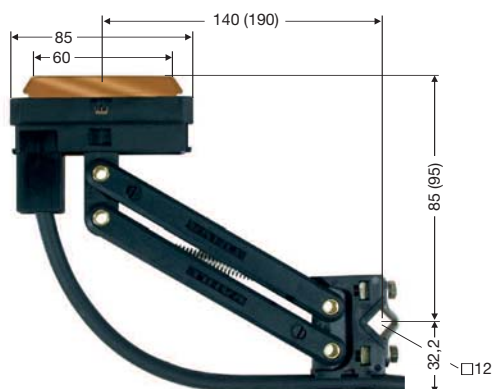
For selection of connecting cables, see page 14



Type	No. of poles	a mm	b mm	c mm	weight kg	Baseplate	Order no.	
KESR 32-55- 6-14	6	56	90	-	0,520	6 pole	168 316	
KESR 32-55- 7-14	7	80	118	53	0,654	8 pole (no. 8= free)	168 317	
KESR 32-55- 8-14	8	80	118	53	0,721	8 pole	168 318	
KESR 32-55- 9-14	9	80	146	53	0,760	10 pole (no. 10= free)	168 319	
KESR 32-55- 10-14	10	80	146	53	0,828	10 pole	168 320	
Single collector:							Phase	PE (ground)
Current collector KESR 32-55					0,067		168 304	168 305

Current collector UST

Type KSTL in parenthesis

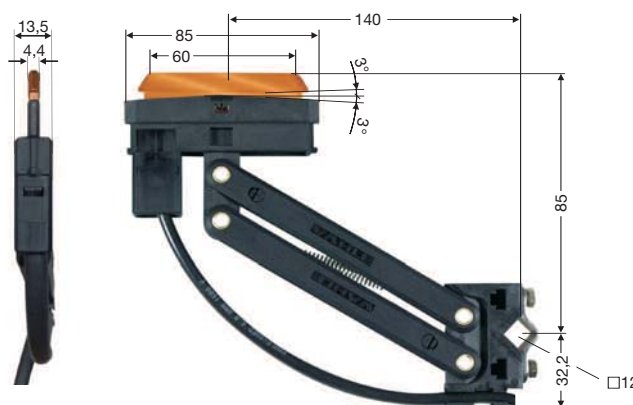


With 2 m connecting cables

Lift and swivel: see following table ± 15 mm
 Contact pressure: approx. 5 N

Current collector USTU

for transfer funnel EFTV 10 and for tangential funnel DSEV



With 2 m connecting cables

Lift and swivel: see following table ± 15 mm
 Contact pressure: approx. 5 N

Type ⁽¹⁾	Current capacity A	Connection cable A / mm ²	d max./ mm	Lift+swivel mm	weight kg	Order no.		Type ⁽¹⁾	Current capacity A	Connection cable A / mm ²	d max./ mm	Lift+swivel mm	weight kg	order no.	
						Phase black	(ground) yellow							Phase black	ground yellow
KST 30	30	2,50	5	± 20	0,240	152 085	152 086	KSTU 55/14	55	6,00	11	± 20	0,368	168 361	168 362
KST 55	55	6,00	11	± 20	0,368	154 438	154 439	KSTU 30/14	30	2,50	5	± 20	0,240	168 363	168 364
KSTL 30	30	2,50	5	± 30	0,240	152 089	152 091								
KSTL 55	55	6,00	11	± 30	0,368	154 443	154 444								

⁽¹⁾ Suffix types e.g. KST 30 \rightarrow KST 30 PH Order No. 152 085
 KST 30 \rightarrow KST 30 PE Order No. 152 086



ACCESSORIES FOR CURRENT COLLECTORS VKS 10

Connecting cable, highly flexible, for current collectors.
(For allocation to current collectors see page 13.)



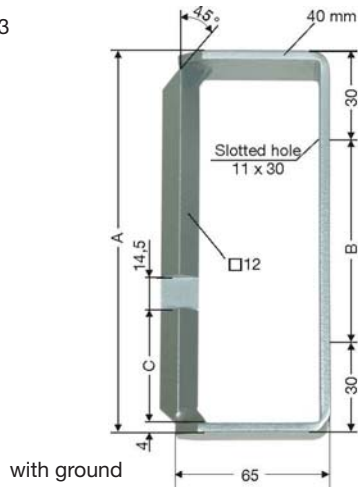
Type	Cross section mm ²	Outside Ø mm	Wt. kg	Order no.	
				Phase black	ground green/yellow
FLA 2.5	2.50	4.00	0.080	165 049	165 050
FLA 4	4.00	6.00	0.100	165 051	165 052
FLA 6	6.00	7.00	0.015	166 368	166 369

Flat plug, single

Type	for cable cross section mm ²	Order no.
FH 2.5	2.50	165 120
FH 4-6	4.00	165 121

Collector bracket

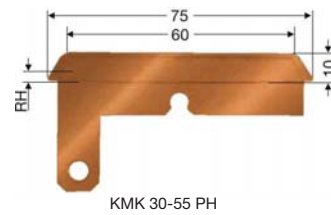
for current collectors
KST 30-55 see page 13



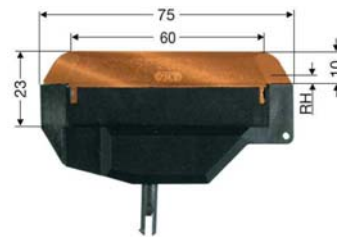
with ground

Type	A mm	B mm	C mm	weight kg	Order no.
UMA 12 HS-B- 7-14 L	122	62	50	0.42	780 182
UMA 12 HS-B- 7-14 R	122	62	50	0.42	780 181
UMA 12 HS-B- 8-14 L	136	76	50	0.46	780 180
UMA 12 HS-B- 8-14 R	136	76	50	0.46	780 179
UMA 12 HS-B- 9-14 L	150	90	50	0.49	780 178
UMA 12 HS-B- 9-14 R	150	90	50	0.49	780 177
UMA 12 HS-B-10-14 L	164	104	50	0.52	780 176
UMA 12 HS-B-10-14 R	164	104	50	0.52	780 175

Carbon brushes



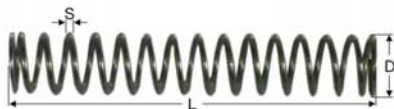
KMK 30-55 PH



MK 55 PH

Type	For current collector	Carbon brush thickness	RH mm	weight kg	Order no.
KMK 30-55 PH	KST 30 - KSTL 55 KST 30 - KSTL 55	4.40 mm	4.00	0.031	154 440
KMK 30-55 PE	KST 30 - KSTL 55 KST 30 - KSTL 55	4.40 mm	4.00	0.031	154 453
MK 55	KSR 32-55	4.20 mm	3.50	0.042	168 225

Springs



Pressure spring DF



Tension spring RF

Type	For current collector	S mm	D mm	L mm	Order no.
DF 2	KESR 32-55	0.90	7.70	43.00	153 848
RF 3	KESR 32-55	0.40	4.40	31.00	153 849

SUPPORT PROFILE FOR HIGH BAY STORAGE VKS 10



Accessories VKS 10

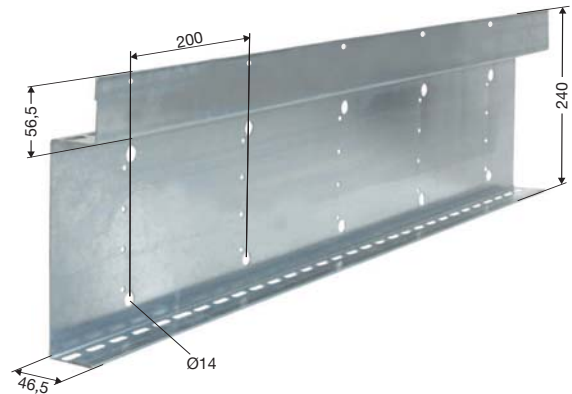
Type	Order no.
Connector cap	780 137
Push-in connector VKS 10/ 60-100A	780 027
Push-in connector VKS 10/ 120-140 A	780 028
Connection bolts, complete for VLS 10/ 60 + 200-280	780 138
Connection bolts, complete for VLS 10/100-140	780 130
Connection bolts, complete for VNS 10/ 60-280	780 139
Plastik glue for tangential funnel DSEV 10	780 280

VKS 10 Support profile

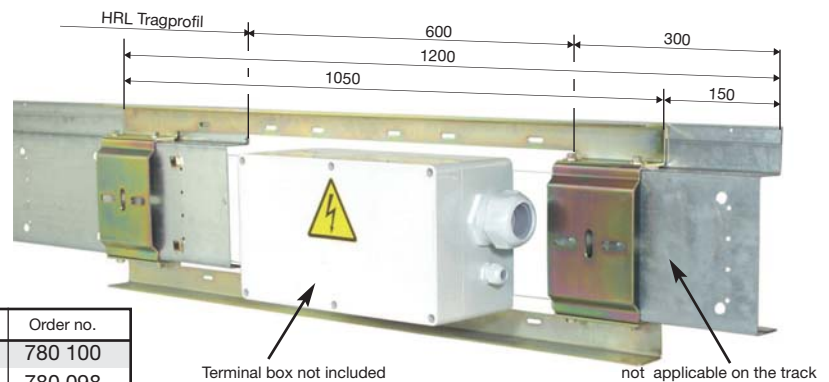
Support profile,

Length: 6 m

Type	weight kg/m	Order no.
VTP 10	4,300	781 006



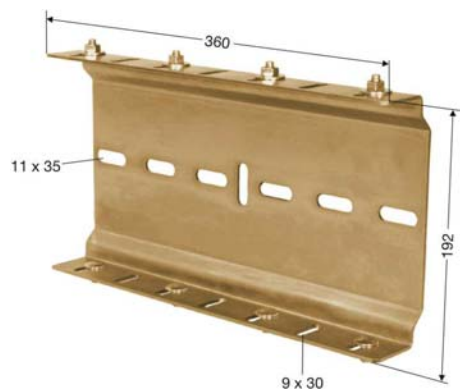
Support profile VTP 10 for feed VNS 10, VLS 10



Type	Order no.
Version for the beginning / end	780 100
Version on the track	780 098

Connector

Only as single component otherwise included in the attachment material of the support profile.



Type	weight kg	Order no.
VTPV 10	2.398	781 000

Hanger

Only as single component otherwise included in the attachment material of the support profile.



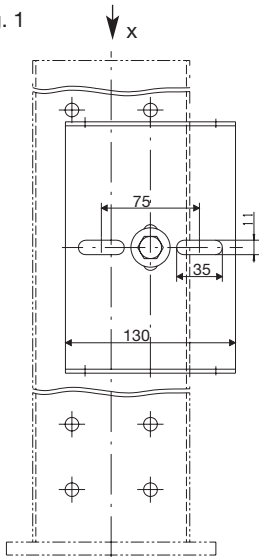
Type	weight kg	Order no.
VTPA 10	0.878	781 007



SUPPORT PROFILE ATTACHMENTS VKS 10

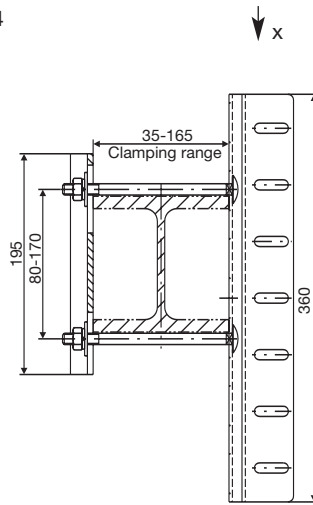
VTPB-P

Fig. 1



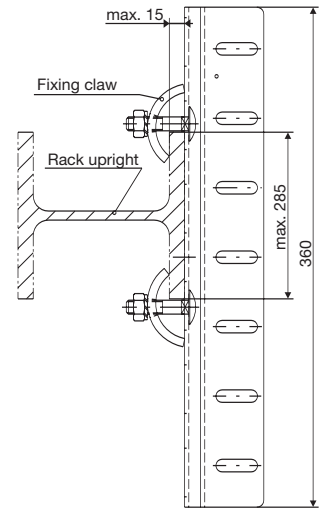
VTPB

Fig. 4

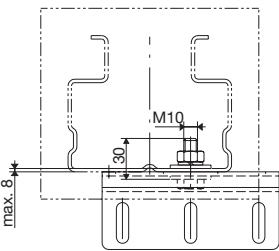


VTPB-SPR

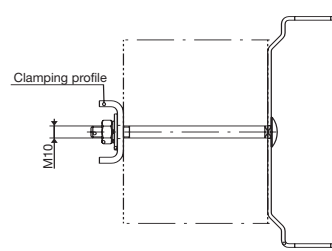
Fig. 2



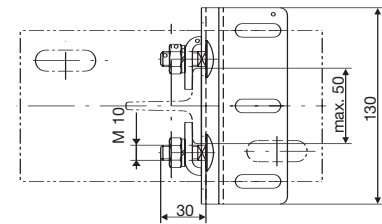
View x



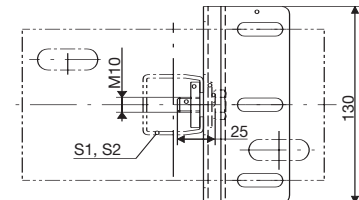
View y



VTPB-SPW Fig. 3



VTPB-S 1/2 Fig. 5

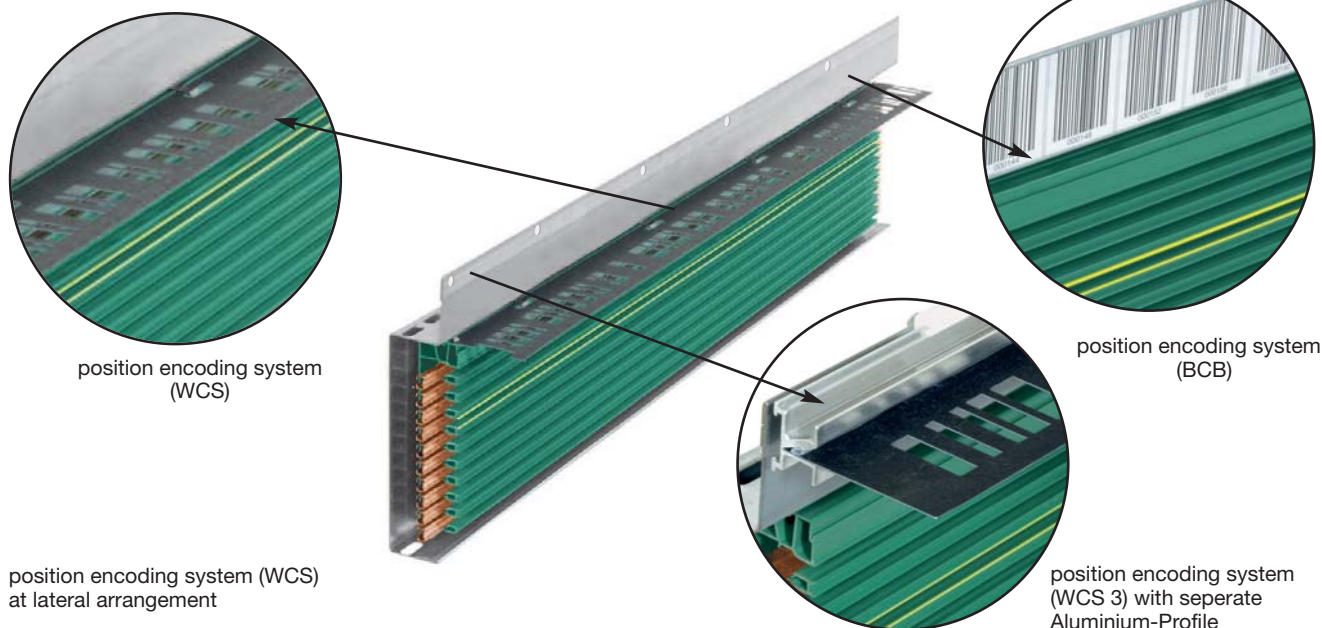


Type	Clamping range	weight kg	Order no.
VTPB-P	max. 8	0.938	780 147
VTPB-SPW	max. 15	1.066	780 148
VTPB-SPR	max. 15	2.674	780 149
VTPB 35 - 45	35 - 45	3.054	780 150
VTPB 45 - 55	45 - 55	3.062	780 151
VTPB 55 - 65	55 - 65	3.076	780 152
VTPB 65 - 75	65 - 75	3.084	780 153
VTPB 75 - 85	75 - 85	3.096	780 154
VTPB 85 - 95	85 - 95	3.102	780 155
VTPB 90 - 105	90 - 105	3.110	780 156
VTPB 100 - 115	100 - 115	3.118	780 157
VTPB 110 - 125	110 - 125	3.132	780 158
VTPB 120 - 135	120 - 135	3.144	780 159
VTPB 130 - 145	130 - 145	3.152	780 160
VTPB 140 - 155	140 - 155	3.164	780 161
VTPB 150 - 165	150 - 165	3.172	780 162
VTPB S 1/2	-	0.944	780 163

POSITION ENCODING SYSTEM, INSTALLATION TOOLS



Supplementary position encoding systems



position encoding system (WCS)

position encoding system (BCB)

position encoding system (WCS) at lateral arrangement

position encoding system (WCS 3) with separate Aluminium-Profile

Fixing clip

for laminate band



Type	weight kg	Order no.
Fixing clip for plastic laminate band	0.002	780 193

Position

encoding band



WCS



BCB

Type	weight kg/m	Order no.
Plastic laminate band with special perforation (WCS 3)	0.040	302 106
Screws for fixation	0.001	780 140
Barcode band (BCB)	0.015	302 107

Installation tool

For use with support profile



Type	weight kg	Order no.
Joint cap assembly tool	0.350	780 070

Installation tool

For use with support profile



Type	weight kg	Order no.
Copper connector mounting lever	1.50	780 090



QUESTIONNAIRE

Company: _____ Date: _____

Tel: _____ Fax: _____

E-Mail: _____ Internet: (URL) _____

1. Number of powerail installations: _____

2. Type of equipment to be powered: _____

3. Operating voltage: _____ Volts, Phases: _____, Frequency: _____ Hz
Three phase voltage: AC voltage: DC voltage:

4. Track length: _____

5. Number of powerails: _____ (main rails: _____ control rails: _____ ground rail: _____)

6. Mounted position of powerail:

- Powerail resp. current collector laterally mounted
- Hanger interval _____ m
- Other: _____

7. Number of pieces of equipment on one powerail installation: _____

8. Indoor plant:

9. Other operating conditions (humidity, dust, chemical influence etc.)

10. Ambient temperature: _____ °C min. _____ °C max.

11. Position and number of feeds: _____

12. Position and number of isolated sections (e.g. for repair work): _____

13. How are the rails laid out? (Please provide sketch): _____

14. Travel speed: _____

15. Power consumption of the individual consumer loads: _____
(Please consult table on reverse side)

16. Max. voltage drop from the powerail feed to the consumer units:

3% or _____ % of the nominal voltage

Remarks: _____

For curved tracks, powerails with isolated sections etc., we require sketches to enable us to prepare a quotation. pto!



Paul Vahle GmbH & Co. KG
 D 59172 Kamen
 Telefax 0 23 07 / 70 44 44
 E-Mail: info@vahle.de
 Internet: www.vahle.de

Date: _____

Motor specification	Equipment 1						Equipment 2					
	Capacity kW	Nominal current			Start-up current		Capacity kW	Nominal current			Start-up current	
		A	cosφ _N	% ED	A	cosφ _A		A	cosφ _N	% ED	A	cosφ _A
Hoisting gear												
Running gear												

Motor specification	Equipment 3						Equipment 4					
	Capacity kW	Nominal current			Start-up current		Capacity kW	Nominal current			Start-up current	
		A	cosφ _N	% ED	A	cosφ _A		A	cosφ _N	% ED	A	cosφ _A
Hoisting gear												
Running gear												

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

Further information: e.g. type of motor (squirrel cage, slip-ring etc.)

Signature: _____



Products and Service

Catalog no.

Powerails	1 a
Battery Charging Systems	1 b
Insulated Powerails U 10	2 a
Insulated Powerails U 20 - U 30 - U 40	2 b
Insulated Powerails U 15 - U 25 - U 35	2 c
Aluminum Enclosed Conductor Systems LSV - LSVG	3 a
Powerail Enclosed Conductor Systems KBSL - KSL - KSLT	4 a
Powerail Enclosed Conductor Systems VKS - VKL	4 b
Powerail Enclosed Conductor Systems MKLD - MKLF - MKLS	4 c
Powerail Enclosed Conductor Systems VKS 10	4 d
Powerail Enclosed Conductor Systems KBH	4 e
Heavy Enclosed Conductor Systems	5
Trolley Wire and Accessories	6
Cable Tenders	7
Cable Carriers for □ tracks	8 a
Cable Carriers for Flatarm Cables on I beams	8 bF
Cable Carriers for Round Cables on I beams	8 bR
Cable Carriers and Accessories for ◇ tracks	8 c
Conductor Cables and Fittings	8 L
Spring Operated Cable Reels	9 a
VAHLE POWERCOM® Digital Transmission Systems	9 c
CPS® Contactless Power Supply	9 d
SMG - Slotted Microwave Guide	9 e
Position Encoding Systems	9 f
Motor Powered Cable Reels	10
Installations/Commissioning	
Spare Parts/Maintenance Service	

