VAHLE

INSULATED CONDUCTOR SYSTEM U10

2A | EN 2020

INSULATED CONDUCTOR SYSTEM U10

CONTENT

General information 2
Technical data 4
Joint (Feed) 5
Line feed 5
Isolating assembly 5
Spacer clip 5
Expansion section 6
Transfer guides 6
Anchor bracket (aluminum) for transfer guide 7
Standard compact hangers 8
Locating clamps 8
Compact hangers (customer specific) 9
Compact current collector KDS2/40 10
Compact current collector KUFR2/40 11
Compact current collector KUFU25 12
Compact current collector SKID63 13
Entry funnel 13
Carbon brushes 14
Springs 14
Connecting cables 15
Terminal boxes 16
Brush wear indicator 16
Installation tools 17
Application questionnaire 19

GENERAL INFORMATION

The U10 insulated conductor system has been designed in accordance with VDE 0100. It complies with current conductor system safety requirements and protects against accidental human contact as stipulated by VDE 0470, part 1 (DIN EN 60526), (protection classification IP 21).

Fig. 1 illustrates that the VDE test “finger” cannot make contact with current carrying components. Compact collectors provide accidental contact protection only when the contact brushes are correctly and fully inside the conductors and covered by the insulating profile. Conductor systems located within reach of personnel, and with collectors exiting the conductors during operation, must have barriers or shut-off switches installed to prevent accidental contact. This is required only for conductor systems with operating voltage above 25 VAC or 60 VDC.

Fig 1: VDE test finger

U10 Conductor System is approved for indoor systems only.

Conductor systems may consist of any number of conductors. Space requirements are minimal. Contact opening at either downward or sideways orientation is possible.

Standard length for conductor sections is 6 m, shorter sections are available.

The standard PE conductor is marked with a continuous yellow stripe at the insulating profile. The ground conductor has a specifically shaped profile which reliably prevents the collector from entering a phase conductor; thus, the support structure cannot be inadvertently electrified.

APPROVALS

UL Certification. Please consult us when ordering.

COMPACT HANGER

Compact hangers are used for conductor installation and will also provide and maintain the defined 14 mm phase distance. Hanger center distance is max. 0.6 m at straight sections, 0.3 m at curved sections.

JOINT SPLICE/FEED

Joint splice/feeds are used to mechanically and electrically connect U10 conductor sections. The included joint splice cap protects personnel from accidentally making contact when the system is under current. Each joint splice/feed can compensate for section expansion/contraction up to 4 mm.

FEED TERMINALS

A feed connection is possible at every joint splice. Also, each isolating assembly and transfer guide can serve as a feed location when a feed clip is installed. When additional feed points within a conductor section are required, feed terminals (inline only) may be installed.

TRANSFER GUIDES

Transfer guides serve as protection of the conductor end as well as a mechanical system separation. They also facilitate reliable passage of collector brushes at movable track sections such as track switches and lift stations. Installed with an aluminum anchor bracket (BFU), transfer guides lock the conductor ends in place at the support track thus creating a system fixpoint.

ISOLATING ASSEMBLIES (AIR GAP)

Isolating assemblies interrupt the electrical current flow in a conductor. To utilize current collectors with the operational task to switch current on/off is only permitted when using low energy control current. For control function, feed sections, maintenance sections etc. we are supplying isolating assemblies with or without SE feed clip.

CURVES

U10 insulated conductors can be bend horizontally or vertically. A curve bending tool is available to produce curves at an installation site.

CURRENT COLLECTOR

Current collectors are manufactured using impact resistant synthetic material and stainless steel components. Copper graphite or carbon contact brushes are used.

The length of the current collector cable cannot exceed 3 m if the installed overload protection is not rated for the current capacity of the cable. See also DIN VDE 0100, part 430 and DIN EN 60204-32. Connecting cables as supplied are sufficiently dimensioned for the listed nominal current. For installation variation reduction factors, as with DIN VDE 0298-4, must be observed.

DIN EN 60204-1 and DIN-EN 60204-2 stipulate that the reliability of PE systems using conductor brushes must be ensured. Doubling the PE collector is a practical and simple solution to achieve compliance.

INDUSTRIAL DESIGNATIONS

DIN – German Institute for Standards
EN – European Standard
ISO – International Organization for Standardization
IEC – International Electrotechnical Commission
VDE – German Electrotechnical Association
IP – International Protection type and classification
UL – International Protection type and classification

SAFETY NOTE

A safety distance of min. (0.5 m) between Conductor / Current Collector arrangement and other moving or fixed equipment must be kept to prevent accidental injury of personnel!

INSULATION PROFILE VALUES (ELECTRICAL)

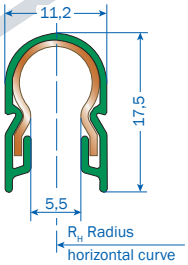
Type	Dielectric insulation DIN 53481	Specific resistance IEC 60093	Surface resistivity IEC 60093	Leakage path resistance IEC 60112
Standard profile, green	>25 kV/mm	$>1 \times 10^{16}$ Ohm x cm	2.1×10^{15} Ohm	CTI 400 – 1.1
High temp. profile, gray	>25 kV/mm	$>1 \times 10^{14}$ Ohm x cm	2.1×10^{15} Ohm	CTI 400 – 1.1

INSULATION PROFILE VALUES (MECHANICAL)

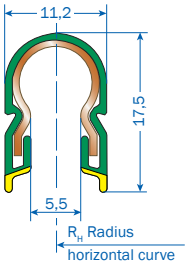
Type	Bending rigidity ISO 178	Tensile strength ISO 527	UV resistance	Max. relative humidity	Ambient temperature range(1)	Flammability
Standard profile, green	74 – 85 N/mm²	44 – 55 N/mm²	Xenon test >1500	<100 %	−30 °C to +55 °C	Flame resistant, self extinguishing, UL 94 V0
High temp. profile, gray	90 – 100 N/mm²	47 – 65 N/mm²	Xenon test >1500	<100 %	−30 °C to +85 °C	Flame resistant, self extinguishing, UL 94 V0

TECHNICAL DATA

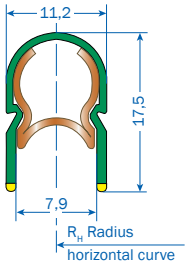
CONDUCTOR SECTION



PH-Standard



PE-Standard



PE-VPN Standard

PHASE DISTANCE

Standard = 14 mm

BENDING CONDUCTORS

Without pre-bending ∞ ≥ R ≥5000 mm

At site:

Horizontal curves	5000 mm ≥ R ≥750 mm
Inward/outward facing curves	5000 mm ≥ R ≥750 mm

Curves R ≤ 750 mm pls. inquire.

CONDUCTOR CODE

U = Unipole insulated conductor

10 = Profile dimensions

25 = Conductor cross section (mm²)

C = Copper conductor

E = Stainless steel conductor

SUPPLIED LENGTH

6 m (19.6″) standard section,

shorter sections available

MAX. SUPPORT DISTANCE

Straight sections: 0.6 m (2″)

Curves: 0.3 m (1″)

APPLICATION

Indoor systems only

VERSIONS

Version	Type	Color	Weight kg/m	Order No.
Phase (standard profile)	U10/25C-….PH-B	green	0.267	16700 •
	U10/25E-….PH-B	green	0.246	16702 •
PE (standard profile)	U10/25C-….PE-A	green	0.267	16706 •
	U10/25E-….PE-A	green	0.246	16708 •
PE-VPN (standard profile)	U10/25C-….VPN-A	green	0.267	14319 •
	U10/25C-….VPNG-A(4)	green	0.267	14331 •
Phase (high temp. profile)	U10/25C-….PH-D85	grey	0.267	16703 •
	U10/25E-….PH-D85	grey	0.246	16705 •
PE (high temp. profile)	U10/25C-….PH-C85	grey	0.267	16709 •
	U10/25E-….PE-C85	grey	0.246	16711 •
PE-VPN (high temp. profile)	U10/25C-….VPN-C85	grey	0.267	14320 •
	U10/25C-….VPNG-C85(4)	grey	0.246	14332 •

CONDUCTOR SYSTEM VALUES

Type	Leakage distance profile mm	Max. nominal Voltage(3)	Max. continuos current A	Resistance Ohm/1000 m	Impedance(2) Ohm/1000 m
U10/25 C	30	690	100	0.744	0.748
U10/25 E	30	690	10	31.328	31.328

SELECTION OF CONDUCTORS

Conductor selection must consider required current capacity and existing environmental conditions.

- U10/25 C conductor system with copper conductor for main current, control signal and data
- U10/25 E conductor system with stainless steel conductor for control signal and data transmission at corrosive environments

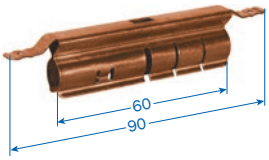
(1) Type designation to be completed, e. g. U10/25E-**6000**PH-B for 6 m phase, order no. 167026
The four-digit number (printed bold) at the type designation indicates the length of the conductor section.
(2) Based on 14 mm phase distance at 50 Hz
(3) Not with UL certification U_{UL} = 600 V
(4) Only for curves facing inward
• The last numeral of the order no. indicates the length of the conductor section in meters. Accordingly complete the order no. with 1, 2, 3, 4, 5 or 6.

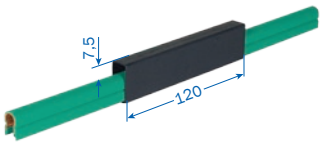
JOINT (FEED)

Max. 2 x 40 A continuous current

Compensates for up to 4 mm section expansion/contraction caused by temperature fluctuations

Connecting cables not included, please order from page 15



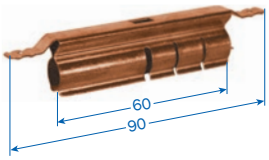


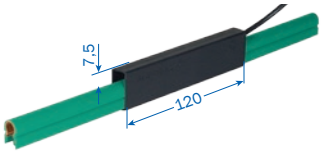
Type	Weight kg	Order No.
VM-UEV10/C	0.026	165006
VM-UEV10VPN/C	0.026	143213

LINE FEED

Max. 2 x 50 A continuous current

Connecting cable not included, please order from page 15





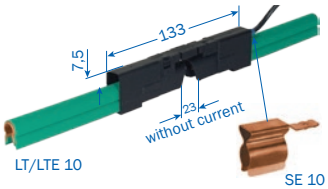
Type	Weight kg/m	Order No.
ES-UES10	0.026	165212
ES-UES10VPN	0.026	143214

ISOLATING ASSEMBLY (AIR GAP)

Max. 40 A continuous current

Two halves are joined during installation

Feed clip SE 10 with tab connector 6.3 x 0.8 mm (max. continuous current 40 A), at least one additional compact hanger required for each isolating assembly.



Type	Description	Weight kg	Comprising	Order No.
ST-LT/LT10		0.017	2 x LT/U 10	165025
ST-LT/LTE10		0.021	2 x LT/U 10 1 x Feed clip SE 10	165114
ST-LTE/LTE10		0.025	2 x LT/U 10 2 x Feed clip SE 10	165026

SPACER CLIP

to provide support for isolating assembly by filling gap between isolating assembly and web of aluminum monorail track at 16.5 mm system height(1).

Type	Weight kg	Order No.
EU-DK10/16.5	0.002	165682

(1) System height = distance contact surface to back of compact hanger (at web of monorail track)

EXPANSION SECTION

single conductor, to be completed at installation site

Expansion capability of expansion section must equal the max. expansion capability of the EMS track.

Two fix points are required with each expansion section. Please order as required by the EMS track layout.

An additional compact hanger is required for each 15 mm expansion capability. Please add to your order as required.

Prefinished, complete expansion sections are also available as a 800 mm long section.

STANDARD

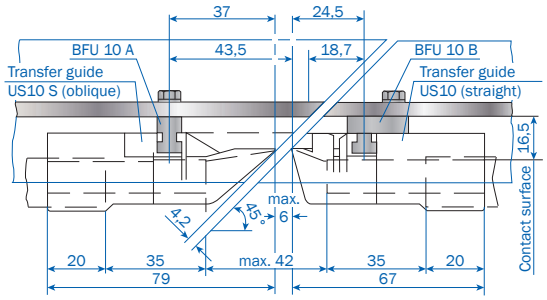
Type	Weight kg	Expansion	Order No.
VM-UDV10/C-30	0.052	up to 30 mm	166542
VM-UDV10/C-45	0.075	up to 45 mm	166543
VM-UDV10/C-60	0.104	up to 60 mm	166544

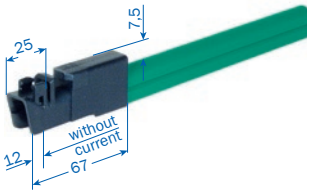
PE-VPN

Type	Weight kg	Expansion	Order No.
VM-UDV10VPN/C-30	0.052	up to 30 mm	143356
VM-UDV10VPN/C-45	0.078	up to 45 mm	143357
VM-UDV10VPN/C-60	0.104	up to 60 mm	143358

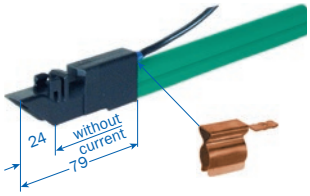
TRANSFER GUIDES

Max. vertical and horizontal offset ±3 mm respective





without feed clip: US 10



with feed clip: USE 10 S
(tab connector 6.3 x 0.8 mm)

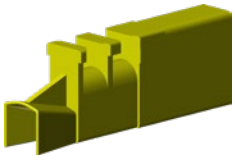
TRANSFER GUIDE

Max. 40 A continuous current

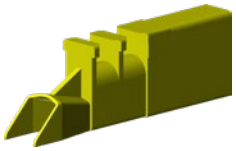
Type	Weight kg/m	Version	Feed clip	Order No.
MU-US10	0.008	straight	without	165008
MU-US10S	0.008	oblique	without	165009
MU-USE10	0.012	straight	with	165010
MU-USE10S	0.012	oblique	with	165011

TRANSFER GUIDE FOR PE-VPN

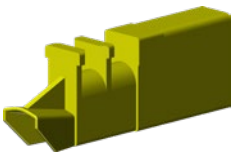
Max. 40 A continuous current



without feed clip:
US 10 PE-VPN



without feed clip:
US 10 SP-VPN



with feed clip:
USE 10 S-VPN
(tab connector 6.3 x 0.8 mm)

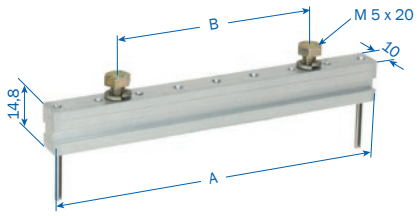
Type	Weight kg/m	Version	Feed clip	Order No. Phase + PE
MU-US10-VPN	0.007	straight	without	143208
MU-US10S-VPN	0.007	oblique	without	143210
MU-US10SP-VPN	0.008	oblique positive	without	143212
MU-USE10-VPN	0.011	straight	with	143207
MU-USE10S-VPN	0.011	oblique	with	143209
MU-USE10SP-VPN	0.012	oblique positive	with	143211

ANCHOR BRACKET (ALUMINUM) FOR TRANSFER GUIDES

to be bolted to the track

Two holes to be drilled through the EMS track to screw on the anchor bracket from the back.

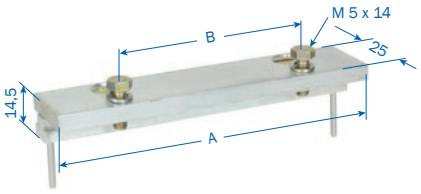
Kit comprises: 1 x anchor bracket, 2 x hex screws M5 with lock washer, 2 x roll pins 2 x 20.



BFU 10A

for system height(1) = 16.5 mm

Type	No. of poles	A mm	B mm	Weight kg	Order No.
MU-BFU10H4/16.5/14-59/42	1 – 4	59	42	0.032	144422
MU-BFU10H6/16.5/14-90/42	1 – 6	90	42	0.040	144499
MU-BFU10H8/16.5/14-118/70	1 – 8	118	70	0.048	165168
MU-BFU10H10/16.5/14-143/70	1 – 10	143	70	0.056	165176

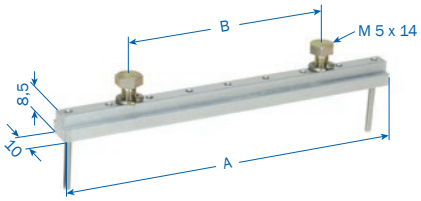


BFU 10B

to be used when EMS track has been cut obliquely (see drawing page 6).

for system height(1) = 16.5 mm

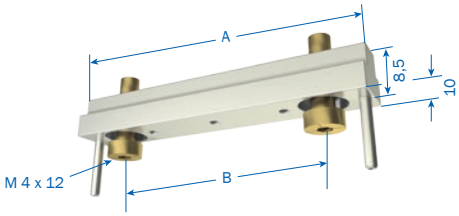
Type	No. of poles	A mm	B mm	Weight kg	Order No.
MU-BFU10H4/16.5/14-59/42-25	1 – 4	59	42	0.053	144419
MU-BFU10H6/16.5/14-90/42-25	1 – 6	90	42	0.065	143982
MU-BFU10H8/16.5/14-118/70-25	1 – 8	118	70	0.077	165272
MU-BFU10H10/16.5/14-143/70-25	1 – 10	143	70	0.089	165274



BFU 10

for system height(1)= 10.5 mm

Type	No. of poles	A mm	B mm	Weight kg	Order No.
MU-BFU10H4/10/14-62/42	1 – 4	62	42	0.022	144022
MU-BFU10H6/10/14-90/42	1 – 6	90	42	0.026	143983
MU-BFU10H8/10/14-118/70	1 – 8	118	70	0.030	165115



BFU 10V

for system height(1) = 10.5 mm

Socked head screws inserted at front of EMS track. Anchor bracket kit consists of:

1 x anchor bracket, 2 x socket head screws M4, 2 x roll pins.

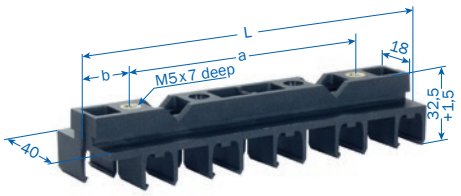
Type	No. of poles	A mm	B mm	Weight kg	Order No.
MU-BFU10V4/10/14-59/42	1 – 4	59	42	0.015	144355
MU-BFU10V6/10/14-90/42	1 – 6	90	42	0.021	144513
MU-BFU10V8/10/14-118/70	1 – 8	118	70	0.026	144514

(1) System height = distance contact surface to back of compact hanger (at web of monorail)

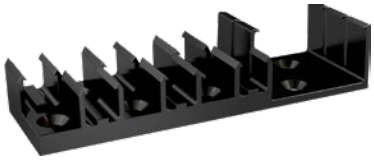
STANDARD COMPACT HANGERS

up to 10 conductors

These compact hangers may be combined to support any number of conductors.



Type	Max. number of poles	L	a	b	Weight kg	Order No.
AH-KA10L-2/16.5-N-PA-14	2	29	0	20.5	0.012	142072
AH-KA10L-4/16.5-10N-PA-14	4	57	42	7.5	0.024	142073
AH-KA10L-6/16.5-10N-PA-14	6	85	42	21.5	0.033	142757
AH-KA10L-8/16.5-10N-PA-14	8	113	42	35.5	0.045	142075
AH-KA10L-10/16.5-N-PA-14	10	141	100	20.5	0.056	142076



COMPACT HANGER KA10 (USED WITH SCREWS)

6 conductor + SMGM

Type	Max. number of poles	L	Weight kg	Order No.
AH-KA10-4/10.5-UNI-PA-SMG-14	4	100	0.027	144354
AH-KA10-6/10.5-UNI-PA-SMG-14	6	128	0.036	100102 11

LOCATING CLAMPS

2 ea. USK location clamps are required for each fix point

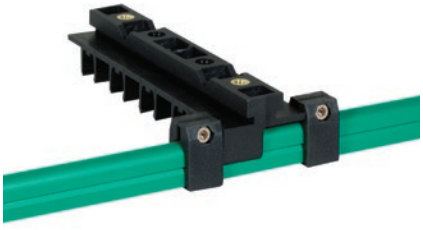


Illustration shows positioning of the two Locating clamps at a compact hanger

LOCATING CLAMP STANDARD

Type	Weight kg	Order No.
USK10	0.006	165645

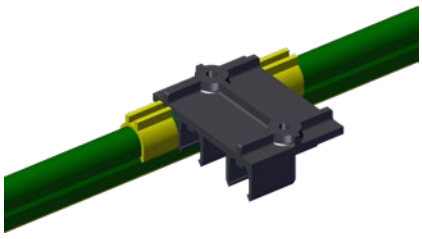


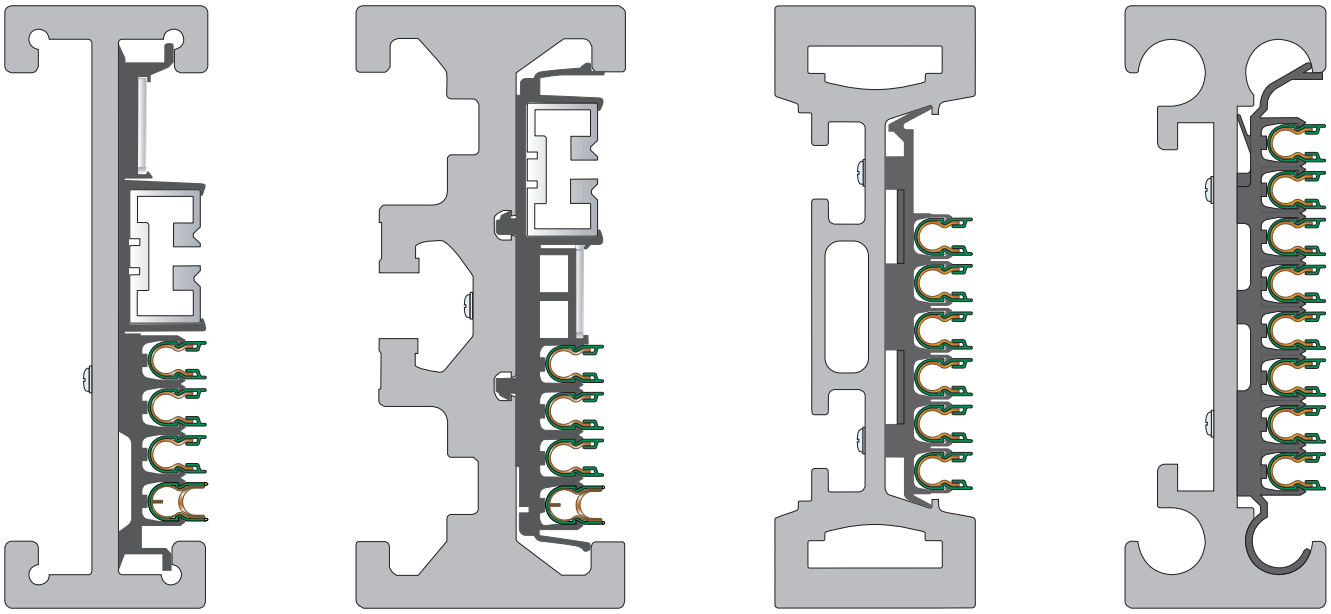
Illustration shows positioning of the two locating clamps at a compact hanger

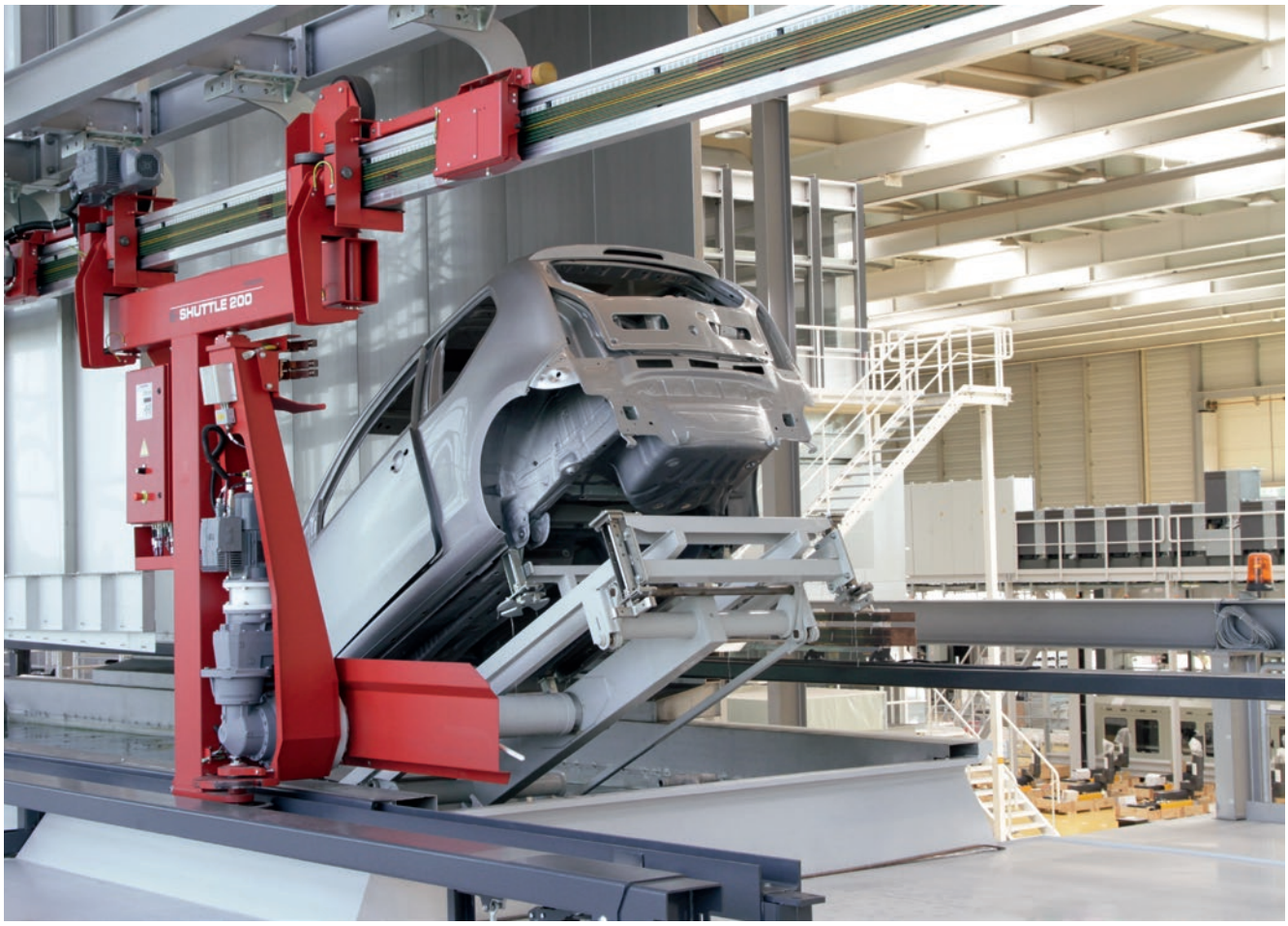
LOCATING CLAMP PE-VPN

Type	Weight kg	Order No.
USK10A-VPN	0.001	2823268

COMPACT HANGERS (CUSTOMER SPECIFIC)

Engineered and manufactured to fit customer specific EMS track





COMPACT CURRENT COLLECTOR

KDS2/40

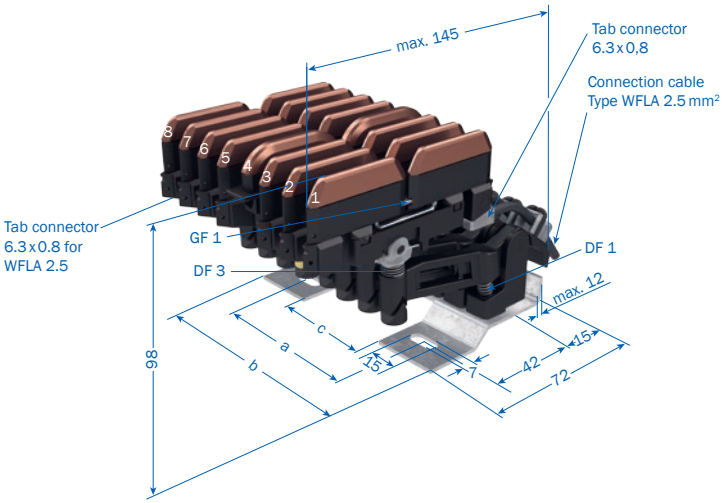
PE-VP for EMS installations

with 1 x 0.5 m connecting cable type WFLA 2.5

Max. current:	1 connecting cable 2.5 mm², 25 A
	2 connecting cables 2.5 mm², 40 A
Lift:	±15 mm
Swivel:	±15 mm
Contact pressure:	approx. 3.5 N per contact brush
Connecting cable:	2.5 mm² type WFLA 2.5 high flex included

PE standard at No. 4 position, variations are possible.

PE makes contact first when entering conductors.



Type	No. of poles	Dim. a mm	Dim. b mm	Dim. c mm	Weight kg	Base plate	Order No.	
							with PE-VP	with PE Standard
SA-KDS2/40/4/14VP0.5/4/4	4	28	62	-	0.428	4-pole	143277	-
SA-KDS2/40/4/14HS0.5/4/4	4	28	62	-	0.428	4-pole	-	168082
SA-KDS2/40/5/14VP0.5/4/6/6	5	56	90	-	0.549	6-pole (No. 6 = open)	143332	-
SA-KDS2/40/5/14HS0.5/4/6/6	5	56	90	-	0.549	6-pole (No. 6 = open)	-	168083
SA-KDS2/40/6/14VP0.5/4/6	6	56	90	-	0.637	6-pole	143219	-
SA-KDS2/40/6/14HS0.5/4/6	6	56	90	-	0.637	6-pole	-	168084
SA-KDS2/40/7/14VP0.5/4/8/8	7	80	118	53	0.744	8-pole (No. 8 = open)	143377	-
SA-KDS2/40/7/14HS0.5/4/8/8	7	80	118	53	0.744	8-pole (No. 8 = open)	-	168085
SA-KDS2/40/8/14VP0.5/4/8	8	80	118	53	0.832	8-pole	143220	-
SA-KDS2/40/8/14HS0.5/4/8	8	80	118	53	0.832	8-pole	-	168086
SA-KDS2/40/9/14VP0.5/4/10/10	9	80	156	53	0.959	10-pole (No. 10 = open)	143378	-
SA-KDS2/40/9/14HS0.5/4/10/10	9	80	156	53	0.959	10-pole (No. 10 = open)	-	168087
SA-KDS2/40/10/14VP0.5/4/10	10	80	156	53	1.047	10-pole	143379	-
SA-KDS2/40/10/14HS0.5/4/10	10	80	156	53	1.047	10-pole	-	168088
Single conductor available with 0.5 m connecting cable							**Phase, black**	**PE, yellow**
SA-KDS2/40/04PH-88/15-0.5					0.091	w/o	168073	-
SA-KDS2/40/30VP-79/15-0.5					0.105	w/o	-	143218
SA-KDS2/40/04PE-88/15-0.5					0.090	w/o	-	168074

CURRENT COLLECTOR SETS (TRAILING UNIT)

Single conductor on base plate. PE standard at No. 4 position, variations possible!

Type	Dim. a mm	Dim. b mm	Dim. c mm	Weight kg	Base plate	Order No. PE-VP	Order No. PE
SA-KDS2/40/1/14VP0.5/4/4/1-3	28	62	-	0.164	4-pole	143361	-
SA-KDS2/40/1/14HS0.5/4/4/1-3	28	62	-	0.164	4-pole	-	168079-D
SA-KDS2/40/1/14VP0.5/4/6/1-3U5-6	56	90	-	0.197	6-pole	143369	-
SA-KDS2/40/1/14HS0.5/4/6/1-3U5-6	56	90	-	0.197	6-pole	-	167454
SA-KDS2/40/1/14VP0.5/4/8/1-3U5-8	80	118	53	0.216	8-pole	143635	-
SA-KDS2/40/1/14HS0.5/4/8/1-3U5-8	80	118	53	0.216	8-pole		167830

KUFR2/40

for installations requiring bi-directional travel

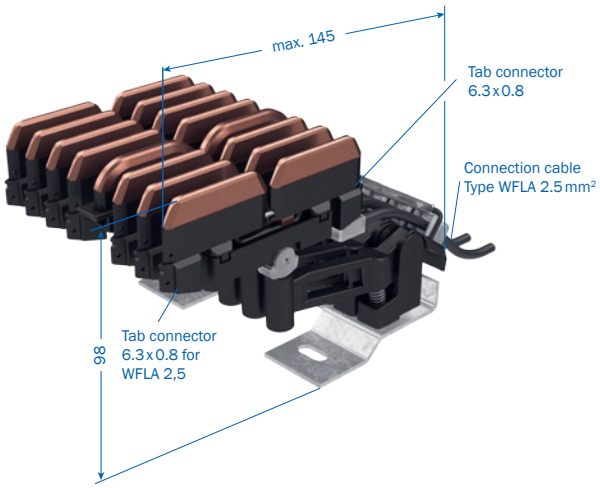
with 1 x 0.5 m connecting cable type WFLA 2.5

Max. current:	1 connecting cable 2.5 mm², 25 A
	2 connecting cables 2.5 mm², 40 A
Stroke:	±15 mm
Swivel:	±15 mm
Contact pressure:	approx. 3.5 N per contact brush
Connecting cable:	2.5 mm² Type WFLA 2.5
Length:	0.5 m, high flex included

PE standard at No. 4 position, variations are possible.

Dimensions of base plate see KDS2/40.

PE makes contact first when entering conductors.



Type	No. of poles	Weight kg	Base plate	Order No.	
				with PE-VP	with PE Standard
SA-KUFR2/40/4/14VP0.5/4/4	4	0.448	4-pole	144474	-
SA-KUFR2/40/4/14HS0.5/4/4	4	0.448	4-pole	-	165927
SA-KUFR2/40/5/14VP0,5/4/6/6	5	0.573	6-pole (No. 6 = open)	144475	-
SA-KUFR2/40/5/14HS0.5/6/6	5	0.573	6-pole (No. 6 = open)	-	165928
SA-KUFR2/40/6/14VP0,5/4/6	6	0.666	6-pole	144476	-
SA-KUFR2/40/6/14HS0.5/6	6	0.666	6-pole	-	165929
SA-KUFR2/40/7/14VP0,5/4/8/8	7	0.779	8-pole (No. 8 = open)	144478	-
SA-KUFR2/40/7/14HS0.5/8/8	7	0.779	8-pole (No. 8 = open)	-	165930
SA-KUFR2/40/8/14VP0,5/4/8	8	0.872	8-pole	144479	-
SA-KUFR2/40/8/14HS0.5/8	8	0.872	8-pole	-	165931
SA-KUFR2/40/9/14VP0,5/4/10/10	9	1.004	10-pole (No. 10 = open)	144480	-
SA-KUFR2/40/9/14HS0.5/10/10	9	1.004	10-pole (No. 10 = open)	-	165932
SA-KUFR2/40/10/14VP0,5/4/10	10	1.097	10-pole	144481	-
SA-KUFR2/40/10/14HS0.5/10	10	1.097	10-pole	-	165933
Single conductor available with 0.5 m connecting cable				**Phase, black**	**PE, yellow**
SA-KUFR2/40/20PH-88/15-0.5		0.093		165955	-
SA-KUFR2/40/20PE-88/15-0.5		0.091		-	165956
SA-KUFR2/40/04VP-79/15-0.5		0.105		-	143776

CURRENT COLLECTOR SETS (TRAILING UNIT)

Single conductor on base plate. PE standard at No. 4 position, variations possible!

Type	Dim. a mm	Dim. b mm	Dim. c mm	Weight kg	Base plate	Order No. PE-VP	Order No. PE
SA-KUFR2/40/1/14VP0.5/4/4/1-3	28	62	-	0.164	4-pole	143774	-
SA-KUFR2/40/1/14HS0.5/4/4/1-3	28	62	-	0.164	4-pole	-	166491
SA-KUFR2/40/1/14VP0.5/4/6/1-3U5-6	56	90	-	0.197	6-pole	143836	-
SA-KUFR2/40/1/14HS0.5/4/6/1-3U5-6	56	90	-	0.197	6-pole	-	167573
SA-KUFR2/40/1/14VP0.5/4/8/1-3U5-8	80	118	53	0.216	8-pole	144482	-
SA-KUFR2/40/1/14HS0.5/4/8/1-3U5-8	80	118	53	0.216	8-pole		167661

COMPACT CURRENT COLLECTOR

KUFU25

for entry funnel EFT10

with 1 m connecting cable type FLA 2.5

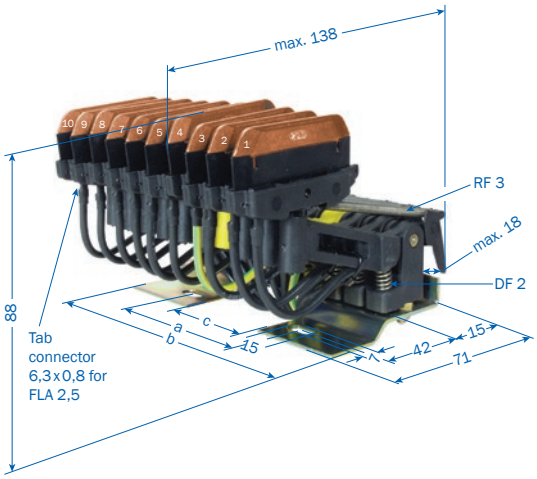
max. continuous current: 25 A

Stroke: +15 mm / −10 mm

Swivel: ±15 mm

Contact pressure: approx. 3.5 N per contact brush

PE at No. 4 position, with 3 conductors at No. 3,
with 2 conductors at No. 2. Variations are possible.
PE makes contact first when entering conductors.



Type	No. of poles	Dim. a mm	Dim. b mm	Dim. c mm	Weight kg	Base plate	Order No.	
							with PE-VP	with PE-Standard
SA-KUFU25/2/14HS1.0/2/2	2	-	34	-	0.228	2-pole	168040	-
SA-KUFU25/2/14SS1.0/2	2	-	34	-	0.228	2-pole	-	168051
SA-KUFU25/3/14HS1.0/3/4/4	3	28	62	-	0.340	4-pole (No. 4 = open)	168041	-
SA-KUFU25/3/14SS1.0/4/4	3	28	62	-	0.340	4-pole (No. 4 = open)	-	168052
SA-KUFU25/4/14HS1.0/4/4	4	28	62	-	0.428	4-pole	168042	-
SA-KUFU25/4/14SS1.0/4	4	28	62	-	0.428	4-pole	-	168053
SA-KUFU25/5/14HS1.0/4/6/6	5	56	90	-	0.549	6-pole (No. 6 = open)	168043	-
SA-KUFU25/5/14SS1.0/6/6	5	56	90	-	0.549	6-pole (No. 6 = open)	-	168054
SA-KUFU25/6/14HS1.0/4/6	6	56	90	-	0.637	6-pole	168044	-
SA-KUFU25/6/14SS1.0/6	6	56	90	-	0.637	6-pole	-	168055
SA-KUFU25/7/14HS1.0/4/8/8	7	80	118	53	0.744	8-pole (No. 8 = open)	168045	-
SA-KUFU25/7/14SS1.0/8/8	7	80	118	53	0.744	8-pole (No. 8 = open)	-	168056
SA-KUFU25/8/14HS1.0/4/8	8	80	118	53	0.832	8-pole	168046	-
SA-KUFU25/8/14SS1.0/8	8	80	118	53	0.832	8-pole	-	168057
SA-KUFU25/9/14HS1.0/4/10/10	9	80	146	53	0.959	10-pole (No. 10 = open)	168047	-
SA-KUFU25/9/14SS1.0/10/10	9	80	146	53	0.959	10-pole (No. 10 = open)	-	168058
SA-KUFU25/10/14HS1.0/4/10	10	80	146	53	1.047	10-pole	168048	-
SA-KUFU25/10/14SS1.0/10	10	80	146	53	1.047	10-pole	-	168059
Single conductor available, without connecting cable							**Phase, black**	**PE, yellow**
SA-KUFU25/28PH-78/15-0.0					0.051		168015	-
SA-KUFU25/28PE-78/15-0.0					0.051		-	168016

SKID63

Current collector especially for push skid systems

Special funnel to compensate high deflections (on request)

Possible deflection : ±30 mm ↕ ↔

Travel speed: up to 180 m/min

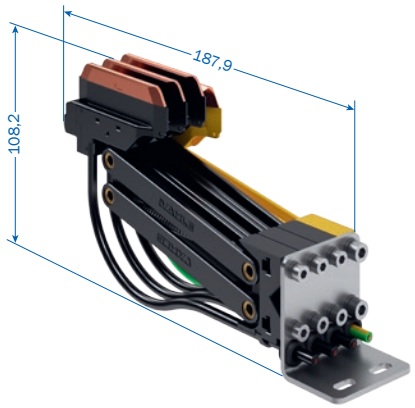
Max. 63 A per carbon brush

Touch protection according to IP21

PE reverse polarity protection

Automatic centering for hopper entries

Optimized for reversing operation



Type	No. of poles	Dim. a mm	Dim. b mm	Dim. c mm	Weight kg	Base plate	Order No.
SA-KSTUR32-4/14VP1,0/4/4	4	4	62	18	0.596	4 pole	144683/00
SA-KSTUR32-4/14VP1,0/1/4	4	1	62	18	0.596	4 pole	144683/00-A

Single current collectors with 1 m connection cable	Weight kg	Base plate	Order No.	
			Phase	PE-VP
SA-KSTUR32/14VP-20A-1000	0.110	none	-	144696/00
SA-KSTUR32/14PH-31A-1000	0.110	none	144695/00	-

ENTRY FUNNEL

EFT10

for current collector KUFU25 and KESR32

to be used with current collector KUFU25 or KESR32

Please note: Entry funnel without current.

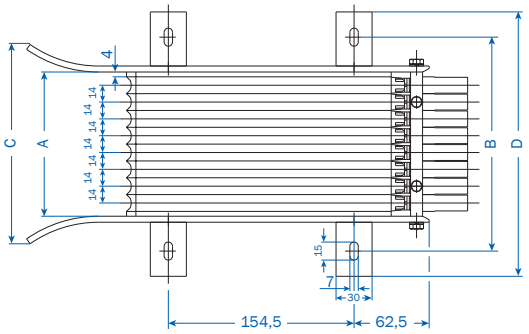
Entry speed: max. 100 m/min

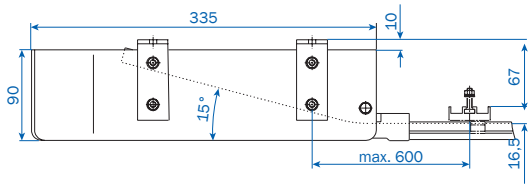
Entry tolerance: horizontal: ±10 mm

vertical: ±10 mm

Version with ground reverse polarity protection on request

suitable current collector KESR



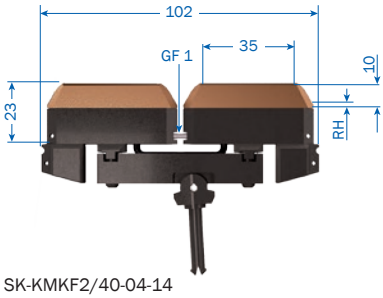


Type	No. of poles	Dim. A mm	Dim. B mm	Dim. C mm	Dim. D mm	Weight kg	Order No.
MU-EFT10-2-KUFU	2	36	94	82	136	1.145	167675
MU-EFT10-3-KUFU	3	50	108	96	150	1.230	167676
MU-EFT10-4-KUFU	4	64	122	110	164	1.315	167677
MU-EFT10-5-KUFU	5	78	136	124	178	1.400	167678
MU-EFT10-6-KUFU	6	92	150	138	192	1.485	167679
MU-EFT10-7-KUFU	7	106	164	152	206	1.570	167680
MU-EFT10-8-KUFU	8	120	178	166	220	1.655	167681
MU-EFT10-9-KUFU	9	134	192	180	234	1.740	167682
MU-EFT10-10-KUFU	10	148	206	194	248	1.825	167683

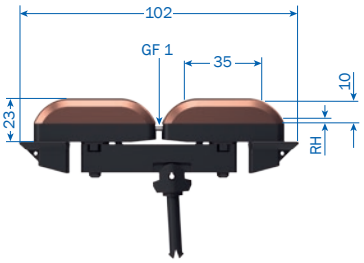
CARBON BRUSHES

width of contact brushes = 3.8 mm

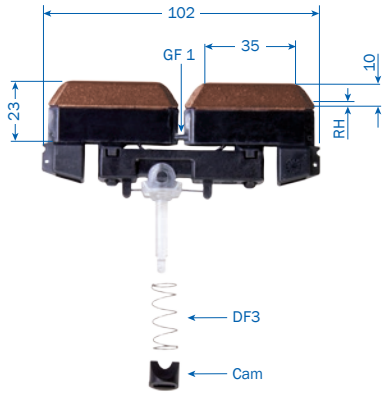
SK-KMKU25-20-14



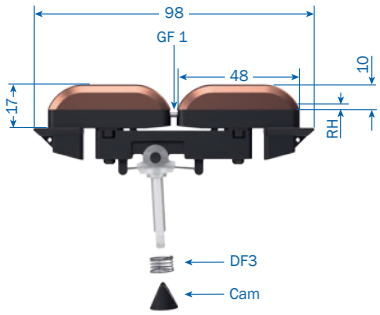
SK-KMKF2/40-04-14



KMKF2/40VP-04-14



SK-DSW2/40-04-14-FN

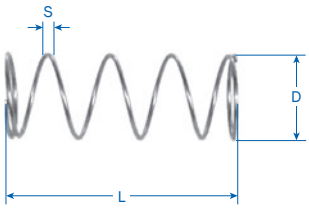


SK-DSW2/40VP-04-14-FN

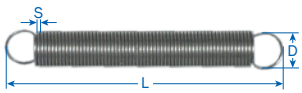
Min. remaining brush height (RH) = 3 mm

Type	for current collector	Weight kg	Order No.
SK-KMKU25-20-14	KUFU25	0.030	168284
SK-DSW2/40-04-14-FN	KDS2/40	0.049	168151
SK-DSW2/40VP-04-14-FN	KDS2/40 Ground-VP	0.060	144059
SK-KMKF2/40-04-14	KUFR2/40	0.050	144277
SK-KMKF2/40VP-04-14	KUFR2/40VP	0.060	143777

SPRINGS



Compression spring DF3



Tension spring RF3

Alignment spring GF1

Cam

Type	for current collector	S mm	D mm	L mm	Order No.
DF3	KDS2/40	0.55	9.55	24.00	152011
RF3	KUFU25, KUFR2/40	0.40	4.40	31.00	153849
GF1	KDS2/40, KUFR2/40	-	2.00	21.50	153850
NOCKEN	KDS2/40				1011917

CONNECTING CABLES

CONNECTING CABLE, HIGHLY FLEXIBLE

for current collector, feed terminal, transfer guide and isolating assembly

(for current collector KDS and KUFR use connecting cable WFLA 2.5)

Length: 0.5 m with tab plug 6.3 x 0.8
Longer connecting cable available

Length: 1 m with tab plug 6.3 x 0.8
Longer connecting cable available

CONNECTING CABLE, DOUBLE INSULATED

for current collector or feed terminal

Type	Cross section mm²	Ø mm		Weight kg		Order No. Phase black	Order No. PE green/yellow
		PH	PE	PH	PE		
AL-FLA2.5PH1-6.3	2.50	3.9	-	0.037	-	165049	-
AL-FLA2.5PE1-6.3	2.50	-	3.6	-	0.035	-	165050
AL-FLA4PH1-6.3	4.00	5.4	-	0.064	-	165051	-
AL-FLA4PE1-6.3	4.00	-	5.2	-	0.059	-	165052
AL-FLA6PH1-6.3	6.00	5.7	-	0.086	-	166368	-
AL-FLA6PE1-6.3	6.00	-	5.7	-	0.083	-	166369
AL-WFLA2.5PH0.5-6.3	2.50	3.9	-	0.020	-	168107	-
AL-WFLA2.5PE0.5-6.3	2.50	-	3.6	-	0.018	-	168108

CONNECTING CABLE, SINGLE INSULATION

for isolating assembly only

Type	Cross section mm²	Ø mm		Weight kg		Order No. Phase black	Order No. PE green/yellow
		PH	PE	PH	PE		
AL-IFKA1.5PH1-6.3	1.50	3.0	-	0.020	-	166557	-
AL-IFKA1.5PE1-6.3	1.50	-	3.0	-	0.020	-	166558
AL-IFKA2.5PH1-6.3	2.50	3.7	-	0.032	-	166238	-
AL-IFKA2.5PE1-6.3	2.50	-	3.7	-	0.032	-	166239
AL-IFKA4PH1-6.3	4.00	4.3	-	0.050	-	166240	-
AL-IFKA4PE1-6.3	4.00	-	4.3	-	0.050	-	166241
AL-IFKA6-PH1-6.3	6.00	4.9	-	0.064	-	166242	-
AL-IFKA6-PE1-6.3	6.00	-	4.9	-	0.064	-	166243

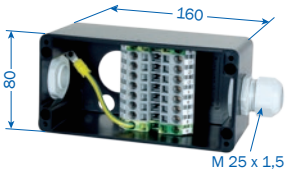
TAB PLUG ONLY (WITHOUT CABLE)

Type	for cable cross section mm²	Weight kg	Order No.
FH2.5	2.5	0.002	165120
FH4-6	4-6	0.002	165121
WFH2.5	2.5	0.002	168109

TERMINAL BOXES

TERMINAL BOX AKE

for conductor current supply with max. 7 x 6 mm² terminal clamps and 2 x 6 mm² PE terminal clamps.
Please inquire when terminal clamp variations are desired.



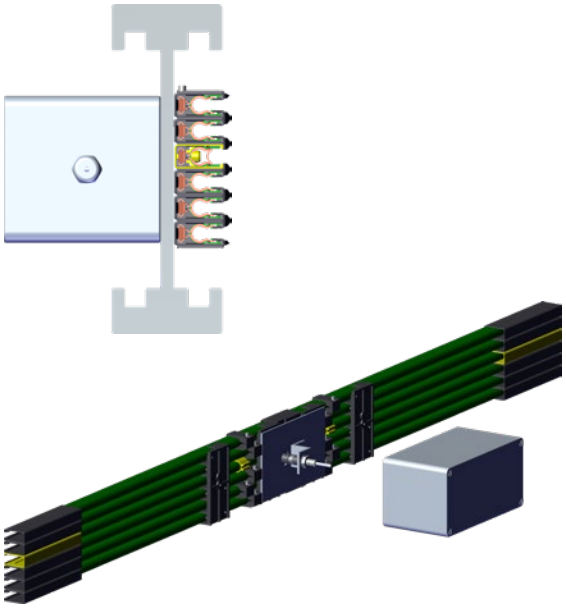
Type	Weight kg	Order No.
ES-AKE1-PH7 x 2L6-PE2 x 2L6-M25	0.445	169462

BRUSH WEAR INDICATOR

Brush wear indicator can be supplied installed on 1 m conductor section. Please specify the corresponding conductor arrangement when ordering.

The brush wear indicator checks the remaining brush height each time a collector set passes. Max. travel speed 70 m/min. When the remaining brush height reaches the preset value of 3 mm the brush wear indicator will send an impulse. It is practical to install the brush wear indicator ahead of a track switch, then the impulse can actuate the track switch to send the unit directly into a maintenance spur.

An opening, min. width 120 mm height 50 mm, must be cut at the EMS track web. PE position is variable, similarly to the conductor arrangement; please inquire. Differing remaining brush height settings above 3 mm are also available.



BRUSH WEAR INDICATOR WITH INDUCTIVE PROXIMITY SWITCH

The last slot of a brush wear indicator with an uneven number of conductors remains unoccupied.

Type	Number of poles	Weight kg	Order No. PE-VPN at No. 4	Order No. PE at No. 4
VT-KVT10-4-14VPN4B	4	2.011	143637	-
VT-KVT10-4-14HS4B	4	2.011	-	166957
VT-KVT10-5-14VPN4B/6	5	2.252	144093	-
VT-KVT10-5-14HS4B/6	5	2.252	-	167440
VT-KVT10-6-14VPN4B	6	2.453	143304	-
VT-KVT10-6-14HS4B	6	2.453	-	166895
VT-KVT10-7-14VPN4B/8	7	2.692	143466	-
VT-KVT10-7-14HS4B/8	7	2.692	-	167441
VT-KVT10-8-14VPN4B	8	2.893	143646	-
VT-KVT10-8-14HS4B	8	2.893	-	166896
VT-KVT10-9-14VPN4B/10	9	3.131	144094	-
VT-KVT10-9-14HS4B/10	9	3.131	-	167442
VT-KVT10-10-14VPN4B	10	3.335	144095	-
VT-KVT10-10-14HS4B	10	3.335	-	166897

INSTALLATION TOOLS

CURVE TOOL

for forming U10 vertical and horizontal curves.

Filler Rods must be ordered separately.

Type	Description	Weight kg	Order No.
MZ-BVU10-VPN	Curve tool	6.918	143318
MZ-FU10-V(1)	Filler rod for PH/PE (4 m)	0.371	165234
MU-FU10-H(2)	Filler rod for PH/PE (4 m)	0.354	144416

TABLE SAW

for cutting U10 insulator profiles and conductor profiles, with length stop

Voltage required: 230 V, 50 Hz

Type	Description	Weight kg	Order No.
MZ-KS10	Table saw, complete	6.500	165276
MZ-SB	Spare saw blade	0.070	165263

CONDUCTOR PUNCH TOOL

for punching joint splice window into conductor profile

after cutting standard length section.

For phase and PE and PE-VPN conductors.

Standard PH/PE

PE-VPN

Type	Description	Weight kg	Order No.
MZ-LZ10PH/PE	Conductor punch tool for Phase and Standard PE	0.480	144363
MZ-LZ10PE-VPN	Conductor punch tool for PE-VPN	0.563	144875

DEBURRING FILE

RF

HRF

Type	Application	Weight kg	Order No.
ROUND FILE RF-150 LONG/HIEB 3/ D = 6 mm	Deburr inside profile after cutting section	0.085	143330
HALF ROUND FILE HRF-150 LONG/ HIEB 3	Deburr outside profile after cutting section	0.085	165264

ADJUSTMENT JIG

facilitates cutting precise length of insulation profile without using measuring tape.

Type	Weight kg	Order No.
MZ-ST10	0.150	165091

TRANSFER GUIDE PE TO PE-VPN

The transfer guide is used for a limited time in systems in which the standard PE conductor rail is to be replaced by the PE-VPN conductor rail. 200,000 transfers or 2 months (whichever comes first).

Type	Weight kg	Order No.
ÜBERLEITUNGSSTÜCK PE AUF PE-VPN	0.035	144880

(1) For making vertical EMS curve sections.
(2) For making horizontal and outward facing AEM curve sections.

JOINT SPLICE/FEED ASSEMBLING TOOL

To push conductor into joint splice clip

If necessary, to widen conductor slot opening

To move joint splice cap in place

Type	Weight kg	Order No.
MZ-MG-SW10	0.125	165093

LOCKING PIN DRIVER

to insert BFU anchor bar transfer guide locking pins

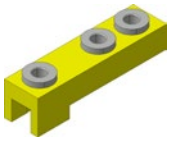
Type	Weight kg	Order No.
MZ-ED10	0.010	165277

CONDUCTOR REMOVAL TOOL

to release and remove conductors from compact hangers

Type	Weight kg	Order No.
MZ-DMW10	0.039	165119

DRILLING JIG FOR FIX POINT (PE-VPN)



Type	Weight kg	Order No.
MZ-BS10A-VPN	0.036	143425

SPIRAL DRILL

to drill holes for locating clamps USK 10A-VPN at fix points

Type	Weight kg	Order No.
SPIRAL DRILL Ø 3.2 MM, Type N	0.003	143426

INSTALLATION TOOL BOX

includes 1x BVU10-VP curve Tool, with filler rods 1x FU10,

1x FU10S-VP and 1x FU10VP-E, 1x KS10 table saw, 1x SB spare blade,

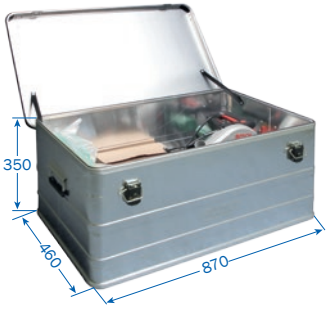
1x LZ10PE-VPN and 1x LZ10PH/PE conductor punch tool, 1x RF round file

and 1x HRF half round file, 1x ST10 adjustment jig, 1x MG-SW 10 joint splice/feed assembly tool,

1x ED10 locking pin driver, 1x DMW10 conductor removal tool,

1x BS10A drilling jig, 1x spiral drill Ø 3.2 mm

Installation tool box can be locked.



Type	Weight kg	Order No.
MZ-MWK-K	26.500	166548

APPLICATION QUESTIONNAIRE FOR U10

Customer _____ Date _____

Final customer _____ Projekt No._____

Installation _____

CUSTOMER CONTACT

	Name	Fon	E-mail
Technical planning			
Purchasing			

SCOPE OF SUPPLY

☐ vCONDUCTOR ☐ vPOS ☐ vCOM ☐ vDRIVE

☐ Installation VAHLE components ☐ Installation Non-VAHLE components _____

☐ Disassembly ☐ Disassembly Non-VAHLE components _____

SCHEDULE

Proposal submittal _____ week/date Delivery _____ week/date

Installation start _____ finish _____ week/date ☐ Weekdays ☐ Weekends

MECHANICAL DATA

1. Installation concept

☐ New installation

☐ Alteration / Expansion Original Conductor System Delivery No.: _____

☐ Replacement 1:1 Original Conductor System Delivery No.: _____

2. Type of application

☐ EMS

☐ Floor track systems (2 tracks)

☐ Skillet system

☐ Other

3. Carrier track / Carrier track supplier / Track designation

☐ 180 x 60 / _____ / _____

☐ 240 x 80 / _____ / _____

☐ Other _____ / _____ / _____

4. Conductor orientation

☐ Facing sideways In direction of travel: ☐ Right ☐ Left

☐ Facing downward

5. Installation height

Off facility floor or support floor _____mm ☐ Freely traversible

6. Track expansion gaps

Expansion distance / gap dimension _____mm

7. Building expansion gaps

Expansion distance / gap dimension _____ mm

8. Specific building features

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

ELECTRICAL DATA

9. Operating voltage

☐ Three-phase voltage ☐ AC Voltage ☐ DC voltage _____V _____ Hz

10. Type of conductor

☐ U10/25C copper conductor

☐ U10/25E stainless steel conductorl

11. Number of conductors (poles)

Main current_____ Control current_____ Ground (PE) standard_____

PE-VP Ground conductor with phase collector avoidance protection available only in copper_____

12. Conductor sequence

Compact hanger number of conductors Location top to bottom:

Pole	Position	Example 12-pole hanger 6-pole used
1.		open
2.		open
3.		L1
4.		L2
5.		L3
6.		PE-VPN
7.		S1
8.		S2
9.		open
10.		open
11.		open
12.		open

13. Travel mode

☐ One direction only ☐ Bi-directional_____ _____ / _____%

14. Travel speeds

Travel speed V max. straight: _____ m/min

Travel speed V max. curve: _____ m/min

Acceleration_____m/s² Acceleration time_____s

_____

15. Connecting cables for conductors

Line feed	Main current conductors_____	cross section _____ mm²
Track switch transfer guides	Main current conductors_____	cross section _____ mm²
Feeds and transfer guides	Control current_____	cross section _____ mm²

ENVIRONMENTAL REQUIREMENTS

16. Installation location

☐ Indoor system ☐ Cool storage ☐ Freezer (to −30 °C)

17. Ambient temperature_____

_____ °C min. _____ °C max.

Installation temperature

approx. _____ °C

18. Relative humidity _____ %

at ambient temperature _____ °C

☐ Oxygen reduced atmosphere

Oxygen content_____ %

19. Extraordinary environmental conditions

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

vPOS – POSITIONING

20. Type

☐ APOS Optic

☐ APOS Magnetic

☐ Support system for Leuze Barcode (35 mm)

vCOM – DATA TRANSMISSION

21. Type

☐ SMGM

☐ Powercom (utilizing conductor system)

☐ Semi-Wave (utilizing conductor system, only together with vDRIVE)

☐ CAN-Bus (utilizing conductor system, only together with vDRIVE)

CONFIGURATION NOTES

Not suited for outdoor installation.

_____

QUANTITY FRAMEWORK

Position	Quantity	Piece/m	Description	
1.		pieces	carrier	
2.		m	length total	
3.		m	length straight	
4.		pieces	H-curves to 15°	R = mm
5.		pieces	H-curves to 30°	R = mm
6.		pieces	H-curves to 45°	R = mm
7.		pieces	H-curves to 60°	R = mm
8.		pieces	H-curves to 75°	R = mm
9.		pieces	H-curves to 90°	R = mm
10.		pieces	H-curves to 180°	R = mm
11.		pieces	TS-connection curves	R = mm
12.		pieces	V-curves to 45°	R = mm
13.		pieces	two-way track switches	
14.		pieces	three-way track switches	
15.		pieces	V-track switches	
16.		pieces	turntables	
17.		pieces	quattro track switches	
18.		pieces	lift stations vertical	No. of connections____ beams____
19.		pieces	shift units horizontal	No. of connections____ beams____
20.		pieces	track expansions	
21.		pieces	building expansions	
22.		pieces	brush wear indicator	
23.		pieces	PE verification	
24.		pieces	connecting cables, capacity	
25.		pieces	connecting cables, PE	
26.		pieces	connecting cables, control	
27.		pieces	terminal boxes	
28.		pieces	conductor vacuum incl. suction head	

REMARKS

NOTES

Paul Vahle GmbH & Co. KG
Westicker Str. 52
59174 Kamen
Germany

Tel.: +49 2307 704-0
Fax: +49 2307 704-444
info@vahle.de

www.vahle.com

W1100116/00/en | 0 | Rev.03 | 06/20 | Errors and technical modification subject to change.