

U15 | U25 | U35

INSULATED CONDUCTOR SYSTEMS





INSULATED CONDUCTORS U 15 – U 25 – U 35

Index	U 15	U 25	U 35
	Page	Page	Page
Basic description	4	4	4
Selection of conductors	5	25	37
Insulated conductors	5	25	37
Joint splices	6	25	38
Expansion sections	6	26	39
Feed terminals	6	26	40
Locating clamps	7	26	41
Insulated hangers	7	27	41
Rail holders	7	27	41
Insulators	7	27	42
Compact hangers, bracket profiles	7	28	–
Attachment hardware	8	28	–
Transfer guides	8, 9	28	42
Sectionalizing	9	27	43
End caps	9	27	42
Transfer funnels	10, 11	30	–
Collectors	11– 16	29	44, 45
Connecting cables	17	–	–
Collector brackets, Cable attachment clamp	17	30	44
Contact grease	17	27	41
Components for collectors, Spare parts	18– 20	31– 333	46, 47
Brush wear indicator	21	–	–
Brackets, Snap-on brackets, Mounting brackets	22	35	–
Examples for ordering, Arrangement	23	34	48
Installation tools	24	–	–
Earthing spider system	–	49	49
Questionnaire	50, 51	50, 51	50, 51
Application photos	2, 5, 36		

Collector rings with insulated conductors see leaflet No. 102.





GENERAL SELECTION OF CONDUCTORS ENGINEERING DATA

Pages 4 – 5

U 15

For light cranes and hoists/elevators, self-propelled monorail carriers, automated storage and retrieval systems, assembly and test tracks, motor powered gates and doors, for all kinds of data and signal transmission, etc.
Ampacity up to 100 A

Pages 5 – 24

U 25

For bridge- and portal crane electrification, stacker cranes, heavy monorail systems, amusement & rapid transit rides, construction- and maintenance lifts etc.
Ampacity up to 450 A

Pages 25 – 36

U 35

Applications as U 25;
however for heavy duty – Ampacity up to 1250 A

Pages 37 – 48

Questionnaire

Pages 50, 51



INSULATED CONDUCTORS U 15 – U 25 – U 35

General

The insulated conductors U15, U25 and U35 are designed according to VDE 0100, which is today's international safety requirement and are finger safe to VDE 0470, part 1 (EN 60 529) (Protection code IP 23 in hanging arrangement)

For collectors is this touch proof only valid if the carbons are completely inside the bus bar.

In hand areas installed conductor systems, in which the collectors leave the bus bar due to site requirements, the customer has to make sure that touch proof is created on site. (e.g. barriers or disconnection)

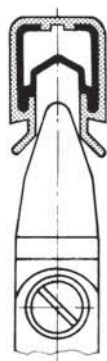
This is only valid for voltages over 25 Volt AC or 60 Volt DC. The adjacent picture demonstrates that the VDE test finger cannot reach live conductors.

The shroud which envelopes the various conductors is an excellent insulator. Therefore our unipole insulated conductors guarantee utmost safety in operation.

Any number of conductors can be installed side by side at minimum space requirement.

Standard rail sections U15, U25 are 6 m and U35 6,25 m long. Shorter sections are available.

The ground conductor is identified by international colour coding. For obvious safety reasons phase and ground collectors are not interchangeable.



Approved and listed by

U 15: SEV and CSA,

U 25: UL.

Consult factory label service.

Hangers

Snap-on or bolt-on brackets can be used to install conductors to the runway track. Spacing between rail supports:

U 15: see page 5,

U 25: see page 27,

U 35: see page 41.

Insulators

The insulated conductors could be installed with insulators. With them the creepage distance is extended to prevent electrical flashover. In systems with difficult environmental conditions (extreme humidity, chemicals, galvanizing etc.) is the use of insulators required.

Engineering data of shroud

	standard shroud color green	heat resistant shroud color grey	high temperature shroud colour granite grey
Electrical data:			
Dielectric strength according to DIN 53481	> 25 kV/mm	> 25	> 80
Special dielectric strength according to 60093	$> 1 \times 10^{16}$ Ohm/cm	$> 1 \times 10^{14}$ Ohm/cm	1×10^{15} Ohm/cm
Special surface resistance according to IEC 60093	$2,1 \times 10^{15}$ Ohm	2×10^{15} Ohm	1×10^{13} Ohm
Creepage distance according EN 60112/VDE 0303 Teil 11	CTI > 400	CTI > 400	CTI > 500
Mechanical properties			
Flexible strength	74-85 N/mm ²	90-100 N/mm ²	70-140 N/mm ²
Tensile strength	44-55 N/mm ²	47-65 N/mm ²	60-80 N/mm ²
Ambient temperature	-30 °C to +55 °C	-30 °C to +85 °C	-30 °C to +130 °C
Flame test proof per DIN 4102 part 1	class B1 no flaming particles, self-extinguishing		

Joint splices

Bolted joint splices are designed to rigidly join conductor bars and provide mechanical and electrical continuity. They include insulated protection covers.

Expansion joint sections must be provided for high temperature fluctuation and for system runs exceeding 100 m for U 15 (150 m for U 25/U 35) – see installation procedure.

Feed terminals

Feed terminal sets are preferably installed at conductor joints. Adequate single core feed cables must be provided for connection of the incoming power.

End caps

The open ends of unipole conductors are closed by end caps.

Transfer funnels and Transfer guides

Single pole and multi pole transfer guides are available for spur-lines, turntables and switches or other transfer applications.

Isolating sections

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

Conductor isolating sections are available for sectionalizing control circuits, maintenance bays etc.

Curves

Factory fabricated or field prepared radius bends(not U35) can be used for horizontal or vertical curves.

Collectors

Depending on the system requirement single or double collectors are used.

The mentioned continuous current are for collectors in stand operation with copper conductors. With the AE-conductor the collectors which are working with only > 10 m/min. Travel speed or stand most of the time are only permitted to work with 50% of the continuous current.

The length of the collector connection cable is not allowed to exceed 3 m, if the preceding overload protection is not dimensioned for this connecting cable.

See VDE 0100 part 430 and EN 60204.

(Note: This often occurs with more than one collector per system)

The supplied connecting cable (H07 RN-F) is suitable for the mentioned currents. For the different cable layings have the reduction factors according to VDE 0298 to be considered.

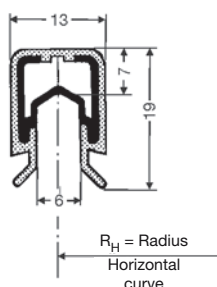
Safety advice

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

Chemical resistance for both designs:

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

Please note: For use in galvanizing and pickling plants, under aggressive conditions and low voltage applications we would appreciate receiving detailed information, especially of the environmental conditions. For quotations and order processing including Powerail systems with curves, dead sections, turntables, switches etc. we require your drawings or sketches. Please use our questionnaire, page 44.



Conductor code:

U = unipole insulated conductor
15 = shroud size
25 = conductor cross sectional area (mm²)
C = copper conductor
E = stainless steel conductor

Length:

6 m is standard length, shorter lengths are available

Conductor spacing:

on compact hangers 18 mm
on standard hangers with insulators min. 50 mm

Curves:

factory prepared or on site with curve tool BVU 10/15 from R=400 mm.

Heating system possible on request

Chemical and electrical properties
see page 4

Max. support distance:

in straight systems and inner or outer curves and with lay out of horizontal curves above $R_H = 5 \text{ m}^{(2)}$:
1000 mm with single collectors
800 mm with double collectors (KDST)

With lay out of horizontal curves below $R_H = 5 \text{ m}^{(2)}$:
500 mm bei with single collectors
400 mm bei with double collectors (KDST)

Type of conductor rail

	U 15/25 C	U 15/25 E
Weight kg/m	0,295	0,285
Standard shroud, color green		
Order- No. phase ⁽¹⁾	162 13 •	162 15 •
Order- No. ground ⁽¹⁾	162 19 •	162 21 •
High temperature shroud, color gray		
Order- No. phase ⁽¹⁾	162 16 •	162 18 •
Order- No. ground ⁽¹⁾	162 22 •	162 24 •

Engineering Data

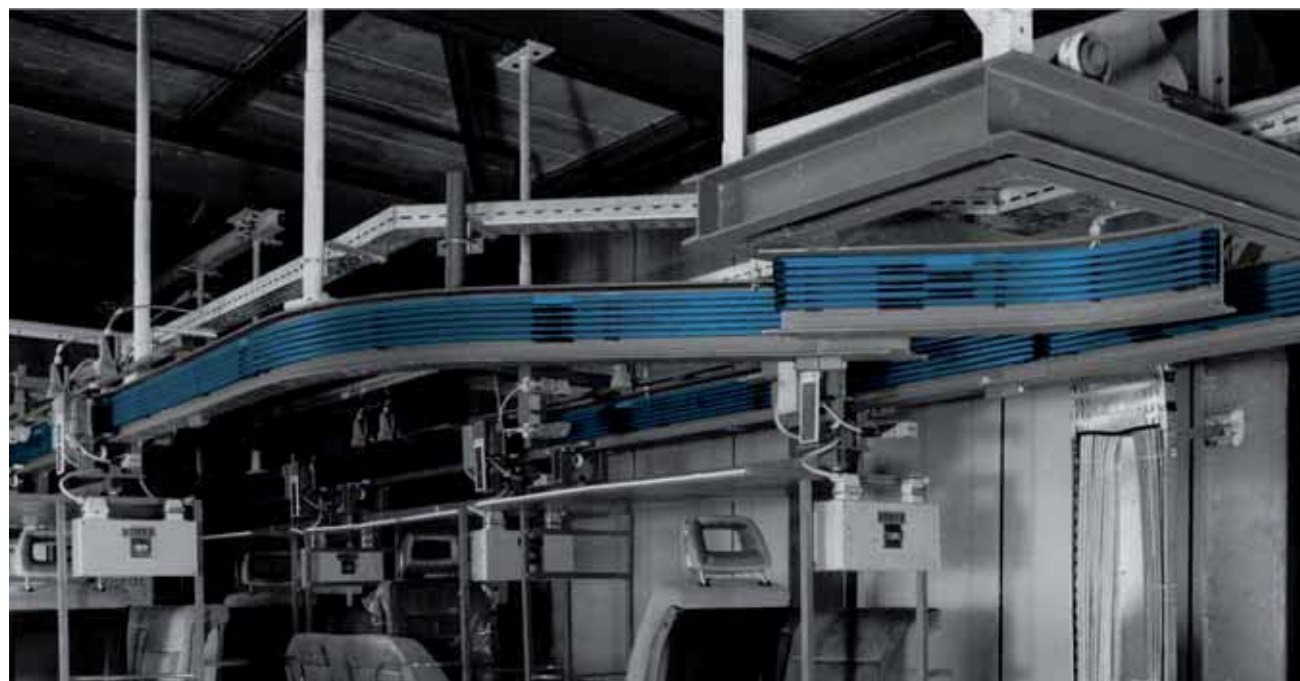
Conductor Rail Type	Cross sectional area mm ²		Leakage distance of shroud mm	nominal voltage (UL) A	max. continuous capacity in A at 35 °C	Resistance ⁽³⁾ Ohm/1000 m	Impedance ⁽³⁾ Ohm/1000 m phase distance		
	Cu	stainless steel					18 mm	25 mm	50 mm
U 15/25 C	25		30	690 (600)	100	0,692	0,6980	0,7010	0,7090
U 15/25 E		25	30	690 (600)	10	29,077	29,077	29,077	29,077

Selection of conductors

in accordance to ampere load and environmental conditions

U 15/25 C copper conductor for power and control system applications.

U 15/25 E stainless steel conductor for control and data-transmission in corrosive atmospheres



New material handling techniques (automated overhead monorails) require reliable electrification and use U 15 conductors.

⁽¹⁾ Add last number (1, 2, 3, 4, 5 or 6 m length suffix) in accordance to bars required.

⁽²⁾ Recommendation

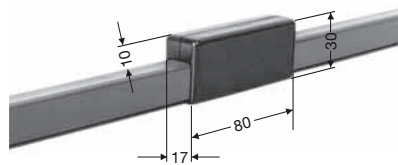
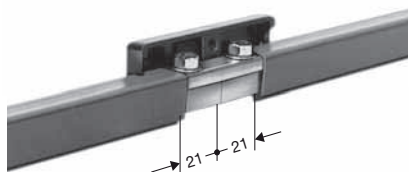
⁽³⁾ With frequenz of 50 Hz and 20 °C



ACCESSORIES FOR U 15

Bolted joint splice

applicable as feed terminal, too.

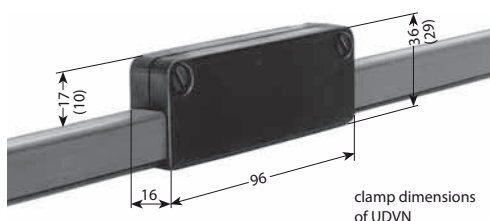


Corresponding to UE 15 K 4

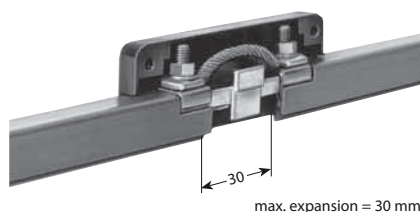
Type	Weight kg	Order- No.
UV 15 K 4⁽¹⁾	0,040	160 102

Expansion sections

consisting of expansion joint installed with a joint splice on a conductor section of 1 m length are required in systems from 100 m length. This length has to be counted into the total length of the system.



clamp dimensions
of UDVN



max. expansion = 30 mm

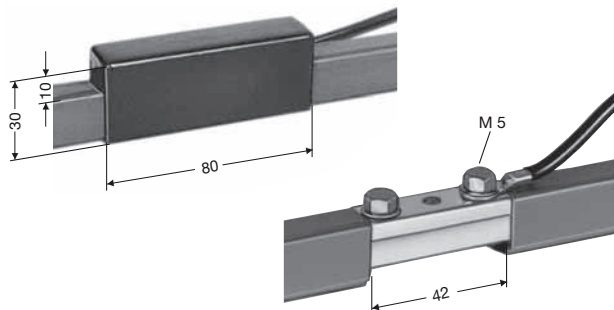
Standard shroud, color green

Type	Weight kg	Order- No.	
		phase	ground
UDV⁽³⁾ 15/25 C K 4⁽¹⁾	0,430	160 276	160 277
UDV⁽³⁾ 15/25 E K 4⁽¹⁾	0,420	160 288	160 289
UDVN⁽²⁾ 15/25 C K 4⁽¹⁾	0,430	160 294	160 295
UDVN⁽²⁾ 15/25 E K 4⁽¹⁾	0,420	160 306	160 307

High temperature shroud, color gray

Type	Weight kg	Order- No.	
		phase	ground
UDV⁽³⁾ 15/25 C K 4⁽¹⁾	0,430	160 280	160 281
UDV⁽³⁾ 15/25 E K 4⁽¹⁾	0,420	160 292	160 293
UDVN⁽²⁾ 15/25 C K 4⁽¹⁾	0,430	160 298	160 299
UDVN⁽²⁾ 15/25 E K 4⁽¹⁾	0,420	160 308	160 309

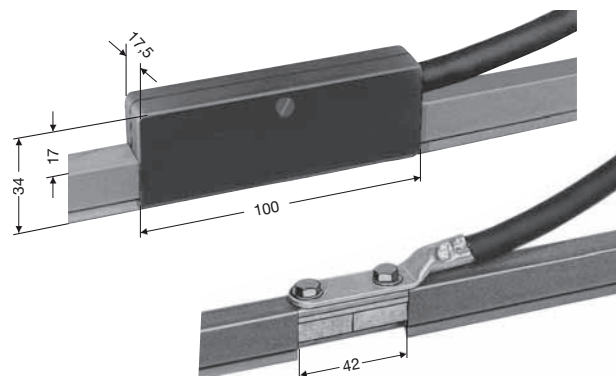
Feed terminals



Corresponding to UV 15 K
Connection cross section max. 2 single cores each 6 mm²

Type	Weight kg	Order- No.
UE 15 K 4⁽¹⁾	0,040	160 107

Cable lug and cable by others

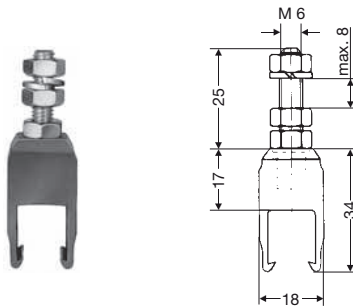


Connection cross section
1 single core 25 mm² (upto ø 8,2 mm)

Type	Weight kg	Order- No.
UEG 15 K⁽¹⁾	0,060	160 216

Cable by others. Staggered installation.
Special cable lug comes with feed terminal.

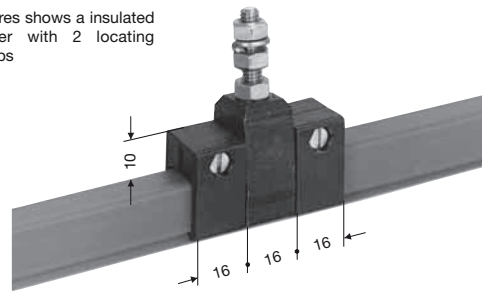
Insulated hangers⁽²⁾



Type	Weight kg	Order- No.
UA 15	0,020	160 113
UA 15 K 4⁽¹⁾	0,020	160 115

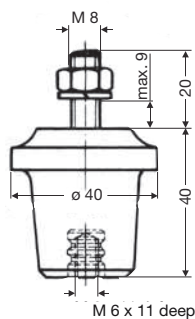
Locating clamp

Pictures shows a insulated hanger with 2 locating clamps



Type	Weight kg	Order- No.
USK 15 K 4⁽¹⁾	0,030	160 106

Insulators⁽²⁾

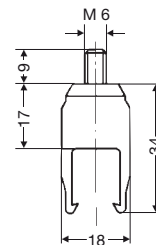


cantilever = 3000 N
creepage distance = 60 mm

Type	Weight kg	Order- No.
GH 40-M 6	0,100	160 117
GH 40-M 6 K 4⁽¹⁾	0,100	160 119

Rail holders

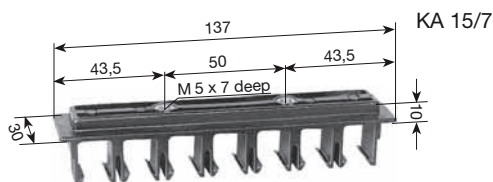
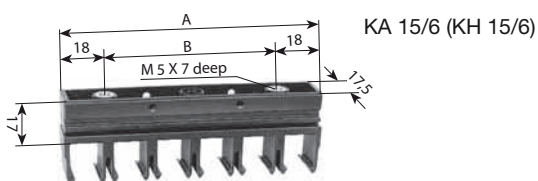
to be used with insulator only



Type	Weight kg	Order- No.
UAK 15	0,015	160 121
UAK 15 K 4⁽¹⁾	0,015	160123

Compact hangers 2- to 7-pole

With this compact hangers is a combination of any number of poles possible.

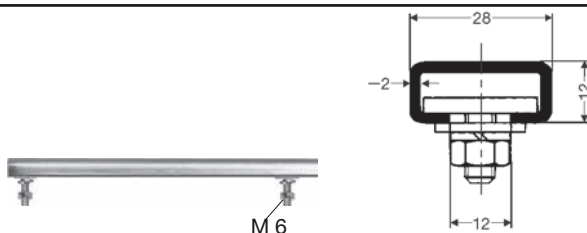


Conductor spacing 18 mm.

The hanger KA 15 is for direct bolting.

The hanger KH 15 has to be inserted in bracket profile.

Type	Dim. A	Dim. B	Weight kg	Order- No.
KH 15/2	36	—	0,012	161 559
KH 15/3	54	—	0,018	161 453
KH 15/4	72	—	0,023	161 452
KH 15/5	90	—	0,029	161 558
KH 15/6	108	—	0,035	160 139
KA 15/2	36	—	0,015	161 566
KA 15/3	54	—	0,023	161 567
KA 15/4	72	36	0,028	162 010
KA 15/5	90	36	0,033	161 498
KA 15/6	108	72	0,040	160 138
KA 15/7	—	—	0,050	160 140



Bracket profiles 28/12

incl. locking hardware

Type	Length mm	for poles	Weight kg	Order- No.
HU 15/200	200	6 + 7	0,130	161 434
HU 15/330	330	12 +14	0,300	161 435

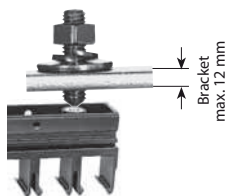
Longer brackets furnished on special order.

⁽¹⁾ with stainless steel hardware

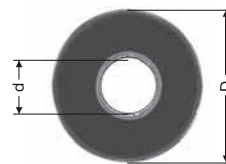


ACCESSORIES FOR U 15

Attachment hardware for compact hangers, insulated hangers and insulators



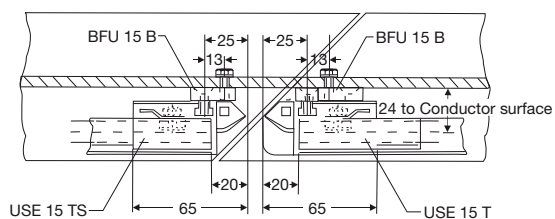
Type	Weight kg	Order- No.
BE 5 K 4⁽¹⁾	0,001	161 441



Type	Thread	d mm	D mm	S mm	Weight kg	Order- No.
Washer 5,3 K 4⁽¹⁾	M 5	5,30	15	1,60	0,002	161 408

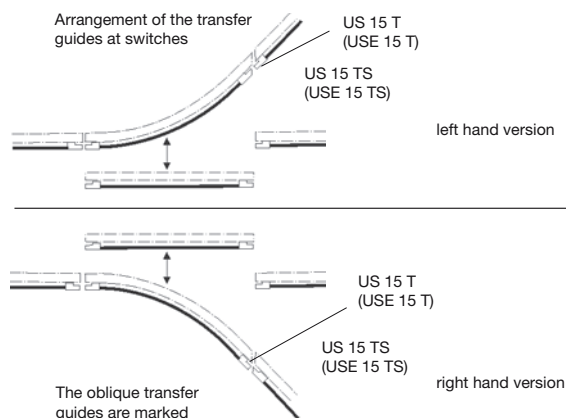
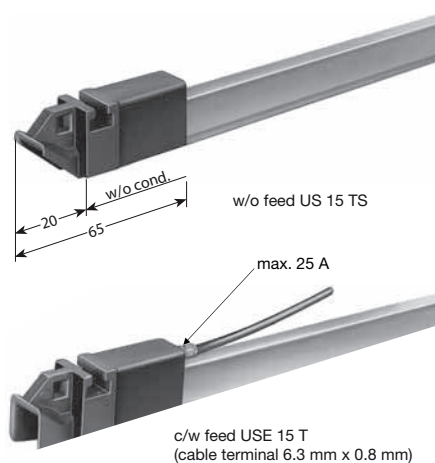
Transfer guides for monorail systems

with and without feed terminals
(also serving for anchor points in conjunction with BFU 15 B)



max. gap between opposite transfer guides:
6 mm for straight transfers
10 mm for oblique transfers
max. vertical and horizontal offset: ± 2 mm

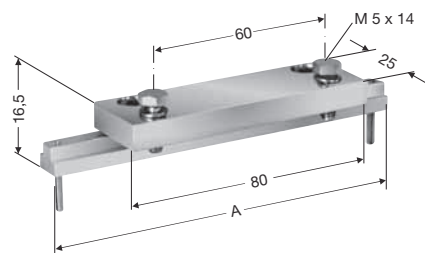
Type	feed terminal	Weight kg	Order- No.
US 15 T	w/o	0,016	160 840
US 15 TS	w/o	0,016	160 841
USE 15 T	c/w	0,018	160 842
USE 15 TS	c/w	0,018	160 843



Anchor bars for monorail transfer guide

for bolting to the track
complete with 2 x locking pins 2 x 20 and 2 x hex screws
M 5 x 14 with washers

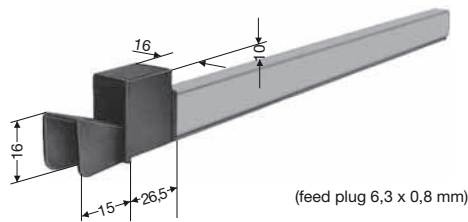
Type	poles	Dim. A mm	Weight kg	Order- No.
BFU 15 B-6	1 - 6	116	0,095	160 851
BFU 15 B-8	1 - 8	152	0,120	160 852



(Distance between conductor sliding surface and track = 24 mm; corresponds to compact hanger KA 15/6)

Transfer guides

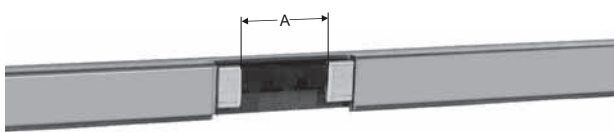
(no anchor point function)



max. air gap 6 mm
max. vertical and horizontal offset ± 2 mm

Type	feed terminal	Weight kg	Order- No.
US 15	w/o	0,010	160 125
USE 15	c/w	0,050	160 126
separately available: SE 15 feed plug		0,040	160 859

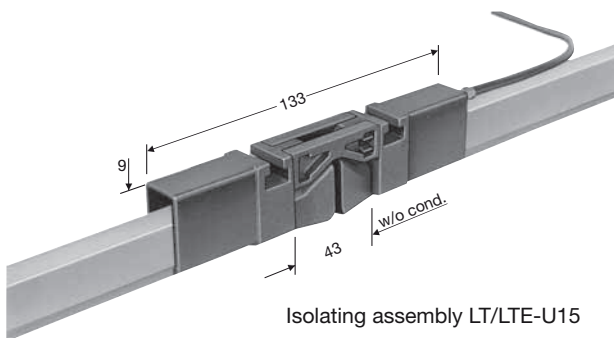
Isolating sections



Type M: factory assembled per system layout
Type L: loose delivery as a single item
On both sides of the isolating section a hanger has to be considered.
Distance max. 200 mm from center isolating section.
Conductors and hangers have to be ordered separately.

Type ⁽¹⁾	Length of isolating piece A	Weight kg	Order- No.
IT/U 15- 5 M	5	0,003	160 111
IT/U 15-15 M	15	0,004	160 240
IT/U 15-30 M	30	0,004	160 112
IT/U 15-90 M	90	0,007	160 241
IT/U 15- 5 L	5	0,003	160 226
IT/U 15-15 L	15	0,004	160 243
IT/U 15-30 L	30	0,004	160 227
IT/U 15-90 L	90	0,007	160 242

Isolating assemblies



Isolating assembly LT/LTE-U15

On both sides of the isolating assembly a hanger has to be considered.
Distance max. 200 mm from center isolating assembly.
Conductors, hangers and connecting cable FLA have to be ordered separately.
Flat plug connection: 6.3 x 0.8 mm

Type	symbol	comprising	Weight kg	Order- No.
LT /LT -U 15		2 x LT/U 15	0,032	160 844
LT /LTE-U 15		2 x LT/U 15 1 x flat plug	0,034	160 845
LTE/LTE-U 15		2 x LT/U 15 2 x flat plug	0,036	160 846

Both isolating assembly parts (LT-U 15) are connected during installation while laterally pressed together.

End caps with locking pin



Type ⁽¹⁾	Weight kg	Order- No.
UK 15-M	0,005	161 656
UK 15-L	0,005	160 109

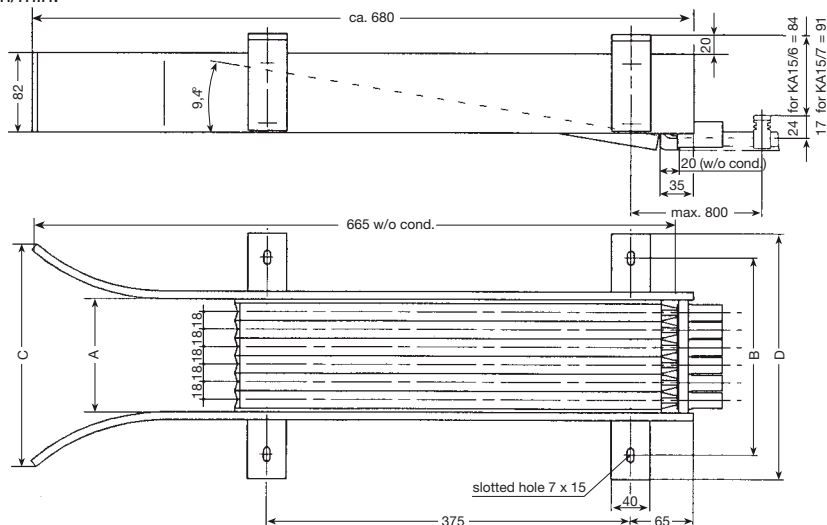
⁽¹⁾ Type M = factory assembled
Type L = loose



TRANSFER FUNNELS FOR U 15

Transfer funnels for KSTU 30/55

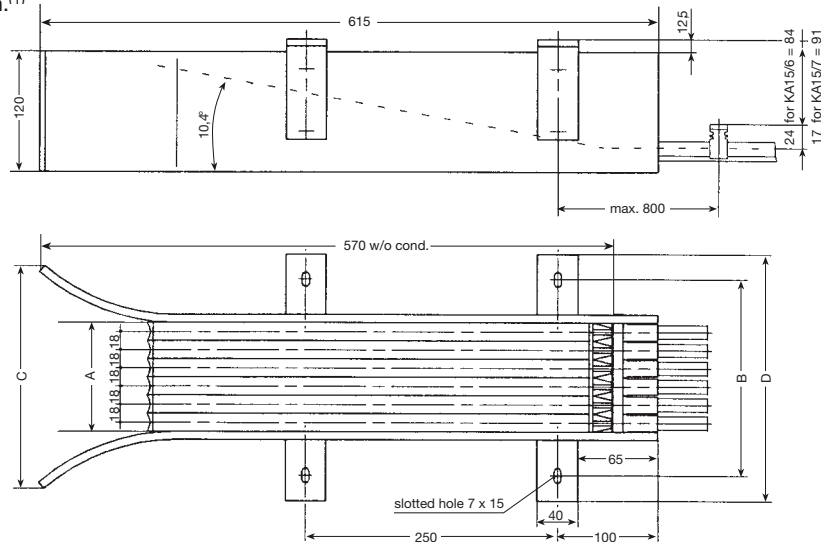
for max. speed $v = 120 \text{ m/min.}^{(1)}$



Type	A mm	B mm	C mm	D mm	Weight kg	Order- No.
EFT U 15-2 - KSTU	44	130	157	180	2,960	161 747
EFT U 15-3 - KSTU	62	148	175	198	3,140	161 748
EFT U 15-4 - KSTU	80	166	193	216	3,320	161 749
EFT U 15-5 - KSTU	98	184	211	234	3,500	161 750
EFT U 15-6 - KSTU	116	202	229	252	3,680	161 751
EFT U 15-7 - KSTU	134	220	247	270	3,860	161 752
EFT U 15-8 - KSTU	162	238	265	288	4,040	161 753

Transfer funnels for KSTLU / KDSTLU

for max. speed $v = 120 \text{ m/min.}^{(1)}$



Type	A mm	B mm	C mm	D mm	Weight kg	Order- No.
EFT U 15-2 - KDSTLU	36	122	148	172	2,860	161 668
EFT U 15-3 - KDSTLU	54	140	166	190	3,060	161 669
EFT U 15-4 - KDSTLU	72	158	184	208	3,260	161 670
EFT U 15-5 - KDSTLU	90	176	202	226	3,460	161 671
EFT U 15-6 - KDSTLU	108	194	220	244	3,650	161 672
EFT U 15-7 - KDSTLU	126	212	238	262	3,850	161 673
EFT U 15-8 - KDSTLU	144	230	256	280	4,050	161 674

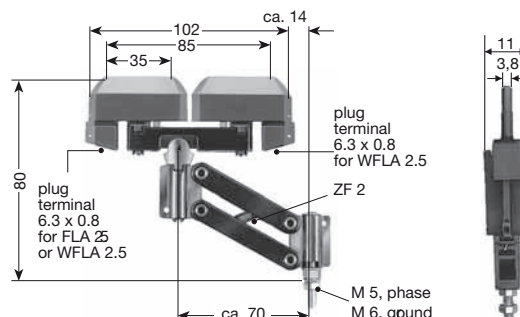


COLLECTORS FOR U 15

Double current collector

max. ampacity: 1 flat plug 25 A, 2 flat plugs 2 x 20 A

Lift ± 10 mm, swivel ± 10 mm,
contact pressure: ca. 3.5 N per brush
Connecting cable to be ordered separately.

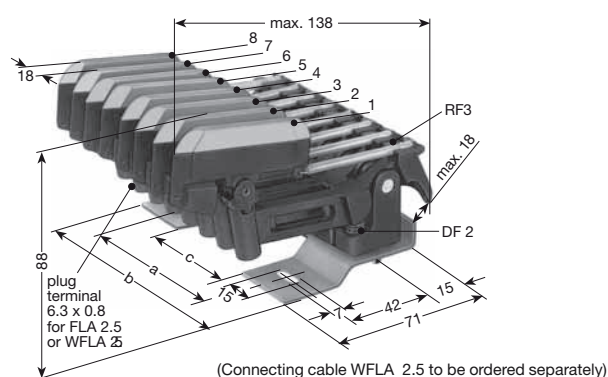


Type ⁽¹⁾	Weight kg	Order- No.	
		phase - black	ground - yellow
KST 2/40	0,080	168 137	168 138

Compact current collectors⁽²⁾

max. ampacity: 1 flat plug 25 A

For conductor spacing of 18 mm;
Lift & swivel ± 15 mm
Contact pressure:
ca. 3.5 N per brush
Ground at No. 4, 3-pole at No. 3
other position on request.
For safety reasons during
maintenance ground collector is
always first and last contact.

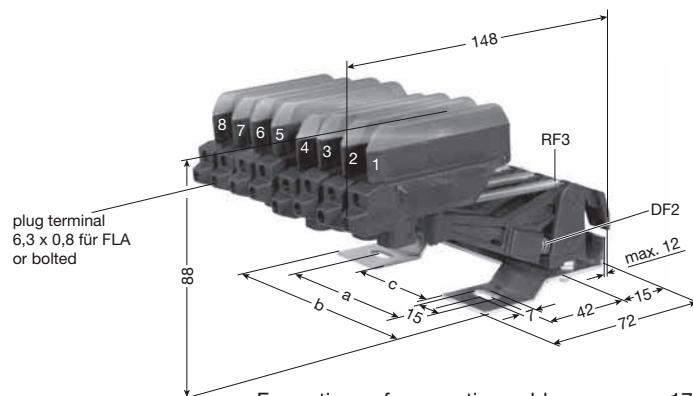


Type ⁽¹⁾	Poles	a mm	b mm	c mm	Weight kg	Base plate	Order- No.	
							for power incl. 1 x ground HS	for control ST
KSF 25-2	2	18	43	-	0,168	2pole	-	155 038
KSF 25-3	3	54	79	-	0,274	4pole (No. 4 = blank)	155 028	155 039
KSF 25-4	4	54	79	-	0,324	4pole	155 029	155 040
KSF 25-5	5	80	115	53	0,425	6pole (No. 6 = blank)	155 030	155 041
KSF 25-6	6	80	115	53	0,475	6pole	155 031	155 042
KSF 25-7	7	120	151	80	0,581	8pole (No. 8 = blank)	155 032	155 043
KSF 25-8	8	120	151	80	0,631	8pole	155 033	155 044
Separately available:							phase	ground
Collector KSF 25					0,050		155 023	155 024

Compact current collectors KESR 32-55

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

Phase distance 18 mm
Lift and swivel ± 15 mm
Contact pressure:
approx 3.5 N per brush
Ground on No. 4, with 3-poles at No. 3
other positions on request.
Ground is always first and last contact.



For options of connecting cables see page 17

KESR-F (Flat plug connection)

Type ⁽¹⁾	Poles	a ⁽²⁾ mm	b ⁽²⁾ mm	c ⁽²⁾ mm	Weight kg	Base plate	Order- No.	
							with ground HS	w/o ground 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
KESR 32-55 F-7-18	7	120	151	80	0,649	8-poles (Nr. 8 = free)	157 289	157 304
KESR 32-55 F-8-18	8	120	151	80	0,713	8-poles	157 434	157 435
Separately available:							phase black	ground yellow
Collector KESR 32-55							157 274	157 275

KESR-S (Bolted connection)

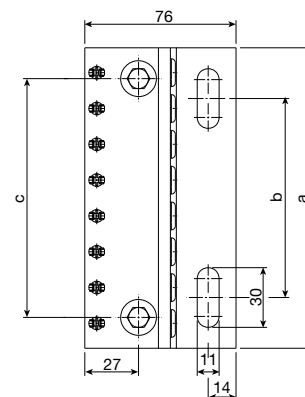
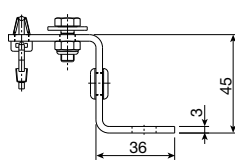
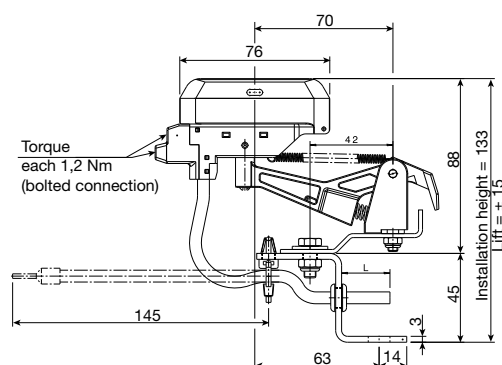
Type ⁽¹⁾	Poles	a ⁽²⁾ mm	b ⁽²⁾ mm	c ⁽²⁾ mm	Weight kg	Base plate	Order- No.	
							with ground HS	w/o ground ST
KESR 32-55 S-3-18	3	54	79	-	0,405	4-poles (Nr. 4 = free)	157 220	157 225
KESR 32-55 S-4-18	4	54	79	-	0,476	4-poles	157 221	157 226
KESR 32-55 S-5-18	5	80	115	53	0,547	6-poles (Nr. 6 = free)	157 222	157 227
KESR 32-55 S-6-18	6	80	115	53	0,618	6-poles	157 223	157 228
KESR 32-55 S-7-18	7	120	151	80	0,689	8-poles (Nr. 8 = free)	157 224	157 229
KESR 32-55 S-8-18	8	120	151	80	0,760	8-poles	157 431	157 433
Separately available:							phase black	ground yellow
Collector KESR 32-55							157 294	157 295

Adapter 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 including adapter plate on request.



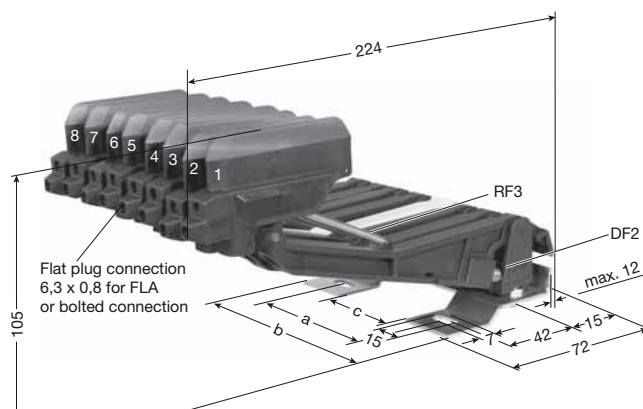
⁽¹⁾ Type completed e.g. KESR 32-55 S-4-18 with ground → KESR 32-55 S-4-18 HS Order-No. 157 221.

⁽²⁾ Base plate with KESR and KSFU 25 always 2-, 4-, 6- or 8-poles.
Collectors 3-poles: Base plate 4-poles, 4th pole free.
Collectors 5-poles: Base plate 6-poles, 6th pole free.
Collectors 7-poles: Base plate 8-poles, 8th pole free.



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

Phase distance 18 mm
Lift and swivel ± 30 mm
Contact pressure: approx 7 N per brush
Ground on No. 4, with 3-poles at No.3
other positions on request.
Ground is always first and last contact.



For options of connecting cables see page 17

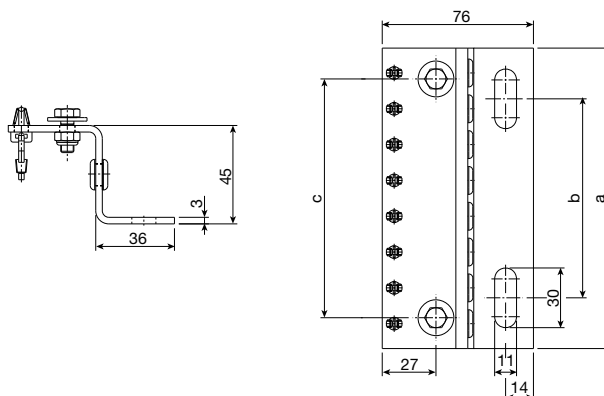
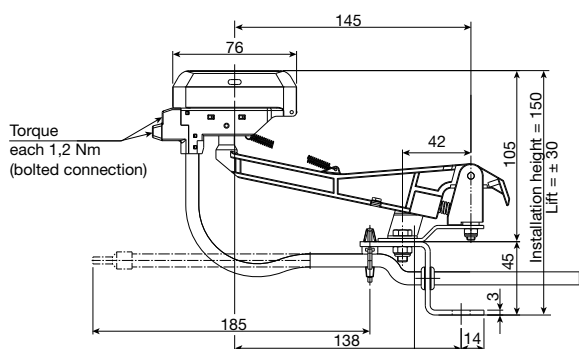
Type ⁽¹⁾	Poles	a ⁽²⁾ mm	b ⁽²⁾ mm	c ⁽²⁾ mm	Weight kg	Base plate	Order-No.	
							with ground HS	w/o ground ST
KESL 32-55 F- 3-18	3	54	79	-	0,438	4-poles (Nr. 4 = free)	157 199	157 300
KESL 32-55 F- 4-18	4	54	79	-	0,517	4-poles	157 200	157 301
KESL 32-55 F- 5-18	5	80	115	53	0,596	6-poles (Nr. 6 = free)	157 201	157 302
KESL 32-55 F- 6-18	6	80	115	53	0,675	6-poles	157 202	157 303
KESL 32-55 F- 7-18	7	120	151	80	0,754	8-poles (Nr. 8 = free)	157 203	157 305
KESL 32-55 F- 8-18	8	120	151	80	0,833	8-poles)	157 204	157 436
Separately available:							Phase	ground
Collector KESL 32-55 F/18							157 188	157 189

Type ⁽¹⁾	Poles	a ⁽²⁾ mm	b ⁽²⁾ mm	c ⁽²⁾ mm	Weight kg	Base plate	Order-No.	
							with ground HS	w/o ground 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
KESL 32-63 S- 7-18	7	120	151	80	0,795	8-poles (Nr. 8 = free)	157 194	157 306
KESL 32-63 S- 8-18	8	120	151	80	0,881	8-poles	157 198	157 437
Separately available: Collector KESR 32-63 S/18							Phase	PE
							157 186	157 187

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 including adapter plate on request.



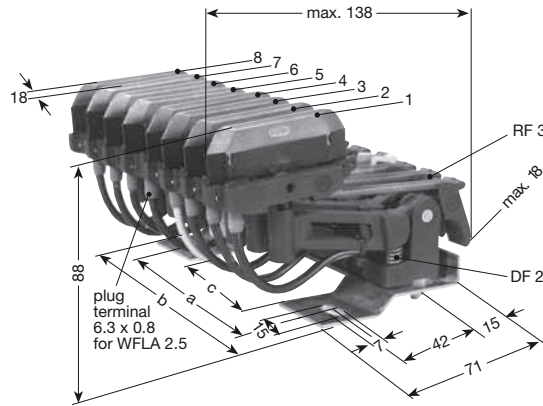
COMPACT CURRENT COLLECTORS FOR U 15



Compact current collectors

max. ampacity: 1 plug terminal 25 A.

For conductor spacing of
18 mm. Lift & swivel ± 15 mm
Contact pressure:
ca. 3.5 N per brush
Ground at No. 4, 3-pole at No. 3
other position on request.
For safety reasons during
maintenance ground collector is
always first and last contact.

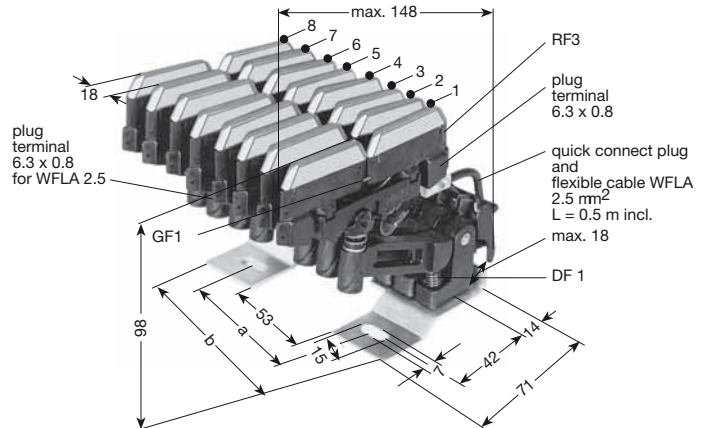


Type ⁽¹⁾	Poles	a mm	b mm	c mm	Weight kg	Base plate	Order- No.	
							for power incl. 1 x ground HS	for control ST
KSFU 25-2	2	18	43	-	0,182	2-poles	155 050	155 059
KSFU 25-3	3	54	79	-	0,295	4-poles (No. 4 = blank)	155 051	155 060
KSFU 25-4	4	54	79	-	0,352	4-poles	155 052	155 061
KSFU 25-5	5	80	115	53	0,460	6-poles (No. 6 = blank)	155 053	155 062
KSFU 25-6	6	80	115	53	0,517	6-poles	155 054	155 063
KSFU 25-7	7	120	151	80	0,625	8-poles (No. 8 = blank)	155 055	155 064
KSFU 25-8	8	120	151	80	0,682	8-poles	155 056	155 065
Separately available:							phase	ground
Collector KSFU 25					0,057	w/o	155 025	155 026

Compact double current collectors

max. ampacity: 1 plug terminal 25 A, 2 plug terminals 2 x 20 A

For conductor spacing of
18 mm. Lift & swivel ± 15 mm
Contact pressure:
ca. 3.5 N per brush
Ground at No. 4, 3-pole at No. 3
other position on request.
For safety reasons during
maintenance ground collector is
always first and last contact.



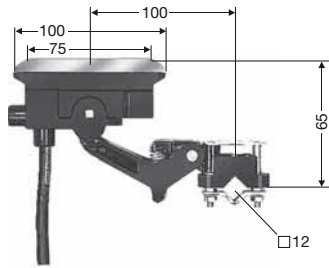
Type ⁽¹⁾	Poles	a mm	b mm	c mm	Weight kg	Base plate	Order- No.	
							for power incl. 1 x ground HS	for control ST
KDS 2/40-1-18	1	54	79	-	0,194	4-poles (No. 2 - 4 = blank)	155 077	155 089
KDS 2/40-2-18	2	54	79	-	0,264	4-poles (No. 3 + 4 = blank)	155 078	155 090
KDS 2/40-3-18	3	54	79	-	0,334	4-poles (No. 4 = blank)	155 079	155 091
KDS 2/40-4-18	4	54	79	-	0,404	4-poles	155 080	155 092
KDS 2/40-5-18	5	80	115	53	0,525	6-poles (No. 6 = blank)	155 081	155 093
KDS 2/40-6-18	6	80	115	53	0,595	6-poles	155 082	155 094
KDS 2/40-7-18	7	120	151	80	0,721	8-poles (No. 8 = blank)	155 083	155 095
KDS 2/40-8-18	8	120	151	80	0,791	8-poles	155 084	155 096
Separately available:							phase-black	ground-yellow
Collector KDS 2/40 , 1pole					0,070	w/o	168 073	168 074

⁽¹⁾ Suffix types e.g. KSFU 25-2 → KSFU 25-2 **HS**, Order- No. 155 050 · KDS 2/40 -1-18 → KDS 2/40 -1-18 **HS**, Order- No. 155 077



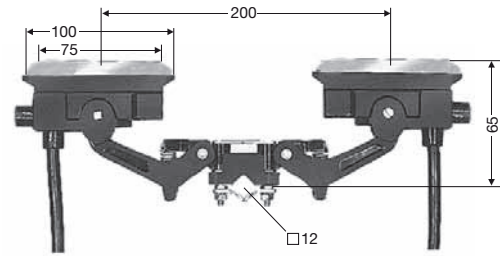
COLLECTORS FOR U 15

Current collectors



c/w 2 m cable · lift & swivel ± 20 mm
contact pressure: 9 N

Double current collectors

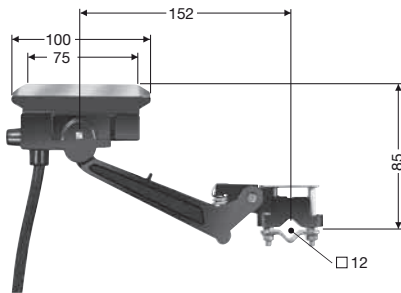


c/w 2 x 2 m cable · lift & swivel ± 20 mm
contact pressure: 9 N per brush

Type ⁽¹⁾	Am- pacity A	Connecting cable mm ²	Ø max/ mm	Weight kg	Order- No.	
					phase - black	ground - yellow
KST 15	15	2,50	8,00	0,256	150 891	150 892
KST 40	40	6,00	11,00	0,428	152 840	152 850
KST 60	60	10,00	12,50	0,588	153 675	153 676

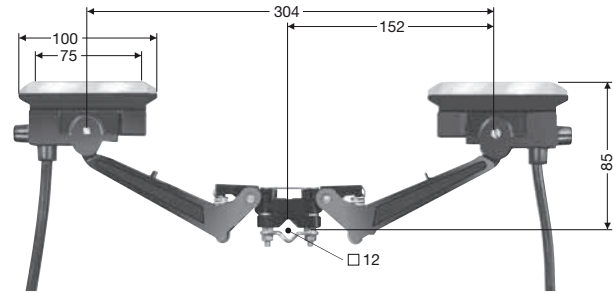
Type ⁽¹⁾	Am- pacity A	Connecting cable mm ²	Ø max/ mm	Weight kg	Order- No.	
					phase - black	ground - yellow
KDST 30	30	2,50	8,00	0,471	150 897	150 898
KDST 80	80	6,00	11,00	0,821	152 960	152 970
KDST 120	120	10,00	12,50	1,114	153 679	153 680

Current collectors



c/w 2 m cable · lift & swivel ± 40 mm
contact pressure: 9 N

Double current collectors

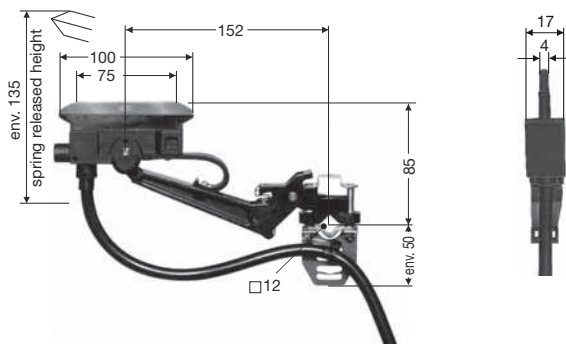


c/w 2 x 2 m cable · lift & swivel ± 40 mm
contact pressure: 9 N per brush

Type ⁽¹⁾	Am- pacity A	Connecting cable mm ²	Ø max/ mm	Weight kg	Order- No.	
					phase - black	ground - yellow
KSTL 15	15	2,50	8,00	0,272	150 893	150 894
KSTL 40	40	6,00	11,00	0,453	152 860	152 870
KSTL 60	60	10,00	12,50	0,591	153 677	153 678

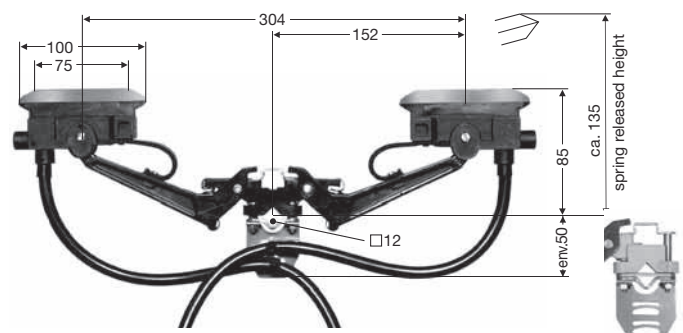
Type ⁽¹⁾	Am- pacity A	Connecting cable mm ²	Ø max/ mm	Weight kg	Order- No.	
					phase - black	ground - yellow
KDSTL 30	30	2,50	8,00	0,492	150 899	150 901
KDSTL 80	80	6,00	11,00	0,822	152 980	152 990
KDSTL 120	120	10,00	12,50	1,188	153 681	153 682

Current collectors for transfer funnel EFT⁽²⁾



c/w 2 m cable
lift ± 20 mm, swivel ± 40 mm contact pressure: 9 N

Double current collectors for transfer funnel EFT⁽²⁾



c/w 2 x 2 m cable
lift ± 20 mm, swivel ± 40 mm contact pressure: 9 N per brush

Type ⁽¹⁾	Am- pacity A	Connecting cable mm ²	Ø max/ mm	Weight kg	Order- No.	
					phase - black	ground - yellow
KSTLU 15	15	2,50	8,00	0,313	150 895	150 896
KSTLU 40	40	6,00	11,00	0,499	153 791	153 792
KSTLU 60	60	10,00	12,50	0,652	153 793	153 794

Type ⁽¹⁾	Am- pacity A	Connecting cable mm ²	Ø max/ mm	Weight kg	Order- No.	
					phase - black	ground - yellow
KDSTLU 30	30	2,50	8,00	0,541	150 902	150 903
KDSTLU 80	80	6,00	11,00	0,895	153 786	153 787
KDSTLU 120	120	10,00	12,50	1,231	153 795	153 796

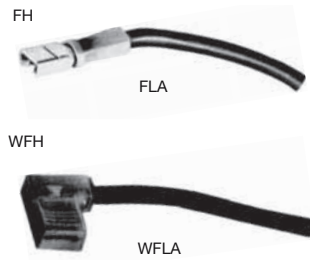
⁽¹⁾ Suffix types e.g. KST 15 → KST 15 PH Order- No. 150 891.

⁽²⁾ Released collector maintains center phase position for easy retracking.

COLLECTOR COMPONENTS FOR U 15



Connecting cable, high-flexible for collectors
(see current collectors on pages 12, 13, 14.)



1 m long with flat plug 6.3 x 0.8.
Longer cables available.

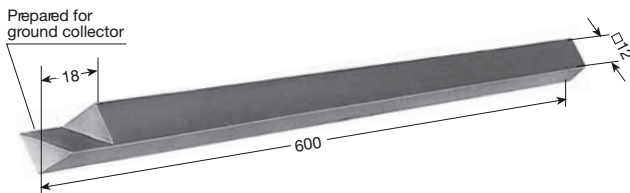
Type	Cross section mm ²	Outer Ø mm	Weight kg	Order- No. phase - black	Order- No. ground - yellow
FLA 2,5	2,50	4	0,080	165 049	165 050
FLA 4	4,00	6	0,100	165 051	165 052
FLA 6	6,00	7	0,015	166 368	166 369
WFLA 2,5	2,50	4	0,080	168 107	168 108

Flat plugs, only

Type	for cross section mm ²	Order- No.
FH 2,5	2,50	165 120
FH 4	4,00	165 121
WFH 2,5	2,50	168 109

Collector bracket

for KST 15 thru KDSTLU 120



Longer brackets furnished on special order.

With brackets above 600 mm length a support has to be considered on site, to avoid a bending or twisting of the collector bracket.

Type	Length mm	Weight kg	Order- No.
UM 12	600	0,710	153 506

Cable attachment clamp

for KSTLU 15 thru KDSTLU 120



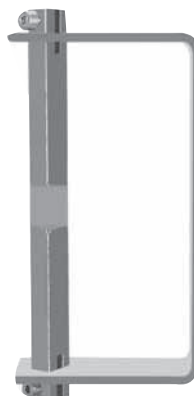
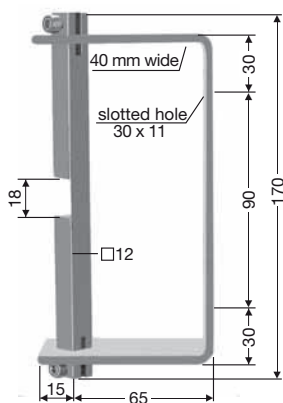
Type	Weight kg	Order- No.
KBK⁽¹⁾	0,030	153 519

Collector bracket

for KST 15 thru KDSTLU 120 collectors,

for KST 30 thru KSTLU 55 collectors,

for control collectors only



Type	Weight kg	Order- No.
UMAS 12 HS -A	0,600	152 233

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

Contact grease

for joints and feeds

100 ml for approx. 200 joints

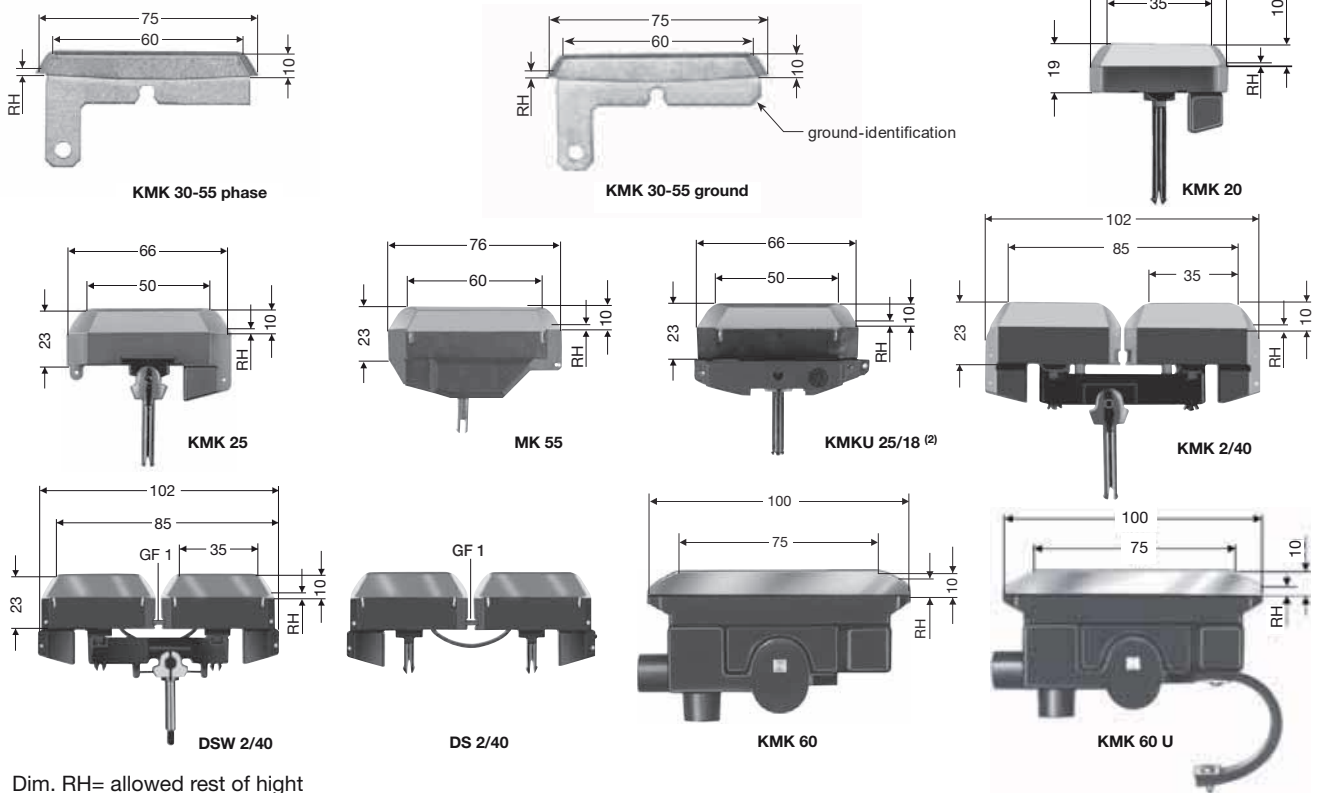
Order- No. 121 502

⁽¹⁾ with stainless steel hardware



COLLECTOR COMPONENTS FOR U 15

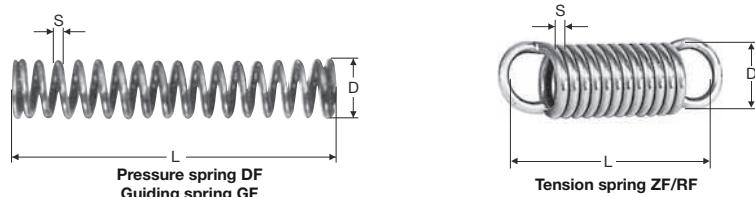
Carbon brushes



Dim. RH= allowed rest of hight

Type	for collectors	width of carbon brushes mm	RH mm	Weight kg	Order- No.
KMK 30-55 PH	KST 30 – KSTL 55	4,40	1,50	0,031	154 440
KMK 30-55 PE	KST 30 – KSTL 55	4,40	1,50	0,034	154 453
KMK 20	KST 20	4,50	5,50	0,020	155 068
KMK 25	KST 25, KSF 25	4,20	1,50	0,030	155 000
MK 55	KESR 32-55	4,20	3,50	0,042	168 225
KMKU 25/18	KSFU 25	4,20	1,50	0,035	155 002
KMK 2/40	KST 2/40	3,80	1,00	0,050	168 135
DSW 2/40⁽¹⁾	KDS 2/40	3,80	1,00	0,050	168 151
DS 2/40	KDS 2/40	3,80	1,00	0,050	168 065
KMK 60	KST 15 – KDSTL 120	4,00	3,00	0,110	153 512
KMK 60 U	KSTLU 15 – KDSTLU 120	4,00	3,00	0,120	153 513

Springs



Type	for collectors	S mm	D mm	L mm	Order- No.
ZF 1	KST 20, KST 25	0,63	5,40	22,00	153 514
ZF 2	KST 2/40	0,85	6,45	24,00	153 515
ZF 3	KST 15 thru KDST 120	1,10	10,80	28,50	153 516
ZF 4	KSTL 15 thru KDSTL 120 and KSTLU 15 thru KDSTLU 120	1,30	11,00	29,00	153 517
DF 1	KSFR 2/40	1,00	7,00	38,00	153 847
DF 2	KSF 25	0,90	7,70	43,00	153 848
DF 3	KDS 2/40	0,55	9,55	24,00	152 011
DF 4	KESL 32-63	1,10	6,40	41,00	157 312
RF 3	KSF 25, KSFR 2/40, KESR 32-55	0,40	4,40	31,00	153 849
GF 1	KSFR 2/40	0,35	2,00	22,00	153 850

⁽¹⁾ Also spare part for collector KSFR 2/40 (old type)

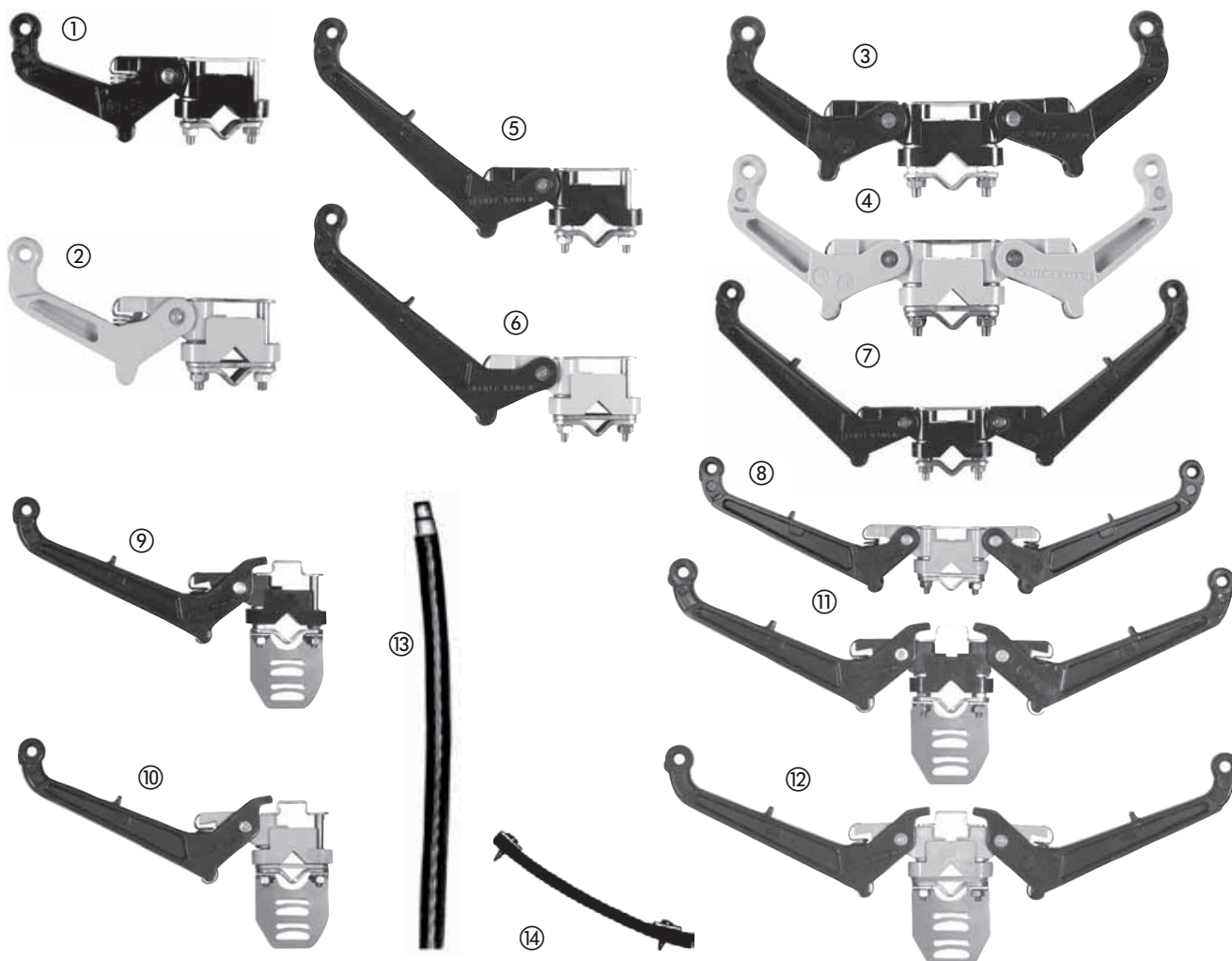
⁽²⁾ 18 mm wide

COLLECTOR COMPONENTS FOR U 15



For KST 15 thru KDSTLU 120

Part-No.	Description	Weight kg	Order- No.
1	Collector base for KST 15 thru KST 60	0,080	153 736
2	Collector base for KST 15 thru KST 60		153 737
3	Collector base for KDST 30 thru KDST 120 (double arm)	0,100	153 738
4	Collector base for KDST 30 thru KDST 120 (double arm)		153 739
5	Collector base for KSTL 15 thru KSTL 60	0,090	153 740
6	Collector base for KSTL 15 thru KSTL 60		153 741
7	Collector base for KDSTL 30 thru KDSTL 120 (double arm)	0,130	153 742
8	Collector base for KDSTL 30 thru KDSTL 120 (double arm)		153 743
9	Collector base for KSTLU 15 thru KSTLU 60	0,090	153 804
10	Collector base for KSTLU 15 thru KSTLU 60		153 805
11	Collector base for KDSTLU 30 thru KDSTLU 120 (double arm)	0,130	153 806
12	Collector base for KDSTLU 30 thru KDSTLU 120 (double arm)		153 807
13	Connecting cable AEA 2,5 PH, 2 m long / AEA-KSTLU-2,5 PH, 2 m long	0,072	151 374 / 156 431
	Connecting cable AEA 2,5 PE, 2 m long / AEA-KSTLU-2,5 PE, 2 m long		151 375 / 156 432
13	Connecting cable AEA 6 PH, 2 m long / AEA-KSTLU-6 PH, 2 m long	0,260	153 744 / 156 433
	Connecting cable AEA 6 PE, 2 m long / AEA-KSTLU-6 PE, 2 m long		153 745 / 156 434
13	Connecting cable AEA 10 PH, 2 m long / AEA-KSTLU-10 PH, 2 m long	0,400	153 746 / 156 427
	Connecting cable AEA 10 PE, 2 m long / AEA-KSTLU-10 PE, 2 m long		153 747 / 156 435
14	Rubber spring ⁽¹⁾ for KSTLU 15, KSTLU 40, KSTLU 60, KDSTLU 30 KDSTLU 80, KDSTLU 120	0,008	153 748



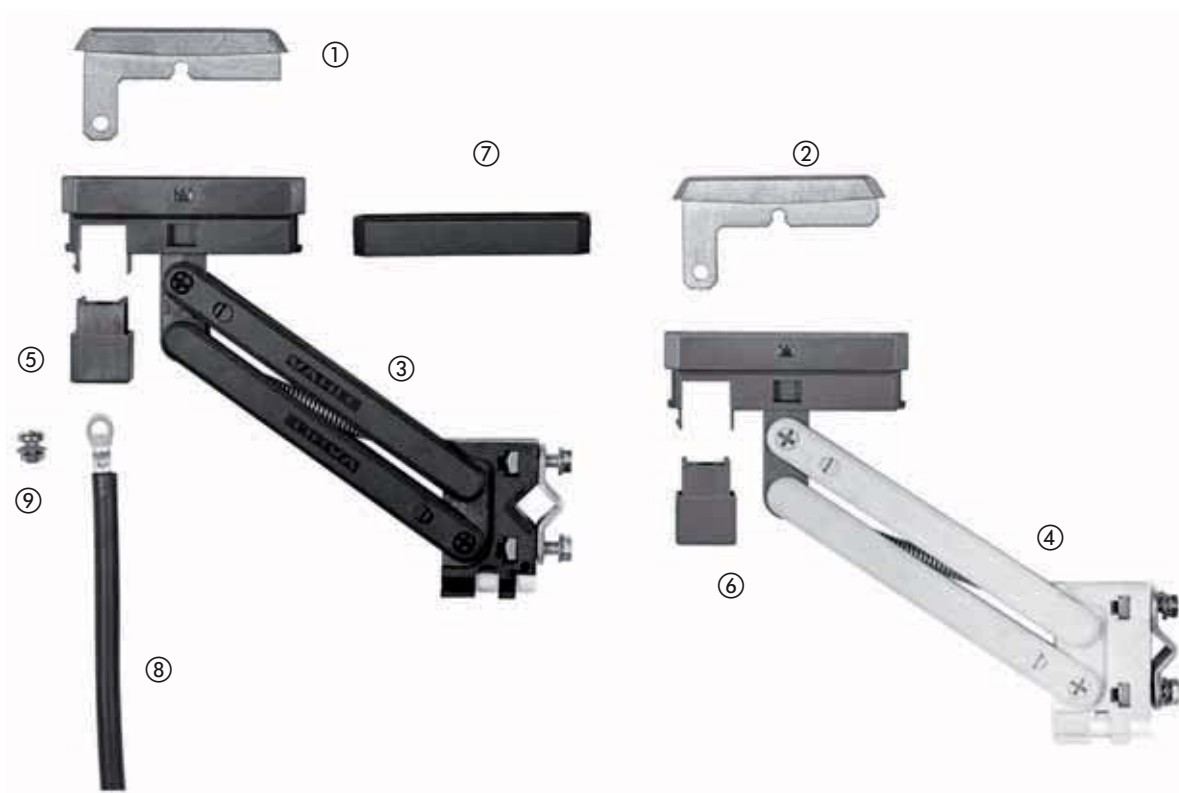
⁽¹⁾ Rubber spring will be included when ordering KMK 60 U brush.



COLLECTOR COMPONENTS FOR U 15

For KST 30-55 thru KSTLU 30-55

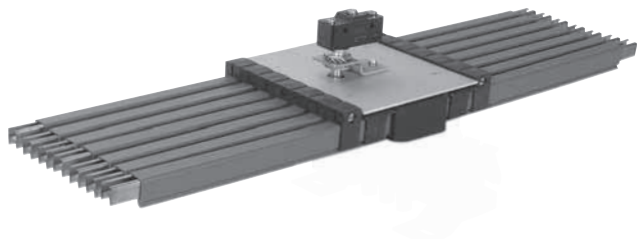
Part.-No.	Description	Weight kg	Order- No.
1	Brush phase PH	0,031	154 440
2	Brush ground PE	0,031	154 453
3	Collector base & arm KST, complete phase PH	0,083	152 275
	Collector base & arm KSTL, complete phase PH		152 279
4	Collector base & arm KST, complete ground PE	0,083	152 276
	Collector base & arm KSTL, complete ground PE		152 281
5	Terminal cap (black) phase PH	0,002	152 291
6	Terminal cap (green) ground PE	0,002	152 292
7	Spacer for KSTU 30-55 only	0,003	152 293
8	Connecting cable RKA 2.5 PH, 2 m long phase PH	0,130	154 447
	Connecting cable RKA 2.5 PE, 2 m long ground PE		154 448
8	Connecting cable RKA 6 PH, 2 m long phase PH	0,250	154 449
	Connecting cable RKA 6 PE, 2 m long ground PE		154 450
9	Terminal bolt	0,002	152 658



BRUSH WEAR INDICATOR FOR U 15



Brush wear indicator KVT 15 N



Shown KVT 15 N-7 in a 7-poles system

The following collectors are suitable for the KVT 15 N 4-7:

KST 20; KST 25
KSF 25-
KESR 32-55 .- .- 18
KESL 32-55 .- .- 18
KESL 32-63 S- .- 18
KST 30 thru KSTU 55
KST 15 thru KDSTLU 120
KSFU 25-.

The brush wear indicator automatically checks the wear of carbon brushes. The indicator is infinitely variable to the wearing height of carbon brushes. A worn down carbon brush actuates an impulse. It is recommended to place the indicator near a maintenance area in order to open automatically a switch leading the monorail hoist to the repair zone.

Size of web cut of monorail track: 120 x 50 mm (L x H)

Pay attention to the installation instructions. PE always at No 4. Other positioning on request.

Brush wear indicator for U 15 with micro-switch

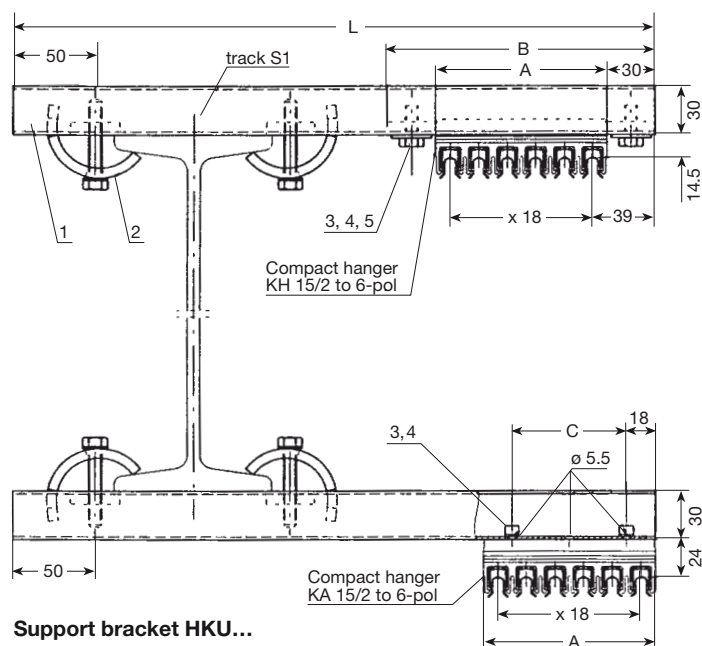
Type	Poles	Dim. a mm	Weight kg	Order- No.
KVT 15 N-4	4	76	0,860	161 720
KVT 15 N-5	5	94	1,020	161 721
KVT 15 N-6	6	112	1,165	161 722
KVT 15 N-7	7	130	1,310	161 723





BRACKETS • SNAP-ON BRACKETS FOR U 15

Support bracket HKO...



Support bracket HKU...

Type	Length L mm	Order- No.
HKO 400	400	161 605
HKO 500	500	161 606
HKO 600	600	161 607
HKO 700	700	161 608
HKO 800	800	161 609
HKO 900	900	161 610
HKU 400	400	161 799
HKU 500	500	161 800
HKU 600	600	161 801
HKU 700	700	161 802
HKU 800	800	161 803
HKU 900	900	161 804

Type	Dim. A mm	Dim. B mm	Dim. C mm
KH 15/2	36	96	—
KH 15/3	54	114	—
KH 15/4	72	132	36
KH 15/5	90	150	36
KH 15/6	108	168	72

EXAMPLES FOR ORDERING U 15



Compact Configuration, 124 m, 5-pole + ground electrification system for 100 Amps.

Qty.	Description	Type	Order- No.
100	VAHLE unipole insulated conductors, 6 m long phase PH	U 15/25 C-6	162 136
5	VAHLE unipole insulated conductors, 2 m long phase PH	U 15/25 C-2	162 132
20	VAHLE unipole insulated conductors, 6 m long ground PE	U 15/25 C-6	162 196
1	VAHLE unipole insulated conductor, 2 m long ground PE	U 15/25 C-2	162 192
10	expansion sections each 1 m long phase PH	UDV 15/25 C K 4	160 276
2	expansion sections each 1 m long ground PE	UDV 15/25 C K 4	160 277
120	joint splices	UV 15 K 4	160 102
6	feed terminals	UEG 15 K 4	160 216
36	locating clamps	USK 15 K 4	160 106
12	end caps	UK 15 - L	160 109
125	compact hangers	KH 15/6	160 139
125	bracket profiles, 200 mm long	HU 15/200	161 434
5	current collectors phase PH	KST 25	155 013
1	current collector ground PE	KST 25	155 014
1	contact grease		121 502

Standard configuration, 40 m, 3-pole + ground electrification system for 10 Amps.

Qty.	Description	Type	Order- No.
18	VAHLE unipole insulated conductors, 6 m long phase PH	U 15/25 E-6	162 156
3	VAHLE unipole insulated conductors, 4 m long phase PH	U 15/25 E-4	162 154
6	VAHLE unipole insulated conductors, 6 m long ground PE	U 15/25 E-6	162 216
1	VAHLE unipole insulated conductor, 4 m long ground PE	U 15/25 E-4	162 214
24	joint splices	UV 15 K 4	160 102
4	feed terminals	UE 15 K 4	160 107
8	locating clamps	USK 15 K 4	160 106
8	end caps	UK 15-L	160 109
164	insulated hangers	UA 15	160 113
3	current collectors phase PH	KST 25	155 013
1	current collectors ground PE	KST 25	155 014
1	contact grease		121 502



INSTALLATION TOOLS FOR U 15

Curve tool

Bending of conductor rails U 15 vertical and horizontal
Motor powered tool available on request.
The filler rod is to be ordered separately.

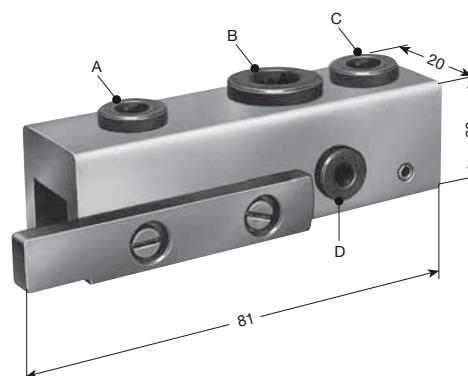
Type	Weight kg	Order- No.
BVU 15	10,000	160 147
FU 15 Filler-rod (4 m)	0,340	160 735



Drill jig

The drill guide should be used when conductor ends have to be prepared for end caps or transfer guides on site.
Drill B and D for end caps.
Drill B for transfer guide US 15 and USE 15.

Type	Weight kg	Order- No.
BS 15	0,100	160 148



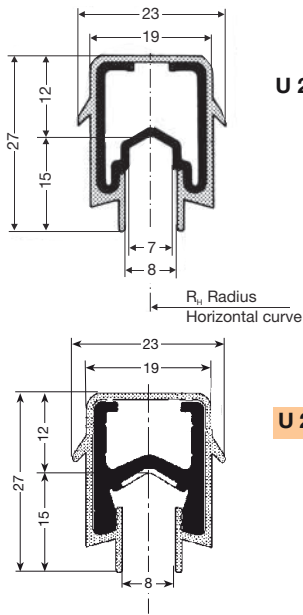
Please see installation instructions for U 15.

Punch tool

To prepare shroud holes for US 15 T thru USE 15 TS
and LT/ LT-U 15 thru LTE / LTE-U15.



Type	Weight kg	Order- No.
HST 15	4,300	160 322



U 25 C

U 25 AE

Conductor code:

U = unipole insulated conductor
 25 = shroud size
 50-125 = conductor cross sectional area (mm²)
 C = copper conductor
 AE = Aluminium conductor contact surface stainless steel.

Length:

6 m is standard length, shorter lengths are available

Conductor spacing:

on standard hangers 50 – 80 mm
 on compact hangers 50 mm
 Chemical and electrical properties and temperature resistance see page 4.

Support spacing:

- for straight runs & for inside & outside curves: 1500 mm
 - horizontal curves: up to $R_H = 10 \text{ m}^{(1)}$: 750 mm
 - horizontal curves: above $R_H = 10 \text{ m}^{(1)}$: 1500 mm

Bending of conductors:

factory prepared from $R = 800 \text{ mm}$
 on site:
 horizontal curves: from $R = 7000 \text{ mm}$
 inside & outside curves: from $R = 2500 \text{ mm}$
 AE-conductor on request.

Heating system available on request.

⁽¹⁾ Recommendation.

Type of conductor rail

Type	U 25/50 C	U 25/75 C	U 25/100 C	U 25/125 C	U 25/90 AE	U 25/125 AE
Weight kg/m	0,550	0,772	1,000	1,260	0,450	0,540
Standard shroud, color green -30 to + 55 °C						
Order- No. phase ⁽²⁾	171 02 •	171 03 •	171 04 •	171 20 •	171 24 •	171 28 •
Order- No. PE ⁽²⁾	171 12 •	171 13 •	171 14 •	171 21 •	171 25 •	171 29 •
High temperature shroud, color grey -30 to + 85 °C						
Order- No. phase ⁽²⁾	171 07 •	171 08 •	171 09 •	171 22 •	171 26 •	171 30 •
Order- No. PE ⁽²⁾	171 17 •	171 18 •	171 19 •	171 23 •	171 27 •	171 31 •

Engineering data

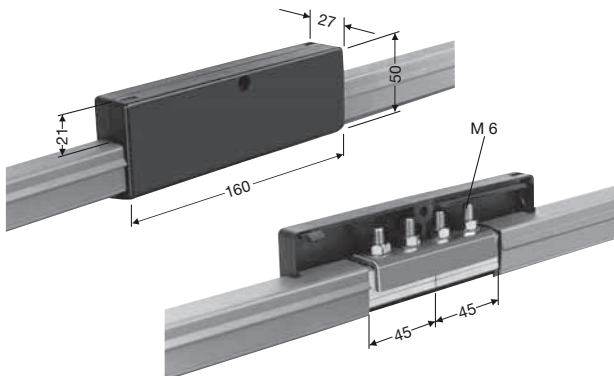
Conductor Rail Type	Cross sectional area mm ²	Leakage distance of covers mm	max. voltage (UL) V	max. Amp. capacity A at 35 °C	Resistance ⁽³⁾ Ohm/1000 m	Impedance ⁽³⁾ Ohm/1000 m based on 50 HZ & conductor spacing	
						50 mm	80 mm
U 25/ 50 C	50	53	1000 (600)	200	0,351	0,378	0,388
U 25/ 75 C	75	53	1000 (600)	300	0,239	0,269	0,283
U 25/100 C	100	53	1000 (600)	400	0,180	0,219	0,236
U 25/125 C	125	53	1000 (600)	450	0,140	0,188	0,208
U 25/ 90 AE⁽⁴⁾	90	53	1000 (600)	230	0,347	0,369	0,380
U 25/125 AE⁽⁴⁾	125	53	1000 (600)	320	0,240	0,271	0,285

Selection of conductors

in accordance to ampere load and environmental conditions.

U 25 / ... C copper conductors for power and control system application.

U 25 / ... AE Aluminium conductor and stainless steel conductor surface for power and control system



Bolted joint splices

Typ UV 25, UV 25 K 4, UV 25 AE and UV 25 AE K 4 applicable as feed terminal, too.

Type	connectin cable max. mm ²	Weight kg	Order- No.
UV 25	2 x 16	0,190	170 595
UV 25 K 4⁽⁵⁾	2 x 16	0,190	170 596
UV 25 AE	2 x 16	0,150	170 960
UV 25 AE K 4⁽⁵⁾	2 x 16	0,150	170 961

Are adequate fo feed terminal UE

⁽²⁾ The last number of the part number indicates the length. Please add 1, 2 ... 6 for your required short length. Interim values have to be rounded up.

⁽³⁾ With frequenz of 50 Hz and 20 °C

⁽⁴⁾ With the AE-conductor collectors which constantly stay at one position or work with a very low travel speed (< 10 m/min.) may only operate with 50% of their continous current.

⁽⁵⁾ Stainless Steel



ACCESSORIES FOR U 25

Expansion sections

factory assembled on 1.5 m long conductor section incl. one rigid joint and will be installed from 150 m of system length on.

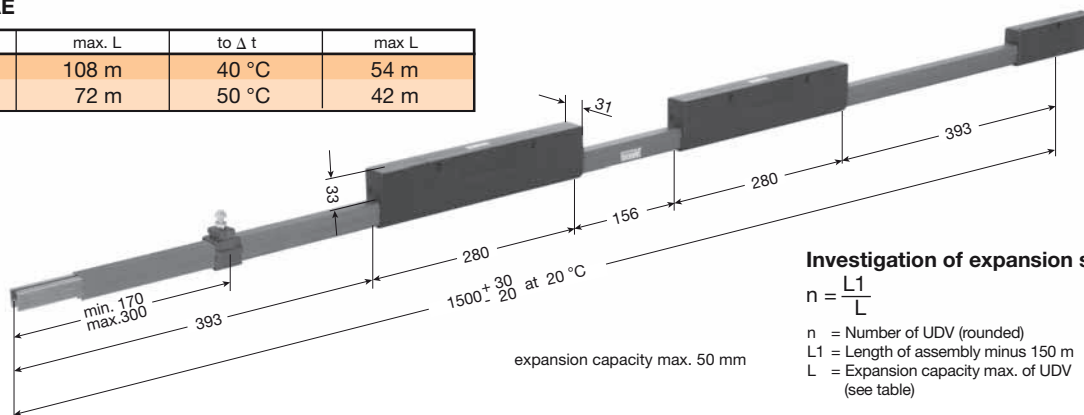
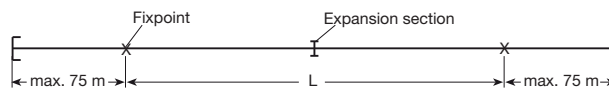
Expansion areas (distances between fixpoints = L)

For UDV 25 C

to Δ t	max. L	to Δ t	max L
20 °C	147 m	40 °C	73,5 m
30 °C	97,5 m	50 °C	58,5 m

For UDV 25 AE

to Δ t	max. L	to Δ t	max L
20 °C	108 m	40 °C	54 m
30 °C	72 m	50 °C	42 m



Investigation of expansion sections

$$n = \frac{L1}{L}$$

n = Number of UDV (rounded)

L1 = Length of assembly minus 150 m

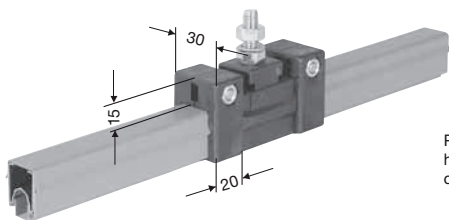
L = Expansion capacity max. of UDV (see table)

Standard shroud, color green

Type	Weight kg	Order- No. phase	Order- No. ground
UDV 25 C K 4 ⁽¹⁾	2,550	171 057	171 058
UDV 25 AE K 4 ⁽¹⁾	1,900	171 059	171 060

High temperature shroud, color gray

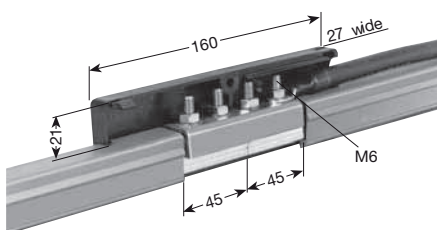
Type	Weight kg	Order- No. phase	Order- No. ground
UDV 25 C K 4 ⁽¹⁾	2,550	171 067	171 068
UDV 25 AE K 4 ⁽¹⁾	1,900	171 069	171 070



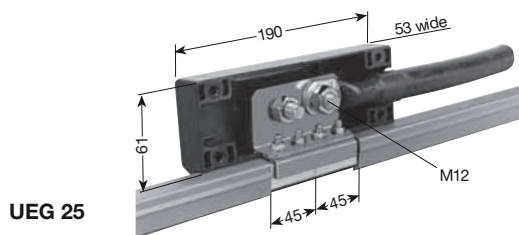
Pictures shows a insulated hanger with 2 locating clamps (fixpoint)

Locating clamp

Type	Weight kg	Order- No.
USK 25 K 4 ⁽¹⁾	0,024	170 010



UE 25



UEG 25

Cables & lugs by others.
UEG requires staggered arrangement with conductor spacing of less than 80 mm. Type M = factory assembled.

Feed terminals

Types UE 25, UE 25 K 4⁽¹⁾, UE 25 AE and UE 25 AE K 4⁽¹⁾ are adequate to bolted joint splice

Type	Connecting cable max. mm ²	Weight kg	Order- No.
UE 25	2 x 16	0,190	170 599
UE 25 M	2 x 16	0,190	170 394
UEG 25	2 x 95	0,560	170 597
UEG 25-M	2 x 95	0,560	170 396
UE 25 K 4 ⁽¹⁾	2 x 16	0,190	170 600
UE 25 K 4 ⁽¹⁾ -M	2 x 16	0,190	170 395
UEG 25 K 4 ⁽¹⁾	2 x 95	0,560	170 598
UEG 25 K 4 ⁽¹⁾ -M	2 x 95	0,560	170 397
UE 25 AE	2 x 16	0,150	171 158
UE 25 AE M	2 x 16	0,150	171 217
UEG 25 AE	2 x 95	0,456	170 962
UEG 25 AE-M	2 x 95	0,456	170 964
UE 25 AE K 4 ⁽¹⁾	2 x 16	0,150	171 159
UE 25 AE K 4 ⁽¹⁾ -M	2 x 16	0,150	171 218
UEG 25 AE K 4 ⁽¹⁾	2 x 95	0,456	170 963
UEG 25 AE K 4 ⁽¹⁾ -M	2 x 95	0,456	170 965

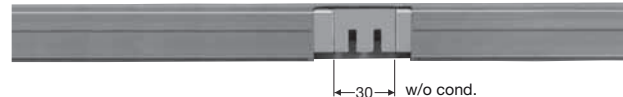
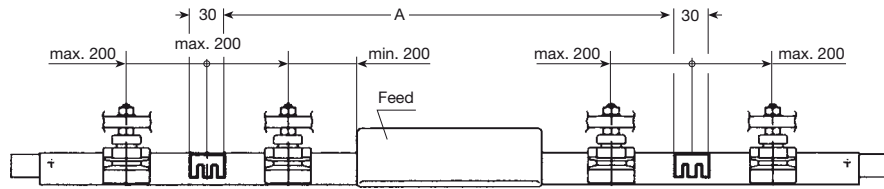
Contact Grease

for joints and feeds

100 ml for approx. 200 joints

Order- No. 121 502

Isolating sections



Type M = Factory assembled per system layout
 Type L = loose delivery as a single item with 2 locking pins (+)3x20.
 On both sides of the isolating section a hanger has to be considered.
 Distance max. 200 mm from center isolating section.
 Conductors, hangers and feed points have to be ordered separately.

Type	Weight kg	Order- No.
IT/U 25/30 M	0,015	170 070
IT/U 25/30 L	0,015	170 071

In order to avoid voltage bridging and for clearing of maintenance, control and live areas use two isolating sections.
 For the distance A number and type of collectors as well as the length of the braking distance of the machinery has to be considered.

End caps

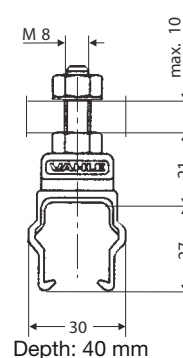
c/w locking pin



Type M = factory assembled
 Type L = Loose

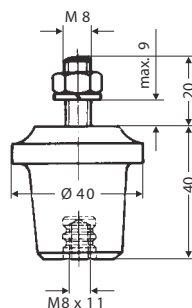
Type	Weight kg	Order- No.
UK 25-M	0,005	170 793
UK 25-L	0,005	170 013

Insulated hangers ⁽¹⁾



Type	Weight kg	Order- No.
UA 25	0,040	170 761
UA 25 K 4 ⁽²⁾	0,040	170 762

Insulators ⁽¹⁾

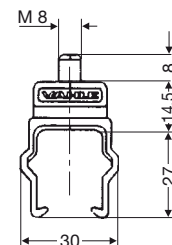


cantilever = 3000 N
 creepage distance = 60 mm

Type	Weight kg	Order- No.
GH 40-M 8	0,100	170 146
GH 40-M 8 K 4 ⁽²⁾	0,100	170 148

Rail holders

to be used with insulator



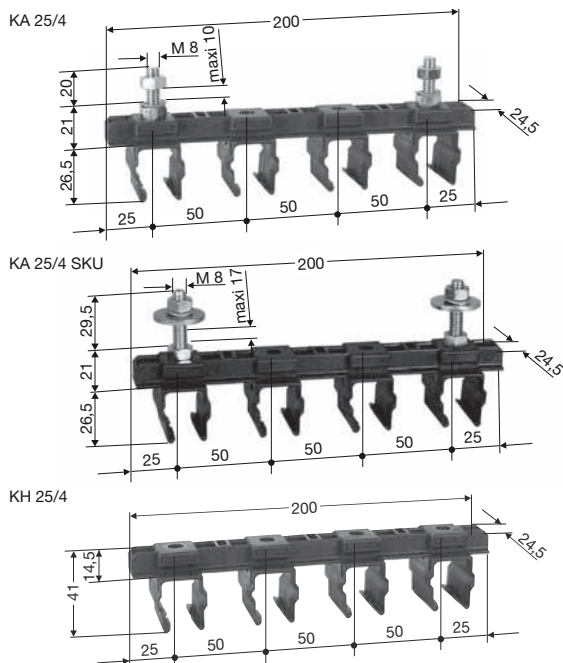
Type	Weight kg	Order- No.
UAK 25	0,023	170 868
UAK 25 K 4 ⁽²⁾	0,023	170 869

⁽¹⁾ Use flat washers (see page 26) on both sides of brackets with slotted holes.

⁽²⁾ with stainless steel hardware



ACCESSORIES FOR U 25



Compact hangers, 2 - 4-pole⁽¹⁾

Any number of conductors can be assembled by cutting/ combining the compact hangers.

Conductor spacing 50 mm.

Hanger KA 25 is for direct bolting to the supporting structure

Hanger KH to be used with bracket profile 38/17.

Hanger KA 25/4-SKU to be used with mounting bracket SKU.

Type	Weight kg	Order-No.
KA 25/2	0,084	170 838
KA 25/3	0,102	170 839
KA 25/4	0,120	170 840
KA 25/2 K 4 ⁽²⁾	0,084	170 853
KA 25/3 K 4 ⁽²⁾	0,102	170 854
KA 25/4 K 4 ⁽²⁾	0,120	170 855
KA 25/4-SKU	0,151	170 878
KA 25/4 K 4-SKU ⁽²⁾	0,151	171 431
KH 25/2	0,034	170 848
KH 25/3	0,050	170 849
KH 25/4	0,070	170 850

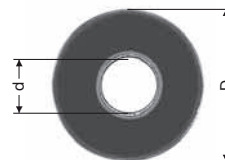
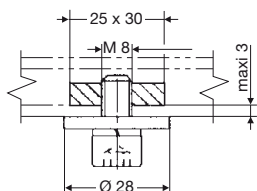


Bracket profiles 38/17

Type	Length mm	Poles	Weight kg	Order- No.
HU 25/400	400	4 - 5	0,830	170 667
HU 25/600	600	10	1,160	170 668

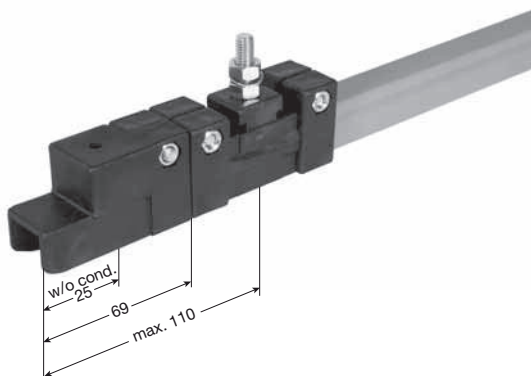
Longer brackets furnished on special order.⁽³⁾

Attachment hardware for Compact hanger KH 25/...



Type	Weight kg	Order- No.
SE 8	0,055	170 677
SE 8 K 4 ⁽²⁾	0,055	170 955

Type	Thread	d mm	D mm	S mm	Weight kg	Order- No.
Washer 8,4	M 8	8,40	24	2,00	0,007	170 624
Washer 8,4 K 4 ⁽²⁾	M 8	8,40	24	2,00	0,007	170 625



Transfer guide

This guide serve for transfer or power interrupting applications.

Additional hangers are to be planned and ordered separately.

Type	Weight kg	Order- No.
US 25 K 4 ⁽²⁾	0,060	170 329

Max. horizontal and vertical offset using collectors

KSTL 15-60 - KDSTL 120 ± 3 mm, air gap 2-5 mm

KST 100/25 - KDSTU 350/25 ± 3 mm, air gap 5-8 mm

Transfer guide US 25 is fastened to conductor ends by means of a stainless screw.

⁽¹⁾ Attachment hardware to be ordered separately; two flat washers to be used in slotted holes.

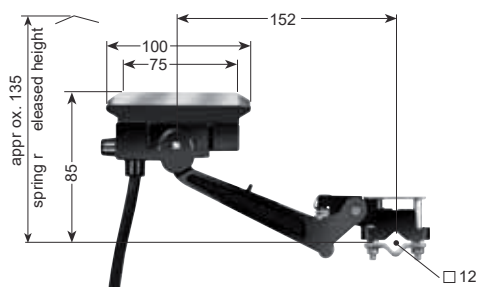
⁽²⁾ with stainless steel hardware

⁽³⁾ Delivery incl. 2 Attachment hardware SE 8.

COLLECTORS FOR U 25⁽¹⁾

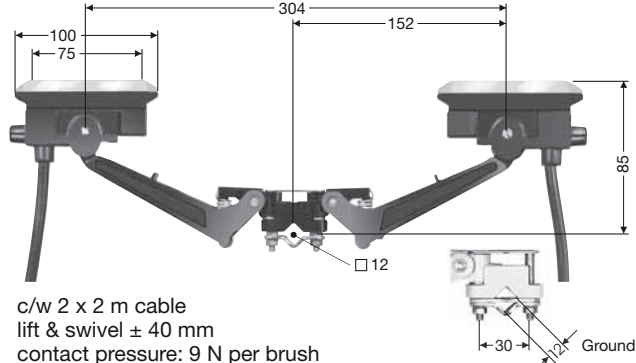


Current collectors



c/w 2 m cable
lift & swivel ± 40 mm
contact pressure: 9 N

Double current collectors

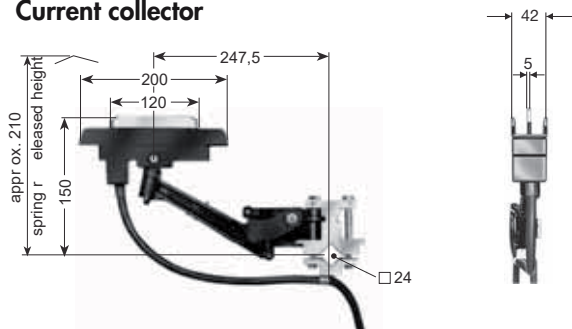


c/w 2 x 2 m cable
lift & swivel ± 40 mm
contact pressure: 9 N per brush

Type	Am- pacity A	Connecting cable A/ mm ²	Connecting cable ø max/ mm	Weight kg	Order- No.	
					phase	ground
KSTL 15	15	2,50	4,40	0,272	150 893	150 894
KSTL 40	40	6,00	11,00	0,453	152 860	152 870
KSTL 60	60	10,00	12,50	0,591	153 677	153 678

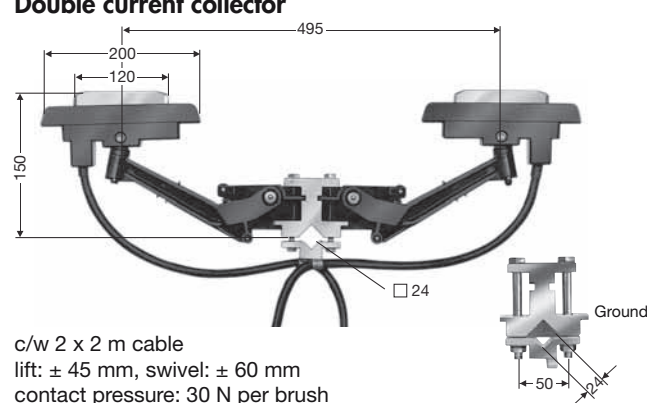
Type	Am- pacity A	Connecting cable A/ mm ²	Connecting cable d max/ mm	Weight kg	Order- No.	
					phase	ground
KDSTL 30	30	2,50	4,40	0,492	150 899	150 901
KDSTL 80	80	6,00	11,00	0,822	152 980	152 990
KDSTL 120	120	10,00	12,50	1,188	153 681	153 682

Current collector



c/w 2 m cable
lift: ± 45 mm, swivel: ± 60 mm
contact pressure: 30 N

Double current collector

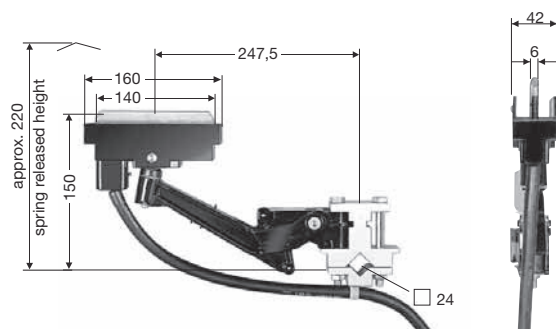


c/w 2 x 2 m cable
lift: ± 45 mm, swivel: ± 60 mm
contact pressure: 30 N per brush

Type	Am- pacity A	Connecting cable A/ mm ²	Connecting cable ø max/ mm	Weight kg	Order- No.	
					phase	ground
KST 100/25	100	16,00	14,50	1,707	170 319	170 320
KST 125/25	125	25,00	16,50	1,800	171 017	171 018

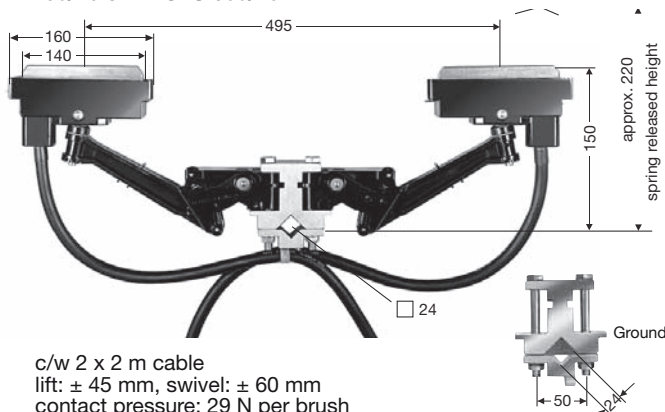
Type	Am- pacity A	Connecting cable A/ mm ²	Connecting cable ø max/ mm	Weight kg	Order- No.	
					phase	ground
KDST 200/25	200	16,00	14,50	3,077	170 321	170 322
KDST 250/25	250	25,00	16,50	3,100	171 019	171 020

Current collectors For transfer funnel use KSTU 140/25 or KSTU 175/25⁽²⁾.



c/w 2 m cable
lift: ± 45 mm, swivel: ± 60 mm
contact pressure: 29 N

Double current collectors For transfer funnel use KDSTU 280/25 or KDSTU 350/25⁽²⁾.



c/w 2 x 2 m cable
lift: ± 45 mm, swivel: ± 60 mm
contact pressure: 29 N per brush

Type	Am- pacity A	Connecting cable A/ mm ²	Connecting cable ø max/ mm	Weight kg	Order- No.	
					phase	ground
KST 140/25	140	25,00	16,50	1,660	170 538	170 539
KST 175/25	175	35,00	18,50	1,700	171 037	171 038
KSTU 140/25	140	25,00	16,50	1,700	170 540	170 541
KSTU 175/25	175	35,00	18,50	1,800	171 039	171 040

Type	Am- pacity A	Connecting cable A/ mm ²	Connecting cable ø max/ mm	Weight kg	Order- No.	
					phase	ground
KDST 280/25	280	25,00	16,50	3,020	170 542	170 543
KDST 350/25	350	35,00	18,50	3,100	171 047	171 048
KDSTU 280/25	280	25,00	16,50	3,100	170 544	170 545
KDSTU 350/25	350	35,00	18,50	3,200	171 049	171 050

⁽¹⁾ The collector of the AE-conductor which are working with only ≤ 10 m/min. travel speed or stand most of the time are only permitted to work with 50 % of the continuous current.

⁽²⁾ Special collectors for aggressive environments on request.



COMPONENTS & COLLECTOR BRACKETS FOR U 25

Transfer funnels, 2-pole up to 6-pole

assembled per system layout.

Transfer funnels are necessary for passing switches and turntables.

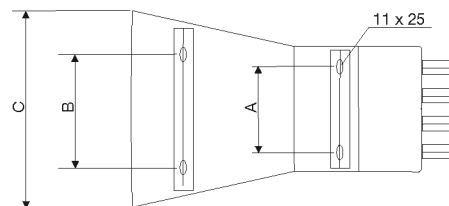
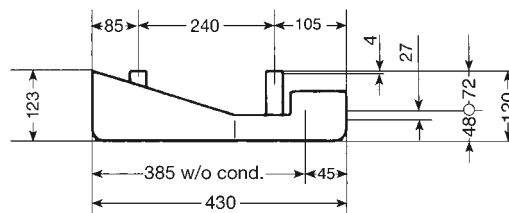
Conductor spacing 50 mm.

The following collectors have to be used:

For pendant arrangement: KSTU 140/25, KSTU 175/25, KSTU 280/25 or KDSTU 350/25.

For lateral arrangement: KSTUR 140/25 on request.

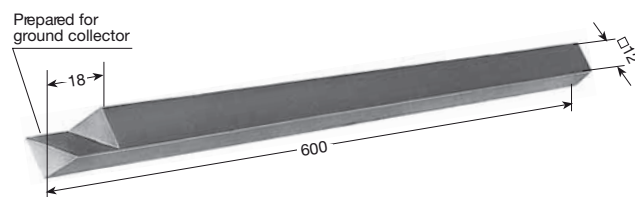
$V_{max} = 100 \text{ m/min}$



Insulated conductor rails are to be ordered separately.

Type	Poles	dim. A mm	dim. B mm	dim. C mm	Order- No.
EMK 25/2	2	46	83	216	170 492
EMK 25/3	3	88	125	258	170 493
EMK 25/4	4	130	167	300	170 494
EMK 25/5	5	172	209	342	170 495
EMK 25/6	6	214	251	384	170 496

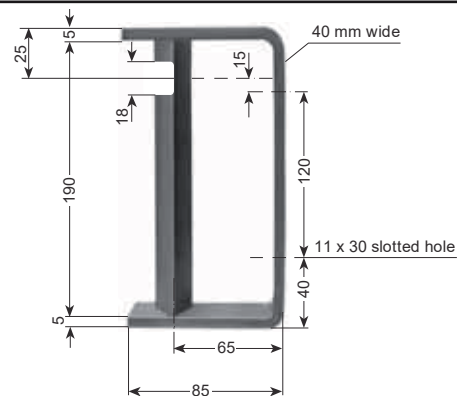
Collector brackets for KSTL 15 thru KDSTL 120



Type	Weight kg	Order- No.
UM 12	0,710	153 506

Longer brackets furnished on special order.

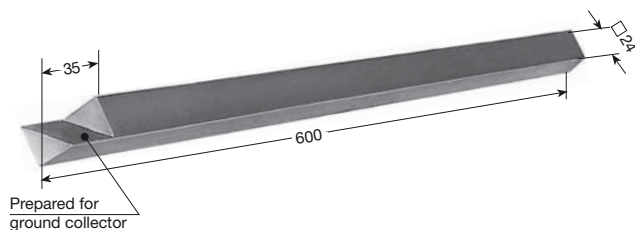
With brackets above 600 mm length a support has to be considered on site, to avoid a bending or twisting of the collector bracket.



Type	Weight kg	Order- No.
UMA 12	0,640	170 334

Suitable for conductor spacing 50 mm (3-poles + ground).

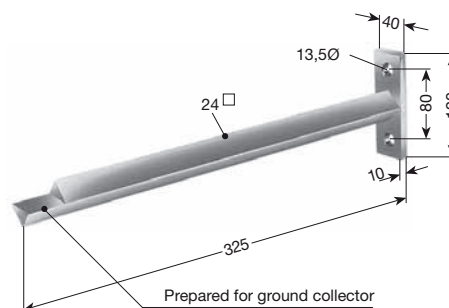
Collector brackets for KST 100/25 thru KDSTU 350/25



Type	Weight kg	Order- No.
UM 24	2,600	175 076

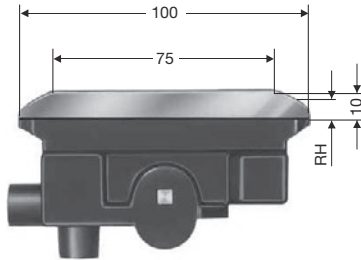
Longer brackets furnished on special order.

With brackets above 600 mm length a support has to be considered on site, to avoid a bending or twisting of the collector bracket.

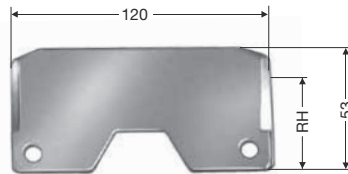


Type	Weight kg	Order- No.
UMF 24	2,850	170 272

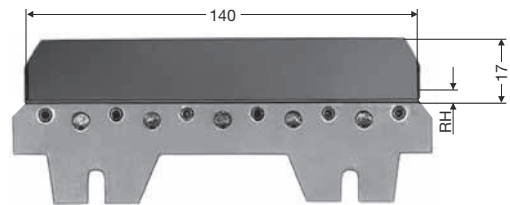
Copper-graphite brush



KMK 60



KMK 100/25

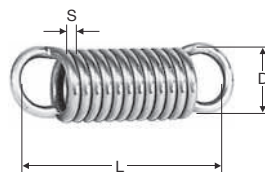


KMK 140/25

Dim. RH: allowed rest of hight

Type	for current collector	RH mm	Weight kg	Order- No.
KMK 60	KSTL 15, KSTL 40, KSTL 60, KDSTL 30, KDSTL 80, KDSTL 120	7,50	0,110	153 512
KMK 100/25	KST 100/25, KDST 200/25, KST 125/25, KDST 250/25	38,00	0,180	170 768
KMK 140/25	KST 140/25, KDST 280/25, KSTU 140/25, KDSTU 280/25 KST 175/25, KDST 350/25, KSTU 175/25, KDSTU 350/25	1,00	0,152	170 164

Tension spring (stainless steel)



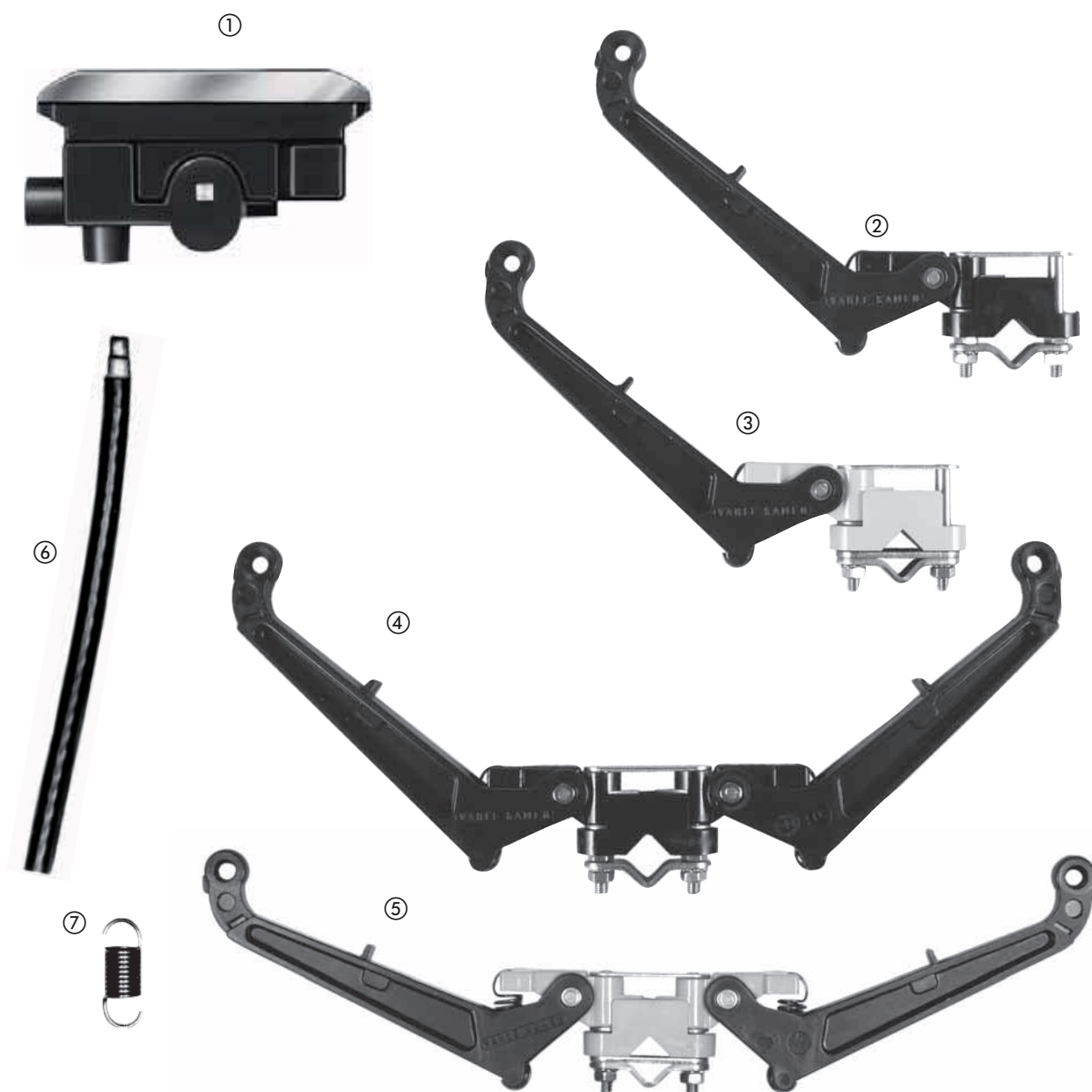
Type	for current collectors	S mm	D mm	L mm	Weight kg	Order- No.
ZF 4	KSTL 15, KSTL 40, KSTL 60, KDSTL 30, KDSTL 80, KDSTL 120	1,30	11,00	29,00	0,004	153 517
ZF 6	KST 100/25, KDST 200/25, KST 125/25, KDST 250/25 KST 140/25, KDST 280/25, KSTU 140/25, KDSTU 280/25 KST 175/25, KDST 350/25, KSTU 175/25, KDSTU 350/25	2,25	17,30	56,50	0,023	170 167



COLLECTOR COMPONENTS FOR U 25

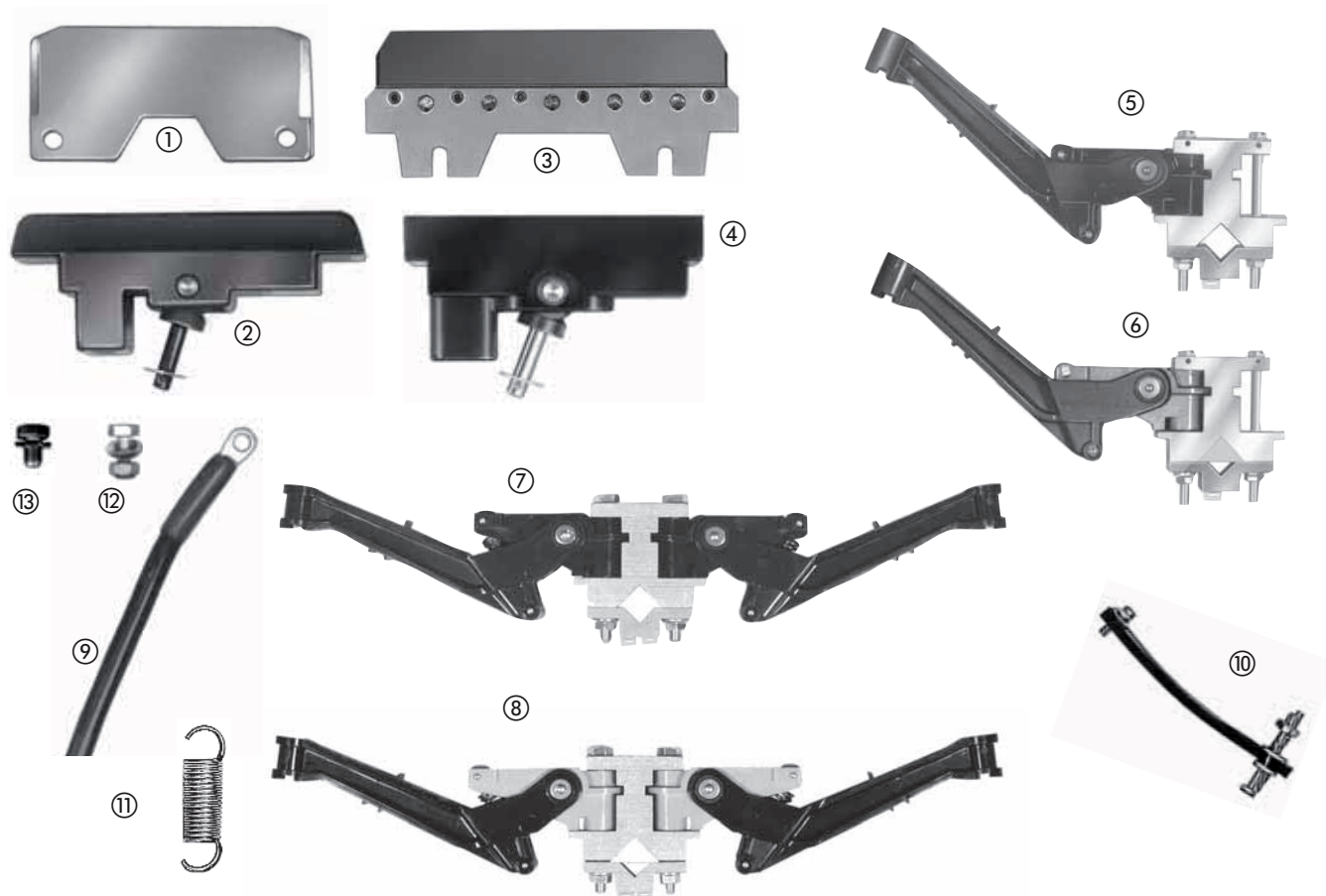
Spares for collectors KSTL 15 thru KDSTL 120

Part.-No.	Description		Weight kg	Order- No.
1	Brush (see page 31)	–	–	
2	Collector base for KSTL 15 thru KSTL 60	phase PH	0,090	153 740
3	Collector base for KSTL 15 thru KSTL 60	ground PH		153 741
4	Collector base for KDSTL 30 thru KDSTL 120	phase PH	0,130	153 742
5	Collector base for KDSTL 30 thru KDSTL 120	ground PE		153 743
6	Connecting cable AEA 2.5 mm², PH, 2 m long	phase PH	0,072	151 374
	Connecting cable AEA 2.5 mm², PE, 2 m long	ground PE		51 375
6	Connecting cable AEA 6 mm², PH, 2 m long	phase PH	0,260	153 744
	Connecting cable AEA 6 mm², PE, 2 m long	ground PE		153 745
6	Connecting cable AEA 10 mm², PH, 2 m long	phase PH	0,400	153 746
	Connecting cable AEA 10 mm², PE, 2 m long	ground PE		153 747
7	Tension spring (see page 31)			



Spares for Collectors KST 100/25 thru KDSTU 350/25

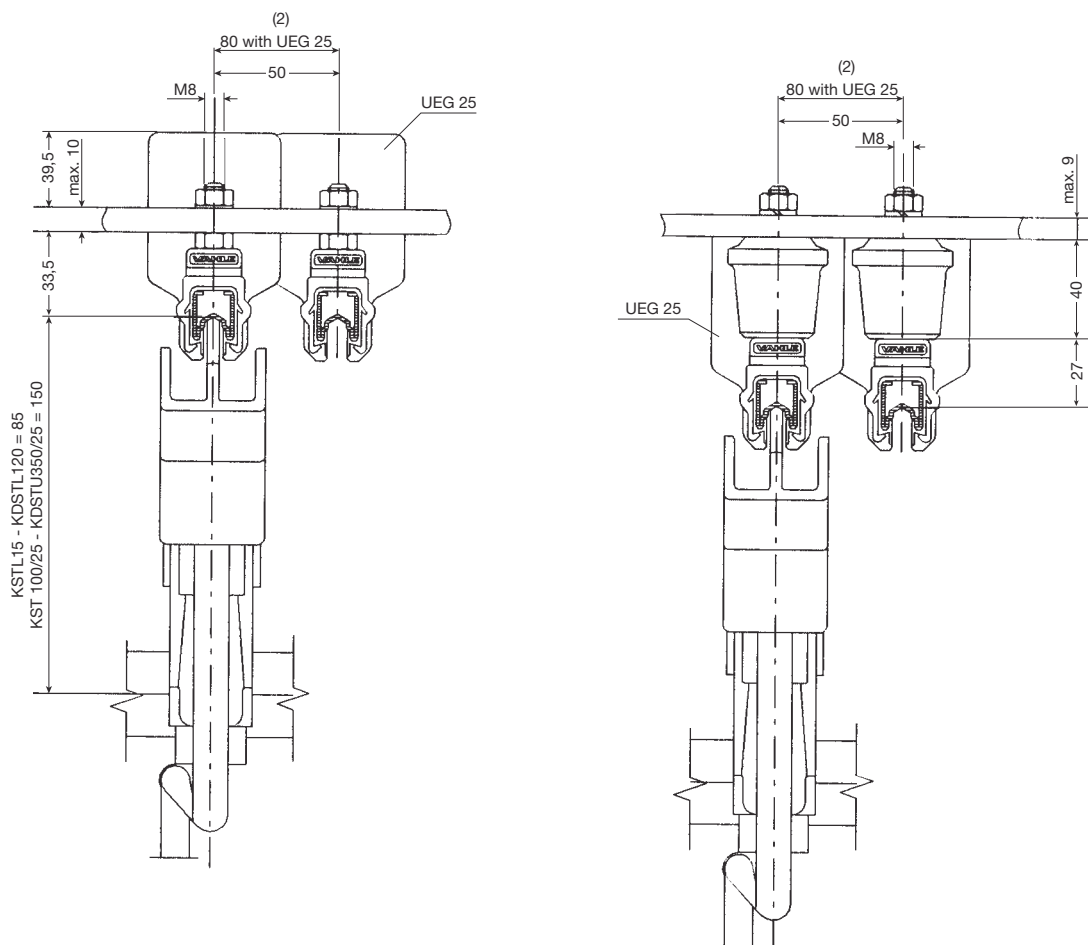
Part.-No.	Description	Weight kg	Order- No.
1	Brush KMK 100/25 (see page 31)	—	—
2	Brush holder for KST 100, KST 125, KDST 200, KDST 250	0,195	170 338
3	Brush KMK 140/25 (see page 29)	—	—
4	Brush holder for KST 140, KDST 280, KST 175, KDST 350	0,375	170 169
4	Brush holder ⁽¹⁾ for KSTU 140/25, KDSTU 280/25, KSTU 175/25, KDSTU 350/25	0,375	170 406
5	Collector base for KST 100, KST 125, KST 140 and KST 175	phase PH 0,578	170 340
6	Collector base for KST 100, KST 125, KST 140 and KST 175	ground PE 170 341	
5	Collector base for KSTU 140, KSTU 175	phase PH 0,555	170 555
6	Collector base for KSTU 140, KSTU 175	ground PE 170 556	
7	Collector base for KDST 200, KDST 250, KDST 280, and KDST 350	phase PH 0,795	170 342
8	Collector base for KDST 200, KDST 250, KDST 280, and KDST 350	ground PE 170 343	
7	Collector base for KDSTU 280, KDSTU 350	phase PH 0,795	170 557
8	Collector base for KDSTU 280, KDSTU 350	ground PE 170 558	
9	Connecting cable RKA 16/8 mm ² , PH, 2 m long	phase PH 0,614	170 344
	Connecting cable RKA 16/8 mm ² , PE, 2 m long	ground PE 0,459	170 345
9	Connecting cable RKA 25/8 mm ² , PH, 2 m long	phase PH 0,840	170 173
9	Connecting cable RKA 25/8 mm ² , PE, 2 m long	ground PE 0,600	170 174
9	Connecting cable RKA 35/8 mm ² , PH, 2 m long	phase PH 0,840	170 997
	Connecting cable RKA 35/8 mm ² , PE, 2 m long	ground PE 0,600	170 998
10	Rubber spring complete for KSTU 140, KDSTU 280, KSTU 175, KDSTU 350	0,035	170 412
11	Tension spring (see page 29)	—	—
12	Terminal bolt M 8 x 20 K 4 for KST 100, KST 125, KDST 200 and KDST 250	0,022	170 818
13	Terminal bolt M 8 x 12 K 4 for KST 140, KST 175, KSTU 140, KSTU 175, KDST 280, KDST 350, KDSTU 280 und KDSTU 350	0,010	170 871



⁽¹⁾ Rubber spring (No. 10) is part of the brush holder.



ARRANGEMENT AND EXAMPLE FOR ORDERING U 25



273 m power supply system, 3-pole + ground

Qty.	Description	Type	Order- No.
132	VAHLE unipole insulated conductors, 6 m long	phase PH U 25/75 C-6	171 036
3	VAHLE unipole insulated conductors, 5 m long cut to 4.5	phase PH U 25/75 C-5	171 035
44	VAHLE unipole insulated conductors, 6 m long	ground PE U 25/50 C-6⁽¹⁾	171 126
1	VAHLE unipole insulated conductor, 5 m long cut to 4.5	ground PE U 25/50 C-5⁽¹⁾	171 125
9	Expansion sections, 1.5 m long	phase PH UDV 25 C K 4	171 057
3	Expansion sections, 1.5 m long	ground PE UDV 25 C K 4	171 058
176	Bolted joint splices	UV 25	170 595
8	Feed terminals	UEG 25	170 597
32	Locating clamps	USK 25 K 4	170 010
8	End caps	UK 25-L	170 013
732	Insulated hangers	UA 25	170 761
3	Double collectors	phase PH KDST 280/25	170 542
1	Collector	ground PE KST 140/25	170 539
1	Collector bracket	UM 24	175 076
1	Contact grease		120 017

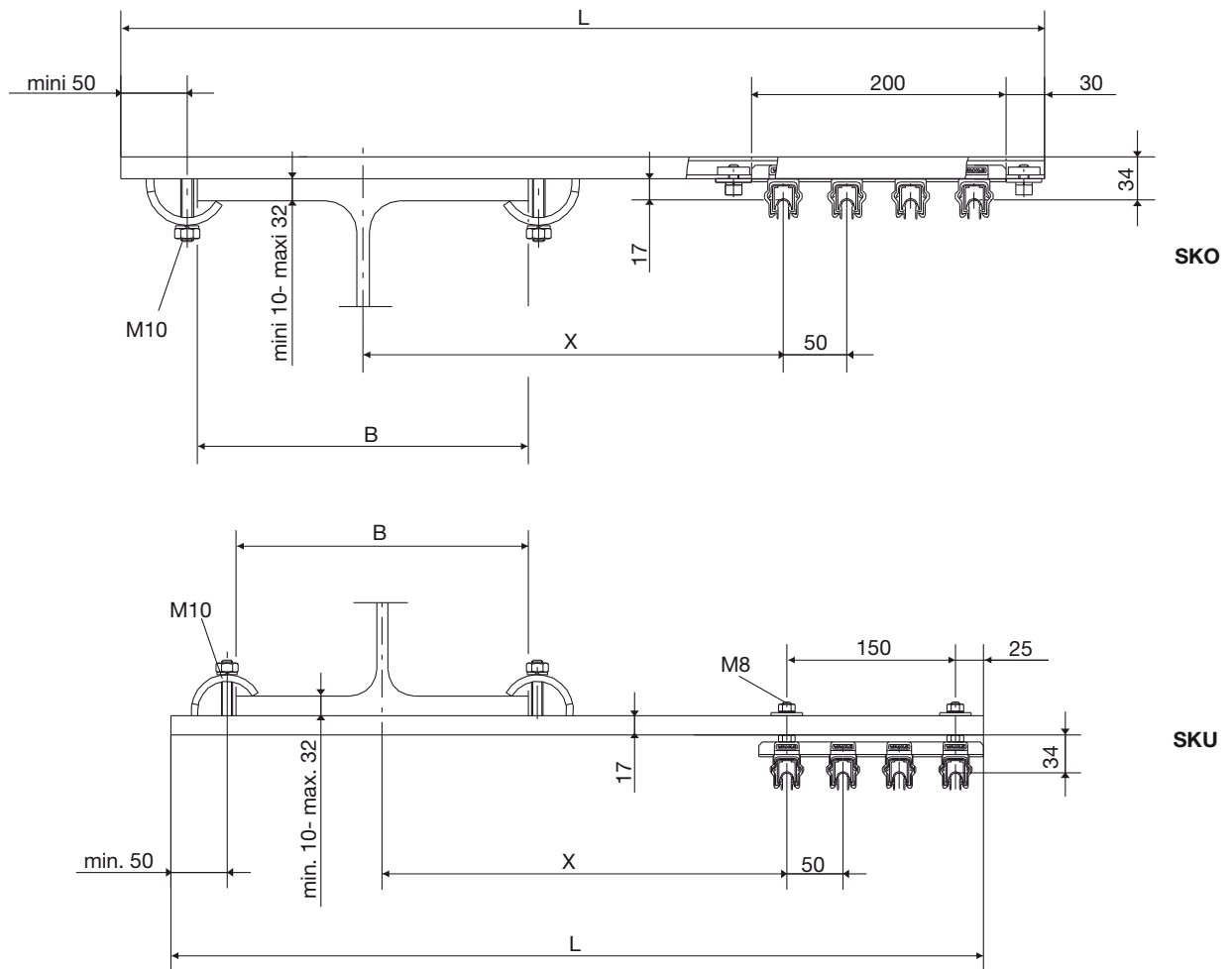
⁽¹⁾ Capacity reduces per VDE 0100, part 540.

⁽²⁾ In a compact arrangement or a phase distance < 80 mm the feed points UEG have to be arranged staggered at a min. of 300 mm.

MOUNTING BRACKETS FOR U 25



For flange thickness D from 10 to 32 mm



for KH 25/4 and KA 25/4

I-Beam flange width B mm	Distance X for brackets									
	SKO					SKU				
	L = 500	L = 600	L = 700	L = 800	L = 900	L = 500	L = 600	L = 700	L = 800	L = 900
upto 80	170-195	170-295	170-395	170-495	—	120-225	120-325	120-425	120-525	—
from 80 upto 120	—	190-275	190-375	190-475	190-575	140-205	140-305	140-405	140-505	140-605
from 120 upto 160	—	210-255	210-355	210-455	210-555	160-185	160-285	160-385	160-485	160-585
from 160 upto 200	—	230-235	230-335	230-435	230-535	—	180-265	180-365	180-465	180-565
from 200 upto 260	—	—	260-305	260-405	260-505	—	210-235	210-335	210-435	210-535

Compact hangers, rail holders and insulators are to be ordered separately

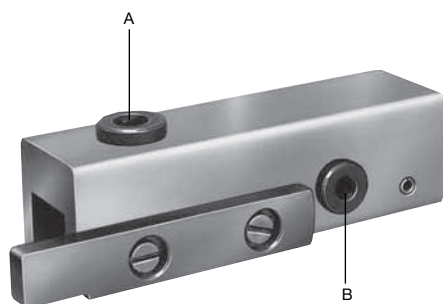
SKO		SKU		L mm	Weight ca. kg
Type	Order- No.	Type	Order- No.		
SKO 500	170 094	SKU 500	170 104	500	0,690
SKO 600	170 095	SKU 600	170 105	600	0,780
SKO 700	170 096	SKU 700	170 106	700	0,870
SKO 800	170 097	SKU 800	170 107	800	0,960
SKO 900	170 098	SKU 900	170 108	900	1,050



INSTALLATION TOOLS FOR U 25

Drilling jig for end cap

Drill A and B for end cap

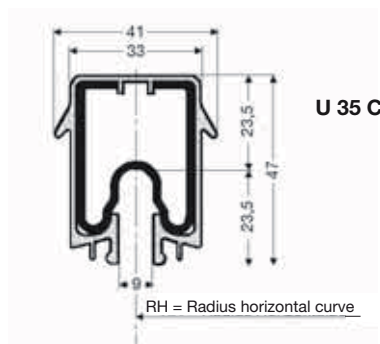


See installation instructions for U25

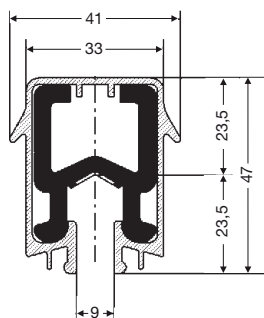
Type	Weight kg	Order-No.
BS 25	0,100	170 207



Inclined elevator A Coruña



U 35 C



U 35 AE

Conductor code:

U	= unipole insulated conductor
35	= shroud size
200, 230, 300, 400, 450, 500, 600	= conductor cross sectional area (mm ²)
C	= copper conductor
AE	= Aluminium conductor contact surface stainless steel

Length:

6,25 m standard length and short length

Support spacing:

– for straight runs and vertical inside and outside curves:	2500 mm
– for horizontal curves up to $R_H = 15 \text{ m}^{(1)}$:	1250 mm
– for horizontal curves over $R_H = 15 \text{ m}$:	2500 mm

Conductor spacing:

– 90 mm for collectors UST 200/35, UDST 400/35 and feed UE
– 130 mm for collectors UST 300/35, UDST 600/35 and feed UEG

Bending of conductors:

factory prepared on request

Heating system:

available

See page 4 for shroud properties.

Type of conductor rail

Typ	U 35/200 C	U 35/300 C	U 35/400 C	U 35/500 C	U 35/230 AE	U 35/450 AE	U 35/600 AE
Weight (kg/m)	2,400	3,400	4,300	6,100	1,070	1,650	2,112
Standard shroud, color green -30 to + 55 °C							
Order- No. phase ⁽²⁾	175 20•	175 21•	175 22•	175 33	175 41•	175 45•	175 64•
Order- No. ground ⁽²⁾	175 26•	175 27•	175 28•	175 34	175 42•	175 46•	175 66•
High temperature shroud, color gray -30 to + 85 °C							
Order- No. phase ⁽²⁾	175 23•	175 24•	175 25•	175 35	175 43•	175 47•	175 62•
Order- No. ground ⁽²⁾	175 29•	175 30•	175 31•	175 36	175 44•	175 48•	175 65•
HT design (130°), colour granite grey -30 to + 130 °C							
Order- No. phase ⁽²⁾	175 71•	175 73•	175 87•	175 75•	175 77•	175 79•	175 85•
Order- No. ground ⁽²⁾	175 72•	175 74•	175 88•	175 76•	175 78•	175 80•	175 86•

Engineering Data

Type	Cross sectional area copper mm ²	Leakage Distance of covers mm	max. voltage V	Continuous Amp. capacity A/35 °C	Resistance ⁽³⁾ Ohm/1000 m	Impedance ⁽³⁾ Ohm/1000 m on 50 Hz, conductor spacing	
						90 mm	130 mm
U 35/200 C	200	85	1000	600	0,094	0,156	0,174
U 35/300 C	300	85	1000	720	0,060	0,138	0,159
U 35/400 C	400	85	1000	860	0,046	0,132	0,154
U 35/500 C	500	85	1000	1250	0,034	0,131	0,152
U 35/230 AE ⁽⁴⁾	230	85	1000	500	0,134	0,183	0,199
U 35/450 AE ⁽⁴⁾	450	85	1000	800	0,069	0,143	0,163
U 35/600 AE ⁽⁴⁾	600	85	1000	1000	0,052	0,136	0,156

⁽¹⁾ Recommended

⁽²⁾ The last number of part-no. Mentions the single length per meter. Please add the required length with 1,2...6. For short length please round the number up.

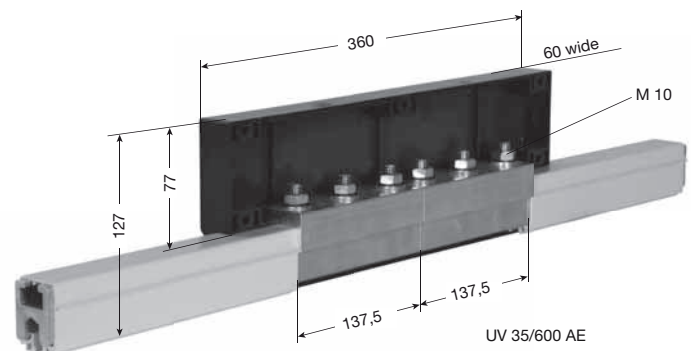
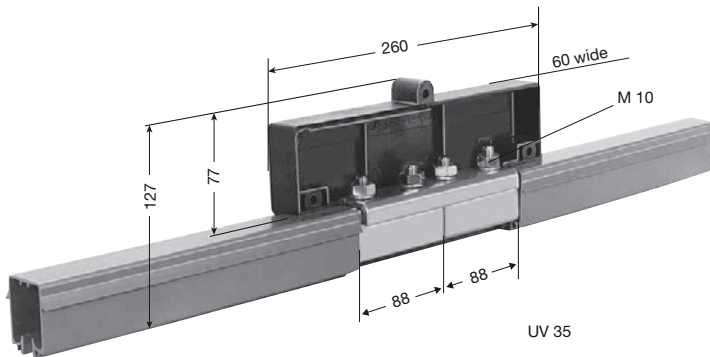
⁽³⁾ With frequenz of 50 Hz and 20 °C

⁽⁴⁾ With the AE-conductor, collectors, which work mainly on one position or with a very low travel speed $\leq 10 \text{ m/min.}$ are only permitted to work with 50% of the continous current.



ACCESSORIES FOR U 35

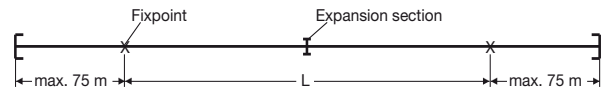
Bolted joint splices



Type	Weight kg	Order-No.	Type	Weight kg	Order-No.
UV 35/200	0,882	175 574	UV 35/200 HT	0,882	175 797
UV 35/300	1,000	175 012	UV 35/300 HT	1,000	175 799
UV 35/400	1,034	175 126	UV 35/400 HT	1,034	175 737
UV 35/500	1,273	175 369	UV 35/500 HT	1,273	175 739
UV 35/200 K 4 ⁽¹⁾	0,882	175 575	UV 35/200 HT K 4 ⁽¹⁾	0,882	175 798
UV 35/300 K 4 ⁽¹⁾	1,000	175 013	UV 35/300 HT K 4 ⁽¹⁾	1,000	175 800
UV 35/400 K 4 ⁽¹⁾	1,034	175 127	UV 35/400 HT K 4 ⁽¹⁾	1,034	175 738
UV 35/500 K 4 ⁽¹⁾	1,273	175 370	UV 35/500 HT K 4 ⁽¹⁾	1,273	175 740
UV 35/230 AE	0,674	175 491	UV 35/230 AE HT	0,674	175 836
UV 35/450 AE	0,776	175 492	UV 35/450 AE HT	0,776	175 838
UV 35/600 AE	1,100	175 619	UV 35/600 AE HT	1,100	175 847
UV 35/230 AE K 4 ⁽¹⁾	0,674	175 495	UV 35/230 AE HT K 4 ⁽¹⁾	0,674	175 837
UV 35/450 AE K 4 ⁽¹⁾	0,776	175 496	UV 35/450 AE HT K 4 ⁽¹⁾	0,776	175 839
UV 35/600 AE K 4 ⁽¹⁾	1,100	175 618	UV 35/600 AE HT K 4 ⁽¹⁾	1,100	175 848

Expansion sections

Factory assembled on 2.5 m conductor section incl. one rigid joint.
The 2.5 m expansion assembly is part of the system length and will be installed from 150 m of system length on.



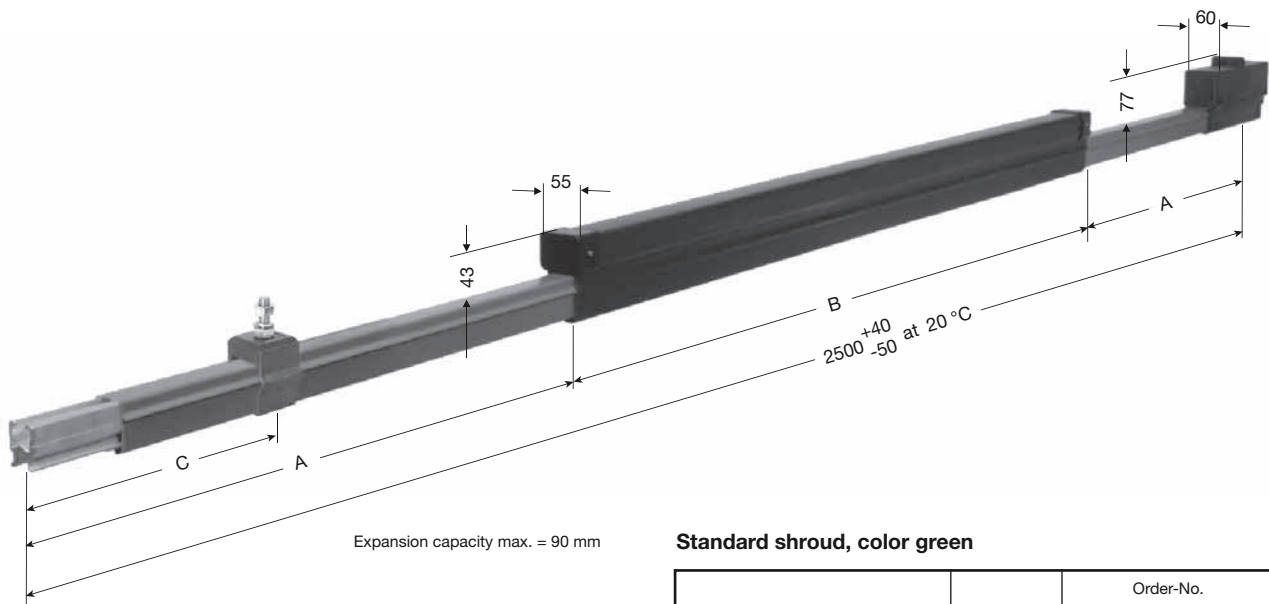
Expansion area (Distance between the fixpoints = L) for UDV 35/200-500 C

to Δ t	max. L	to Δ t	max L
30 °C	176 m	50 °C	105,5 m
40 °C	132 m	60 °C	88,0 m

Expansion area (Distance between the fixpoints = L) for UDV 35/230-600 AE

bis Δ t	max. L	bis Δ t	max L
30 °C	130,0 m	50 °C	78,0 m
40 °C	97,5 m	60 °C	65,0 m

	A	B	C min.-max.
UDV 35/200-400 C K 4	631,5	1237	300-500
UDV 35/500 C K 4	631,5	1237	300-500
UDV 35/230-450 AE K 4	631,5	1237	300-500
UDV 35/600 AE K 4	509,0	1482	300-390



Determination of expansion sections

$$n = \frac{L1}{L}$$

n = Number of UDV (rounded up)
L1 = system length minus 150 m
L = max. expansion capacity of UDV
(see table)

Standard shroud, color green

Type	Weight kg	Order-No.	
		phase	ground
UDV 35/200-400 C K 4 ⁽¹⁾	16,00	175 527	175 528
UDV 35/500 C K 4 ⁽¹⁾	17,50	175 540	175 541
UDV 35 /230-450 AE K 4 ⁽¹⁾	7,00	175 517	175 518
UDV 35 /600 AE K 4 ⁽¹⁾	12,00	175 670	175 671

High temperature shroud, color gray

Type	Weight kg	Order-No.	
		phase	ground
UDV 35/200-400 C K 4 ⁽¹⁾	16,000	175 529	175 530
UDV 35/500 C K 4 ⁽¹⁾	17,500	175 542	175 543
UDV 35/230-450 AE K 4 ⁽¹⁾	7,000	175 519	175 520
UDV 35/600 AE K 4 ⁽¹⁾	12,00	175 627	175 672

HT design, colour granite grey

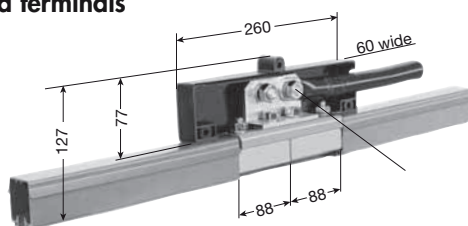
Type	Weight kg	Order-No.	
		phase	ground
UDV 35/200-400 C HT K 4 ⁽¹⁾	16,000	175 700	175 701
UDV 35/500 C HT K 4 ⁽¹⁾	17,500	175 702	175 703
UDV 35/230-450 AE HT K 4 ⁽¹⁾	7,000	175 719	175 720
UDV 35/600 AE HT K 4 ⁽¹⁾	12,000	175 849	175 850

⁽¹⁾ with stainless steel hardware

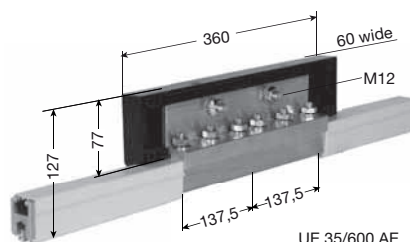


ACCESSORIES FOR U 35

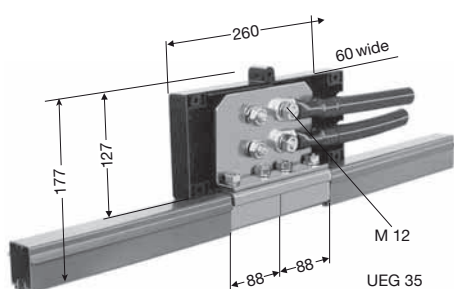
Feed terminals



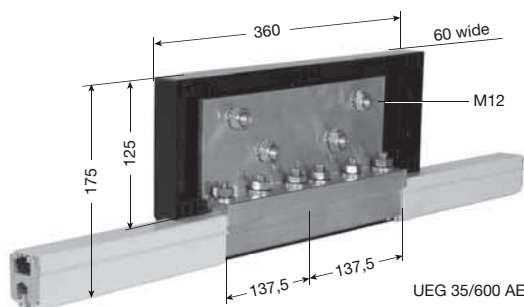
UE 35



UE 35/600 AE



UEG 35



UEG 35/600 AE

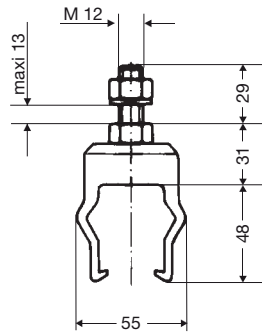
Type	Connecting cable max. mm ²	Weight kg	Order-No.	Type	Connecting cable max. mm ²	Weight kg	Order-No.
UE 35/200-400	2 x 150	1,264	175 040	UE 35/200-400 HT	2 x 150	1,264	175 824
UE 35/200-400-M	2 x 150	1,264	175 548	UE 35/200-400 HT-M	2 x 150	1,264	175 826
UE 35/200-400 K4 ⁽¹⁾	2 x 150	1,264	175 043	UE 35/200-400 HT K4 ⁽¹⁾	2 x 150	1,264	175 825
UE 35/200-400 K4 ⁽¹⁾ -M	2 x 150	1,264	175 549	UE 35/200-400 HT K4 ⁽¹⁾ -M	2 x 150	1,264	175 827
UE 35/500	2 x 150	1,204	175 397	UE 35/500 HT	2 x 150	1,204	175 828
UE 35/500-M	2 x 150	1,204	175 907	UE 35/500 HT-M	2 x 150	1,204	175 845
UE 35/500 K4 ⁽¹⁾	2 x 150	1,204	175 398	UE 35/500 HT K4 ⁽¹⁾	2 x 150	1,204	175 829
UE 35/500 K4 ⁽¹⁾ -M	2 x 150	1,204	175 908	UE 35/500 HT K4 ⁽¹⁾ -M	2 x 150	1,204	175 846
UEG 35/200-400	4 x 185	1,930	175 105	UEG 35/200-400 HT	4 x 185	1,930	175 780
UEG 35/200-400-M	4 x 185	1,930	175 147	UEG 35/200-400 HT-M	4 x 185	1,930	175 788
UEG 35/200-400 K4 ⁽¹⁾	4 x 185	1,930	175 106	UEG 35/200-400 HT K4 ⁽¹⁾	4 x 185	1,930	175 787
UEG 35/200-400 K4 ⁽¹⁾ -M	4 x 185	1,930	175 324	UEG 35/200-400 HT K4 ⁽¹⁾ -M	4 x 185	1,930	175 789
UEG 500	4 x 185	1,998	175 371	UEG 500 HT	4 x 185	1,998	175 747
UEG 500-M	4 x 185	1,998	175 394	UEG 500 HT-M	4 x 185	1,998	175 778
UEG 500 K4 ⁽¹⁾	4 x 185	1,998	175 372	UEG 500 HT K4 ⁽¹⁾	4 x 185	1,998	175 777
UEG 500 K4 ⁽¹⁾ -M	4 x 185	1,998	175 417	UEG 500 HT K4 ⁽¹⁾ -M	4 x 185	1,998	175 779
UE 35 AE	2 x 150	0,872	175 489	UE 35 AE HT	2 x 150	0,872	175 830
UE 35 AE-M	2 x 150	0,872	175 905	UE 35 AE HT-M	2 x 150	0,872	175 903
UE 35 AE-K4 ⁽¹⁾	2 x 150	0,872	175 490	UE 35 AE HT-K4 ⁽¹⁾	2 x 150	0,872	175 831
UE 35 AE-K4 ⁽¹⁾ -M	2 x 150	0,872	175 906	UE 35 AE HT-K4 ⁽¹⁾ -M	2 x 150	0,872	175 904
UE 35/600 AE	2 x 150	1,617	175 693	UE 35/600 AE HT	2 x 150	1,617	175 909
UE 35/600 AE-M	2 x 150	1,617	175 707	UE 35/600 AE HT-M	2 x 150	1,617	175 910
UE 35/600 AE-K4 ⁽¹⁾	2 x 150	1,617	175 694	UE 35/600 AE HT-K4 ⁽¹⁾	2 x 150	1,617	175 911
UE 35/600 AE-K4 ⁽¹⁾ -M	2 x 150	1,617	175 708	UE 35/600 AE HT-K4 ⁽¹⁾ -M	2 x 150	1,617	175 912
UEG 35 AE	4 x 185	1,278	175 487	UEG 35 AE HT	4 x 185	1,278	175 832
UEG 35 AE-M	4 x 185	1,278	175 521	UEG 35 AE HT-M	4 x 185	1,278	175 834
UEG 35 AE-K4 ⁽¹⁾	4 x 185	1,278	175 488	UEG 35 AE HT-K4 ⁽¹⁾	4 x 185	1,278	175 833
UEG 35 AE-K4 ⁽¹⁾ -M	4 x 185	1,278	175 522	UEG 35 AE HT-K4 ⁽¹⁾ -M	4 x 185	1,278	175 835
UEG 35/600 AE	4 x 185	2,058	175 674	UEG 35/600 AE HT	4 x 185	2,058	175 841
UEG 35/600 AE-M	4 x 185	2,058	175 675	UEG 35/600 AE HT-M	4 x 185	2,058	175 843
UEG 35/600 AE-K4 ⁽¹⁾	4 x 185	2,058	175 628	UEG 35/600 AE HT-K4 ⁽¹⁾	4 x 185	2,058	175 842
UEG 35/600 AE-K4 ⁽¹⁾ -M	4 x 185	2,058	175 676	UEG 35/600 AE HT-K4 ⁽¹⁾ -M	4 x 185	2,058	175 844

Cable lugs and cables by others. UEG requires staggered arrangement with conductor spacing of less than 130 mm. M = factory assembled.

Contact grease for joints & feeds

100 ml for approx. 200 joints

Order-No. 121 502



Allowed change power 3600 N



UA 35



UAD 35

Depth: 50 mm

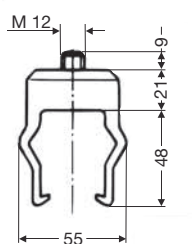
Insulated hangers

Type	Weight kg	Order-No.
UA 35	0,120	175 137
UA 35 K 4⁽¹⁾	0,120	175 138
UAD 35	0,110	175 667
UAD 35 K 4⁽¹⁾	0,110	175 637

Rail holders

to be used with insulator

Locating clamp



Depth: 50 mm

Allowed change power 3600 N

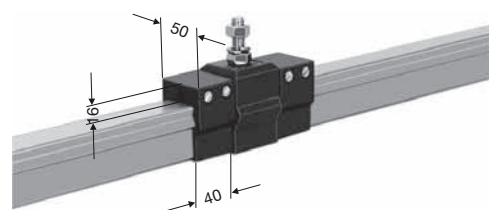


Photo shows hanger with two
ating clamps for an anchor point.

Type	Weight kg	Order- No.
UAK 35	0,060	175 139
UAK 35 K 4⁽¹⁾	0,060	175 140

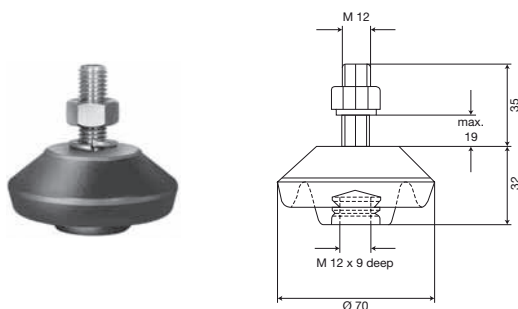
Type	Weight kg	Order- No.
USK 35 K 4⁽¹⁾	0,074	175 039

⁽¹⁾ with stainless steel hardware

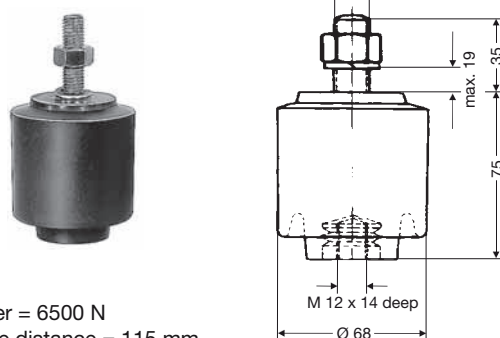


ACCESSORIES FOR U 35

Insulators



Cantilever = 4500 N
Creepage distance = 69 mm



Cantilever = 6500 N
Creepage distance = 115 mm

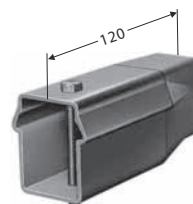
Type	Weight kg	Order- No.
GHH 30-M 12	0,210	175 052
GHH 30-M 12 K 4⁽¹⁾	0,210	175 054

Type	Weight kg	Order- No.
GHH 75-M 12	0,560	175 056
GHH 75-M 12 K 4⁽¹⁾	0,560	175 058

End caps

with locking pin

Typ M = factory assembled per layout
Typ L = loose



Type	Weight kg	Order- No.
UK 35-M	0,064	175 171
UK 35-L	0,064	175 060

Transfer guides

Usage in conductor interrupts.
Installation in systems according to layout drawing
max. vertical and horizontal offset ± 6 mm
air gap at transit max. 20 mm

Additional hangers and locating clamps have to be ordered separately.

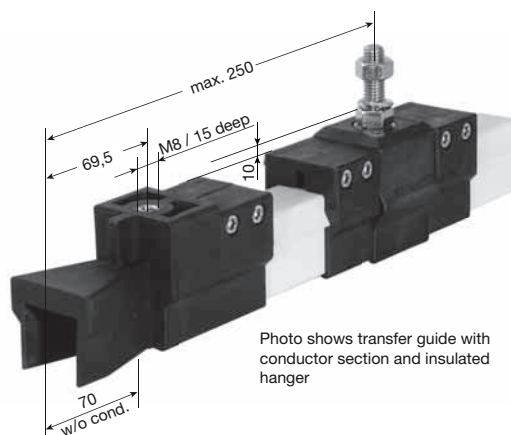


Photo shows transfer guide with conductor section and insulated hanger

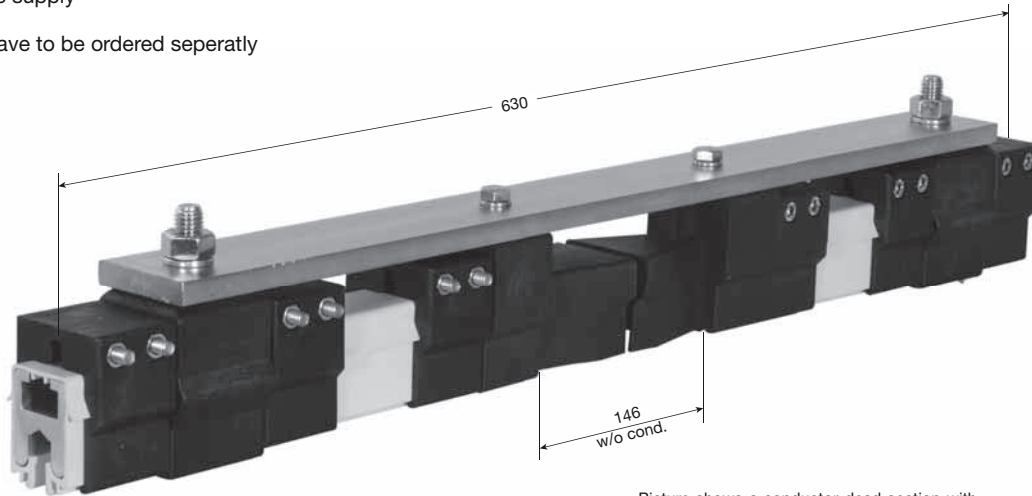
Type	Weight kg	Order- No.
US 35 AE K 4⁽¹⁾	0,120	175 678
US 35 C K 4⁽¹⁾	0,120	175 677

Conductor dead sections

Type M = factory assembled according to layout drawing

Type L = loose supply

Conductors have to be ordered separately



Picture shows a conductor dead section with conductor section and 4 loose attached locating clamps.

Type	Weight kg	Order-No.
LT/U 35 AE-L	1,330	175 629
LT/U 35 C-L	1,330	175 679

Type	Weight kg	Order-No.
LT/U 35 AE-M	1,330	175 636
LT/U 35 C-M	1,330	175 699

Isolating sections

Type M = factory assembled according to layout drawing

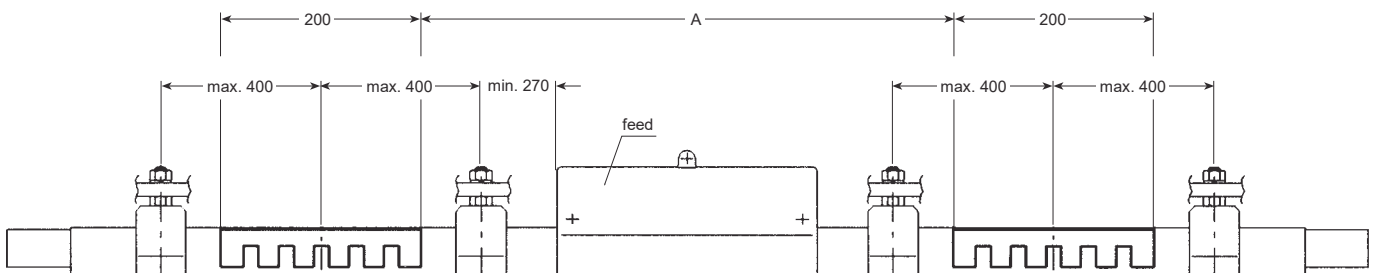
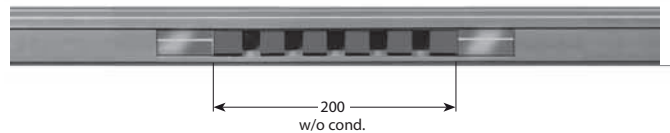
Type L = loose supply as single item

On both sides of the isolating section a hanger has to be considered.

Distance max. 400 mm from center isolating section.

Conductors, hangers and feed points have to be ordered separately.

Attention: with factory assembled isolating sections the feed terminals have to be factory assembled aswell.



In order to avoid voltage bridging and for clearing of maintenance, control and live areas use two isolating sections.

For the distance A number and type of collectors aswell as the length of the braking distance of the machinery has to be considered.

Type	Weight kg	Order-No.
IT/U 35/200 M	0,200	175 062
IT/U 35/300 M	0,200	175 063
IT/U 35/400 M	0,200	175 064
IT/U 35/500 M	0,200	175 399
IT/U 35/230 M	0,200	175 499
IT/U 35/450 M	0,200	175 500

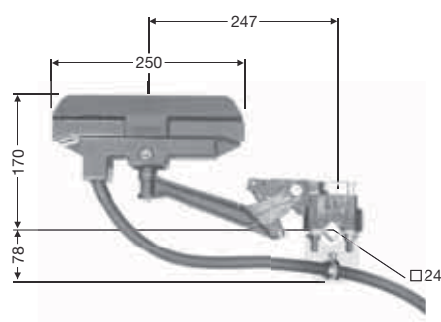
Type	Weight kg	Order-No.
IT/U 35/200 L	0,200	175 101
IT/U 35/300 L	0,200	175 102
IT/U 35/400 L	0,200	175 103
IT/U 35/500 L	0,200	175 400
IT/U 35/230 L	0,200	175 497
IT/U 35/450 L	0,200	175 498



COLLECTOR COMPONENTS FOR U 35

Current Collectors

Use current collectors USTR in case of lateral opened conductor system

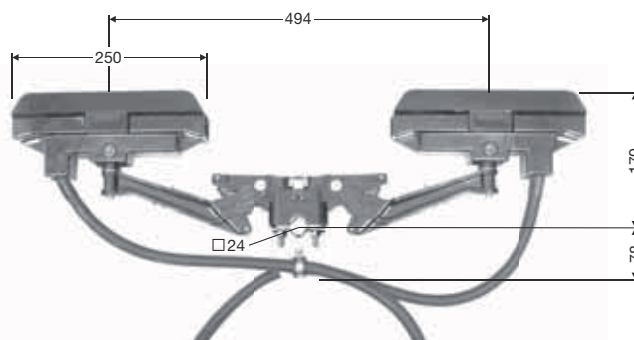


c/w 3 m cable
(pendent 2,6 m)
lift & swivel ± 50 mm
contact pressure ca. 30 N

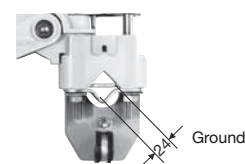


Double current collectors

Use current collectors UDSTR in case of lateral opened conductor system



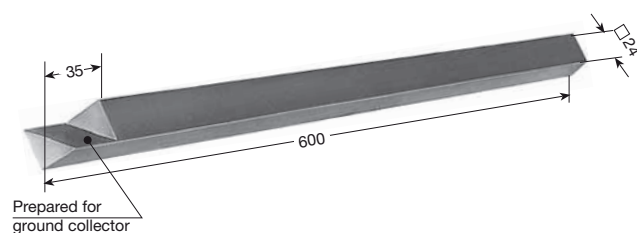
c/w 2 x 3 m cable
(pendent 2.6 m)
lift & swivel ± 50 mm
contact pressure: ca. 30 N per brush



Type	Am- pacity A	Connecting cable A/ mm ²	ø max/ mm	Weight kg	Order- No.		Type	Am- pacity A	Connecting cable A/ mm ²	ø max/ mm	Weight kg	Order- No.	
					phase - black	ground - yellow						phase - black	ground - yellow
UST 200/35	200	50	21	4,000	175 068	175 069	UDST 400/35	400	50	21	7,000	175 072	175 073
USTR 200/35	200	50	21	4,000	175 169	175 170	UDSTR 400/35	400	50	21	7,000	175 185	175 186
UST 200/35 HT	200	50	21	4,000	175 893	175 894	UDST 400/35 HT	400	50	21	7,000	175 695	175 696
USTR 200/35 HT	200	50	21	4,000	175 895	175 896	UDSTR 400/35 HT	400	50	21	7,000	175 769	175 770

With the AE-conductor, collectors, which work mainly on one position or with a very low travel speed ≤ 10 m/min. are only permitted to be work with 50% of the continuous current.

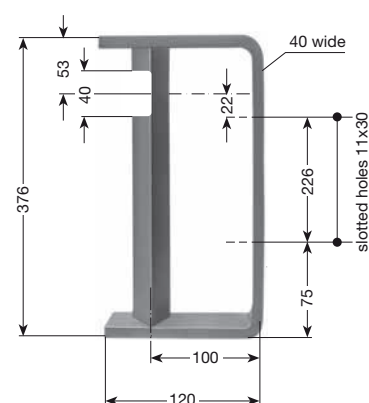
Collector brackets



Type	Weight kg	Order- No.
UM 24	2,600	175 076

Longer brackets furnished on special order.

With brackets above 600 mm length a support has to be considered on site, to avoid a bending or twisting of the collector bracket.

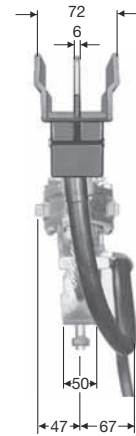
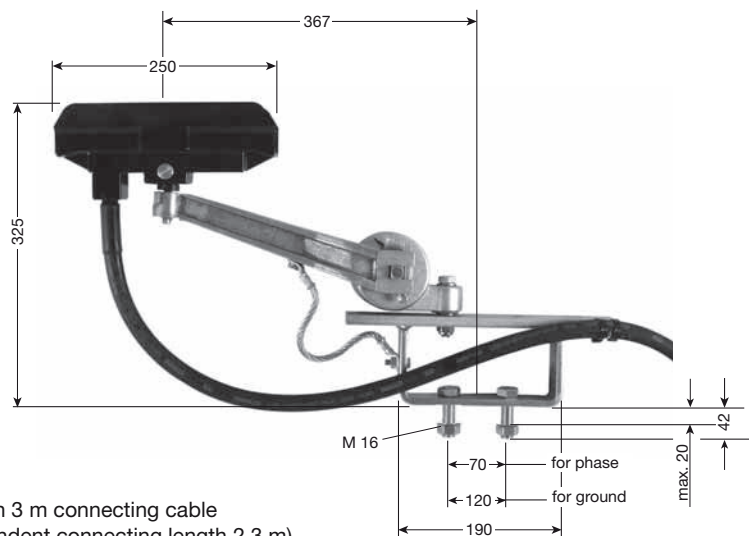


Type	Weight kg	Order- No.
UMA 24	2,800	175 125

Suitable for conductor rail distance 90 mm (3-poles + ground)

Current collectors

With lateral opened conductor rail systems the collector USTR has to be used. With phase distance <130 mm staggered arrangement.

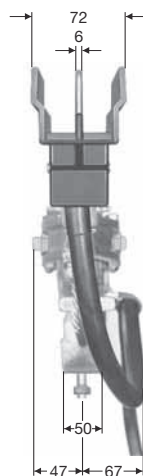
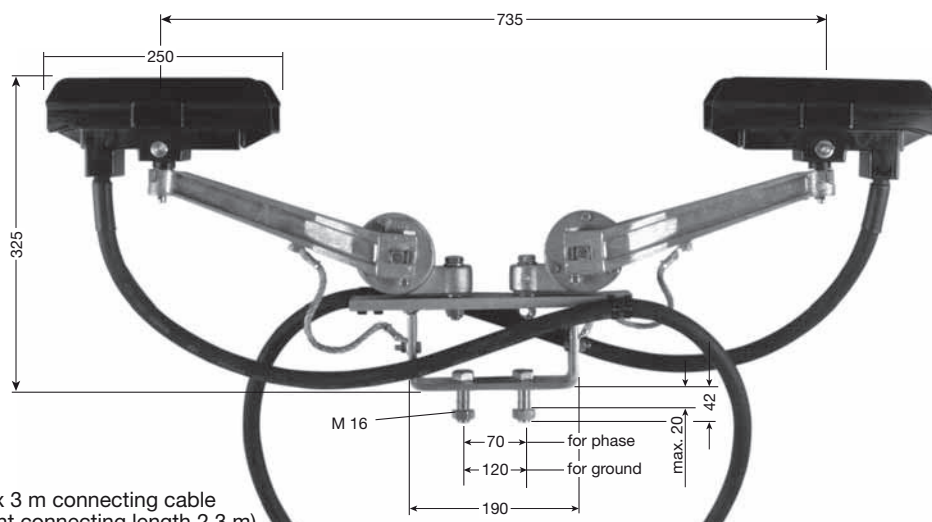


with 3 m connecting cable
(pendent connecting length 2,3 m)
Lift +/- 70 mm, lateral swivel +/- 80 mm
Contact pressure: 50-70 N

Type	Am- pacity A ⁽¹⁾	Connecting cable A/ mm ²	ø max/ mm	Weight kg	Order- No. phase - black	ground - yellow
UST 300/35	300	95	26	10,900	175 087	175 088
USTR 300/35	300	95	26	10,900	175 320	175 321
UST 300/35 HT	300	95	26	10,900	175 897	175 898
USTR 300/35 HT	300	95	26	10,900	175 899	175 900

Double current collectors

With lateral opened conductor rail systems the collector UDSTR has to be used. With phase distance <130 mm staggered arrangement.



with 2 x 3 m connecting cable
(pendent connecting length 2,3 m)
Lift +/- 70 mm, lateral swivel +/- 80 mm
Contact pressure: 50-70 N

Type	Am- pacity A ⁽¹⁾	Connecting cable A/ mm ²	ø max/ mm	Weight kg	Order- No. phase - black	ground - yellow
UDST 600/35	600	95	26	18,300	175 089	175 090
UDSTR 600/35	600	95	26	18,300	175 174	175 175
UDST 600/35 HT	600	95	26	18,300	175 697	175 698
UDSTR 600/35 HT	600	95	26	18,300	175 901	175 902

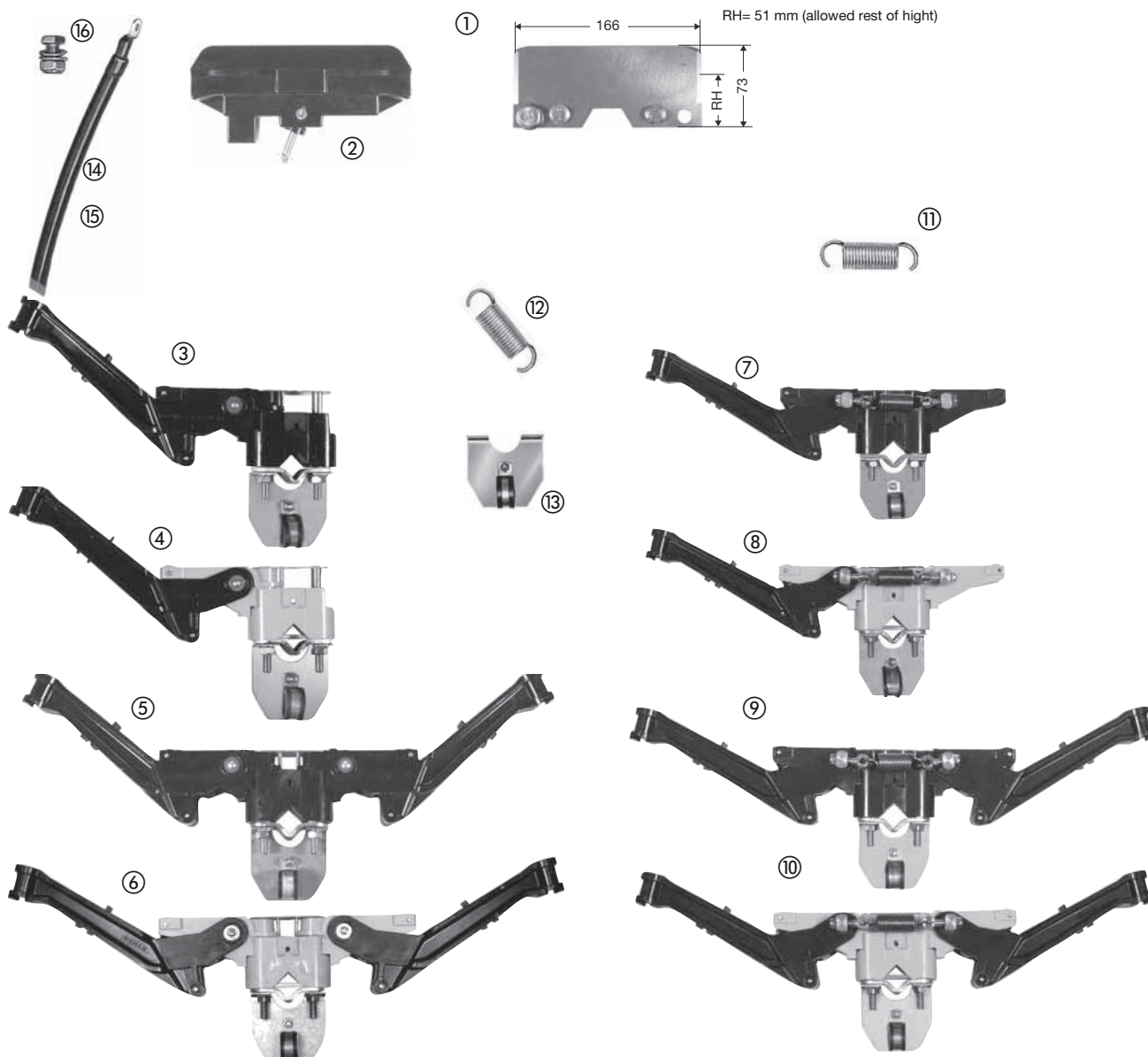
⁽¹⁾ The collector of the AE-conductor which are working with only ≤ 10 m/min. travel speed or stand most of the time are only permitted to work with 50 % of the continuous current.rden.



COLLECTOR COMPONENTS FOR U 35

Spares for collectors UST 200/35, UDST 400/35, USTR 200/35, UDSTR 400/35

Part-No.	Description	Weight kg	Order-No.
1	Brush KMU 300/35 with fixing and connecting screw	0,400	175 077
2	Brush holder	0,500	175 078
3	Collector base for UST 200/35	0,550	175 080
4	Collector base for UST 200/35		175 081
5	Collector base for UDST 400/35	0,795	175 082
6	Collector base for UDST 400/35		175 083
7	Collector base for USTR 200/35	0,780	175 550
8	Collector base for USTR 200/35		175 551
9	Collector base for UDSTR 400/35	0,940	175 552
10	Collector base for für UDSTR 400/35		175 553
11	Lateral tension spring ZF 6 for USTR 200/35 and UDSTR 400/35	0,023	170 167
12	Tension spring ZF 7 for UST 200/35, UDST 400/35, USTR 200/35 and UDSTR 400/35	0,030	160 719
13	Cable attachment clamp	0,150	175 107
14	Connecting cable RKA 50 mm ² , 3 m long	2,220	175 084
	Connecting cable RKA-HT 50 mm ² , 3 m long		175 657
15	Connecting cable RKA 50 mm ² , 3 m long	2,220	175 085
	Connecting cable RKA-HT 50 mm ² , 3 m long		175 658
16	Terminal bolt M 12 x 25 K4	0,054	175 401

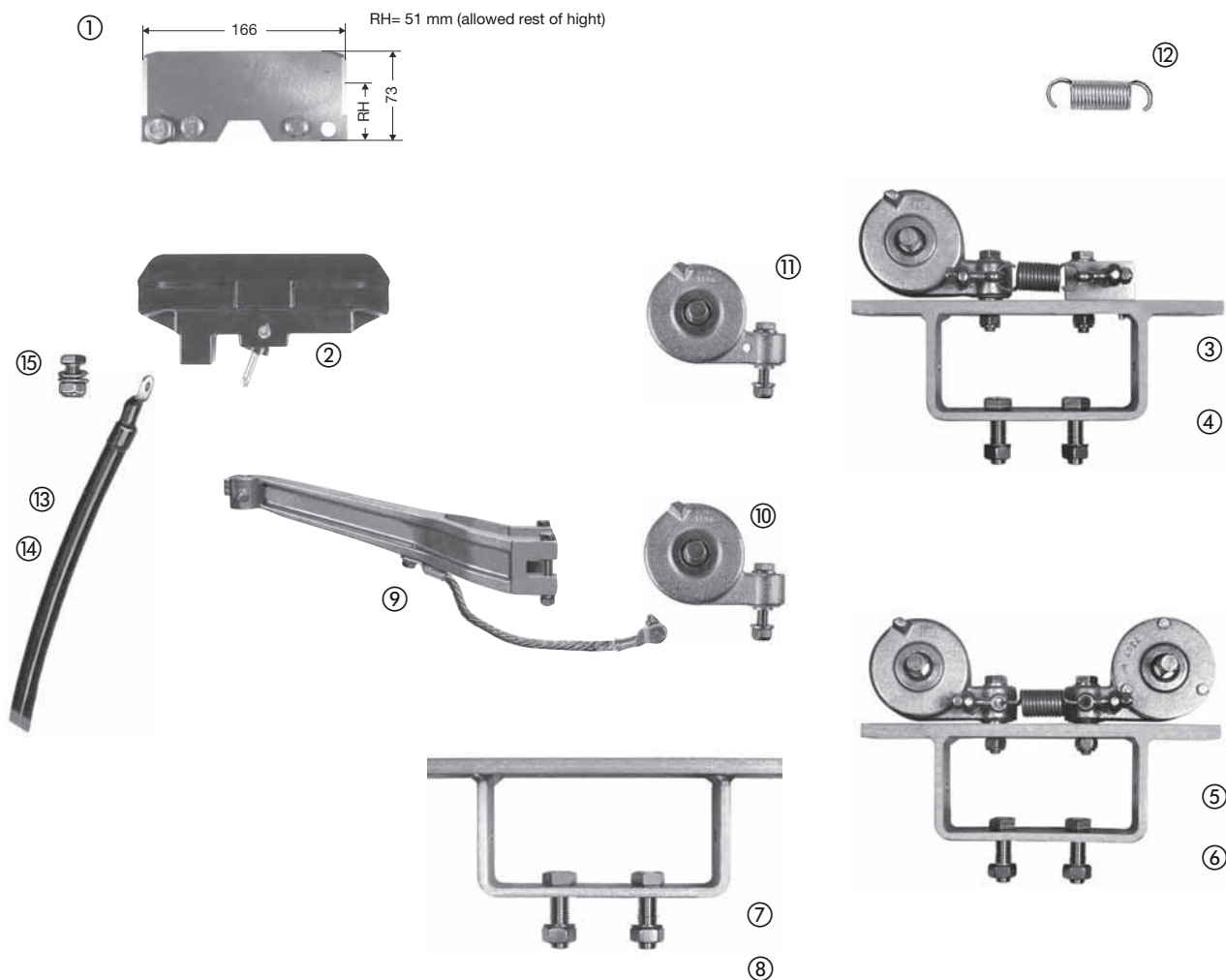


COLLECTOR COMPONENTS FOR U 35



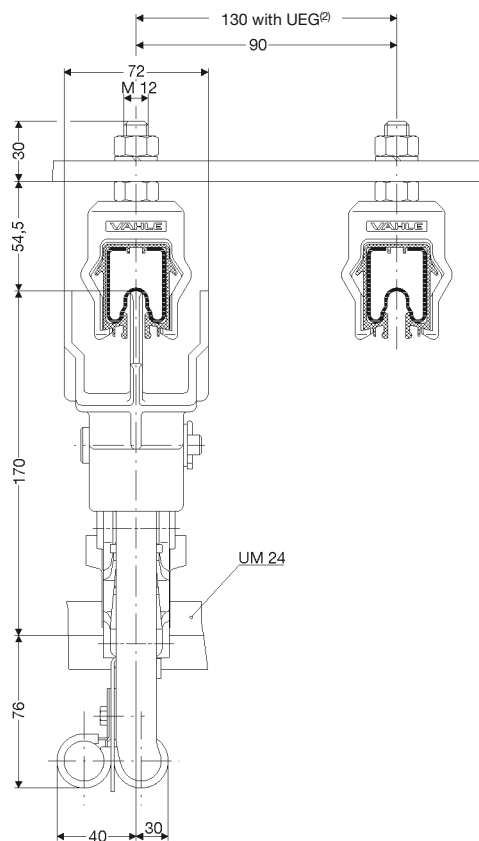
Spares for collectors UST 300/35, UDST 600/35, USTR 300/35 and UDSTR 600/35

Part-No.	Description	Weight kg	Order-No.
1	Brush KMU 300/35 with fixing and connecting screw	0,400	175 077
2	Brush holder	0,500	175 078
3	Collector base for USTR 300/35	6,380	175 554
4	Collector base for USTR 300/35		175 555
5	Collector base for UDSTR 600/35	8,050	175 556
6	Collector base for UDSTR 600/35		175 557
7	Base plate, complete		175 095
8	Base plate, complete		175 096
9	Lever, complete		175 093
10	Spring housing, complete for UST 300/35 and UDST 600/35		175 094
11	Spring housing, complete for USTR 300/35 and UDSTR 600/35		175 562
12	Lateral tension spring for USTR 300/35 and UDSTR 600/35		175 558
13	Connecting cable RKA 95 mm ² , 3 m long	3,750	175 149
	Connecting cable RKA HT 95 mm ² , 3 m long		175 659
14	Connecting cable RKA 95 mm ² , 3 m long	3,750	175 150
	Connecting cable RKA HT 95 mm ² , 3 m long		175 660
15	Terminal bolt M 12 x 25 K4	0,054	175 401

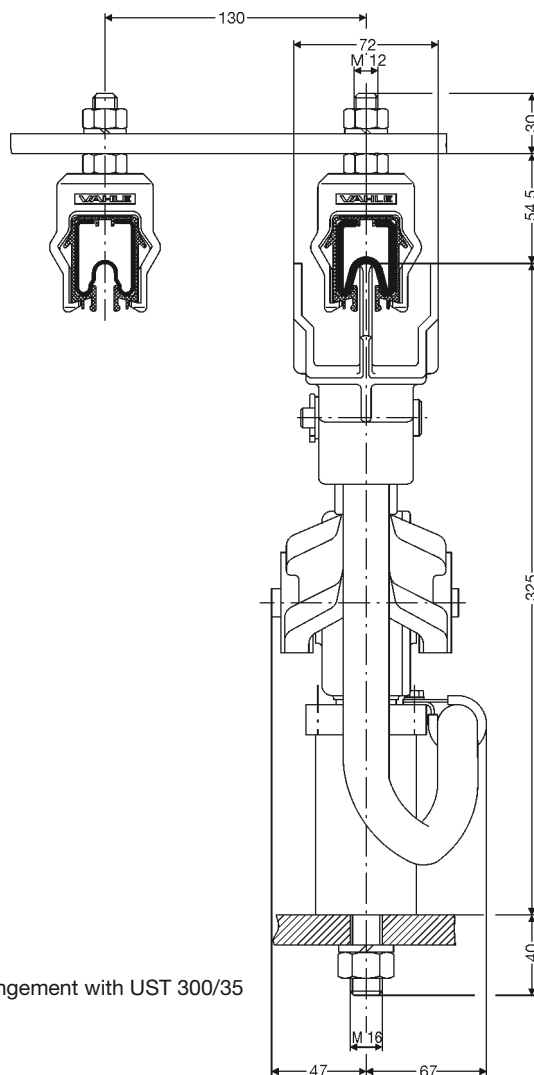




ARRANGEMENT AND EXAMPLE FOR ORDERING U 35



Arrangement with UDST 400/35



Arrangement with UST 300/35

250 m power supply system 720 A, 3-pole + ground

Qty	Description	Type	Order- No.
117	VAHLE unipole insulated conductors, 6.25 m long	phase PH U 35/300 C-6	175 216
3	VAHLE unipole insulated conductors, 4 m long cut to 3.75 m	phase PH U 35/300 C-2	175 214
39	VAHLE unipole insulated conductors, 6.25 m long	ground PE U 35/200 C-6⁽¹⁾	175 266
1	VAHLE unipole insulated conductor, 4 m long cut to 3.75 m	ground PE U 35/200 C-2⁽¹⁾	175 264
3	Expansion sections, 2.5 m long	phase PH UDV 35/200-400 C K4	175 527
1	Expansion sections, 2.5 m long	ground PE UDV 35/200-400 C K4	175 528
117	Bolted joint splice	UV 35/300	175 012
39	Bolted joint splice	UV 35/200	175 574
8	Feed terminal	UE 35/200-400	175 040
16	Locating clamps	USK 35 K 4	175 039
8	End caps	UK 35-L	175 060
404	Insulated hangers	UA 35	175 137
6	Double collectors	phase PH UDST 400/35	175 072
1	Double collector	ground PE UDST 400/35	175 073
2	Collector brackets	UM 24	175 076
1	Contact grease		121 502

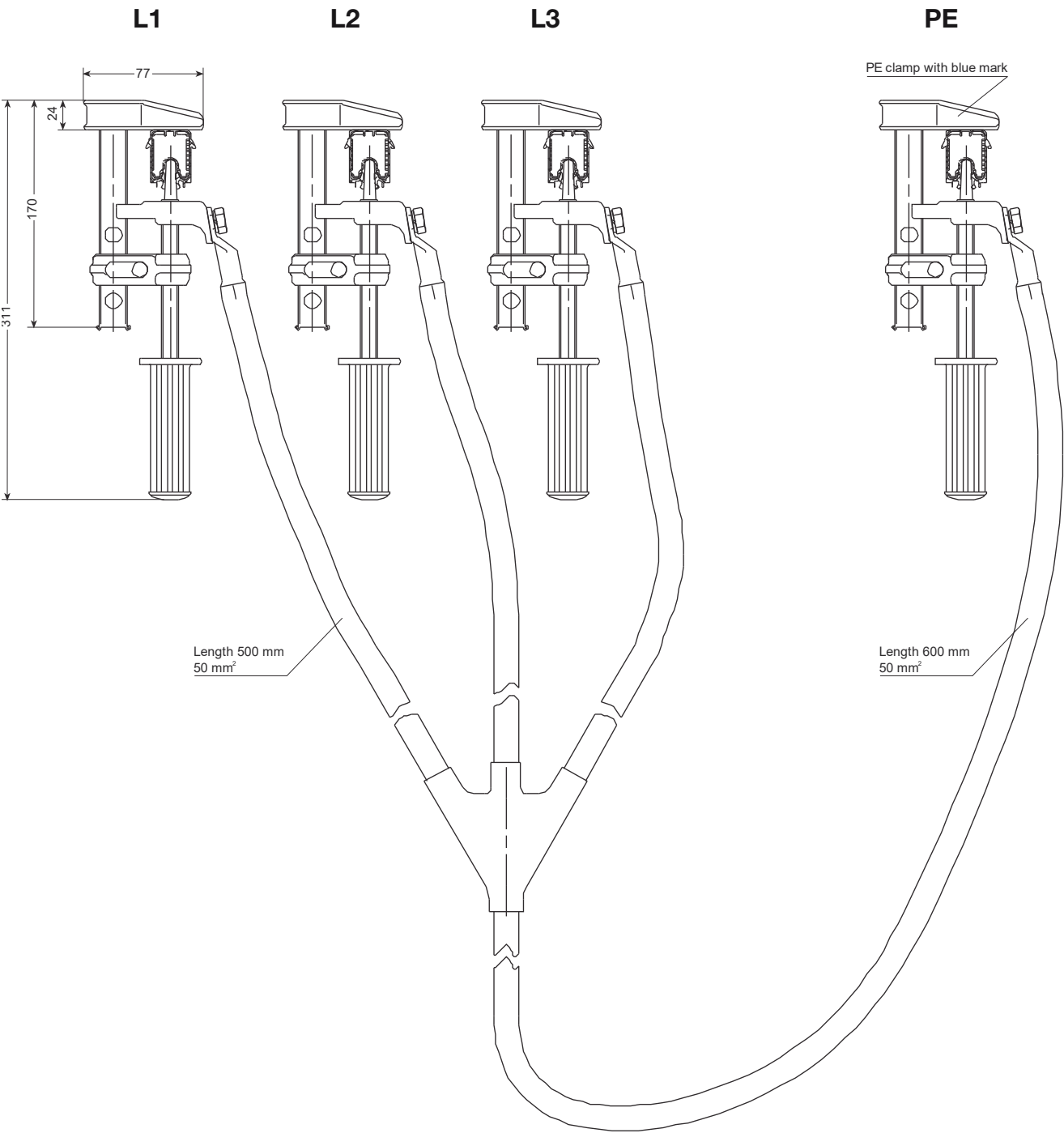
⁽¹⁾ Cross section reduction according to VDE 0100, part 540

⁽²⁾ With a phase distance < 130 mm the feed terminals UEG have to be staggered arranged min. 400 mm from each other.



Earthing spider system, 4-pole for insulated conductors – VDE 0105 Part 100 (EN 50110-1)

Serves for earthing and short-circuiting the phase conductors with the ground conductor in the case of maintenance work.
The system consists of terminal clamps for the conductors and copper wire ropes.
Earthing spider system cannot be used together with compact conductor arrangement.



Type	for conductor type	Copper section of wire rope	Order- No.
EUK	U 25 und U 35	50 mm ²	130 035



QUESTIONNAIRE FOR INSULATED CONDUCTOR SYSTEMS

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: _____



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