POWERAIL CONDUCTOR SYSTEMS

MKLD - MKLF - MKLS

VAHLE

19 12

ELECTRIFICATION SYSTEMS

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VAHLE-Powerail MKL...

Powerail MKL... is a totally enclosed conductor system for indoor and outdoor use. The insulated housing can accommodate different copper sections.

Typ MKLD from 6 to 10 copper conductors
continuous copper strips 40 - 200 A
copper strips come as separate items as coils.

Typ MKLF from 6 to 10 copper conductors
with factory-assembled plug-in joints 40 - 100 A.

Typ MKLS from 6 to 10 copper conductors
with factory-assembled bolted joints 40 - 200 A.

MKL... Powerails require the minimum of space, are easy to install and cannot corrode.

They meet all national and international safety requirements.
MKL... can be equipped with neoprene sealing strips and with a heating system.
The conductor with sealing strip meets IP 24. This means contact safety according to EN 60529 (VDE 0470, part 1).
For the collectors is this contact safety only vaild if the collector is in the housing. Systems in which the collectors are moving in and out of the conductor due to factory requirements need a separat contact safeety e.g. closed areas. This is only necessary for 25 Volts AC or 60 Vots DC.

Standard configurations are listed on page 5. Other configurations are possible.

Applications

Mobile power feeding of overhead cranes, monorail systems, electric hoists, electric power tools, machine tools, automated storage and retrieval systems, assembly and test lines, hangar doors, studio & station lighting systems and many others.

Housing

Gray colored, fully insulated, for 6 to 10 copper conductors.
Standard sections are 1, 2, 3 or 4 m long.
Specific lengths and curves are available.
Ground conductor identified by international color code.
Long and short lip housing profiles and collector safety keys avoid phase reversing.
Any number of conductors can be accomplished by installing several Powerails side by side.

Couplings of Housing

By fully insulated joint caps.

Feed sets

End feeds or line feeds are available.

Hangers

The brackets are installed to the crane track (see page 8).
The conductor rails are located in sliding and fixpoint hangers.
Max. support distance with the following ambient temperatures:

Indoor systems and covered outdoor systems	≤ 35° C = 2,00 m
Indoor and outdoor systems with and without heating	> 35° C = 1,33 m

Expansion sections

Expansion sections for length compensation are available and do not interrupt electric conductors.

Anti-condensation sections

For combined indoor/outdoor applications use anti-condensation sections. They do not interrupt electric conductors.

Contact sections, turntables, switches

Powerail for working areas and transfer applications see pages 12 & 13.

Sectionalizing

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

Available in air gap version (5 mm), where the collector carbon bridges the gap, e.g. for mains.

Also available in insulating piece version (30 mm). In this case the insulating piece is longer than the carbon and each Powerail section can be separated electrically, e.g. for control.

Collectors

The current collectors are made of impact-resistant polyamide.
Spring loaded carbon brushes maintain uniform contact. Connecting cables, hinged or flexible towing arms are included.
Double collectors to be used for transfer applications and higher amperage.
The length of the collector cable should not exeed 3 m if the installed fuse is not suitable for the cross section of this connecting cable. (Please note: This is often the fact if more than one collector is used in the system).

Please note: For use in galvanizing and pickling plants under aggressive conditions and low voltages we would appreciate receiving detailed information, especially of the environmental conditions.
To speed up quotations and order processing, we would appreciate receiving your drawings or sketches for Powerail systems with curves, dead sections, turntables, switches, etc. Please use our questionnaire, page 23/24.

In special environmental conditions the PVC housings could be assembled with INOX-strips (See Page 19). For low voltage applications and special environmental conditions please contact the factory.

Technical Data of Powerail MKL...

Electrical properties:

Ampacity	200 A (at 80% ED)	
Nennspannung (UL)	690 V (600 V)	
Dielectric strength	IEC 60243	30–40 KV/mm
Specific resistance	IEC 60093	5 x 10^{15} Ohm/cm
Surface resistance	IEC 60093	10^{13} Ohm
Leakage resistance	EN 60112	CTI 600–2,7

Mechanical properties:

Flexible strength	75N/mm² ± 10 %
Tensile strength	40 N/mm² ± 10 %
Temperature range (ambient):	– 30 °C to + 60 °C

Flame test proof:
no flaming particles, self extinguishing — DIN 41 02 – Class B 1 Part 1

Resistance to chemicals: at + 45 °C

Gasoline	Sulphuric acid 50 %
Mineral Oil	Caustic soda 25 % & 50 %
Grease	Hydro-chloric acid, concentrated

Consider the voltage drop calculation to maintain the limits established by the motor manufacturers:

Formulas:

AC: $\Delta U = \sqrt{3} \times I \times l \times Z$

DC: $\Delta U_1 = 2l \times I \times R$

$$\Delta U_2 = \frac{\Delta U_1 \cdot 100}{V}$$

ΔU_1 = Voltage drop [V]
ΔU_2 = Voltage drop [%]
I = Ampere load [A]
R = Resistence [Ohm/km]
l = Power feed length [m]
L = System length [m]

Effective length:

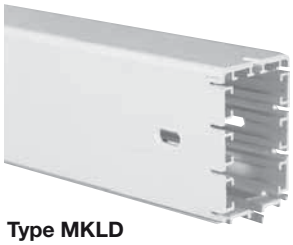
l = L power feed located at the end of the system
l = L/2 power feed located at the mid-point of the system
l = L/4 power feed located at both ends of the system
l = L/6 power feed located at L/6 from each end of the system

Z = Impedance [Ohm/km]
V = Voltage rating [V]

The total ampere load is determined from the nominal rated current of all motors working simultaneously on the same feed section of your electrification system. A diversity factor of 0.5 – 0.9 can be considered.
The conductor size and/or number of feed points should be increased or booster cables should be used in parallel in case the drop is exceeding the limitations.

POWERAIL TYPES AND CAT.-NOS.

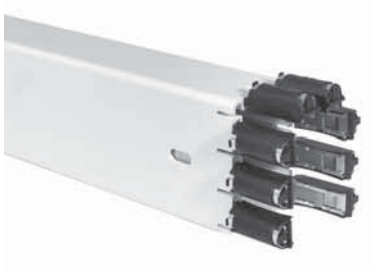
MKLD



Type MKLD
with continuous copper strips,
to be drawn in during installation.

Type[1]	HS c/w PE SS w/w PE	Weight kg/m	Order No.
Housing only			
(Copper strips to be drawn in during installation, see page 18. Configurations on page 5).			
MKLD- ... HS		1,533	235 10•
MKLD- ... SS		1,533	235 04•

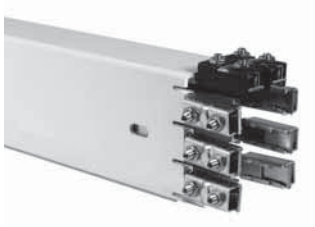
MKLF



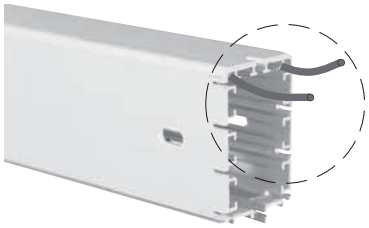
Type MKLF
with factory assembled copper strips
and plug-in joints,
(40 – 100 A)

Housing with factory assembled copper strips ans plug-in joints			
MKLF 6/ 40- ... HS		2,122	234 84•
MKLF 6/ 40- ... SS		2,122	234 83•
MKLF 6/ 60- ... HS		2,354	234 85•
MKLF 6/100- ... HS		2,612	234 86•
MKLF 7/ 40- ... HS		2,232	234 88•
MKLF 7/ 40- ... SS		2,232	234 87•
MKLF 7/ 60- ... HS		2,463	234 89•
MKLF 7/100- ... HS		2,707	234 90•
MKLF 8/ 40- ... HS		2,342	234 92•
MKLF 8/ 40- ... SS		2,342	234 91•
MKLF 8/ 60- ... HS		2,573	234 93•
MKLF 8/100- ... HS		2,816	234 94•

MKLS



Type MKLS
with factory assembled copper strips
and bolted joints,
(40 – 200 A)



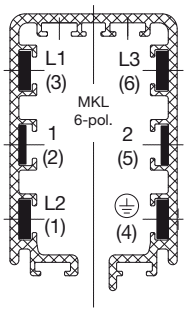
Types MKLD, MKLF and MKLS
with heating system

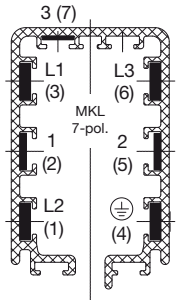
Housing with factory assembled copper strips and bolted joints			
MKLS 6/ 40- ... HS		2,166	234 72•
MKLS 6/ 40- ... SS		2,166	234 71•
MKLS 6/ 60- ... HS		2,395	234 73•
MKLS 6/100- ... HS		2,635	234 74•
MKLS 6/140- ... HS		2,809	234 95•
MKLS 6/160- ... HS		3,138	234 96•
MKLS 6/200- ... HS		3,381	234 97•
MKLS 7/ 40- ... HS		2,282	234 76•
MKLS 7/ 40- ... SS		2,282	234 75•
MKLS 7/ 60- ... HS		2,513	234 77•
MKLS 7/100- ... HS		2,760	234 78•
MKLS 7/140- ... HS		2,931	234 98•
MKLS 7/160- ... HS		3,254	234 99•
MKLS 7/200- ... HS		3,450	235 00•
MKLS 8/ 40- ... HS		2,399	234 80•
MKLS 8/ 40- ... SS		2,399	234 79•
MKLS 8/ 60- ... HS		2,631	234 81•
MKLS 8/100- ... HS		2,874	234 82•
MKLS 8/140- ... HS		3,047	235 01•
MKLS 8/160- ... HS		3,371	235 02•
MKLS 8/200- ... HS		3,614	235 03•

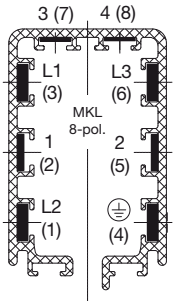
* ... Complete types e.g. MKLD-4 HS for 4 m MKLD with Order-No. 235 104
MKLF 8/40 -4 HS for 4 m MKLF 8/40 with PE Order-No. 234 924

• Add last number (1,2,3,4 length suffix) in accordance to bars required.

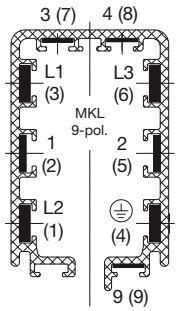
Type **HS** c/w PE **SS** w/o PE	No. of Con-duc-tors	Copper cross section mm² Phase L1, L2, L3	⏚	Control-line	Ampere rating with 35°C L1, L2, L3 100% A	Nominal voltage[2] V	Impedance at 50 Hz 20 °C Ω /1000 m	Resis-tance at 20°C Ω /1000 m	Leakage Distance mm	configurations[3]
MKL … 6/ 40 HS	6	3 x 10	10	2 x 10	40	690	1,73	1,72	30	
MKL … 6/ 40 SS	6	–	–	6 x 10	40	690	1,73	1,72	30	
MKL … 6/ 60 HS	6	3 x 14	14	2 x 10	60	690	1,26	1,25	30	
MKL … 6/100 HS	6	3 x 26	26	2 x 10	100	690	0,71	0,69	30	
MKL … 6/140 HS	6	3 x 33	26	2 x 10	140[1]	690	0,57	0,55	30	
MKL … 6/160 HS	6	3 x 42	26	2 x 10	160[1]	690	0,46	0,43	30	
MKL … 6/200 HS	6	3 x 51	26	2 x 10	200[1]	690	0,39	0,35	30	
MKL … 7/ 40 HS	7	3 x 10	10	2 x 10 1 x 11	40	690	1,73	1,72	30	
MKL … 7/ 40 SS	7	–	–	6 x 10 1 x 11	40	690	1,73	1,72	30	
MKL … 7/ 60 HS	7	3 x 14	14	2 x 10 1 x 11	60	690	1,26	1,25	30	
MKL … 7/100 HS	7	3 x 26	26	2 x 10 1 x 11	100	690	0,71	0,69	30	
MKL … 7/140 HS	7	3 x 33	26	2 x 10 1 x 11	140[1]	690	0,57	0,55	30	
MKL … 7/160 HS	7	3 x 42	26	2 x 10 1 x 11	160[1]	690	0,46	0,43	30	
MKL … 7/200 HS	7	3 x 51	26	2 x 10 1 x 11	200[1]	690	0,39	0,35	30	
MKL … 8/ 40 HS	8	3 x 10	10	2 x 10 2 x 11	40	690	1,73	1,72	30	
MKL … 8/ 40 SS	8	–	–	6 x 10 2 x 11	40	690	1,73	1,72	30	
MKL … 8/ 60 HS	8	3 x 14	14	2 x 10 2 x 11	60	690	1,26	1,25	30	
MKL … 8/100 HS	8	3 x 26	26	2 x 10 2 x 11	100	690	0,71	0,69	30	
MKL … 8/140 HS	8	3 x 33	26	2 x 10 2 x 11	140[1]	690	0,57	0,55	30	
MKL … 8/160 HS	8	3 x 42	26	2 x 10 2 x 11	160[1]	690	0,46	0,43	30	
MKL … 8/200 HS	8	3 x 51	26	2 x 10 2 x 11	200[1]	690	0,39	0,35	30	

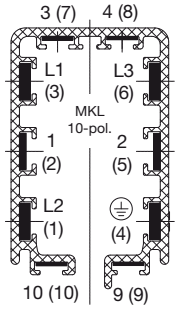






MKLD 9/ 40 HS	9	3 x 10	10	2 x 10 3 x 11	40	690	1,73	1,72	30	
MKLD 9/ 40 SS	9	–	–	6 x 10 3 x 11	40	690	1,73	1,72	30	
MKLD 9/ 60 HS	9	3 x 14	14	2 x 10 3 x 11	60	690	1,26	1,25	30	
MKLD 9/100 HS	9	3 x 26	26	2 x 10 3 x 11	100	690	0,71	0,69	30	
MKLD 9/140 HS	9	3 x 33	26	2 x 10 3 x 11	140[1]	690	0,57	0,55	30	
MKLD 9/160 HS	9	3 x 42	26	2 x 10 3 x 11	160[1]	690	0,46	0,43	30	
MKLD 9/200 HS	9	3 x 51	26	2 x 10 3 x 11	200[1]	690	0,39	0,35	30	
MKLD 10/ 40 HS	10	3 x 10	10	2 x 10 4 x 11	40	690	1,73	1,72	30	
MKLD 10/ 40 SS	10	–	–	6 x 10 4 x 11	40	690	1,73	1,72	30	
MKLD 10/ 60 HS	10	3 x 14	14	2 x 10 4 x 11	60	690	1,26	1,25	30	
MKLD 10/100 HS	10	3 x 26	26	2 x 10 4 x 11	100	690	0,71	0,69	30	
MKLD 10/140 HS	10	3 x 33	26	2 x 10 4 x 11	140[1]	690	0,57	0,55	30	
MKLD 10/160 HS	10	3 x 42	26	2 x 10 4 x 11	160[1]	690	0,46	0,43	30	
MKLD 10/200 HS	10	3 x 51	26	2 x 10 4 x 11	200[1]	690	0,39	0,35	30	





Conductors 9 & 10 for max. 24 V AC or 60 V DC.

[1] 80% E.D.

… Complete types e.g. MKLS 7/60 HS for 7 poles with bolted joints
In case of using a neutral conductor copper pos.1 will be taken.
layout of the system on request (please see page 2)

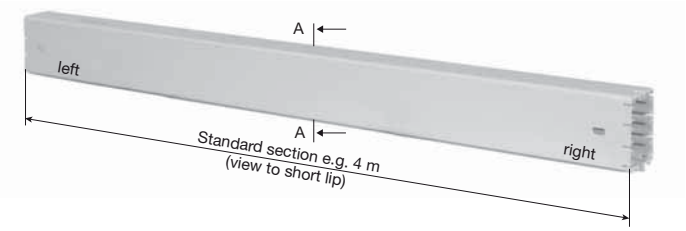
[2] Nominal voltage UL= 600 V

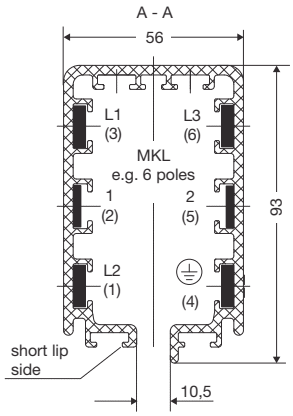
[3] Numbers in paranthesis apply to control line.

MKLD
MKLF
MKLS

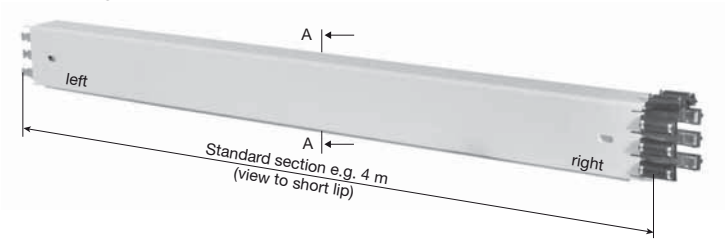
Standard sections

Type MKLD for continuous copper strips.

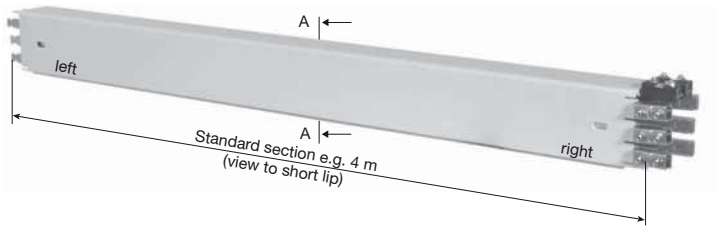




Type MKLF with plug-in joints, factory assembled.



Type MKLS with bolted joints, factory assembled.



Straight standard sections have no stiffener clamps. Stiffener clamps can be supplied loose or assembled each meter.

Stiffener clamps (paire)	Order-No.
loose, galvanized steel	234 017
loose, stainless steel	234 018

Stiffener clamps (piece)	Order-No.
factory assembled, galvanized steel	234 587
factory assembled, stainless steel	234 588

Curves

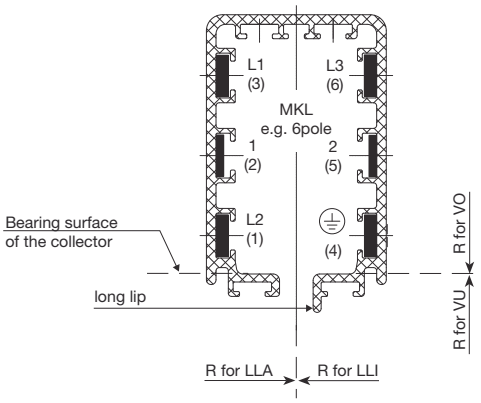
Min. bending radius, horizontal = 1100 mm
Max. length L = 3600 mm
max. \ 120 °
Smallest vertical radius = 2000 mm

Surcharge on request (piece)	Order-No.
Horizontal curve LLI and LLA(1)	234 547
Vertical curve VO and VU(2)	234 620

(1) LLI = long lip inside
(1) LLA = long lip outside
(2) VO = vertical curve upwards
(2) VU = vertical curve downwards

Long lip side of Powerails should always be mounted facing the machinery track.

For replacement curves please advise any changes.

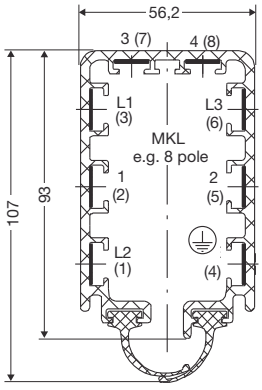


Sealing strip with accessories

Type	Order-No.
Sealing strip (3)	600 551
Fastener (1 per end)	236 105
Joint (2 per joint)	258 300
Conductor threading tool EZRD	234 552

Not available for 9- and 10-pole systems.

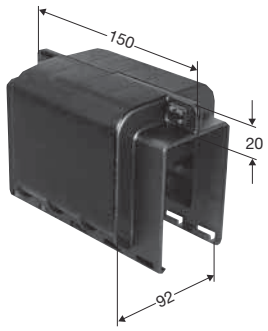
(3) The max. single length is 40 m long.
For further distances are joint laces necessary.
For each meter system length have 2 m sealing strip to be ordered. The delivery will be in pairs.



MKLD

Joint cap, self-locking

Ready installed

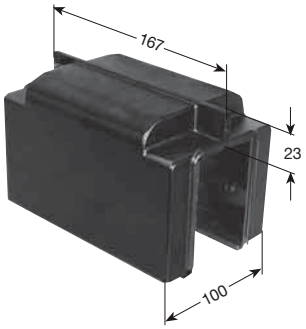


Type	Weight kg	Order-No.
MVMD	0,16	234 678

MKLF
MKLS

Joint cap, self-locking

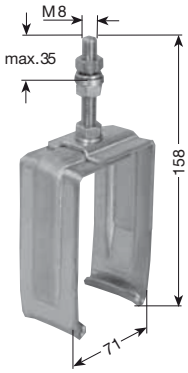
Ready installed

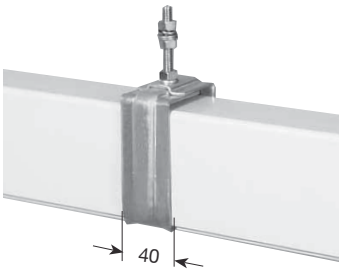


Type	Weight kg	Order-No.
MVMS	0,240	234 585

MKLD
MKLF
MKLS

Sliding hanger

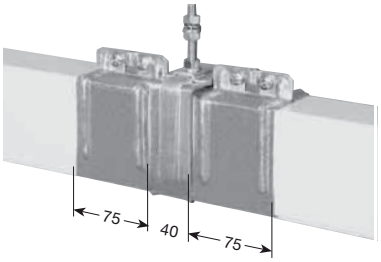


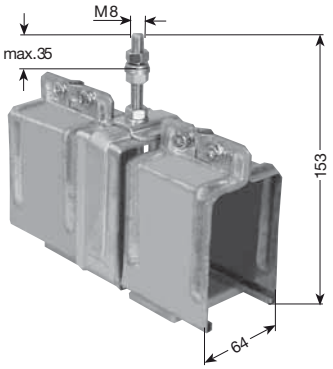


Sliding hanger mounted to Powerail section

Type	Weight kg	Order-No.
MGA	0,276	234 013

Fixpoint hanger

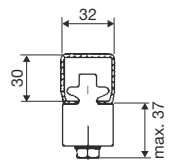




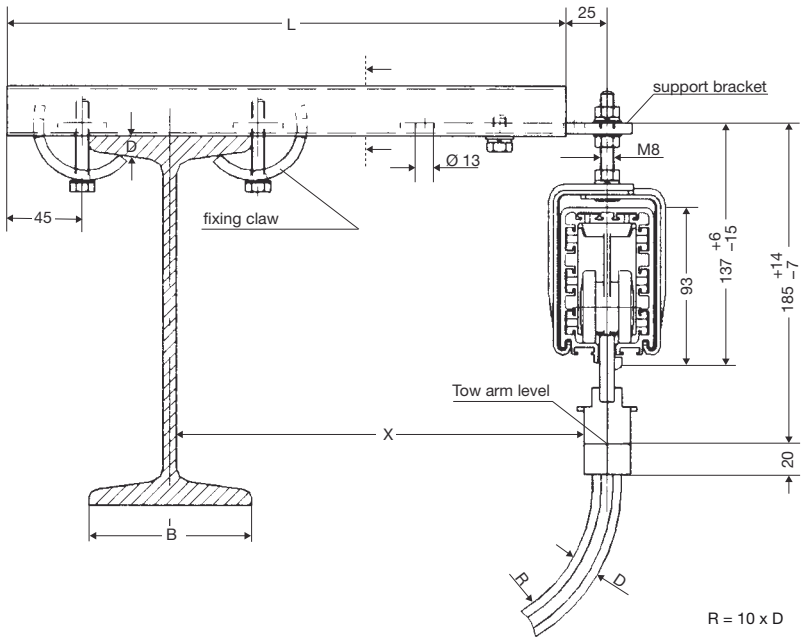
Fixpoint hanger mounted to Powerail section

Typ	Weight kg	Order-No.
MFN	0,620	235 142

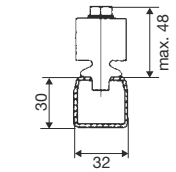
View w/o I-beam



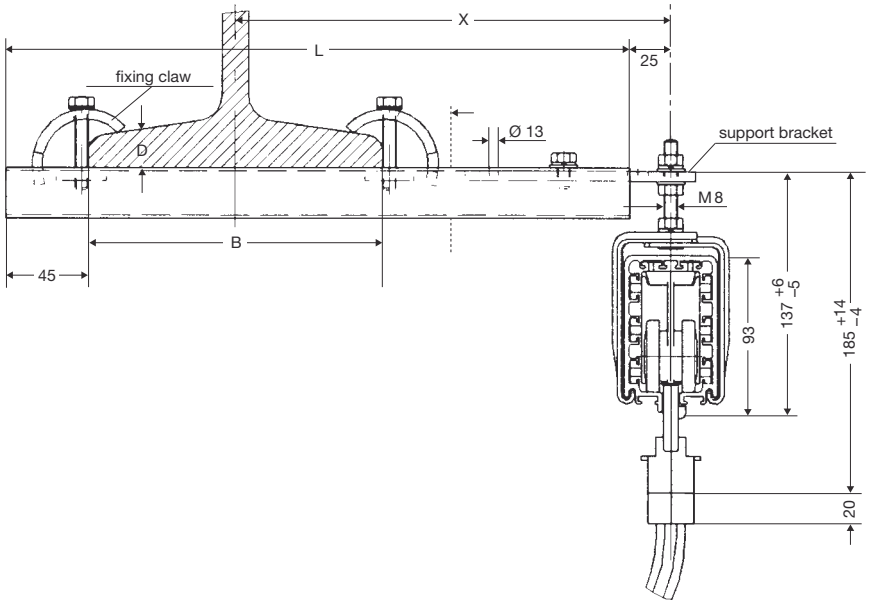
Claw suitable
for D = 6-15 mm



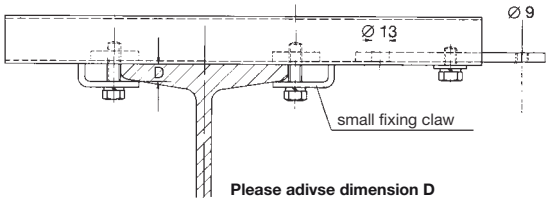
View w/o I-beam



Claw suitable
for D = 15-25 mm



EHK small claw version, D = max. 10 mm



Please adivse dimension D

Attention:
Make sure that hoist wheels have enough clearance. Use small claw if necessary. Check -beam dimension D.

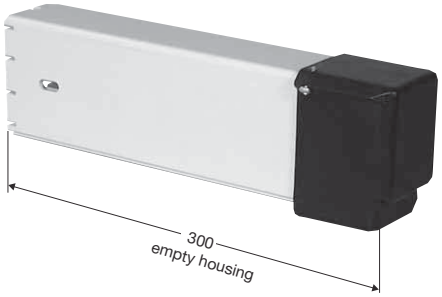
rail of EHK is identical to type S 1, Cat. 8a.

Type	X mm	L mm	B max mm	Weight kg	Order-No. for standard version	Order-No. with small claw version
EHK 250	250	350	170	1,070	251 600	251 720
EHK 300	300	400	170	1,150	251 610	251 730
EHK 400	400	500	170	1,300	251 620	251 740
EHK 500	500	600	170	1,450	251 630	251 750
EHK 600	600	700	170	1,600	251 640	251 760
EHK 700	700	800	170	1,750	251 650	251 770
EHK 750	750	850	170	1,820	251 660	251 780
EHK 800	800	900	170	1,900	251 670	251 790

Select next larger size bracket when your -beam dimension B is more than 170 mm.

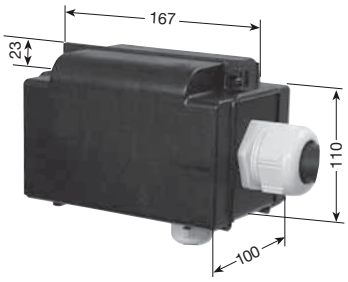
End sections

0,3 m long

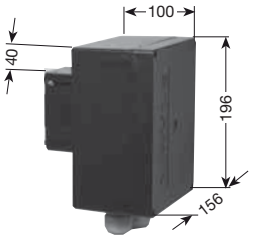


Type	Execution	Weight kg	Order-No.
MSED/L	left	0,550	235 144
MSED/R	right	0,550	235 145

End feeds



6 - 8 pole



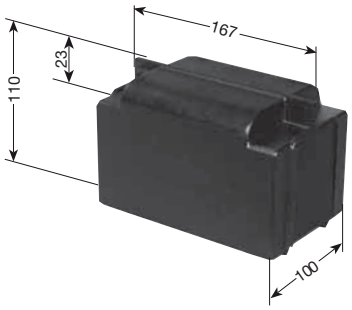
9 - 10 pole

End feeds come loose w/o Powerail.
They can be mounted at either end.

Termination by others, using cable lugs and M 5 studs.

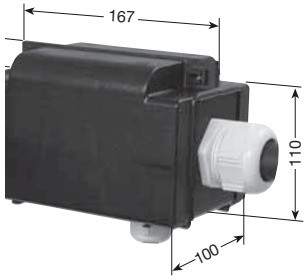
Typ	Cable gland dimensions see p. 18	Weight kg	Order-No.
MKED 6-8/ 40-60 HS	M 25 & M 40	0,580	235 152
MKED 9-10/ 40-60 HS		1,040	235 155
MKED 6-8/ 40 SS	M 25	0,520	235 157
MKED 9-10/ 40 SS		0,980	235 160

End cap



Type	Execution	Weight kg	Order-No.
MSES	left & right	0,286	235 141

End feeds



End feeds come loose w/o Powerail.
They can be mounted at either end.

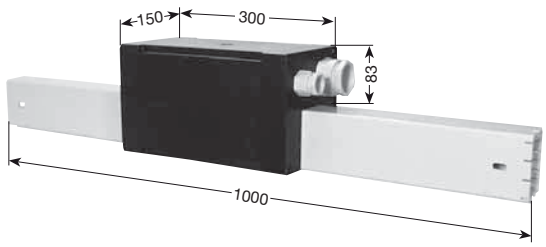
Termination by others, using cable lugs and M 5 studs.

Type	Cable gland dimensions see p. 18	Weight kg	Order-No.
MKES 6-8/ 40-60 HS	M 25 & M 40	0,580	235 230
MKES 6-8/ 40 SS	M 25	0,520	235 233

LINE FEEDS

with terminal box; incl. 1 m Powerail

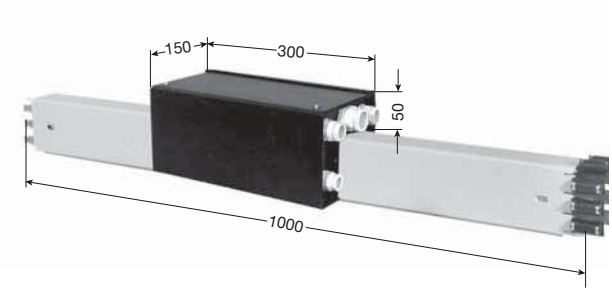
MKLD



Termination by others using cable lugs and M 8 studs.

Type	Cable gland dim. see p. 18)	Weight kg	Order-No.
MNGD 6/ 40-100 HS	M 50 and M 25	2,740	235 055
MNGD 7/ 40-100 HS		2,817	235 056
MNGD 8/ 40-100 HS		2,894	235 057
MNGD 9/ 40-100 HS		2,954	235 058
MNGD 10/ 40-100 HS		2,994	235 059
MNGD 6/140-200 HS	M 50 and M 25	2,744	235 060
MNGD 7/140-200 HS		2,821	235 061
MNGD 8/140-200 HS		2,898	235 062
MNGD 9/140-200 HS		2,958	235 063
MNGD 10/140-200 HS		2,998	235 064
MNGD 6/ 40 SS	M 25	2,667	235 050
MNGD 7/ 40 SS		2,744	235 051
MNGD 8/ 40 SS		2,826	235 052
MNGD 9/ 40 SS	M 25 and M 20	2,886	235 053
MNGD 10/ 40 SS		2,926	235 054

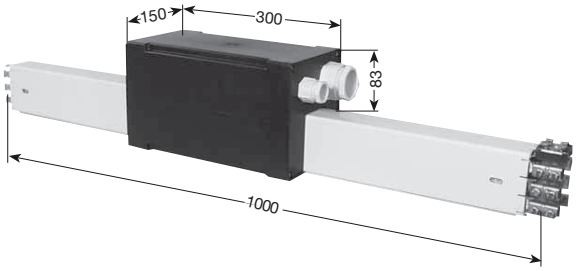
MKLF



Termination by others using cable lugs and M 8 studs.

Type	Cable gland dim. see p. 18)	Weight kg	Order-No.
MNGF 6/ 40 HS	M 50 and M 25	3,367	235 089
MNGF 7/ 40 HS		3,566	235 090
MNGF 8/ 40 HS		3,763	235 091
MNGF 6/ 60 HS		3,598	235 092
MNGF 7/ 60 HS		3,797	235 093
MNGF 8/ 60 HS		3,994	235 094
MNGF 6/100 HS		3,841	235 095
MNGF 7/100 HS		4,040	235 096
MNGF 8/100 HS		4,237	235 097
MNGF 6/ 40 SS	M 25	3,299	235 086
MNGF 7/ 40 SS		3,498	235 087
MNGF 8/ 40 SS		3,695	235 088

MKLS

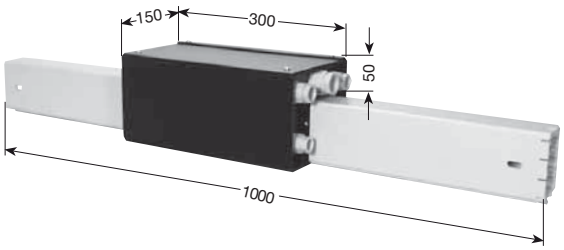


Termination by others using cable lugs and M 8 studs.

Type	Cable gland dim. see p. 18)	Weight kg	Order-No.
MNGS 6/ 40 HS	M 50 and M 25	3,451	235 068
MNGS 7/ 40 HS		3,662	235 069
MNGS 8/ 40 HS		3,873	235 070
MNGS 6/ 60 HS		3,682	235 071
MNGS 7/ 60 HS		3,893	235 072
MNGS 8/ 60 HS		4,104	235 073
MNGS 6/100 HS		3,925	235 074
MNGS 7/100 HS		4,136	235 075
MNGS 8/100 HS		4,347	235 076
MNGS 6/140 HS	M 50 and M 25	4,103	235 077
MNGS 7/140 HS		4,314	235 078
MNGS 8/140 HS		4,525	235 079
MNGS 6/160 HS		3,427	235 080
MNGS 7/160 HS		4,638	235 081
MNGS 8/160 HS		4,849	235 082
MNGS 6/200 HS		4,670	235 083
MNGS 7/200 HS		4,881	235 084
MNGS 8/200 HS		5,092	235 085
MNGS 6/ 40 SS	M 25	3,383	235 065
MNGS 7/ 40 SS		3,394	235 066
MNGS 8/ 40 SS		3,805	235 067

MKLD

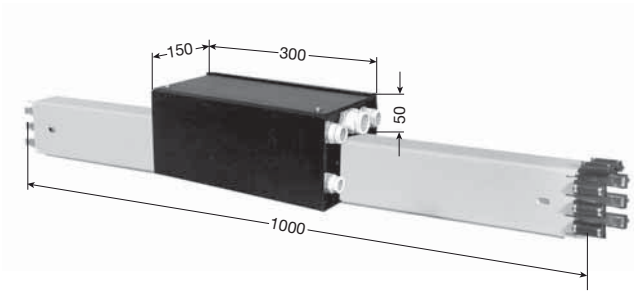
Type	Cable gland dim. see p. 19)	Weight kg	Order-No.
MNLD 6/ 40-100 HS	M 25 for PE, L1, L2, L3 M 25 for 1-4 M 25 for 9/10	2,432	234 740
MNLD 7/ 40-100 HS		2,509	234 745
MNLD 8/ 40-100 HS		2,586	234 746
MNLD 9/ 40-100 HS		2,657	234 747
MNLD 10/ 40-100 HS		2,697	234 748
MNLD 6/140-200 HS	M 25 for PE, L1, L2, L3 M 25 for 1-4 M 25 for 9/10	2,447	234 749
MNLD 7/140-200 HS		2,524	234 750
MNLD 8/140-200 HS		2,601	234 755
MNLD 9/140-200 HS		2,672	234 756
MNLD 10/140-200 HS		2,712	234 757
MNLD 6/ 40 SS	1 x M 25	2,374	234 735
MNLD 7/ 40 SS		2,451	234 736
MNLD 8/ 40 SS		2,533	234 737
MNLD 9/ 40 SS	2 x M 25	2,612	234 738
MNLD 10/ 40 SS		2,652	234 739



Termination by others using cable lugs and M 8 studs.

MKLF

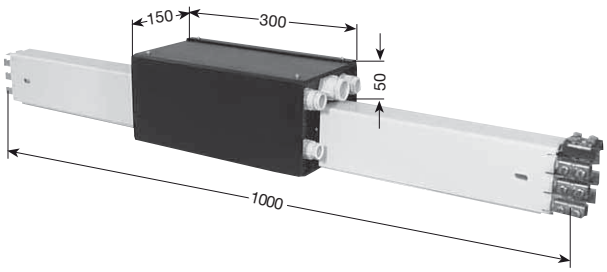
Type	Cable gland dim. see p. 19)	Weight kg	Order-No.
MNLF 6/ 40 HS	M 25 for PE, L1, L2, L3 M 25 for 1-4	3,059	235 131
MNLF 7/ 40 HS		3,258	235 132
MNLF 8/ 40 HS		3,455	235 133
MNLF 6/ 60 HS		3,290	235 134
MNLF 7/ 60 HS		3,489	235 105
MNLF 8/ 60 HS		3,686	235 106
MNLF 6/100 HS		3,533	235 107
MNLF 7/100 HS		3,732	235 108
MNLF 8/100 HS		3,929	235 109
MNLF 6/ 40 SS	M 25	3,006	235 098
MNLF 7/ 40 SS		3,205	235 099
MNLF 8/ 40 SS		3,402	235 100



Termination by others using cable lugs and M 8 studs.

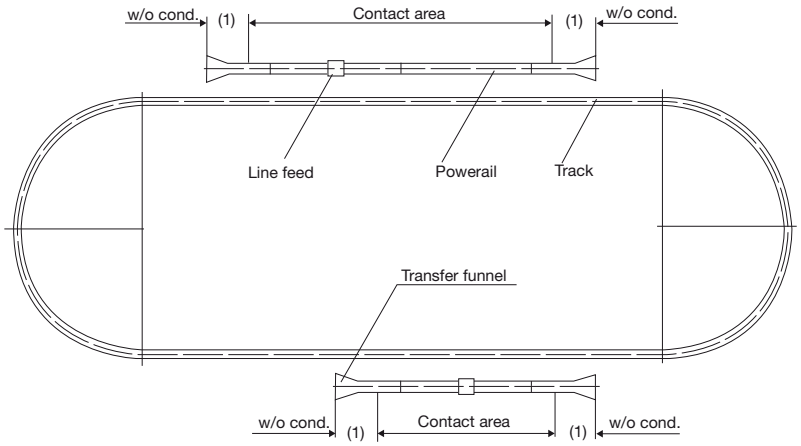
MKLS

Type	Cable gland dim. see p. 19)	Weight kg	Order-No.
MNLS 6/ 40 HS	M 25 for PE, L1, L2, L3 M 25 for 1-4	3,143	235 113
MNLS 7/ 40 HS		3,345	235 114
MNLS 8/ 40 HS		3,565	235 115
MNLS 6/ 60 HS		3,374	235 116
MNLS 7/ 60 HS		3,585	235 117
MNLS 8/ 60 HS		3,796	235 118
MNLS 6/100 HS		3,617	235 119
MNLS 7/100 HS		3,828	235 120
MNLS 8/100 HS		4,039	235 121
MNLS 6/140 HS	M 25 for PE, L1, L2, L3 M 25 for 1-4	3,806	235 122
MNLS 7/140 HS		4,017	235 123
MNLS 8/140 HS		4,228	235 124
MNLS 6/160 HS		4,119	235 125
MNLS 7/160 HS		4,341	235 126
MNLS 8/160 HS		4,552	235 127
MNLS 6/200 HS		4,373	235 128
MNLS 7/200 HS		4,584	235 129
MNLS 8/200 HS		4,795	235 130
MNLS 6/ 40 SS	M 25	3,090	235 110
MNLS 7/ 40 SS		3,301	235 111
MNLS 8/ 40 SS		3,512	235 112

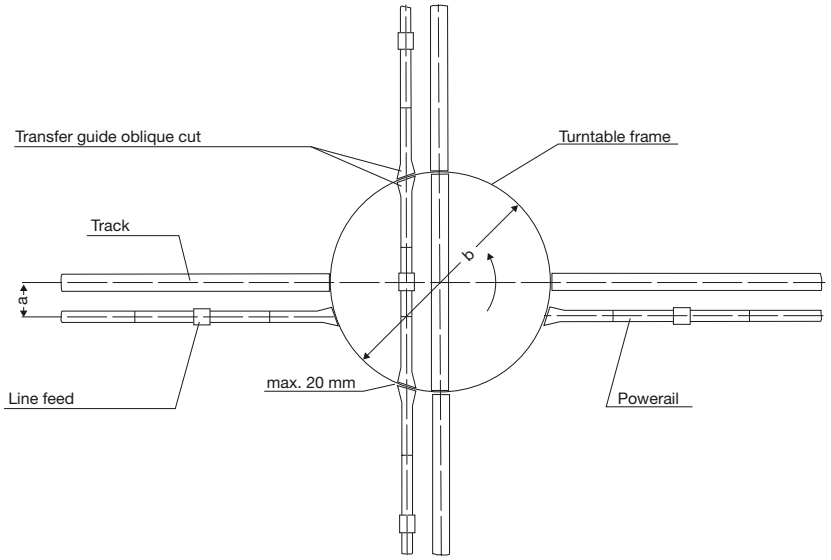


Termination by others using cable lugs and M 8 studs.

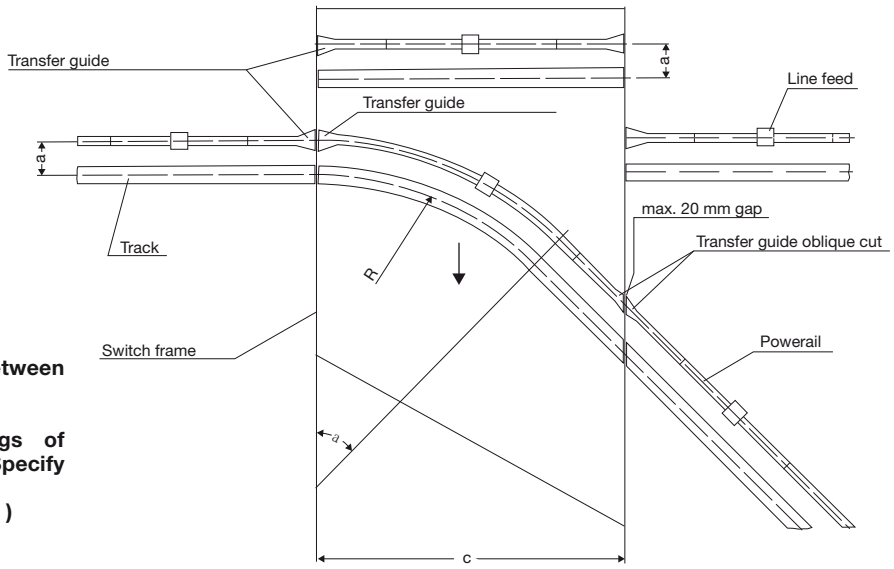
Contact section[1]



Turntable



Sliding switch



Max. 20 mm air gap between transfer guides.

Please submit drawings of transfer applications. Specify dimensions a, b, c, R and angle α (α = max. 50°)

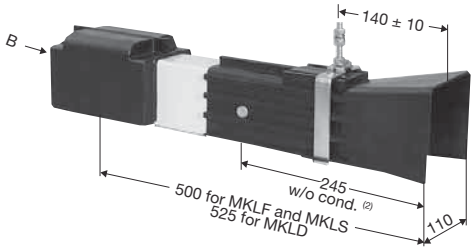
Please submit drawings for all transfer applications.

[1] Contact sections must not be activated before collectors are fully engaged.
Flexible support type tow arms MFM (see page 17) for collectors are essential with contact sections.

Transfer funnels

Energize Powerail only after current collector brushes have full contact with copper conductors.

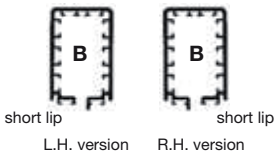
For all types the use of flexible towing arms is required.



Type[1]	Weight kg	Order-No. L.H. version	Order-No. R.H. version
MTN 6/ 40-140 ... HS	2,201	235 162	235 172
MTN 7/ 40-140 ... HS	2,265	235 163	235 173
MTN 8/ 40-140 ... HS	2,528	235 164	235 174
MTN 6/160-200 ... HS	2,201	236 210	236 215
MTN 7/160-200 ... HS	2,265	236 211	236 216
MTN 8/160-200 ... HS	2,528	236 212	236 217
MTN 6/ 40 ... SS	2,201	235 167	235 177
MTN 7/ 40 ... SS	2,265	235 168	235 178
MTN 8/ 40 ... SS	2,528	235 169	235 179

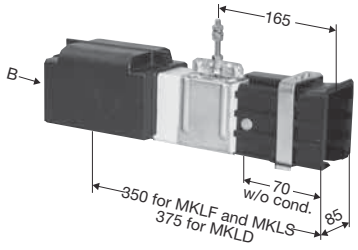
horizontal offset max. 15 mm
vertical offset max. 10 mm

Max. drive-in speed of the collector 60 m/min.



Transfer guides, straight

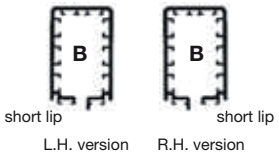
With all types double collectors or 2 single collectors neccessary.



Type[1]	Weight kg	Order-No. L.H. version	Order-No. R.H. version
MUN 6/ 40-140 ... HS	2,155	235 182	235 192
MUN 7/ 40-140 ... HS	2,219	235 183	235 193
MUN 8/ 40-140 ... HS	2,482	235 184	235 194
MUN 6/160-200 ... HS	2,155	236 220	236 225
MUN 7/160-200 ... HS	2,219	236 221	236 226
MUN 8/160-200 ... HS	2,482	236 222	236 227
MUN 6/ 40 ... SS	2,155	235 187	235 197
MUN 7/ 40 ... SS	2,219	235 188	235 198
MUN 8/ 40 ... SS	2,482	235 189	235 199

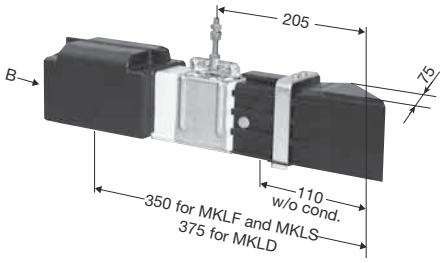
Mismatch of the transfer guides together:
lateral max. 4 mm, height max. 3 mm

Max. drive through speed of the collectors 80 m/min.



Tansfer guides, oblique

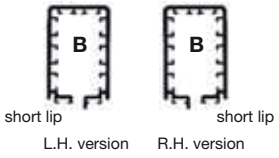
With all types 2 single collectors neccessary.



Type[1]	Weight kg	Order-No. L.H. version	Order-No. R.H. version
MUNS 6/ 40-140 ... HS	2,185	235 202	235 212
MUNS 7/ 40-140 ... HS	2,249	235 203	235 213
MUNS 8/ 40-140 ... HS	2,512	235 204	235 214
MUNS 6/160-200 ... HS	2,185	236 230	236 235
MUNS 7/160-200 ... HS	2,249	236 231	236 236
MUNS 8/160-200 ... HS	2,512	236 232	236 237
MUNS 6/ 40 ... SS	2,185	235 207	235 217
MUNS 7/ 40 ... SS	2,249	235 208	235 218
MUNS 8/ 40 ... SS	2,512	235 209	235 219

Mismatch of the transfer guides together:
lateral max. 4 mm, height max. 3 mm

Max. drive through speed of the collectors 80 m/min.



Details of oblique cutper system layout.

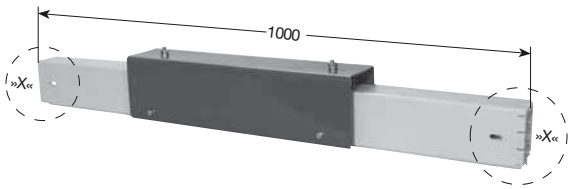
[1] Complete types e.g. MUN 6/40-200... HS
L.H.-version: MUN 6/40-200 L HS Order-No. 235 182

[2] Relating to the middle of the collector.

ANTI-CONDENSATION SECTIONS

incl. 1 m section

MKLD



Type	Weight kg	Order-No.
MBD- HS	2,520	235 223
MBD- SS	2,520	235 222

MKLF

X: See page 2 for different versions of Powerail ends

Typ	Weight kg	Order-No.
MBF- 6/ 40 HS	3,034	235 236
MBF- 7/ 40 HS	3,156	235 237
MBF- 8/ 40 HS	3,276	235 238
MBF- 6/ 60 HS	3,266	235 239
MBF- 7/ 60 HS	3,388	235 240
MBF- 8/ 60 HS	3,508	235 241
MBF- 6/100 HS	3,509	235 242
MBF- 7/100 HS	3,631	235 243
MBF- 8/100 HS	3,750	235 244
MBF- 6/ 40 SS	3,034	235 245
MBF- 7/ 40 SS	3,156	235 246
MBF- 8/ 40 SS	3,276	235 247

The anti-condensation section consists of 1 m Powerail with air circulation holes, covered by a protection hood.

The anti-condensation section doesn't seperate the conductor.

The anti-condensation section is to be used where Powerails are passing from indoor to outdoor, preventing condensation of hot air, escaping from the indoor section, in the cooler outdoor section.

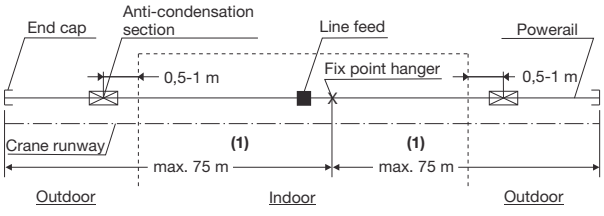
MKLS

Typ	Weight kg	Order-No.
MBS- 6/ 40 HS	3,118	235 260
MBS- 7/ 40 HS	3,252	235 261
MBS- 8/ 40 HS	3,386	235 262
MBS- 6/ 60 HS	3,350	235 263
MBS- 7/ 60 HS	3,484	235 264
MBS- 8/ 60 HS	3,618	235 265
MBS- 6/100 HS	3,593	235 266
MBS- 7/100 HS	3,727	235 267
MBS- 8/100 HS	3,861	235 268
MBS- 6/140 HS	3,767	235 269
MBS- 7/140 HS	3,901	235 270
MBS- 8/140 HS	4,035	235 271
MBS- 6/160 HS	4,091	235 272
MBS- 7/160 HS	4,225	235 273
MBS- 8/160 HS	4,358	235 274
MBS- 6/200 HS	4,334	235 275
MBS- 7/200 HS	4,468	235 276
MBS- 8/200 HS	4,601	235 277
MBS- 6/ 40 SS	3,118	235 278
MBS- 7/ 40 SS	3,252	235 279
MBS- 8/ 40 SS	3,868	235 280

Use of the anti-condensation section

At transfers of the conductor where the hall get out-of-doors.

Thereby a icing of the outside conductor will be avoided, as the warm air leaks out of the anticondensation
section and will not condensate in the housing (see sketch).



Feeding

No extra feeds required as the Powerail is not interrupted.

Collectors

No extra collectors required.

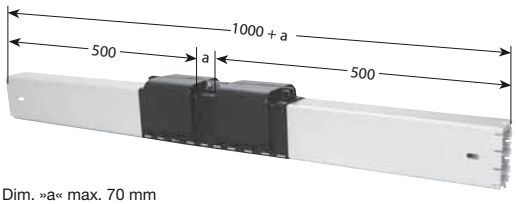
Installation

The anti-condensation section is to be placed outdoors, close to the transfer point.

(1) For longer runs use expansion joint section (see page 15)

MKLD

Type	Weight kg	Order-No.
MDD- 6-8 HS	1,890	235 224
MDD- 9 HS	1,883	235 225
MDD- 10 HS	1,877	235 226
MDD- 6-8 SS	1,890	235 227
MDD- 9 SS	1,883	235 228
MDD- 10 SS	1,877	235 229



Dim. »a« max. 70 mm

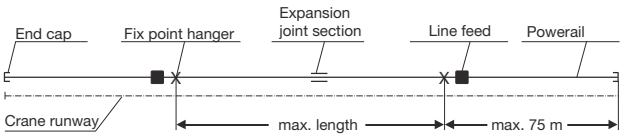
Expansion section Typ MDD is required to compensate difference in expansion between insulated housing and copper conductors.

The expansion joints are used if the Powerail length between feeds, curves, transfer guides and other fix points is exceeding 10 m.

Max. length to temperature differences:

Δ t 20 °C = 70 m Δ t 40 °C = 35 m Δ t 80 °C = 17 m
Δ t 30 °C = 45 m Δ t 60 °C = 23 m

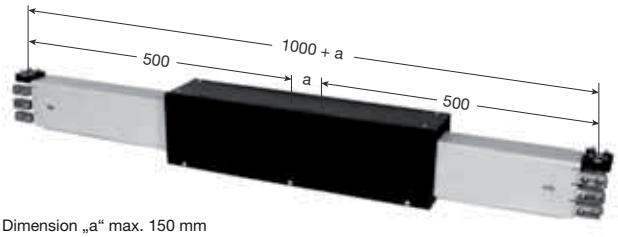
Longer runs or higher differences in temperature require several expansion joints.



Additional feed points and collectors are not necessary as the conductor rail is not electrically separated.

MKLF MKLS

Type	Weight kg	Order-No.
MDS- 6/ 40-140 HS	5,400	235 395
MDS- 7/ 40-140 HS	5,520	235 396
MDS- 8/ 40-140 HS	5,640	235 397
MDS- 6/160-200 HS	5,900	235 398
MDS- 7/160-200 HS	6,020	235 399
MDS- 8/160-200 HS	6,140	235 400
MDS- 6/ 40 SS	5,400	235 401
MDS- 7/ 40 SS	5,520	235 402
MDS- 8/ 40 SS	5,620	235 403

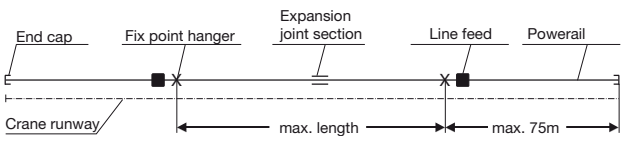


Dimension „a“ max. 150 mm

Expansion joint section Type **MDS** is required to compensate difference in expansion between insulated housing and supporting structure:
The expansion joints are used if the powerail length between feeds, curves, transfer guides and other fix points is exceeding 20 m.

Max. length to temperature differences:

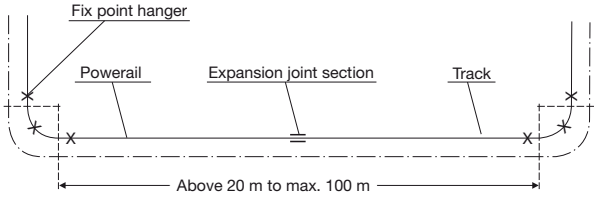
Δ t 90 °C (–30 °C to + 60 °C) one expansion joint section per 100 m, and so on each 100 m.
Arrangement of fixpoints according to sketches.
The remaining conductor sections **have to be** arranged in sliding hangers.



With the expansion joint the conductor will not be electricaly seperated.
Additional feed points or collectors are not neccessary.

Installation

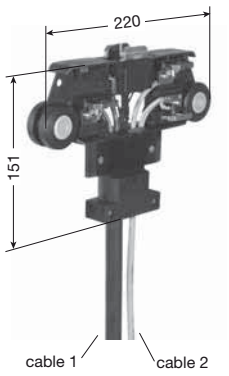
The distance „a“ have to be adjusted to 75 mm during installation.
This is due by installation temperatures between -10 °C upto + 35 °C.



MKLD
MKLF
MKLS

Collectors MSWA

upto max. 180 m/min.
In conductor rails with sealing strip upto 100 m/min.



Connecting cables:

for power line: cable 1 → 4 x 6 mm²
cable 2 → ... x 1,5 mm²

for control line: cable 1 → ... x 2,5 mm²
two cables for 8-pole and more)

Example of ordering collector with 2 m cable
Order-No. 236 177-2
for collector **MSWA** 6/50-2 HS

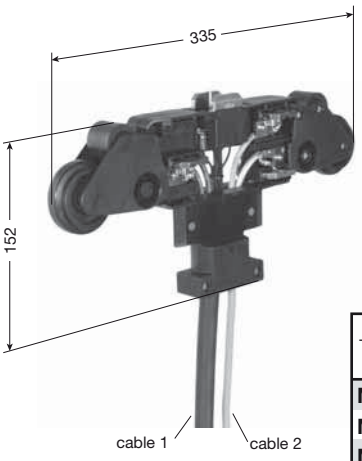
Cleaning trolleys on request.

Type	Ampacity at 60% ED A	No. of poles	ø of connecting cables mm cable 1	cable 2	Weight kg	Order-No.
MSWA 6/50-1 HS	50	6	≈17,0	≈ 7,0	1,058	236 177
MSWA 7/50-1 HS	50	7	≈17,0	≈ 7,5	1,083	236 178
MSWA 8/50-1 HS	50	8	≈17,0	≈ 8,0	1,121	236 179
MSWA 9/50-1 HS	50	9	≈17,0	≈ 9,0	1,300	236 180
MSWA 10/50-1 HS	50	10	≈17,0	≈ 9,5	1,380	236 181
MSWA 6/25-1 ST	25	6	≈11,5	–	0,782	236 182
MSWA 7/25-1 ST	25	7	≈11,5	–	0,792	236 183
MSWA 8/25-1 ST	25	8	≈10,0	≈10,0	0,836	236 184
MSWA 9/25-1 ST	25	9	≈11,0	≈10,0	1,029	236 185
MSWA 10/25-1 ST	25	10	≈11,5	≈10,0	1,155	236 186

For curves use single collectors only.
Connecting cable 1 m, longer cable available.

Double collectors MSWAS

upto max. 250 m/min.
In conductor rails with sealing strip upto 100 m/min.



Connecting cables:

for power line: cable 1 → 4 x 6 mm²
cable 2 → ... x 1,5 mm²

for control line: cable 1 → ... x 2,5 mm²
(two cables for 8-pole and more)

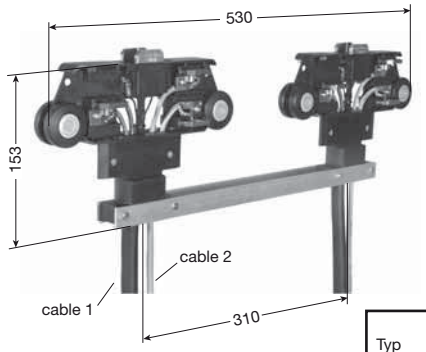
Example of ordering double collectors with 2 m cable
Order-No. 236 315-2
for collector **MSWA** 6/50-2 HS

Type	Ampacity at 60% ED A	No. of poles	ø of connecting cables mm cable 1	cable 2	Weight kg	Order-No.
MSWAS 6/50 -1 HS	50	6	≈17,0	≈ 7,0	1,178	236 200
MSWAS 7/50 -1 HS	50	7	≈17,0	≈ 7,5	1,203	236 201
MSWAS 8/50 -1 HS	50	8	≈17,0	≈ 8,0	1,241	236 202
MSWAS 9/50 -1 HS	50	9	≈17,0	≈ 9,0	1,420	236 203
MSWAS 10/50 -1 HS	50	10	≈17,0	≈ 9,5	1,500	236 204
MSWAS 6/25 -1 ST	25	6	≈11,5	–	0,902	236 205
MSWAS 7/25 -1 ST	25	7	≈11,5	-	0,912	236 206
MSWAS 8/25 -1 ST	25	8	≈10,0	≈10,0	0,956	236 207
MSWAS 9/25 -1 ST	25	9	≈11,0	≈10,0	21,149	236 208
MSWAS 10/25 -1 ST	25	10	≈11,5	≈10,0	1,275	236 209

For curves use single collectors only.
Connecting cable 1 m, longer cable available.

Double collector DMSWA

upto max. 180 m/min.
In conductor rails with sealing strip upto 100 m/min.



Connecting cables:

for power line: cable 1 → 4 x 6 mm²
cable 2 → … x 1,5 mm²

for control line: cable 1 → … x 2,5 mm²
two cables for 8-pole and more)

Example of ordering collector with 2 m cable
Order-No. 236 315-2
for collector **DMSWA** 6/50-2 HS

Typ	Ampacity at 60% ED A	No. of poles	ø of connecting cables mm cable 1	cable 2	Weight kg	Order-No.
DMSWA 6/100 S-1 HS	100	6	≈17,0	≈ 7,0	2,256	236 315
DMSWA 7/100 S-1 HS	100	7	≈17,0	≈ 7,5	2,306	236 316
DMSWA 8/100 S-1 HS	100	8	≈17,0	≈ 8,0	2,382	236 317
DMSWA 9/100 S-1 HS	100	9	≈17,0	≈ 9,0	2,740	236 318
DMSWA 10/100 S-1 HS	100	10	≈17,0	≈ 9,5	2,900	236 319
DMSWA 6/50 S-1 ST	50	6	≈11,5	–	1,704	236 320
DMSWA 7/50 S-1 ST	50	7	≈11,5	–	1,724	236 321
DMSWA 8/50 S-1 ST	50	8	≈10,0	≈10,0	1,812	236 322
DMSWA 9/50 S-1 ST	50	9	≈11,0	≈10,0	2,198	236 323
DMSWA 10/50 S-1 ST	50	10	≈11,5	≈10,0	2,450	236 324

For curves use single collectors only.
Connecting cable 1 m, longer cable available.

(1) Please use the enclosed adapter plate (prism) during installation.
(2) .../K made of stainless steel.

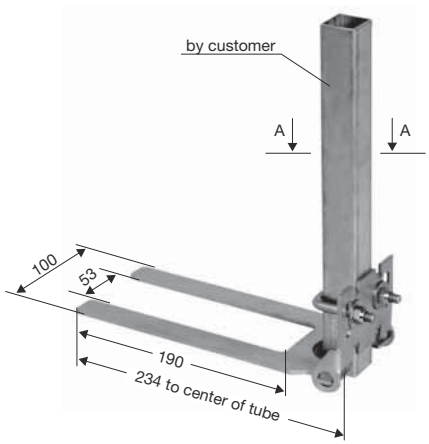
MKLD
MKLF
MKLS

Towing arm

Installation to a tube
with 30-34 mm diameter or a 30 mm hollow profile.

A-A
Version with
square hallow section
w/o adapter plate

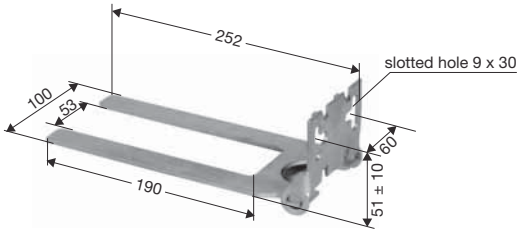
A-A
Aversion with
tube[1]



Type	Weight kg	Order-No.
MGU	0,550	600 334
MGU/K[2]	0,550	600 336

Towing arm

Installation to plain surface

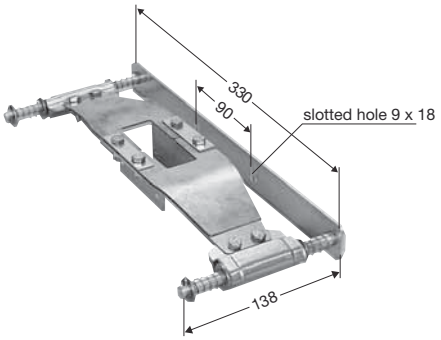


Type	Weight kg	Order-No.
MGF	0,510	600 335
MGF/K[2]	0,510	600 337

MKLD
MKLF
MKLS

Flexible towing arm

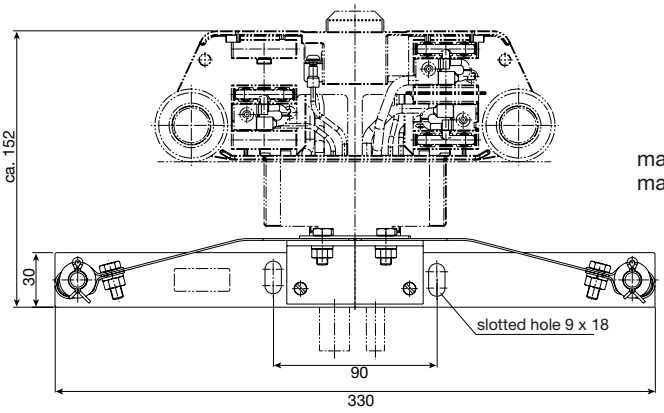
For single collectors – flexible support type
for systems with transfer funnels MTN



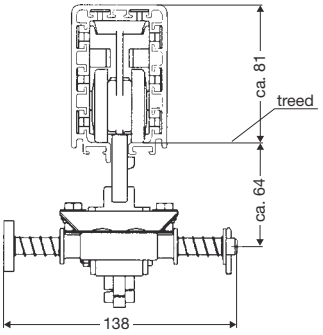
If you are going to use the flexible towing arm in system with curves please contact us.

Type	Weight kg	Order-No.
MFMN	1,120	236 460

Flexible tow arm configuration



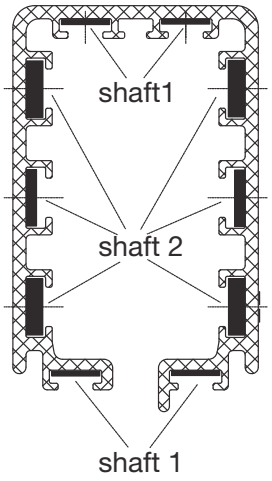
max. horizontal offset 15 mm
max. vertical offset 10 mm



[1] Please use the enclosed adapter plate (prism) during installation.
[2] .../K made of stainless steel.

Max. length of 11 mm wide strips		for shaft I			Weight kg/m	Cu Order-No.	Weight kg/m	Inox Order-No.
11 mm²	max. length (m)	90	260	300	0,10	234 198	0,09	234 384
11 x 1 mm (40 A)	Type of cassette	A	B	C				

Max. length of 13 mm wide strips		for shaft II			Weight kg/m	Cu Order-No.	Weight kg/m	Inox Order-No.
10 mm²	max. length (m)	115	300	–	0,09	234 197	–	–
13 x 0,8 mm (40 A)	Type of cassette	A	B	C				
14 mm²	max. length (m)	65	200	300	0,13	236 006	0,13	234 383
13 x 1,1 mm (60 A)	Type of cassette	A	B	C				
26 mm²	max. length (m)	45	130	200	0,23	234 200	–	–
13 x 2 mm (100 A)(1)	Type of cassette	A	B	C				
33 mm²	max. length (m)	35	100	160	0,29	234 201	–	–
13 x 2,5 mm (140 A)(1)	Type of cassette	A	B	C				
42 mm²	max. length (m)	25	60(80)(1)	(120)(1)	0,37	234 202	–	–
13 x 3,2 mm (160 A)(1)	Type of cassette	A	B	C				
51 mm²	max. length (m)	22	50(65)(1)	(100)(1)	0,45	234 203	–	–
13 x 3,9 mm (200 A)(1)	Type of cassette	A	B	C				



(1) Values for installation through VAHLE-engineers (with help device possible).

Use bolted joints and possibly expansion sections for bigger lengths than shown in the table. In this case installation by Vahle experts is recommended, especially for copper cross section of 42 mm² and 51 mm².

Consult factory for proper layout.

(2)With straightening tool (see page 20).

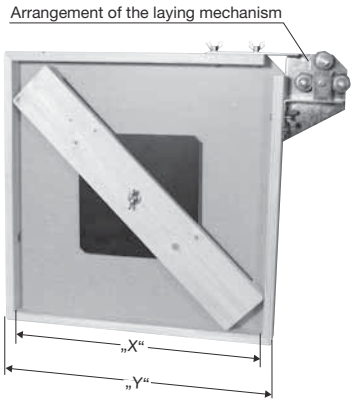
Cable glands for feeds

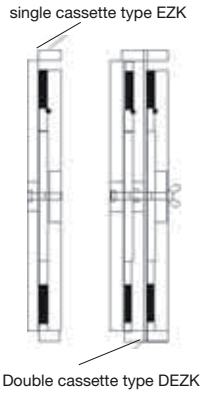
Cable glands	for cable-Ø in mm	capacity A execution: D/F/S	page
M 25 and M 40	9 – 19 and 17 – 26	40 – 60 HS	9
M 25	9 – 19	40 SS	9
M 25 and M 50	9 – 19 and 23 – 34	40 – 100 HS	10
M 25 and M 50	9 – 19 and 29 – 40	140 – 200 HS	10
M 25	9 – 19	40 SS	10
M 25 for PE and L1/L2/L3	6 – 19	40 – 200 HS	11
M 25 for 1 – 4 and 9/10	9 – 15	40 – 200 HS	11
M 25 6 – 10pole	9 – 19	40 SS	11
M 20	6 - 13	40-200 SS/HS	20

Copper cassettes

Execution of cassette	Type	Dim. »X«	Dim. »Y«	Weight kg	Order-No.
A	**EZK 1 einfach**	462	500	3,500	234 219
B	**EZK 2 einfach**	662	700	4,450	234 220
C	**EZK 3 einfach**	862	900	5,400	234 250
A	**DEZK 1 doppelt**	462	500	6,500	234 221
B	**DEZK 2 doppelt**	662	700	8,200	234 222
C	**DEZK 3 doppelt**	862	900	9,900	234 251

Type of copper cassette depends on copper cross section and system length (see page 18).

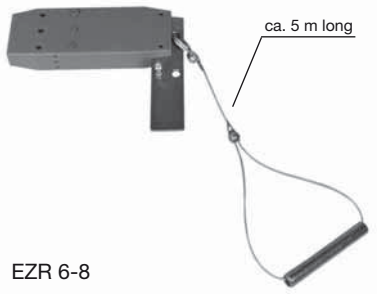




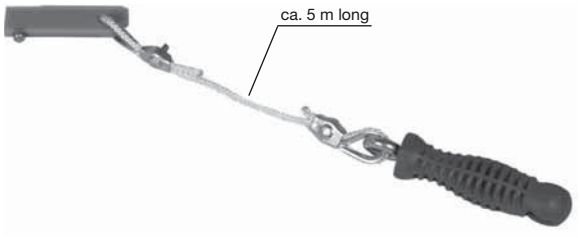
Straightening tool (required from strip sections 26 mm² upwards)

Typ	Weight kg	Order-No.
RV	1,610	234 218

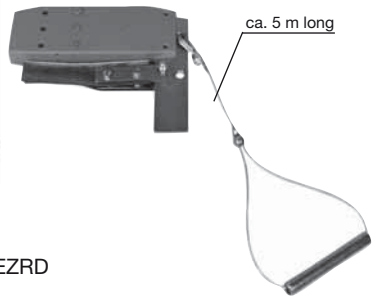
Conductor threading tool



EZR 6-8



EZR 9/10



EZRD

Type	Weight kg	Order-No.
EZR 6-8 (for conductors inside housing, shafts I & II)	1,450	234 204
EZR 9/10 (for conductors outside housing, shafts I not shown)	0,170	234 730
EZRD (for sealing strip; not shown)	1,620	234 552

Sectionalizing

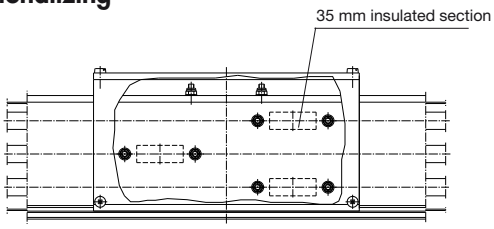
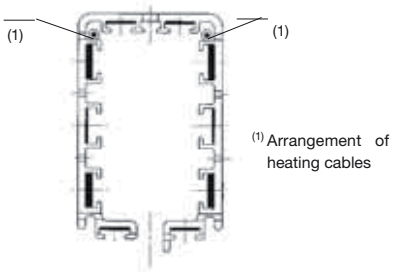


Illustration shows insulated section

Please indicate which conductors are to be interrupted (see page 4). Factory assembled.

5 mm air gap		35 mm insulated section	
Type	Order-No.	Type	Order-No.
MSTL 1	235 302	**MSTI 1**	236 362
MSTL 2	235 303	**MSTI 2**	236 363
MSTL 3	235 304	**MSTI 3**	236 364
MSTL 4	235 305	**MSTI 4**	236 365
MSTL 5	235 306	**MSTI 5**	236 366
MSTL 6	235 307	**MSTI 6**	236 367
MSTL 7	235 308	**MSTI 7**	236 368
MSTL 8	235 309	**MSTI 8**	236 369
MSTL 9	235 310	**MSTI 9**	236 370
MSTL 10	235 311	**MSTI 10**	236 371

Heating system



Heating systems are recommended for outdoor Powerail installations with icing conditions and for extremely humid environments. The heating is accomplished by heating conductors being arranged inside the Powerail housing as shown in the adjacent drawing.

Attention! Heating system to be used only when temperature is + 5° C or lower.

Determine a heating cable between 24 and 30 watt/m capacity.

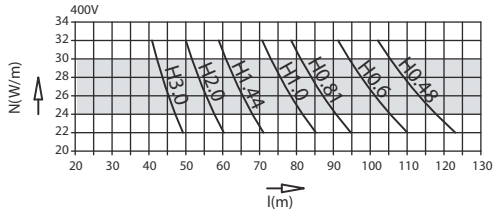
For longer runs, not covered by the adjacent diagrams, divide the length of the system into two or more heating sections.

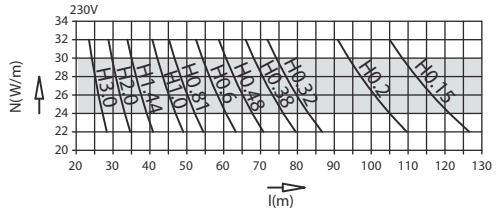
Supply lower voltage via a transformer in case of shorter heating sections.

Heating capacity [Watt/m]: N' = $\frac{U^2}{R \cdot L^2}$

U = supply voltage [Volt]
R = resistance of heating cable [Ohm/m]
L = length of heating section [m]

Selection of heating cables





Type	Resistance[2]	Order-No.
heating cable: H 0,15	0,15 Ohm/m	196 382
heating cable: H 0,20	0,20 Ohm/m	196 383
heating cable: H 0,32	0,32 Ohm/m	196 384
heating cable: H 0,38	0,38 Ohm/m	196 385
heating cable: H 0,48	0,48 Ohm/m	196 386
heating cable: H 0,60	0,60 Ohm/m	196 387
heating cable: H 0,81	0,81 Ohm/m	196 389
heating cable: H 1,00	1,00 Ohm/m	196 390
heating cable: H 1,44	1,44 Ohm/m	196 391
heating cable: H 2,00	2,00 Ohm/m	196 392
heating cable: H 3,00	3,00 Ohm/m	196 393

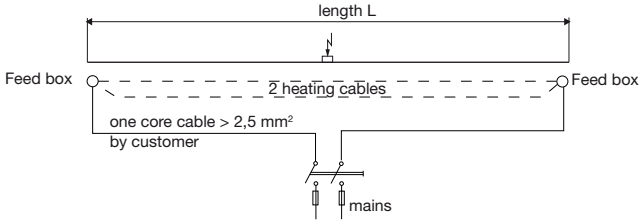
Composition of heating cable:

Conductor:	material resistor CrNi, stranded
Insulation:	PTFE-(Teflon)
	tinned copper braid
Sheath:	PTFE-insulation
OD:	3,7 mm - 4,3 mm

Type of Junction box	cable gland Measurements see page 18	Order-No.
left end	M 20	235 938
right end	M 20	235 939
line feed	2x M 20	235 940
1 set connecting material for heating system		195 291
1 conductor threading tool for heating		235 049

For each end feed box 2 sets of material for connecting ends are required.
For line feed you need 4 sets of material for connection ends.

Layout of one heating section with feeder boxes at both ends



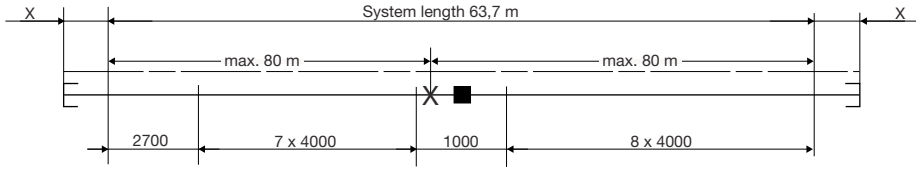
Temperature control units on request.

Example for ordering heating system for 60 m Powerail

1) 122 m heating cable type H 1,44
   (incl. safety lengths)
   Supply voltage 400 V, 2 heating sections
   Heating capacity per above diagram approx. 2 x 30 W/m
   with 60 m 2 x 31 W/m approx. 3720 W = 3,72 kW.
2) Two terminal boxes for heating system
3) Four sets of connecting material
4) Threading tool for heating cable

All switches, fuses, cable etc. by others!

EXAMPLE FOR ORDERING • SPARE PARTS



X = 300 mm end section = expansion section for copper conductor for MKLD (w/o cond.). Not for MKLF and MKLS.

Example for ordering

MKL…8/100-HS (see page 5)

Qty.	Description	MKLD		MKLF		MKLS	
		Type	Order-No.	Type	Order-No.	Type	Order-No.
15	Flat copper strip 4 m	MKLD-4 **HS**	235 104	–	–	–	–
1	Flat copper strip 3 m for short length 2.7 m	MKLD-3 **HS**	235 103	–	–	–	–
15	Powerail 4 m	–	–	MKLF 8/100-4 **HS**	234 944	MKLS 8/100-4 **HS**	234 824
1	Powerail 3 m for short length 2.7 m	–	–	MKLF 8/100-3 **HS**	234 943	MKLS 8/100-4 **HS**	234 823
1	Line feed	MNGD 8/40-100 **HS**	235 057	MNGF 8/100-**HS**	235 097	MNGS 8/100-**HS**	235 076
1	End section, right	MSED/R	235 145	–	–	–	–
1	End section, left	MSED/L	235 144	–	–	–	–
2	End caps	–	–	MSES	235 141	MSES	235 141
18	Joint caps	MVMD	234 678	–	–	–	–
16	Joint caps	–	–	MVMS	234 585	MVMS	234 585
1	Fixpoint hanger	MFN	235 142	MFN	235 142	MFN	235 142
32	Sliding hangers	MGA	234 013	MGA	234 013	MGA	234 013
195m	Flat copper strip, 3 coils à 65 m	26 mm^2	234 200	–	–	–	–
65m	Flat copper strip, 1 coil à 65 m	17 mm^2	234 199	–	–	–	–
130m	Flat copper strip, 2 coils à 65 m	10 mm^2	234 197	–	–	–	–
130m	Flat copper strip, 2 coils à 65 m	11 mm^2	234 198	–	–	–	–
1	Collector	MSWA 8/50-1 **HS**	236 179	MSWS 8/50-1 **HS**	236 179	MSWA 8/50-1 **HS**	236 179
1	Tow arm	MGR	234 015	MGR	234 015	MGR	234 015
1	Copper cassette	EZK 2	234 220	–	–	–	–
1	Laying mechanism	RV	234 218	–	–	–	–
1	Conductor threading tool	EZR 6-8	234 204	–	–	–	–

Spare parts for Powerail

	Order-No.
Plug in joint for MKLF (11 mm Cu; 40 A)	236 395
Plug in joint for MKLF (13 mm Cu; 40–100 A)	600 483
Bolted joint for MKLS (11 mm Cu; 40 A)	234 686
Bolted joint for MKLS (13 mm Cu; 40–200 A)	234 685
Joint Cap for transfer guide and transfer funnel, pair (MKLD, MKLF and MKLS)	234 779
Sealing strip	600 551

Spare parts for collector MSWA

	Order-No.
Carbon Phase (lateral, 9th and 10th pole)	600 088
Carbon Ground (lateral, PE)	600 090
Carbon top (7th and 8th pole)	236 187
Carbon spring standard (for all carbons, pair)	600 338
Rigid bar for DMSWA	234 515
High speed set for collector MSWAS	236 199

QUESTIONNAIRE

Company: _____ Date: _____

_____ _____

Tel: _____ Fax: _____

E-Mail: _____ Internet: (URL) _____

1. Number of powerail installations: _____

2. Type of equipment to be powered: _____

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

4. Track length: _____

5. Number of 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 (max. 2 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. Position and number of feeding points(1): _____

12. How will the conductor system be arranged?(1) _____

13. Brackets required: yes ☐ no ☐ c/c distance beam / powerail _____
    Flange width of beam _____

14. Position and number of isolating sections (e.g. for maintenance): _____

15. Travel speed: _____ in curves: _____ at transfers: _____

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

17. Max. Voltage drop from the powerail feed point to the consumer considering starting current:
    3% ☐ or _____ % ☐ referring to nominal voltage

Remarks: _____

(1) For curved tracks, powerail with isolating sections etc., we require sketches to enable us to prepare a quotation. pto!

QUESTIONNAIRE

To the nearest local VAHLE agency: Date:

Motor data	Crane 1							Crane 2						
	Power kW	Nominal current			Starting current		Type of Motos[1]	Power KW	Nominal current			Starting current		Type of Motos[1]
		A	cos j_N	% ED	A	cos j_A			A	cos j_N	% ED	A	cos j_A	
Hoist motors														
Auxiliary hoist														
Long travel														
Cross travel														

Motor data	Crane 3							Crane 4						
	Power kW	Nominal current			Starting current		Type of Motos [1]	Power KW	Nominal current			Starting current		Type of Motos[1]
		A	cos j_N	% ED	A	cos j_A			A	cos j_N	% ED	A	cos j_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.

[1]Use:
K for squirrel cage motor
S for slipring motor
F for frequency controlled motor

Further remarks: _____

_____

_____

_____

Signature: _____

Catalog No. 4c/E 2009

Products and Service

MANAGEMENTSYSTEM

DQS certified in accordance with
DIN EN ISO 9001:2000
OHSAS 18001 (Reg. no. 003140 QM OH)

VAHLE 19 12
ELECTRIFICATION SYSTEMS

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