



Enclosed Conductor System MKH

SYSTEMS IN MOTION



Enclosed conductor system MKH

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Description of the conductor system

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

- Type MKHD in 6 to 10 copper conductor version, continuous copper strips 40 - 160 A (copper strips come as separate items as coils).
- Type MKHF in 6- and 8-conductor version, with preassembled copper conductors and spring loaded connectors from 40 to 100 A.
- Type MKHS in 6- and 8-conductor version, with preassembled copper conductors and bolted joints from 40 to 200 A.

A compact design, corrosion resistance and easy installation are the main characteristics.

The MKH complies with VDE, european and international standards as well as accident prevention regulations. It is protected to IP 23 standards.

The MKH can be supplied with sealing strip and heating system. The powerail with sealing strip is protected to IP 24 standards and EN 60529 (0470, part 1) regulation.

Collectors are safe against touch only when fully entered into the powerail.

If there is the possibility to touch live parts by hand, ie. collectors that might leave the powerail during operation, provide safety barrier or disconnect mains. This is valid only for a supply voltage exceeding 24 V AC or 60 VDC.

If a conductor is used as N please note VDE 0100 part 430.

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.

Approvals

UL-approved

Housing

Color grey, plastic housing for 6 to 10 conductors. Standard section 4 m. Other sections are available. The ground conductor is identified by international color code. Phase reversing prevented by design of the collector and housing. Higher number of conductors possible by combination of several powerails.

Couplings

Through plastic joint caps.

Feed Sets

Through line feeds or end feeds.

End sections

End section incl. end cap for MKHD and end caps for MKHF and MKHS.

Hangers

The brackets are installed to the crane track (see page 11). The conductor rails are located in sliding and fixpoint hangers. Max. support distance with the following ambient temperatures:
Indoor systems and covered outdoor systems: $\leq 35^{\circ}\text{C} = 2,00\text{ m}$
Indoor and outdoor systems with and without heating: $> 35^{\circ}\text{C} = 1,33\text{ m}$

Expansion during temperature fluctuation

Housing-expansion section without electrical isolation for MKHD. Expansion section (Housing and Cu) without electrical isolation for MKHF and MKHS.

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 20 & 21

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).

The conductors can be separated through air gaps (5 mm) or insulating pieces (35 mm). With the air gap the collector carbon bridges the gap, e.g. for mains.

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 re-inforced polyester fiberglass, for high strength and light weight. Spring loaded carbon brushes maintain uniform contact. Connecting cables and hinged or flexible towing arms included.

With following system requirements double collectors have to be used:

- Transfers with switches and turntables
- low voltages, frequency controlled drives
- Transmission of data- and/or emergency stop signals
- high electrical loads

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

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 35.

Electrical properties

Max. continuous current	Nominal voltage (UL)	Dielectric strength	Spec. resistance	Surface resistance	Leakage resistance
200 A (with 80% duty cycle)	690 V (600 V)	IEC 60243 30-40 KV/mm	IEC 60093 $5 \times 10^{15} \Omega/\text{cm}$	IEC 60093 $10^{13} \Omega$	EN 60112 CTI 400-2,7

Mechanical properties

Flexible strength	Tensile strength	Temperature range (ambient):	Combustibility	Resistance to chemicals (at + 45 °C)
75 N/mm ² ± 10 %	40 N/mm ² ± 10	- 30 °C bis + 60 °C	flame retardant DIN 41 02 - Klasse B 1; self extinguishing	Gasoline, Mineral Oil, Grease, Sulphuric acid 50 %, Caustic soda 25 % & 50 % Hydro-chloric acid, concentrated

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

$$\begin{aligned} \text{AC: } \Delta U &= \sqrt{3} \times I \times l \times Z \\ \text{DC: } \Delta U_1 &= 2 \times I \times l \times R \end{aligned}$$

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

$$\begin{aligned} \Delta U_1 &= \text{Voltage drop [V]} & R &= \text{Resistance } [\Omega/1000 \text{ m}] \\ \Delta U_2 &= \text{Voltage drop in \%} & l &= \text{Power feed length [m]} \\ I &= \text{Ampere load [A]} & L &= \text{System length [m]} \end{aligned}$$

$$\begin{aligned} l = L & \text{ power feed located at the end of the system} \\ l = L/2 & \text{ power feed located at the center of the system} \\ l = L/4 & \text{ power feed located at both ends of the system} \\ l = L/6 & \text{ power feed located at } L/6 \text{ from each end of the system} \\ Z &= \text{Impedance } [\Omega/1000 \text{ m}] \\ V &= \text{Voltage rating [V]} \end{aligned}$$

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.

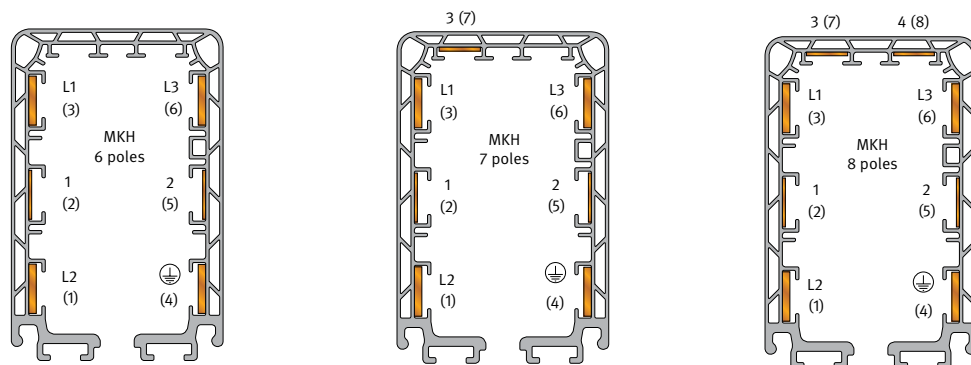
The conductor size and/or number of feed points should be increased or booster cables should be used in parallel in case the drop is exceeding the limitations.

Technical Data

Cross sections:⁽¹⁾

In case of using a neutral conductor copper pos.1 will be taken.

Layout of the system on request
(please see page 3)



Type ⁽²⁾ (HS with PE SS without PE)	No. of con- ductors	Copper cross section mm ²				Ampere rating with 35 °C L1, L2, L3 100% A	Nominal voltage V	Impe- dance at 50 Hz 20 °C Ω/1000 m	Resi- stance at 20 °C Ω/1000 m	Leakage distance mm
		Phase L1, L2, L3		Control-line						
MKH ... 6 / 40 - HS	6	3 x 10	10	2 x 10		40	690	1,73	1,72	30
MKH ... 6 / 40 - SS	6			6 x 10		40	690	1,73	1,72	30
MKH ... 6 / 63 - HS	6	3 x 14	14	2 x 10		63	690	1,26	1,25	30
MKH ... 6 / 100 - HS	6	3 x 26	26	2 x 10		100	690	0,71	0,69	30
MKH ... 6 / 140 - HS	6	3 x 33	26	2 x 10		140 ⁽³⁾	690	0,57	0,55	30
MKH ... 6 / 160 - HS	6	3 x 42	26	2 x 10		160 ⁽³⁾	690	0,46	0,43	30
MKH ... 6 / 200 - HS ⁽⁴⁾	6	3 x 51	26	2 x 10		200 ⁽³⁾	690	0,38	0,35	30
MKH ... 7 / 40 - HS	7	3 x 10	10	2 x 10	1 x 11	40	690	1,73	1,72	30
MKH ... 7 / 40 - SS	7			6 x 10	1 x 11	40	690	1,73	1,72	30
MKH ... 7 / 63 - HS	7	3 x 14	14	2 x 10	1 x 11	63	690	1,26	1,25	30
MKH ... 7 / 100 - HS	7	3 x 26	26	2 x 10	1 x 11	100	690	0,71	0,69	30
MKH ... 7 / 140 - HS	7	3 x 33	26	2 x 10	1 x 11	140 ⁽³⁾	690	0,57	0,55	30
MKH ... 7 / 160 - HS	7	3 x 42	26	2 x 10	1 x 11	160 ⁽³⁾	690	0,46	0,43	30
MKH ... 7 / 200 - HS ⁽⁴⁾	7	3 x 51	26	2 x 10	1 x 11	200 ⁽³⁾	690	0,38	0,35	30
MKH ... 8 / 40 - HS	8	3 x 10	10	2 x 10	2 x 11	40	690	1,73	1,72	30
MKH ... 8 / 40 - SS	8			6 x 10	2 x 11	40	690	1,73	1,72	30
MKH ... 8 / 63 - HS	8	3 x 14	14	2 x 10	2 x 11	63	690	1,26	1,25	30
MKH ... 8 / 100 - HS	8	3 x 26	26	2 x 10	2 x 11	100	690	0,71	0,69	30
MKH ... 8 / 140 - HS	8	3 x 33	26	2 x 10	2 x 11	140 ⁽³⁾	690	0,57	0,55	30
MKH ... 8 / 160 - HS	8	3 x 42	26	2 x 10	2 x 11	160 ⁽³⁾	690	0,46	0,43	30
MKH ... 8 / 200 - HS ⁽⁴⁾	8	3 x 51	26	2 x 10	2 x 11	200 ⁽³⁾	690	0,38	0,35	30

(1) Numbers in paranthesis apply to control line

(2) Complete types e.g. MKHS 7/63 HS for 7 poles with bolted joints

(3) 80% duty cycle

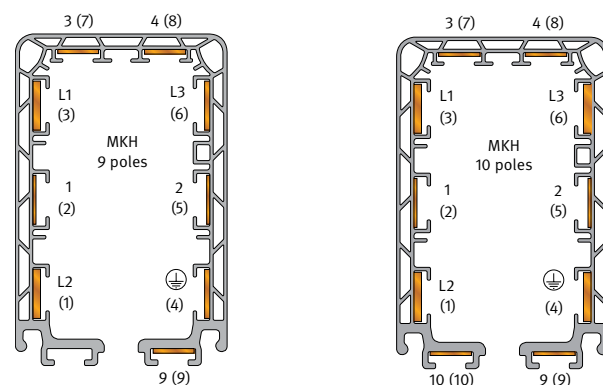
(4) only for MKHS

Technical data & standard sections

Cross sections:⁽¹⁾

In case of using a neutral conductor copper pos.1 will be taken.

Layout of the system on request
(please see page 3)

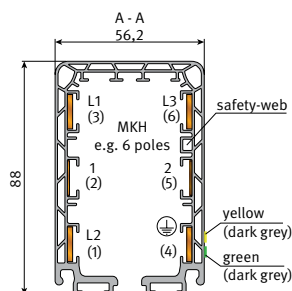


Type	No. of con- duc- tors	Copper cross section mm ²				Ampere rating with 35 °C L1, L2, L3 100% A	No- minal vol- tage V	Impe- dance at 50 Hz 20 °C Ω/1000 m	Resi- stance at 20 °C Ω/1000 m	Leakage distance mm
		Phase L1, L2, L3		Control-line						
MKHD 9 / 40 - HS	9	3 x 10	10	2 x 10	3 x 11	40	690	1,73	1,72	30
MKHD 9 / 40 - SS	9			6 x 10	3 x 11	40	690	1,73	1,72	30
MKHD 9 / 63 - HS	9	3 x 14	14	2 x 10	3 x 11	63	690	1,26	1,25	30
MKHD 9 / 100 - HS	9	3 x 26	26	2 x 10	3 x 11	100	690	0,71	0,69	30
MKHD 9 / 140 - HS	9	3 x 33	26	2 x 10	3 x 11	140 ⁽²⁾	690	0,57	0,55	30
MKHD 9 / 160 - HS	9	3 x 42	26	2 x 10	3 x 11	160 ⁽²⁾	690	0,46	0,43	30
MKHD 10 / 40 - HS	10	3 x 10	10	2 x 10	4 x 11	40	690	1,73	1,72	30
MKHD 10 / 40 - SS	10			6 x 10	4 x 11	40	690	1,73	1,72	30
MKHD 10 / 63 - HS	10	3 x 14	14	2 x 10	4 x 11	63	690	1,26	1,25	30
MKHD 10 / 100 - HS	10	3 x 26	26	2 x 10	4 x 11	100	690	0,71	0,69	30
MKHD 10 / 140 - HS	10	3 x 33	26	2 x 10	4 x 11	140 ⁽²⁾	690	0,57	0,55	30
MKHD 10 / 160 - HS	10	3 x 42	26	2 x 10	4 x 11	160 ⁽²⁾	690	0,46	0,43	30

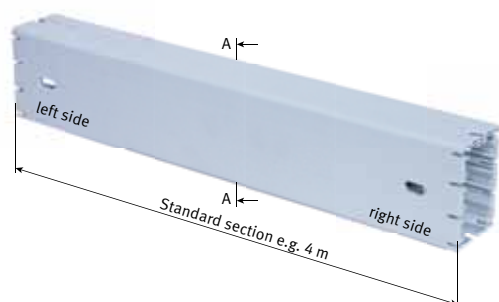
(1) Numbers in paranthesis apply to control line

(2) 80% duty cycle

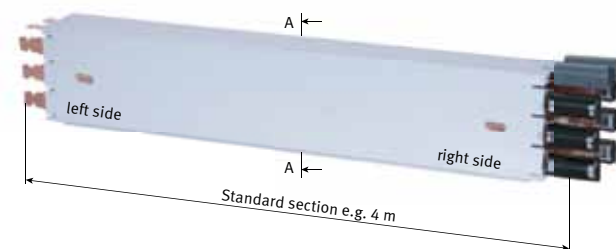
Standard sections



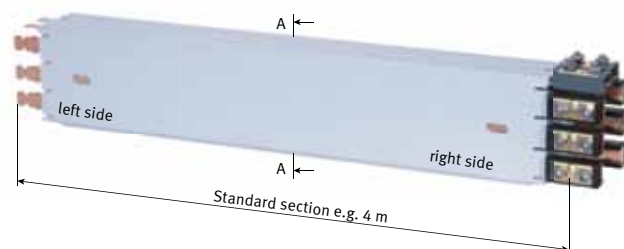
Type MKHD for continuous copper strips



Type MKHF with plug-in joints, factory assembled



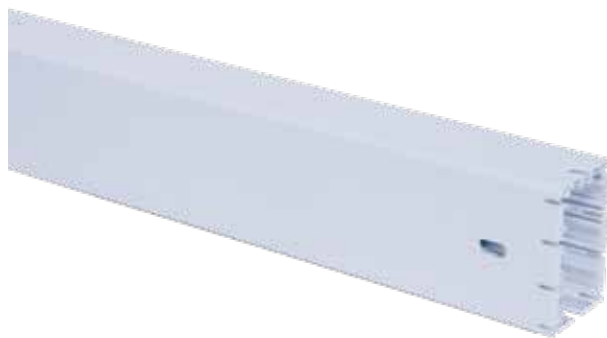
Type MKHS with bolted joints, factory assembled



Types & order numbers

Type MKHD

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



Type ⁽¹⁾	Weight kg/m		Order-No.
MKHD- ... HS	1,129		262 50•
MKHD- ... SS	1,129		262 51•

Type MKHF

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



Type ⁽¹⁾	Weight kg/m		Order-No.
MKHF 6 / 40 - ... HS	1,736		262 03•
MKHF 6 / 40 - ... SS	1,736		262 02•
MKHF 6 / 63 - ... HS	1,968		262 04•
MKHF 6 / 100 - ... HS	2,226		262 05•
MKHF 7 / 40 - ... HS	1,846		262 07•
MKHF 7 / 40 - ... SS	1,846		262 06•
MKHF 7 / 63 - ... HS	2,077		262 08•
MKHF 7 / 100 - ... HS	2,321		262 09•
MKHF 8 / 40 - ... HS	1,956		262 11•
MKHF 8 / 40 - ... SS	1,956		262 10•
MKHF 8 / 63 - ... HS	2,167		262 12•
MKHF 8 / 100 - ... HS	2,430		262 13•

⁽¹⁾ Complete types e.g. MKHD - 4 HS for 4 m with PE, Order-No. 262 504

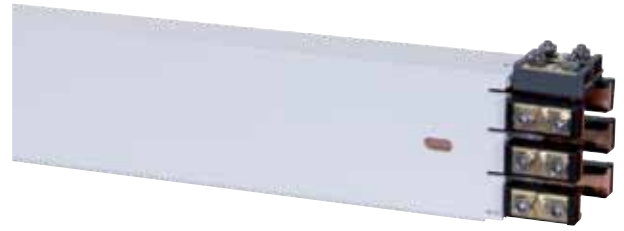
MKHF 8 / 40 - 4 HS for 4 m with PE, Order-No. 262 114

• The last number of the order specifies the section length. Please suffix the order number with 1, 2, 3, 4.

Types & order numbers

Type MKHS

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



Type ⁽¹⁾	Weight kg/m		Order-No.
MKHS 6 / 40 - ... HS	1,780		262 18•
MKHS 6 / 40 - ... SS	1,780		262 17•
MKHS 6 / 63 - ... HS	2,009		262 19•
MKHS 6 / 100 - ... HS	2,249		262 20•
MKHS 6 / 140 - ... HS	2,423		262 21•
MKHS 6 / 160 - ... HS	2,752		262 22•
MKHS 6 / 200 - ... HS	2,995		262 23•
MKHS 7 / 40 - ... HS	1,896		262 25•
MKHS 7 / 40 - ... SS	1,896		262 24•
MKHS 7 / 63 - ... HS	2,127		262 26•
MKHS 7 / 100 - ... HS	2,374		262 27•
MKHS 7 / 140 - ... HS	2,545		262 28•
MKHS 7 / 160 - ... HS	2,868		262 29•
MKHS 7 / 200 - ... HS	3,064		262 30•
MKHS 8 / 40 - ... HS	2,013		262 32•
MKHS 8 / 40 - ... SS	2,013		262 31•
MKHS 8 / 63 - ... HS	2,245		262 33•
MKHS 8 / 100 - ... HS	2,488		262 34•
MKHS 8 / 140 - ... HS	2,661		262 35•
MKHS 8 / 160 - ... HS	2,985		262 36•
MKHS 8 / 200 - ... HS	3,228		262 37•

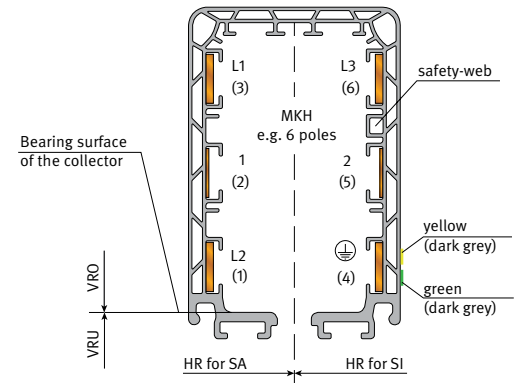
⁽¹⁾ Complete types e.g. MKHS 8 / 40 - 4 HS for 4m with PE, Order-No. 262 324

- The last number of the order specifies the section length. Please suffix the order number with 1, 2, 3, 4.

Sections & Sealing strips

Curves

Min. bending radius, horizontal = 1000 mm
 max. length L = 3600 mm
 max. $\curvearrowright$ 120 °
 Smallest vertical radius = on request



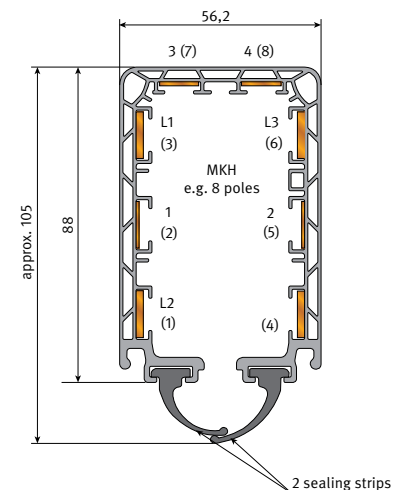
Type	Surcharge for bending on request		Order-No.
MKH	horizontal curve for SI and SA ⁽¹⁾		234 547
MKH	vertical curve for VRO and VU ⁽²⁾		234 620

⁽¹⁾ SI = Safety-web inside ⁽²⁾ VRO = Vertical radius upwards
⁽¹⁾ SA = Safety web outside ⁽²⁾ VRU = Vertical radius downwards

Safety web will be mounted in direction of track.

Changes in measurements of curves have to be mentioned for replacement orders.

Sealing strip including accessories

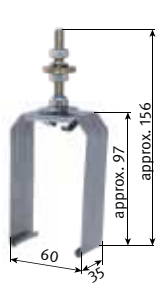


Type	Description	Order - No.
Sealing strip ⁽³⁾		600 551
Fixing clamp	for sealing strip (1 per end)	236 105
Joint	for coupling the sealing strip (2 per joint)	258 300
Mounting glider EZRD	for sealing strip	234 552
Sealing strip slide plate	for collector MSWA	236 625

⁽³⁾ The max. single length is 40 m long. For longer distances joint laces are necessary.
 For each meter system length 2 m sealing strip to be ordered. The delivery will be in pairs.
 Not available for 9- and 10-pole systems.

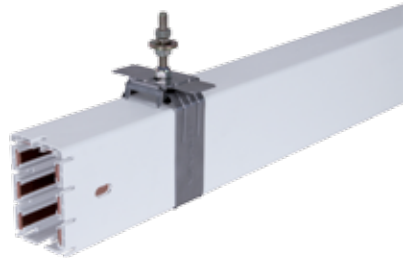
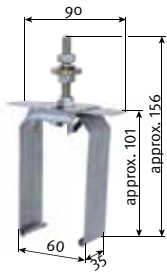
Hangers & end sections

Sliding hanger



Type	Weight kg		Order - No.
MGH	0,110		262 000
MGH/K	0,110		262 003

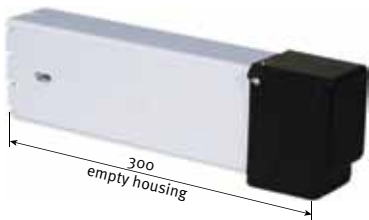
Fixpoint hanger



Type	Weight kg		Order - No.
MFH	0,150		262 001
MFH/K	0,150		262 002

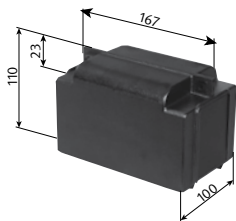
End section (MKHD)

0,3 m long



Type	Weight kg	Execution		Order - No.
MHED / L	0,429	left		262 537
MHED / R	0,429	right		262 536

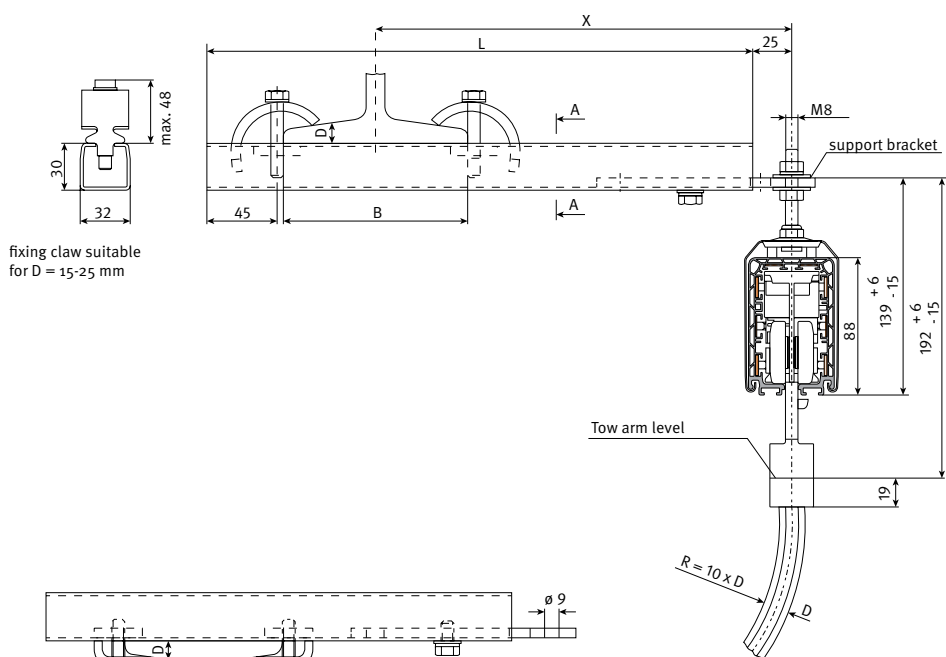
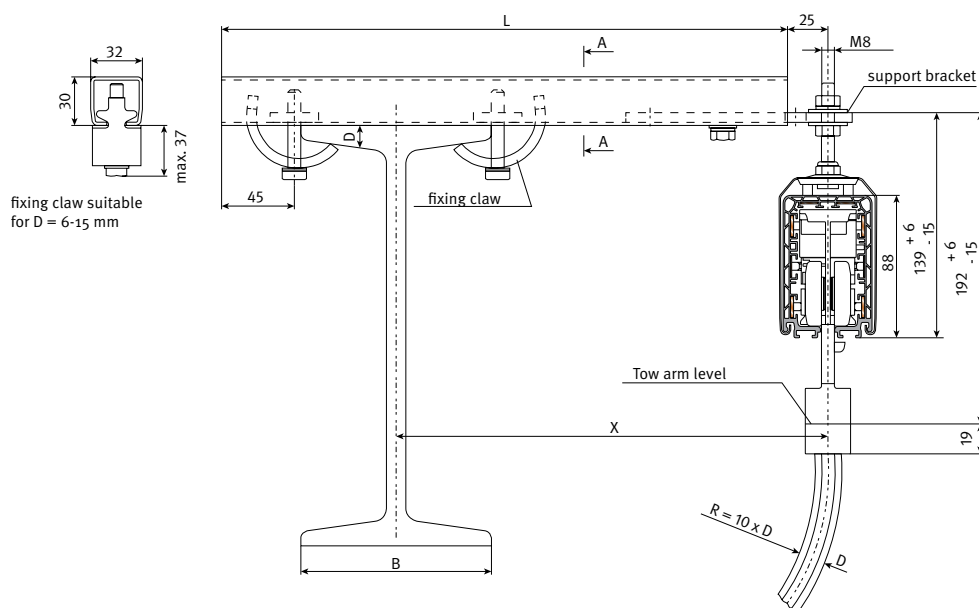
End cap (MKHF / MKHS)



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

Brackets

view without I-beam



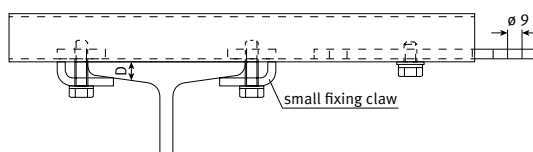
Arrangement EHK with small fixing claw

Attention!

Make sure that hoist wheels have enough clearance.

Use small claw if necessary.

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

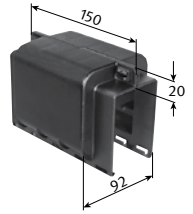


Type	X mm	L mm	B max mm	Weight kg	Order - No.	
					Standard version	with small fixing claw
EHK 250	250	350	170	1,070	251 600	251 720
EHK 300	300	400	170	1,150	251 610	251 730
EHK 400	400	500	170	1,300	251 620	251 740
EHK 500	500	600	170	1,450	251 630	251 750
EHK 600	600	700	170	1,600	251 640	251 760
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.

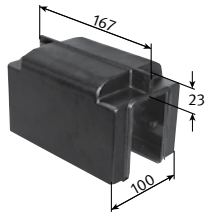
Jointing material & End feeds

Joint cap, self locking (MKHD)



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

Joint cap, self locking (MKHF / MKHS)

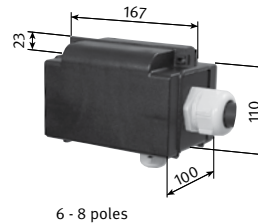


Type	Weight kg		Order - No.
MVMS	0,240		234 585

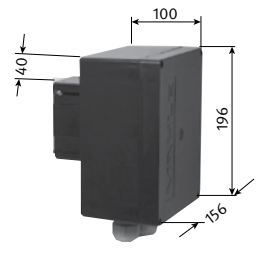
End feed (MKHD)

End feed comes loose without powerail section.
It can be mounted at the left or right hand side.

Electrical connection with customer supplied
cable shoes to M6 terminals.



6 - 8 poles



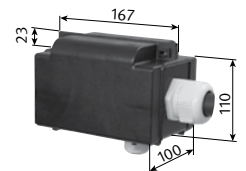
9 - 10 poles

Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MKED 6 - 8 / 40 - 63 HS	0,707	M 25 u. M 40		235 152
MKED 9 - 10 / 40 - 63 HS	0,936	M 25 u. M 40		262 538
MKED 6 - 8 / 40 SS	0,647	M 25		235 157
MKED 9 - 10 / 40 SS	0,870	M 25		262 539

End feed (MKHF / MKHS)

End feed comes loose without powerail section.
It can be mounted at the left or right hand side.

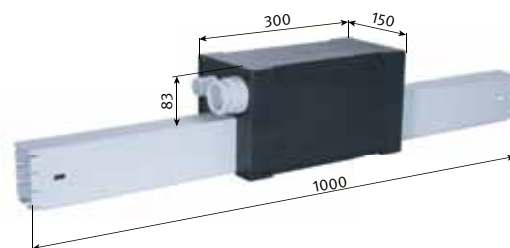
Electrical connection with customer supplied
cable shoes to M6 terminals.



Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MKES 6 - 8 / 40 - 63 HS	0,707	M 25 u. M 40		235 230
MKES 6 - 8 / 40 SS	0,647	M 25		235 233

Line feeds

Electrical connection with customer supplied cable shoes to M8 terminals.



Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MHGD 6 / 40 - 100 HS	2,336	M 50 and M 25		262 545
MHGD 7 / 40 - 100 HS	2,413	M 50 and M 25		262 546
MHGD 8 / 40 - 100 HS	2,490	M 50 and M 25		262 547
MHGD 9 / 40 - 100 HS	2,550	M 50 and M 25		262 548
MHGD 10 / 40 - 100 HS	2,590	M 50 and M 25		262 549
MHGD 6 / 140 - 160 HS	2,340	M 50 and M 25		262 550
MHGD 7 / 140 - 160 HS	2,417	M 50 and M 25		262 551
MHGD 8 / 140 - 160 HS	2,494	M 50 and M 25		262 552
MHGD 9 / 140 - 160 HS	2,554	M 50 and M 25		262 553
MHGD 10 / 140 - 160 HS	2,594	M 50 and M 25		262 554
MHGD 6 / 40 SS	2,263	M 25		262 540
MHGD 7 / 40 SS	2,340	M 25		262 541
MHGD 8 / 40 SS	2,422	M 25		262 542
MHGD 9 / 40 SS	2,482	M 25		262 543
MHGD 10 / 40 SS	2,522	M 25		262 544

Line feeds

Electrical connection with customer supplied cable shoes to M8 terminals.

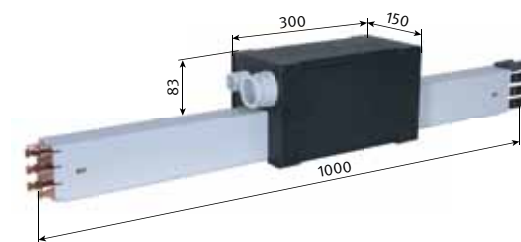


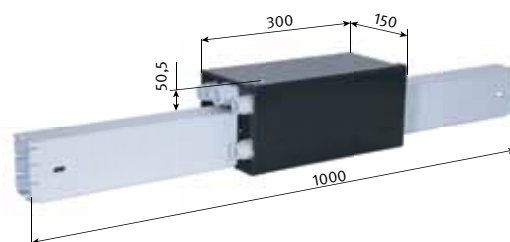
Photo shows MHGF

Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MHGF 6 / 40 HS	2,981	M 50 and M 25		262 492
MHGF 7 / 40 HS	3,180	M 50 and M 25		262 493
MHGF 8 / 40 HS	3,377	M 50 and M 25		262 494
MHGF 6 / 63 HS	3,212	M 50 and M 25		262 495
MHGF 7 / 63 HS	3,411	M 50 and M 25		262 496
MHGF 8 / 63 HS	3,608	M 50 and M 25		262 497
MHGF 6 / 100 HS	3,455	M 50 and M 25		262 498
MHGF 7 / 100 HS	3,654	M 50 and M 25		262 499
MHGF 8 / 100 HS	3,851	M 50 and M 25		262 500
MHGF 6 / 40 SS	2,913	M 25		262 489
MHGF 7 / 40 SS	3,112	M 25		262 490
MHGF 8 / 40 SS	3,309	M 25		262 491

Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MHGS 6 / 40 HS	3,065	M 50 and M 25		262 450
MHGS 7 / 40 HS	3,276	M 50 and M 25		262 451
MHGS 8 / 40 HS	3,487	M 50 and M 25		262 452
MHGS 6 / 63 HS	3,296	M 50 and M 25		262 453
MHGS 7 / 63 HS	3,507	M 50 and M 25		262 454
MHGS 8 / 63 HS	3,718	M 50 and M 25		262 455
MHGS 6 / 100 HS	3,539	M 50 and M 25		262 456
MHGS 7 / 100 HS	3,759	M 50 and M 25		262 457
MHGS 8 / 100 HS	3,961	M 50 and M 25		262 458
MHGS 6 / 140 HS	3,717	M 50 and M 25		262 459
MHGS 7 / 140 HS	3,928	M 50 and M 25		262 460
MHGS 8 / 140 HS	4,139	M 50 and M 25		262 461
MHGS 6 / 160 HS	4,041	M 50 and M 25		262 462
MHGS 7 / 160 HS	4,252	M 50 and M 25		262 463
MHGS 8 / 160 HS	4,463	M 50 and M 25		262 464
MHGS 6 / 200 HS	4,284	M 50 and M 25		262 465
MHGS 7 / 200 HS	4,495	M 50 and M 25		262 466
MHGS 8 / 200 HS	4,706	M 50 and M 25		262 467
MHGS 6 / 40 SS	2,997	M 25		262 447
MHGS 7 / 40 SS	3,008	M 25		262 448
MHGS 8 / 40 SS	3,419	M 25		262 449

Line feeds

Electrical connection with customer supplied cable shoes to M8 terminals.



Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MHLD 6 / 40 - 100 HS	2,028	M 25 for L1, L2, L3 M 25 for 1 - 4 M 20 for PE, 9/10		262 560
MHLD 7 / 40 - 100 HS	2,105			262 561
MHLD 8 / 40 - 100 HS	2,182			262 562
MHLD 9 / 40 - 100 HS	2,253			262 563
MHLD 10 / 40 - 100 HS	2,293			262 564
MHLD 6 / 140 - 160 HS	2,043	M 25 for L1, L2, L3 M 25 for 1 - 4 M 20 for PE, 9/10		262 565
MHLD 7 / 140 - 160 HS	2,120			262 566
MHLD 8 / 140 - 160 HS	2,197			262 567
MHLD 9 / 140 - 160 HS	2,268			262 568
MHLD 10 / 140 - 160 HS	2,308			262 569
MHLD 6 / 40 SS	1,970	1 x M 25		262 555
MHLD 7 / 40 SS	2,047			262 556
MHLD 8 / 40 SS	2,129			262 557
MHLD 9 / 40 SS	2,208	2 x M 25		262 558
MHLD 10 / 40 SS	2,248			262 559

Line feeds

Electrical connection with customer supplied cable shoes to M8 terminals.

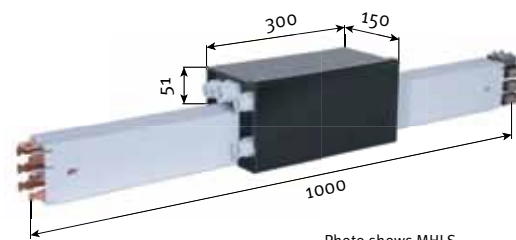


Photo shows MHLS

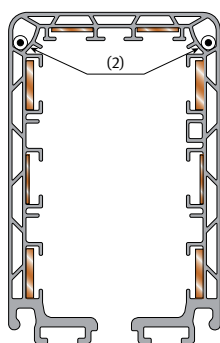
Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MHLF 6 / 40 HS	2,673	M 25 for L1, L2, L3		262 480
MHLF 7 / 40 HS	2,872	M 25 for 1 - 4		262 481
MHLF 8 / 40 HS	3,069	M 20 for PE		262 482
MHLF 6 / 63 HS	2,904			262 483
MHLF 7 / 63 HS	3,103			262 484
MHLF 8 / 63 HS	3,300			262 485
MHLF 6 / 100 HS	3,147			262 486
MHLF 7 / 100 HS	3,346			262 487
MHLF 8 / 100 HS	3,543			262 488
MHLF 6 / 40 SS	2,620	M 25		262 477
MHLF 7 / 40 SS	2,819			262 478
MHLF 8 / 40 SS	3,016			262 479

Type	Weight kg	Cable gland (Dimensions see p. 31)		Order - No.
MHLS 6 / 40 HS	2,757	M 25 for L1, L2, L3		262 518
MHLS 7 / 40 HS	2,959	M 25 for 1 - 4		262 519
MHLS 8 / 40 HS	3,179	M 20 for PE		262 520
MHLS 6 / 63 HS	2,988			262 521
MHLS 7 / 63 HS	3,199			262 522
MHLS 8 / 63 HS	3,410			262 523
MHLS 6 / 100 HS	3,231			262 524
MHLS 7 / 100 HS	3,442			262 525
MHLS 8 / 100 HS	3,653			262 526
MHLS 6 / 140 HS	3,420	M 25 for PE, L1, L2, L3		262 527
MHLS 7 / 140 HS	3,631	M 25 for 1 - 4		262 528
MHLS 8 / 140 HS	3,842			262 529
MHLS 6 / 160 HS	3,733			262 530
MHLS 7 / 160 HS	3,955			262 531
MHLS 8 / 160 HS	4,166			262 532
MHLS 6 / 200 HS	3,987			262 533
MHLS 7 / 200 HS	4,198			262 534
MHLS 8 / 200 HS	4,409			262 535
MHLS 6 / 40 SS	2,704	M 25		262 515
MHLS 7 / 40 SS	2,915			262 516
MHLS 8 / 40 SS	3,126			262 517

Heating

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

(1) ± 2,5 %



We recommend a heating system for outdoor installations and installations in humid plants. The heating consists of arrangement two heating cables as per drawing.

Attention: Switch on heating system below + 5 °C ambient temperature.

The type of heating cable has to be calculated: heat output per heating cable between 20 - 25 W/m.

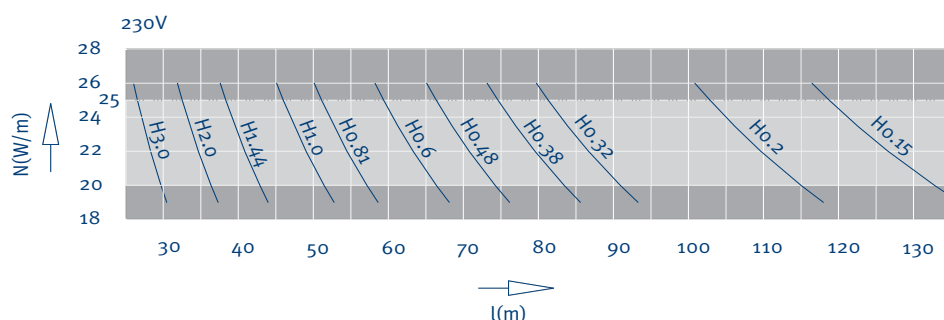
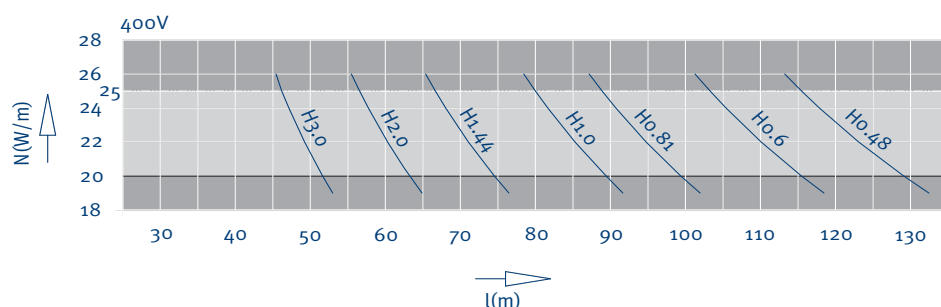
For longer heating distances the total length has to be divided into several heating sections.

For short heating distances to feed with lower secondary voltage via transformer.

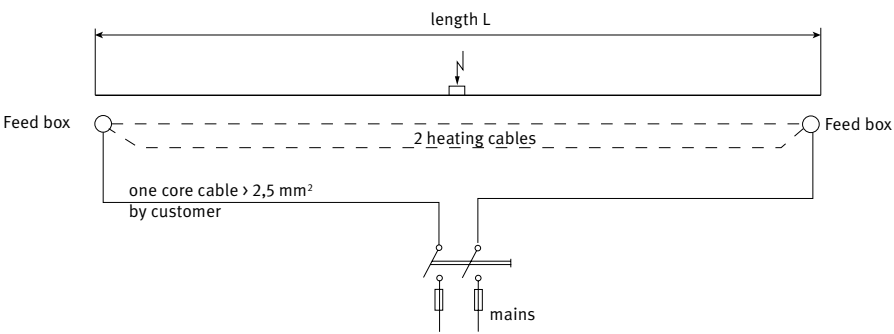
(2) Arrangement of heating cable

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

U = Supply voltage [Volt]
R = Resistance of heating cable [Ohm/m]
L = Length of heating section [m]



Heating



Wiring layout for a heating section with junction boxes at each end⁽³⁾

Type	Design	Cable gland (Dimensions see p. 31)		Order - No.
Feed box	left end	M 20		262 037
Feed box	right end	M 20		262 038
Feed box	line feed	2 x M 20		262 039
1 set material for connecting clamps				195 291

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.

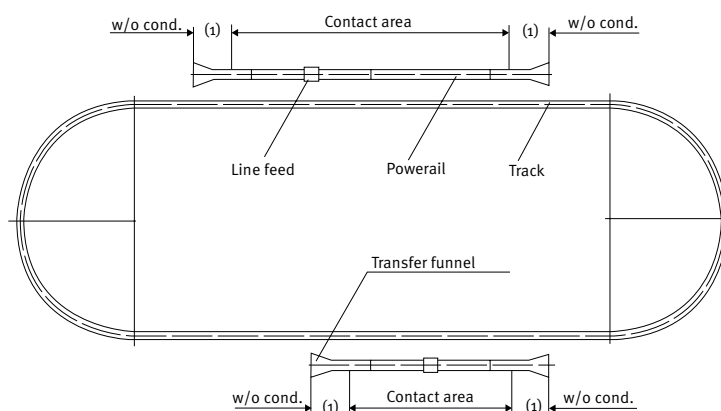
Order for 60 m powerail (example)

- 1) 122 m heating cable type H 2,0
(2 x 60 m and 2 x 1 m additional)
Voltage 400 V, two heating circuits in parallel
heating capacity as per above mentioned diagramm
 $2 \times 22 \text{ W/m at } 60 \text{ m } 2 \times 22 \text{ W/m } \sim 2640 \text{ W} = 2,64 \text{ kW}.$
- 2) 1x Junction box left end
1x Junction box right end
- 3) 4x sets of material for connection ends.

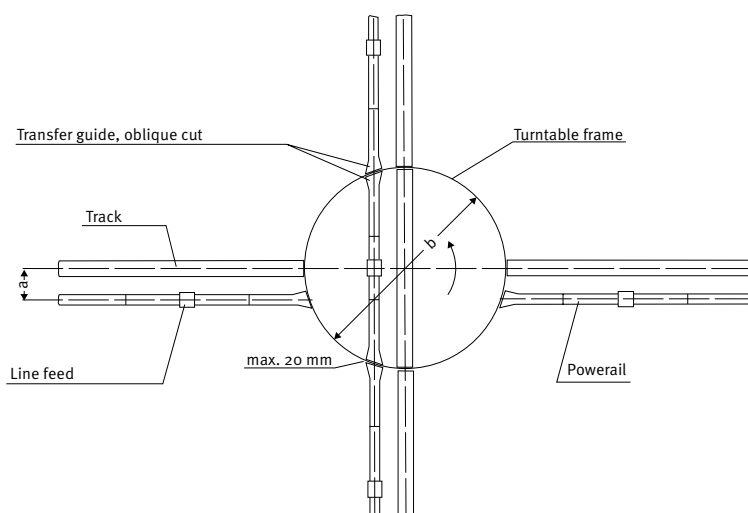
Switch gear assembly and temperature control unit as per customer's inquiry. Fuses, cables etc. have to be provided by the customer.

Contact sections, Turntables and Switches

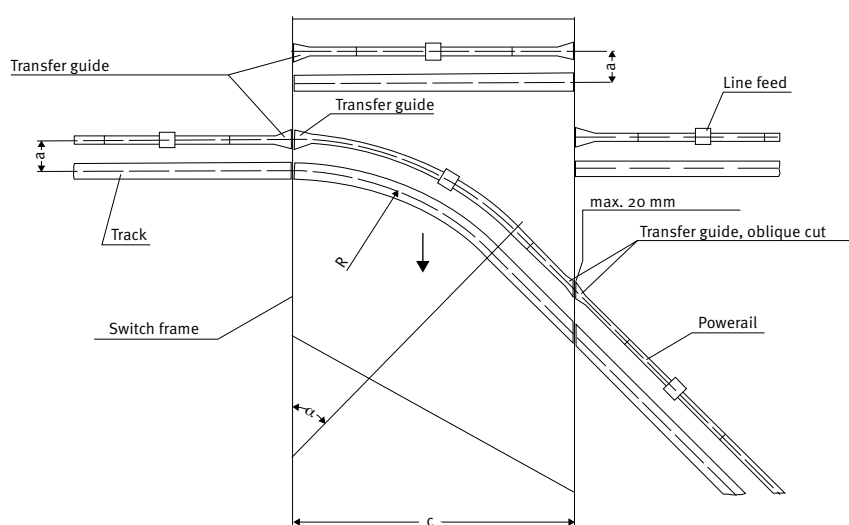
Contact section⁽¹⁾



Turntable



Sliding switch



Please submit drawings of transfer applications.
Specify dimensions a, b, c, R
and angle α ($\alpha = \max. 50^\circ$)
Max. 20 mm air gap between transfer guides.

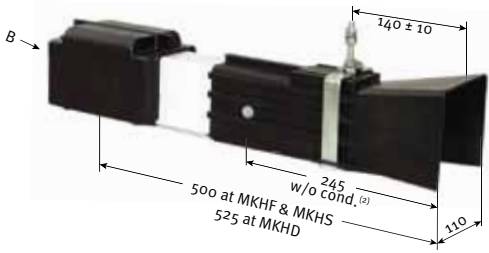
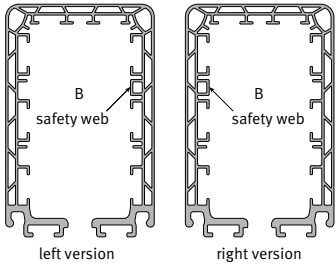
To create all components for contact sections, turntables and switches we require detailed construction drawings.

(1) Contact sections must not be activated before collectors are fully engaged.

Entry funnel

Powerail should not be activated before the collector carbons have complete contact with the conductors.

Offset: max. 10 mm horizontal
 max. 10 mm vertical
Max. speed for crossover of the
current collector 60 m/min.



Type ⁽¹⁾	Weight kg		Order - No. / Version	
			left	right
MTH 6 / 40 - 100 HS	1,961		262 375	262 387
MTH 7 / 40 - 100 HS	2,013		262 376	262 388
MTH 8 / 40 - 100 HS	2,266		262 377	262 389
MTH 6 / 140 - 160 HS	1,961		262 378	262 390
MTH 7 / 140 - 160 HS	2,013		262 379	262 391
MTH 8 / 140 - 160 HS	2,266		262 380	262 392
MTH 6 / 200 HS	2,017		262 384	262 396
MTH 7 / 200 HS	2,070		262 385	262 397
MTH 8 / 200 HS	2,322		262 386	262 398
MTH 6 / 40 SS	1,961		262 381	262 393
MTH 7 / 40 SS	2,015		262 382	262 394
MTH 8 / 40 SS	2,267		262 383	262 395

(1) Complete types e.g. MTH 8 / 140 - 160 ... HS left version → MTH 8 / 140 - 160 L HS, Order - No. 262 380
(2) corresponding to the center of collector

Transfer guides

Transfer guides, straight

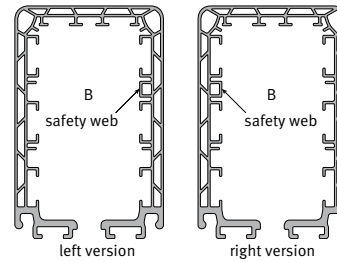
Necessary with all types of double collectors or 2 single collectors.

Staggered arrangement of the transfer guides to each other:

max. 5 mm horizontal

max. 3 mm vertical

Max. speed for crossover of the current collector 80 m/min.



Type ⁽¹⁾	Weight kg		Order - No. / Version	
			left	right
MUH 6 / 40 - 100 HS	1,914		262 399	262 408
MUH 7 / 40 - 100 HS	1,969		262 400	262 409
MUH 8 / 40 - 100 HS	2,224		262 401	262 410
MUH 6 / 140 - 160 HS	1,914		262 402	262 411
MUH 7 / 140 - 160 HS	1,969		262 403	262 412
MUH 8 / 140 - 160 HS	2,224		262 404	262 413
MUH 6 / 200 HS	1,984		262 417	262 420
MUH 7 / 200 HS	2,036		262 418	262 421
MUH 8 / 200 HS	2,291		262 419	262 422
MUH 6 / 40 SS	1,914		262 405	262 414
MUH 7 / 40 SS	1,969		262 406	262 415
MUH 8 / 40 SS	2,224		262 407	262 416

(1) Complete types e.g. MUH 7 / 40 - 100 ... HS left version → MUH 7 / 40 - 100 L HS, Order - No. 262 400

(2) corresponding to the center of collector

Transfer guides, oblique⁽¹⁾

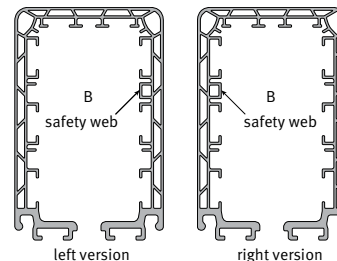
Necessary with all types of double collectors or 2 single collectors.

Staggered arrangement of the transfer guides to each other:

max. 5 mm horizontal

max. 3 mm vertical

Max. speed for crossover of the current collector 80 m/min.



Type ⁽¹⁾	Weight kg		Order - No. / Version	
			left	right
MUHS 6 / 40 - 100 HS	1,980		262 423	262 432
MUHS 7 / 40 - 100 HS	2,031		262 424	262 433
MUHS 8 / 40 - 100 HS	2,282		262 425	262 434
MUHS 6 / 140 - 160 HS	1,980		262 426	262 435
MUHS 7 / 140 - 160 HS	2,031		262 427	262 436
MUHS 8 / 140 - 160 HS	2,282		262 428	262 437
MUHS 6 / 200 HS	2,036		262 441	262 444
MUHS 7 / 200 HS	2,087		262 442	262 445
MUHS 8 / 200 HS	2,337		262 443	262 446
MUHS 6 / 40 SS	1,980		262 429	262 438
MUHS 7 / 40 SS	2,031		262 430	262 439
MUHS 8 / 40 SS	2,282		262 431	262 440

(1) Complete types e.g. MUHS 6 / 140 - 160 ... HS right version → MUHS 6 / 140 - 160 R HS, Order - Nr. 262 435

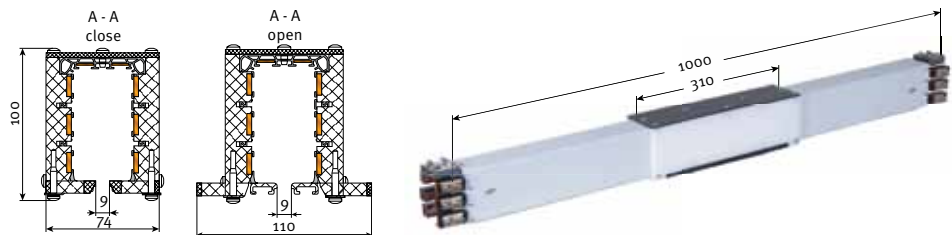
(2) corresponding to the center of collector

Removal sections

Assembly and disassembly of the collector is possible at the end of the track as well as at the removal section.

By opening and closing the sliders at the bottom of the conductor housing the collector can be mounted and removed easily. Before opening disconnect mains.

The removal section does not disconnect the powerail electrically.



For single collectors

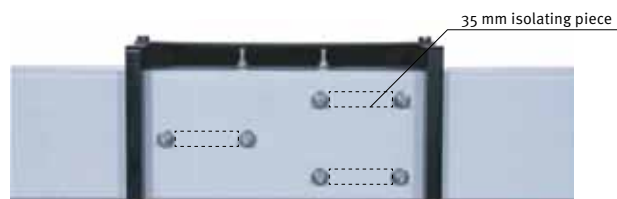
Type	Weight kg		Order - No.
MATH 6 / 40 - 100 HS	4,358		262 147
MATH 7 / 40 - 100 HS	4,536		262 148
MATH 8 / 40 - 100 HS	4,714		262 149
MATH 6 / 140 - 160 HS	4,358		262 150
MATH 7 / 140 - 160 HS	4,536		262 151
MATH 8 / 140 - 160 HS	4,714		262 152
MATH 6 / 200 HS	4,604		262 156
MATH 7 / 200 HS	4,782		262 157
MATH 8 / 200 HS	4,960		262 158
MATH 6 / 40 SS	4,358		262 153
MATH 7 / 40 SS	4,536		262 154
MATH 8 / 40 SS	4,714		262 155

For double collectors

Type	Weight kg		Order - No.
MATHD 6 / 40 - 100 HS	5,019		262 159
MATHD 7 / 40 - 100 HS	5,197		262 160
MATHD 8 / 40 - 100 HS	5,375		262 161
MATHD 6 / 140 - 160 HS	5,019		262 162
MATHD 7 / 140 - 160 HS	5,197		262 163
MATHD 8 / 140 - 160 HS	5,375		262 164
MATHD 6 / 200 HS	5,265		262 168
MATHD 7 / 200 HS	5,443		262 169
MATHD 8 / 200 HS	5,621		262 170
MATHD 6 / 40 SS	5,019		262 165
MATHD 7 / 40 SS	5,197		262 166
MATHD 8 / 40 SS	5,375		262 167

Conductor dead sections

5 mm air gap



Type		Order - No.
MHTL 1		262 578
MHTL 2		262 579
MHTL 3		262 580
MHTL 4		262 581
MHTL 5		262 582
MHTL 6		262 583
MHTL 7		262 584
MHTL 8		262 585

35 mm isolating piece

Type		Order - No.
MHTI 1		262 586
MHTI 2		262 587
MHTI 3		262 588
MHTI 4		262 589
MHTI 5		262 590
MHTI 6		262 591
MHTI 7		262 592
MHTI 8		262 593
MHTI 9		262 594
MHTI 10		262 595

Please advise us which conductors should be disconnected (see Page 5). The dead section comes factory assembled.

Anti-condensation sections

The anti-condensation section consists of 1 m conductor with air circulation holes, covered by a protection hood.
The anti-condensation section doesn't separate the conductor.

Use of the anti-condensation section

At transition areas where the system transitions from indoor to outdoor. 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

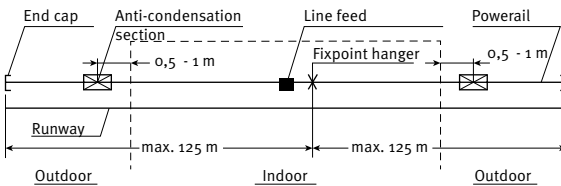
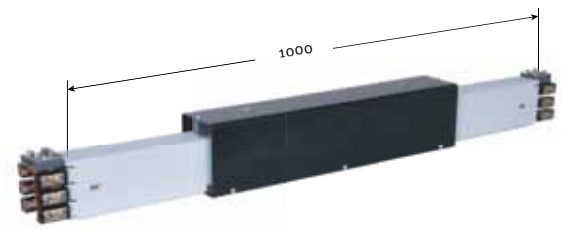
No extra feeds required as the Powerail is not interrupted

Collectors

No extra collectors required

Installation

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



Type	Weight kg		Order - No.
MBHD 6 - 10 HS	1,938		262 570
MBHD 6 - 10 SS	1,938		262 571

Type	Weight kg		Order - No.
MBHS 6 / 40 - 100 HS	4,622		262 135
MBHS 7 / 40 - 100 HS	4,840		262 136
MBHS 8 / 40 - 100 HS	5,018		262 137
MBHS 6 / 140 - 160 HS	4,662		262 138
MBHS 7 / 140 - 160 HS	4,840		262 139
MBHS 8 / 140 - 160 HS	5,018		262 140
MBHS 6 / 200 HS	4,899		262 144
MBHS 7 / 200 HS	5,077		262 145
MBHS 8 / 200 HS	5,255		262 146
MBHS 6 / 40 SS	4,662		262 141
MBHS 7 / 40 SS	4,840		262 142
MBHS 8 / 40 SS	5,018		262 143

Expansion Sections

Expansion sections are required to compensate for the different expansions between copper conductors and steel- or concrete structures, in varying temperatures without interrupting electrical power. Expansion joints are used when the Powerail length between feeds, curves, switches or other fix points is exceeding 10 m.

Max. length during differences in temperature:

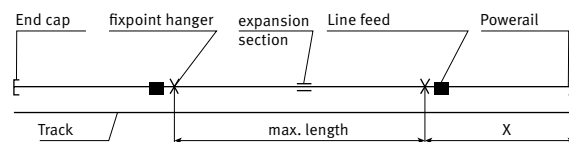
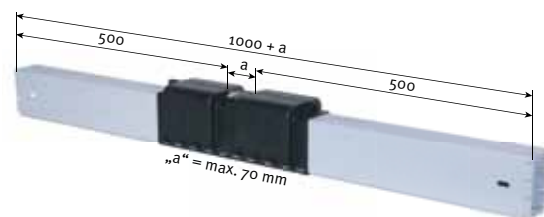
$\Delta t \ 20\text{ }^{\circ}\text{C} = 70\text{ m}$ $\Delta t \ 40\text{ }^{\circ}\text{C} = 35\text{ m}$ $\Delta t \ 80\text{ }^{\circ}\text{C} = 17\text{ m}$

$\Delta t \ 30\text{ }^{\circ}\text{C} = 45\text{ m}$ $\Delta t \ 60\text{ }^{\circ}\text{C} = 23\text{ m}$

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

X = max. 55 m für Außenanlagen

X = max. 100 m für Innenanlagen



Type	Weight kg		Order - No.
MDHD 6 - 8 HS	1,486		262 572
MDHD 9 HS	1,479		262 573
MDHD 10 HS	1,473		262 574
MDHD 6 - 8 SS	1,486		262 575
MDHD 9 SS	1,479		262 576
MDHD 10 SS	1,473		262 577

Expansion Sections

The Expansion sections are required to compensate for the different expansions between copper conductors and steel- or concrete structures, in varying temperatures without interrupting electrical power. Expansion joints are used when the Powerail length between feeds, curves, switches or other fix points is exceeding 20 m.

Max. length during differences in temperature:

t 90 °C (- 30 °C to + 60 °C) install one expansion joint per 100 m.
An additional expansion joint every 100 m.

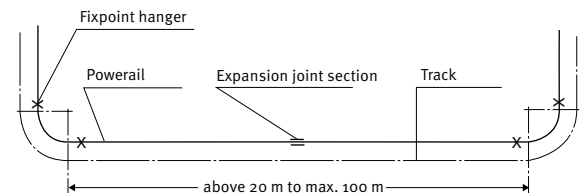
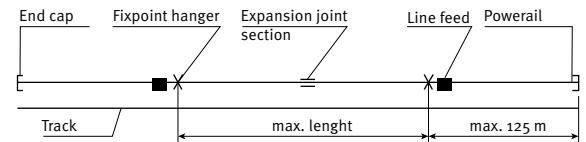
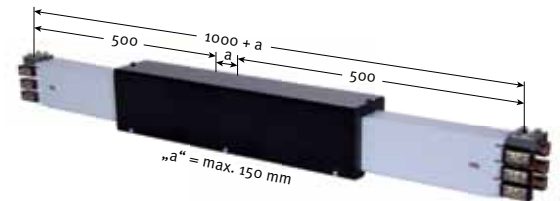
Arrangement of fixpoints according to sketches.

The remaining conductor sections have to be installed with sliding hangers.

Additional feeds or current collectors are not required as the expansion-sections do not interrupt electrical power.

Assembly

The gap dimension „a“ is 75 mm and is valid for an ambient temperature of -10 °C to +35 °C during installation.



Type	Weight kg		Order - No.
MDHS 6 / 40 - 100 HS	6,234		262 004
MDHS 7 / 40 - 100 HS	6,383		262 005
MDHS 8 / 40 - 100 HS	6,532		262 006
MDHS 6 / 140 - 160 HS	6,234		262 007
MDHS 7 / 140 - 160 HS	6,383		262 008
MDHS 8 / 140 - 160 HS	6,532		262 009
MDHS 6 / 200 HS	6,477		262 013
MDHS 7 / 200 HS	6,626		262 014
MDHS 8 / 200 HS	6,775		262 015
MDHS 6 / 40 SS	6,234		262 010
MDHS 7 / 40 SS	6,383		262 011
MDHS 8 / 40 SS	6,532		262 012

Collectors

Single collector MSA

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 double collectors with 2 m cable

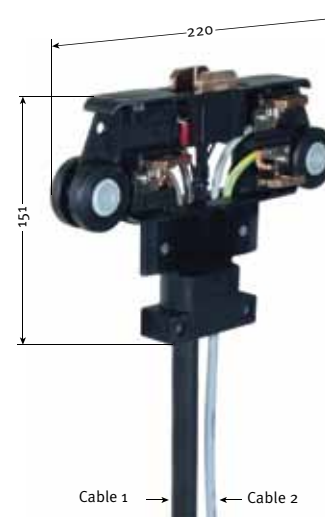
Oder - No. 236 177-2

for collector MSA 6/50-2 HS

Cleaning trolleys on request

For curves use single collectors only.

Connecting cable 1 m, longer cable available



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

Collectors

Single collector MSWAS

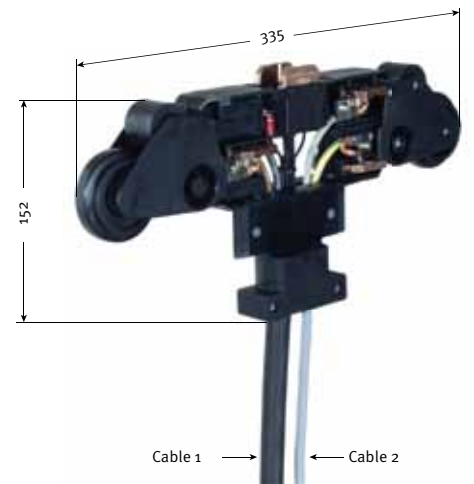
upto max. 250 m/min.
In conductor rails with sealing strip upto 100 m/min.

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
Oder - No. 236 000-2
for collector MSWA 6/50-2 HS

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



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

Collectors

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)

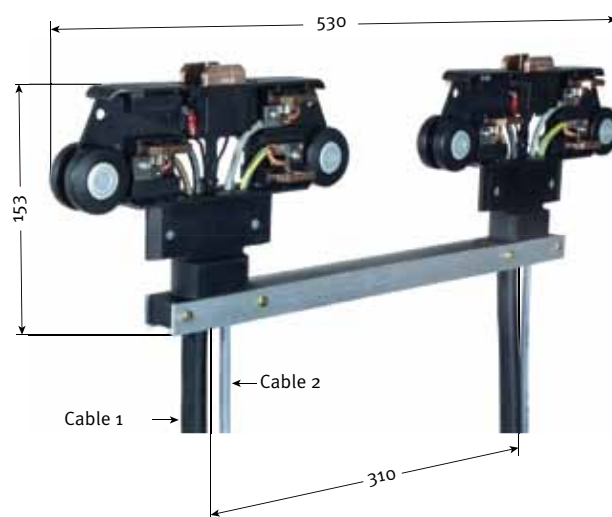
Example of ordering collector with 2 m cable

Order - No. 236 315-2

for collector DMSWA 6/100-2 HS

For curves use single collectors only.

Connecting cable 1 m, longer cable available

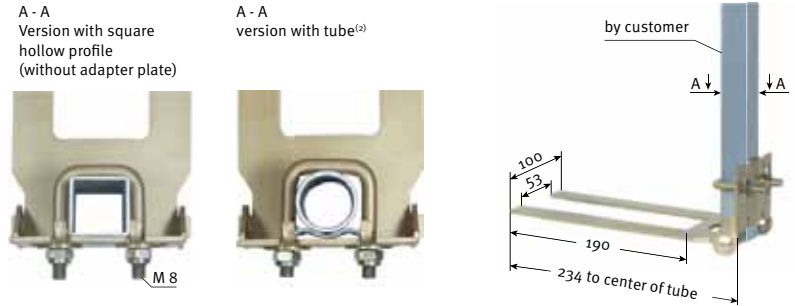


Type	Weight kg	No. of conductors	Power rating at 60% DC	Ø of connecting-cables in mm		Order - No.
				Cable 1	Cable 2	
DMSWA 6 / 100 S - 1 HS	2,256	6	100	≈ 17,0	≈ 7,0	236 315
DMSWA 7 / 100 S - 1 HS	2,306	7	100	≈ 17,0	≈ 7,5	236 316
DMSWA 8 / 100 S - 1 HS	2,382	8	100	≈ 17,0	≈ 8,0	236 317
DMSWA 9 / 100 S - 1 HS	2,740	9	100	≈ 17,0	≈ 9,0	236 318
DMSWA 10 / 100 S - 1 HS	2,900	10	100	≈ 17,0	≈ 9,5	236 319
DMSWA 6 / 50 S - 1 ST	1,704	6	50	≈ 11,5		236 320
DMSWA 7 / 50 S - 1 ST	1,724	7	50	≈ 11,5		236 321
DMSWA 8 / 50 S - 1 ST	1,812	8	50	≈ 10,0	≈ 10,0	236 322
DMSWA 9 / 50 S - 1 ST	2,198	9	50	≈ 11,0	≈ 10,0	236 323
DMSWA 10 / 50 S - 1 ST	2,450	10	50	≈ 11,5	≈ 10,0	236 324

Tow arms

Tow arm

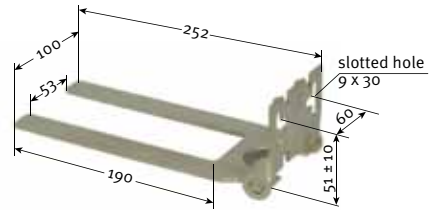
Installation options of 30 mm square-, hollow profile or tube with 30 - 34 mm



Type	Weihgt kg		Order - No.
MGU	0,550		600 334
MGU / K ⁽²⁾	0,550		600 336

(1) For assembly use enclosed adapter plate.
(2) Stainless steel.

Tow arm
for plane surface

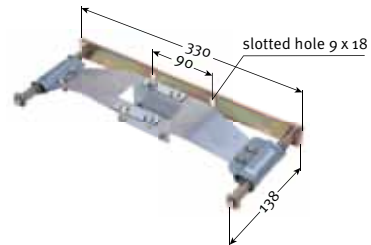


Type	Weihgt kg		Order - No.
MGF	0,510		600 335
MGF / K ⁽²⁾	0,510		600 337

Flexible tow arm

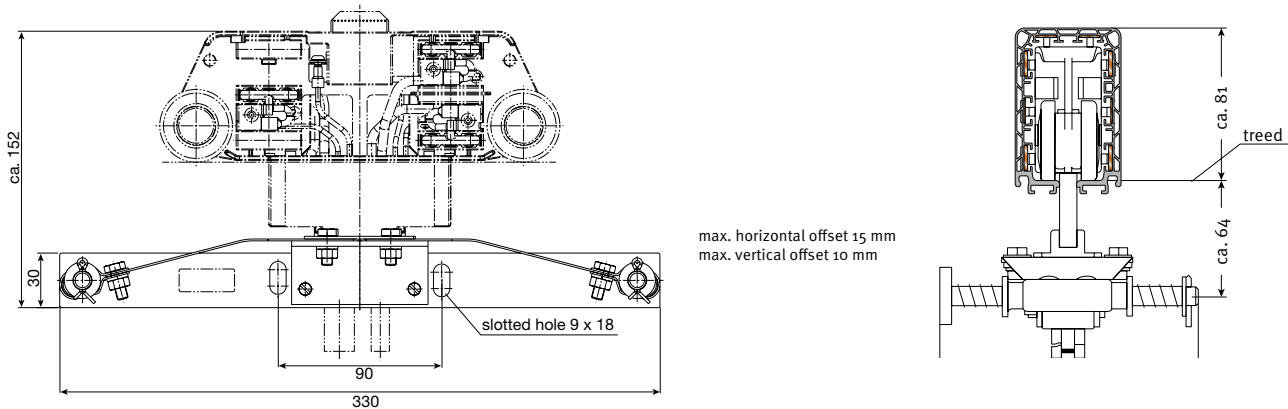
For single collectors – flexible support type
for systems with transfer funnels MTH

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



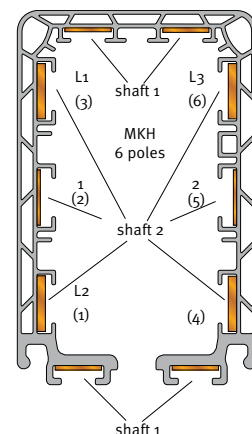
Type	Weihgt kg		Order - No.
MFMN	1,120		236 460

Flexible tow arm configuration



Flat copper & cable glands

Flat copper (MKHD)



Max. length of 11 mm wide strips (for shaft 1)

Type	Weight kg/m	Type of cassette			Order - No. (Cu)	Order - No. (Inox)
		A	B	C		
11 mm ² 11 x 1 mm (40 A)	0,10	90	260	300	234 198	-
11 mm ² 11 x 1 mm (40 A)	0,09	90	260	300	-	234 384

Max. length of 13 mm wide strips (for shaft 2)

Type	Weight kg/m	Type of cassette			Order - No. (Cu)	Order - No. (Inox)
		A	B	C		
10 mm ² 13 x 0,8 mm (40 A)	0,09	115	300	-	234 197	-
14 mm ² 13 x 1,1 mm (63 A)	0,13	65	200	300	236 006	-
17 mm ² 13 x 1,3 mm (63 A)	0,13	65	200	300	-	234 383
26 mm ² 13 x 2 mm (100 A) ⁽²⁾	0,23	45	130	200	234 200	-
33 mm ² 13 x 2,5 mm (140 A) ⁽²⁾	0,29	35	100	160	234 201	-
42 mm ² 13 x 3,2 mm (160 A) ⁽²⁾	0,37	25	80 ⁽¹⁾	120 ⁽¹⁾	234 202	-

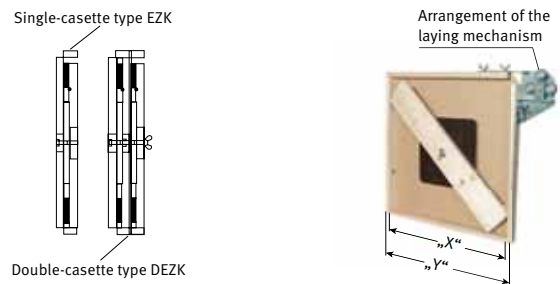
(1) 1) Values for installation through VAHLE-engineers (with help device possible). Use bolted joints and possibly expansion sections for bigger lengths than shown in the table. In this case installation by Vahle experts is recommended, especially for copper cross section of 42 mm² and 51 mm². Consult factory for proper layout.

(2) 2) With straightening tool (see page 32).

Cable glands for feeds

Cable glands	for cable-Ø in mm	capacity A (execution: D/F/S)	Page
M 25 and M 40	11 - 17 and 19 - 28	40 - 60 HS	S. 12, 13
M 25	11 - 17	40 SS	S. 12, 13
M 25 and M 50	9 - 19 and 23 - 34	40 - 100 HS	S. 13, 14
M 25 and M 50	9 - 19 and 29 - 40	140 - 200 HS	S. 13, 14
M 25	9 - 19	40 SS	S. 13, 14
M 25 for L1/L2/L3	9 - 19	40 - 200 HS	S. 15, 16
M 25 for 1 - 4 and 9/10	6 - 15	40 - 200 HS	S. 15, 16
M 25 6 to 10 - poles	9 - 19	40 SS	S. 15, 16
M 20	6 - 13	40 - 200 SS / HS	S. 15, 16, 18

Assembling tools
Copper cassettes



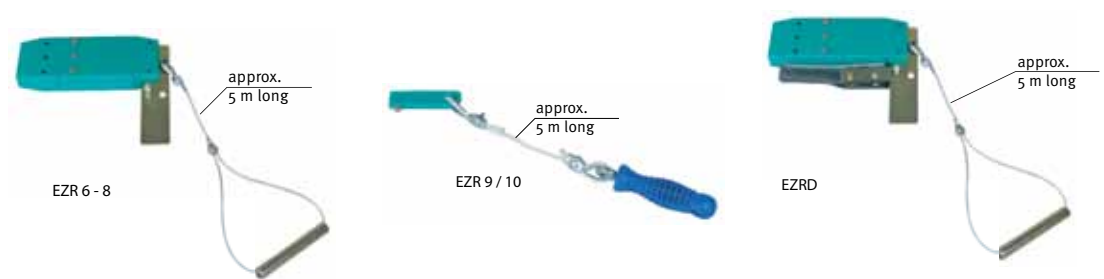
Type	Weight kg	Dim. » X «	Dim. » Y «	Type of cassette	Order - No.
EZK 1 single	3,500	462	500	A	234 219
EZK 2 single	4,450	662	700	B	234 220
EZK 3 single	5,400	862	900	C	234 250
DEZK 1 double	6,500	462	500	A	234 221
DEZK 2 double	8,200	662	700	B	234 222
DEZK 3 double	9,900	862	900	C	234 251

Type of copper cassette depends on copper cross section and system length (see page 31).

Straightening tool
required from strip sections 26 mm² upwards

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

Conductor threading tool



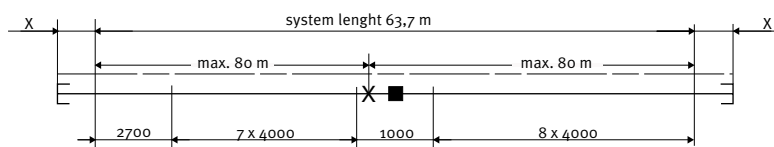
Type	Weight kg	Description	Order - No.
EZR 6 - 8	1,450	(for conductors inside housing, shafts 1 & 2)	234 204
EZR 9 / 10	0,170	(for conductors outside housing, shafts 1)	234 730
EZRD	1,620	(for sealing strip and for conductors inside housing 1 & 2)	234 552

Example for ordering

MKH ... 8 / 100 - HS (see pages 5 & 6)

X = 300 mm end section for copper conductor MKHD (w/o cond.)

Not for MKHF & MKHS.



Quantity	Type	MKHD		MKHF		MKHS	
		Type	Order - No.	Type	Order - No.	Type	Order - No.
15	Flat copper strip 4m	MKHD - 4 HS	262 504				
1	Flat copper strip 3 m for short length 2.7 m	MKHD - 3 HS	262 503				
15	Powerail 4m			MKHF 8 / 100 - 4 HS	262 134	MKHS 8 / 100 - 4 HS	262 344
1	Schleifleitung 3m für 2,7m Unterlänge			MKHF 8 / 100 - 3 HS	262 133	MKHS 8 / 100 - 3 HS	262 343
1	Line feed	MHGD - 8 / 40 - 100 HS	262 547	MHGF 8 / 100 - HS	262 500	MHGS 8 / 100 - HS	262 456
1	End section, left 0,3 m long	MHED / L	262 537				
1	End section, right 0,3 m long	MHED / R	262 536				
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	MFH	262 001	MFH	262 001	MFH	262 001
32	Sliding hangers	MGH	262 000	MGH	262 000	MGH	262 000
195m	Flat copper strip, 3 coils à 65 m	26 mm ²	234 200				
65m	Flat copper strip, 1 coil à 65 m	14 mm ²	236 006				
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	Single collector	MSWA 8 / 50 - 1 HS	236 179	MSWA 8 / 50 - 1 HS	236 179	MSWA 8 / 50 - 1 HS	236 179
1	Tow arm	MGU	600 334	MGU	600 334	MGU	600 334
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 enclosed conductor system

Type		Order - No.
Plug-in joint for MKHF (11 mm Cu; 40 A)		262 020
Plug-in joint for MKHF (13 mm Cu; 40–100 A)		600 483
Bolted joint for MKHS (11 mm Cu; 40 A)		262 019
Bolted joint for MKHS (13 mm Cu; 40–200 A)		262 018
Joint Cap for transfer guide and transfer funnel, pair (MKHD, MKHF und MKHS)		234 779
Sealing strip (max. length each 40 m)		600 551
Coupling for sealing strip, in pairs (2 per joint)		258 300
Fixing clamp for sealing strip (1 per end)		236 105

for collector MSWA

Type		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 DMSW & DMSWA		234 515
High speed set for collector MSWAS		236 199
Sealing strip slide plate for collectors MSWA		236 625

Company: _____

Date: _____

Fon: _____

Fax: _____

eMail: _____

Internet: _____

1. Number of powerail installations: _____

2. Type of equipment to be powered: _____

3. Operating voltage: _____ Volt 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. Hall expansion joints: _____ pieces. min. _____ max. expansion

12. Position and number of feeding points⁽¹⁾: _____13. Position and number of isolating sections (e.g. for maintenance)⁽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: _____ in curves: _____ at transfers: _____

17. Power consumption of the individual consumer loads: _____

(Please consult table mentioned below.)

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	% DC	A	cos Φ_A			A	cos Φ_N	% DC	A	cos Φ_A	
Hoist motors														
Auxiliary hoist														
Long travel														
Cross travel														

Mark with * those motors which can run simultaneously.

Mark with those motors which can start up simultaneously.

Further remarks: _____

⁽¹⁾ For curved tracks, powerail with isolating sections etc., we require sketches to enable us to prepare a quotation⁽²⁾ Use: K for squirrel cage motor, S for slipping motor, F for frequency controlled motor

We reserve all rights to make alterations in the interests of further development

Please copy and fill in the questionnaire

Signature _____

Products and Service

Catalog No.

1 Open conductor systems	
Open conductor systems	1a
2 Insulated conductor systems	
U10	2a
FABA 100	2b
U15, U25, U35	2c
U20, U30, U40	2d
3 Compact conductor systems	
VKS 10	3a
VKS - VKL	3b
4 Enclosed conductor systems	
KBSL - KSL	4a
KBH	4b
MKH	4c
LSV - LSVG	4d
5 Contactless power supply	
Contactless power supply (CPS®)	5a
6 Data transmission	
VAHLE Powercom®	6a
Slotted Microwave Guide (SMG)	6b
7 Positioning systems	
VAHLE APOS®	7a
8 Festoon systems and cables	
Festoon systems for □-tracks	8a
Festoon systems for flat cables on I-track	8b
Festoon systems for round cables on I-track	8c
Festoon systems for ◇-track	8d
Cables	8e
9 Reels	
Spring operated cable reels	9a
Motor powered cable reels	9b
10 Other	
Battery charging systems	10a
Heavy enclosed conductor systems	10b
Tender	10c
Contact wire	10d
Assemblies / Commissioning	
Spare parts / Maintenance service	



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ISO 9001:2008 OHSAS 18001:2007
(Reg. Nr. 003140 QM 08/BSOH)

VAHLE



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