



HEAVY ENCLOSED CONDUCTOR SYSTEMS



Basic Description

The totally enclosed VAHLE-Conductor Rail Trunking Systems have been manufactured since 1925 and have proven an outstanding success for safe power feeding of dockside cranes, loading-bridges, container handling equipment etc. in all major ports and other material handling places.

The ducting system is used in any position where overhead or bare conductors could create difficulties in regard to space available or where safety is of utmost importance.

The ducting can be either below or above ground level and when necessary it can be installed in curves. The flush-mounted version is normally installed in a concrete trench of standard dimensions as illustrated, while in the surface-mounted version the trunking is made of steel. Other concrete trench dimensions are possible in case of space limitation or where high-voltage systems require a larger duct. All versions are entirely covered by steel-plates resting on both sides of the ducting, one side being hinged.

The plates facilitate walking and the system can be used as a catwalk where railway-lines, sleepers etc. impede normal walking. Heavy wheel loads can be taken and cover plates up to one inch thickness or chequered cover plates with underwelded reinforcements are quite common. The individual plates cannot be lifted by hand, but can be opened with simple tools to enable inspection or maintenance of the conductor rails, insulators and current collectors.

A practically unlimited number of cranes or other machinery can be supplied by this VAHLE-System and cranes can be added provided that the conductor rails are of the proper capacity. The ducting system can be extended on either side with minimum interruption of normal operation. Interconnecting switches to feed various berths separately or to arrange for hospital bays are ready available.

The simple design of the VAHLE ducting systems provides maximum reliability under heavy duty service. The system meets the usual safety regulations.

Cover Plate lifting devices

There are two basic systems, the one used in connection with VAHLE ducting type "A" - lifting arm rigidly mounted to the crane-undercarriage and the other system being used in connection with VAHLE ducting type "B" and "C" - lifting bogie with four track wheels and articulated attachment to the crane-undercarriage.

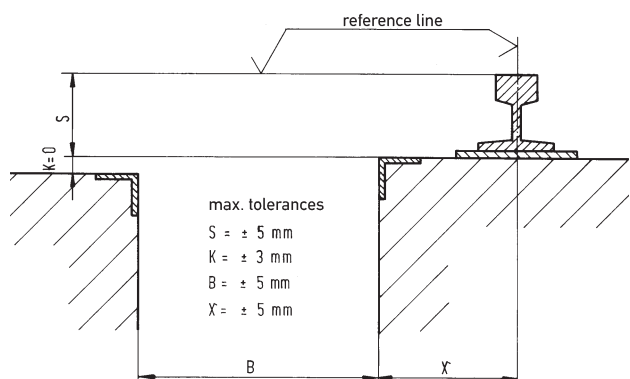
Type "A" of the VAHLE ducting system is mainly for lighter duty short runs with no misalignment between crane rail and the duct edge. The cover plate lifting bogies of VAHLE ducting "B" and "C" are rolling on the steel angle, channel or Z-beam protecting the upper edges of the concrete trench.

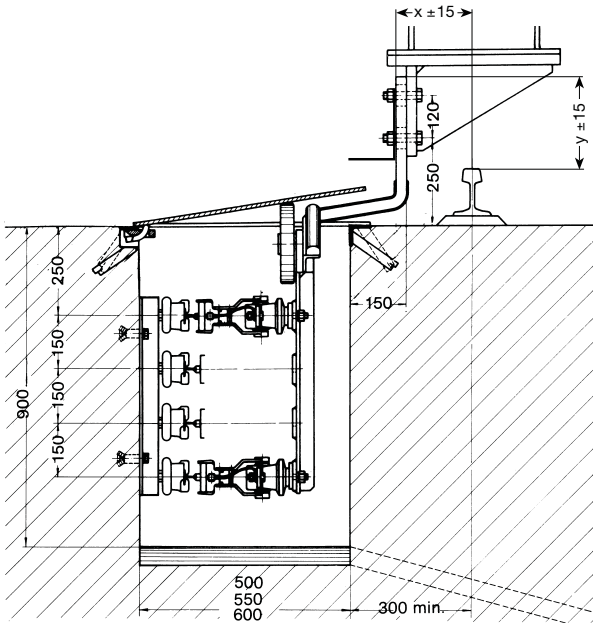
The articulated towing linkage can compensate for dips or lateral misalignment of up to 150 mm.

Both systems have bronze gliders and lid lifting rollers with plastic coating to ensure smooth raising and lowering of the cover plates, even with high travelling speeds.

Spring loaded, sealed VAHLE current collectors with high-quality metal impregnated carbon shoes are attached to the lifting devices and guarantee a continuous contact with either lateral or upright mounted conductor rails. The type of current collectors will be selected in accordance with the required ampere load.

Trench tolerance





Type A

Steelwork Components:

Edge angle 60/60 x 6 mm in 6 m sections.
Edge angle 75/55 x 7 mm in 6 m sections with negative hinge part.
Insulator brackets std. spacing 2,5 meters.
Chequered pivoted cover plates*, 550 mm wide, 2 m long.

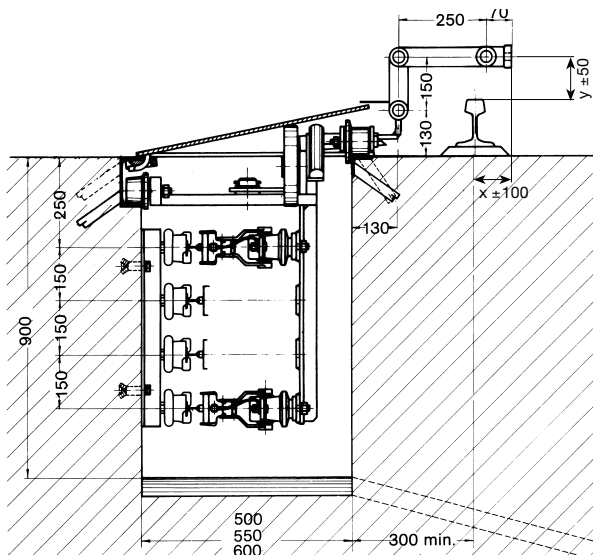
Thickness (mm)	8	10	12
permissible wheel load (tons)	1	2	5

Conductors:

VAHLE Copperhead Rails F 45, K 45, C 45 or A 45 available from 500 to 1500 Amps (see catalog 1a).
Standard insulators VDB, max.1000 Volts.

Cover lifting device:

incl. towing arm and VAHLE current collectors GSV series (100, 200, 400 or 800 Amp units available).



Type B

Steelwork Components:

Edge angle 60/60 x 8 mm in 6 m sections.
Channel \square NP 140 in 6 m sections with negative hinge part.
Insulator brackets std. spacing 2,5 meters.
Chequered pivoted cover plates* 550 mm wide, 2 m long.

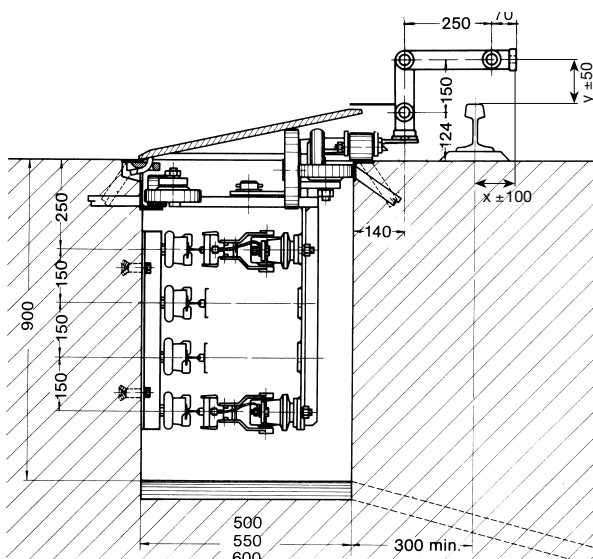
Thickness (mm)	8	10	12
permissible wheel load (tons)	1	2	5

Conductors:

VAHLE Copperhead Rails F 45, K 45, C 45 or A 45 available from 500 to 1500 Amps (see catalog 1a).
Standard insulators VDB, max.1000 Volts.

Cover lifting Bogie:

incl. towing linkage and VAHLE current collectors GSV series (100, 200, 400 or 800 Amp units available).



Type C

Steelwork Components:

Edge angle 60/60 x 8 mm in 6 m sections.
Z-beam \square 65/140/65 x 8 mm in 6 m sections with negative hinge part.
Insulator brackets std. spacing 2,5 meters.
Plain pivoted cover plates*, 550 mm wide, 1,5 m long.

Thickness (mm)	14	16	18	20
permissible wheel load (tons)	5	8	10	12

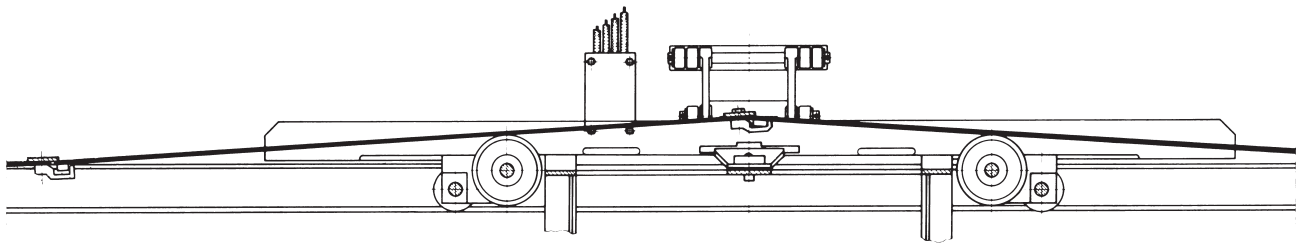
Conductors:

VAHLE Copperhead F 45, K 45, AC 45 or C 45 available from 500 to 1500 Amps (see catalog 1a).
Standard insulators VDB, max.1000 Volts.

Cover lifting Bogie:

Incl. towing linkage and VAHLE current collectors GSV series (100, 200, 400 or 800 Amp units available).

*The cover plate dimensions and permissible wheel loads apply to 500 mm (20") width of trench. Standard hinges (surface mounted) are also available.



VAHLE Conductor trench system EID for container handling crane.

These heavy duty enclosed conductor systems mainly serve for safe mobile power feeding of dockside cranes, loading and unloading facilities, container handling equipment, transfer bridges and many other applications of similar nature. The conductor trench system is installed in parallel to the machinery track.

The main features are: The trench cover consists of steel plates with a link connection to each other so to form a continuous steel ribbon. The cover plate lifting bogies connected to the crane undercarriage via an articulated towing arm will lift the ribbon caterpillar-like when riding along the ducting system. The lifting bogies allow for free passing of the conductor cable towards the crane.

The connection of the cover plate lifting bogies and the crane undercarriage does compensate for dips or lateral misalignment by this not interfering a safe and continuous pick-up action of the current collectors. The wheel assemblies of the lifting bogies are well-spaced in order to avoid pinching or jamming.

The thickness of the cover plates will be designed in accordance to the possible wheel loads of crossing traffic over the conductor trench. The system can be installed in bends.

The VAHLE conductor trench is easy accessible for inspection and maintenance by just dismantling one linkage between two plate sections – all other plates can then be removed by lifting them a little over 30°. The same easy way applies for re-installing.



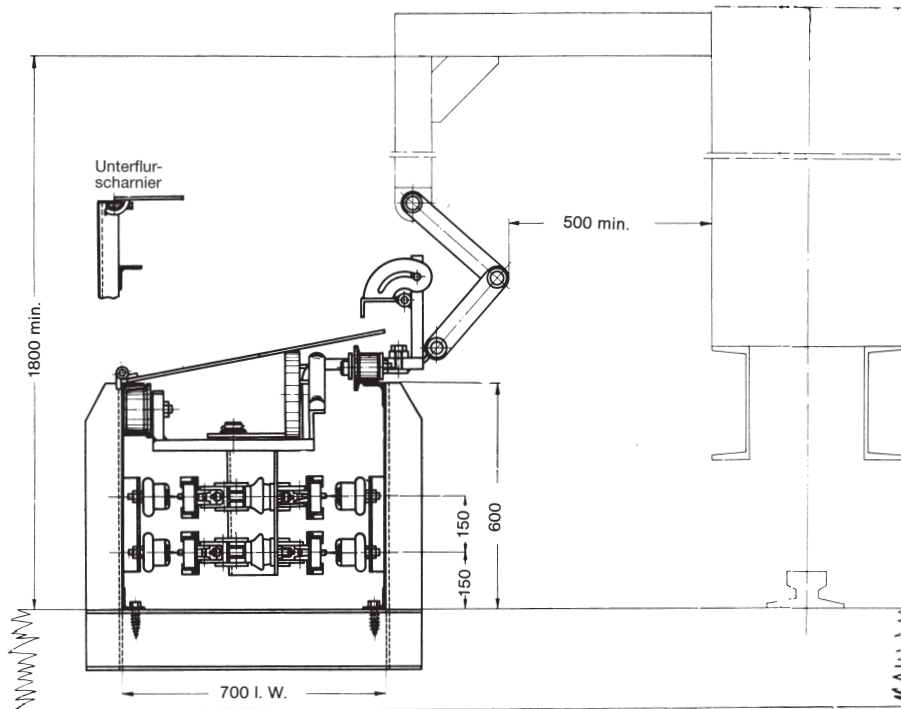
SURFACE MOUNTED

Basic Description

The VAHLE-Surface Mounted Ducting System is used in subsidence and filled-up areas not allowing for a concrete trench. The conductor housing is fixed to concrete or timber sleepers and is placed parallel to the crane rail.

The four conductors (3 -phases + ground) are arranged laterally on both sides or upright-mounted on the bottom of the housing.

The current is collected by spring-loaded collectors which are bolted to a moving cover plate lifting bogie. This lifting trolley with its four track wheels runs on the hinge U-channel and an edge angle iron and is connected to the crane undercarriage by means of an articulated joint capable to compensate for horizontal and vertical misalignment up to 150 mm between crane rail and conductor system.



Engineering Data:

Standard steel ducting:

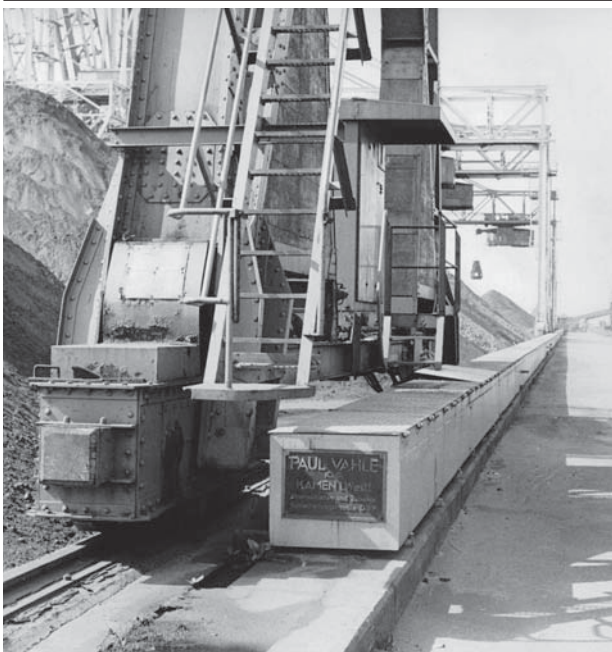
6 m sections - 4 mm sheets
frame- and support-centers: 2 m.
Hinged cover plates of
chequered 6 mm sheets.

Conductors:

VAHLE Copperhead Rails
F 45, K 45, AC 45 or C 45
available from 500 to 1500 amps
(see catalog No. 1a).
Standard insulators VDB,
max. 1000 Volts, 2 m centers.

Cover Plate lifting Bogie

with Current Collectors
available from 100 to 800 amps.



Basic Description

The Heavy Duty Steel Enclosed Conductor System, Type FK represents an unique arrangement of VAHLE-Copperhead Rails. It is mainly used for the safe long travel electrification of heavy O.H.T. Cranes, Portal Cranes, Container Handling facilities and other installations with movable machinery.

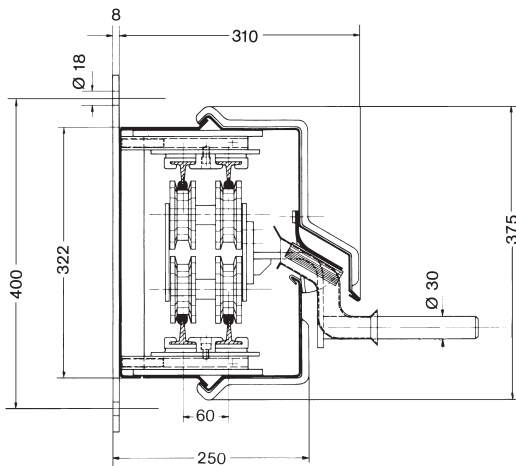
The conductors are supported by double block insulators which are inserted in the frame profiles of FK housing.

The standard housing accomodates 4 conductors (3 phases + ground), 2 top and 2 bottom rails.

More conductors can be installed with only a slight increase in the width of the system.

The FK is a real space-saving unit because the collector trolley (available for 120, 240, 360 amps.) does not require an extra runway. It is carried on insulated plastic rollers and guided on the copperheads of VAHLE-Conductors.

The front slot opening for the pick-up cable is covered by a neoprene sealing strip which makes the system proof against rain, snow and dust. The towing arrangement compensates for misalignment.



Engineering Data

Enclosure:

Housing with frame work of 3 mm steel sheets - 7 m long

Detachable front covers* of 2,5 mm steel sheets, 3,5 m long

Neoprene sealing strip 4 x 100 mm

Support centers: 3,5 m

Current collector trolleys:

FKW 120 A, FKW 240 A, FKW 360 A

Conductors:

410 Amp. 4 x F 35/ 50

530 Amp. 3 x F 35/100
1 x F 35/ 50

730 Amp. 3 x F 35/200
1 x F 35/100

max. 600 Volts

Insulator centers: 1,75 m



VAHLE FK-system for container terminal

* hinged front covers if required.



VAHLE CP SYSTEM

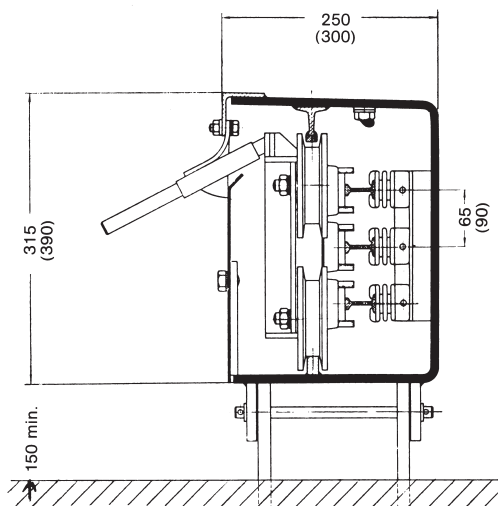
Basic Description

The VAHLE CP-Crashproof Conductor Line is a combination of a guide rail and a safety electrification system. The surface mounted housing serves as border of the quay and is placed adjacent to the seaside crane rail. The U-shaped housing is manufactured with a thickness of 6, 8, 10 or 12 mm and contains 3 laterally mounted phase conductors. The current collector trolley is running on a continuous flat iron profile on the bottom and is well guided against the top mounted earth conductor (welded to the housing). The front covers have a thickness of 3 mm, and the slot opening for the pick-up cable is covered by

a neoprene strip. Accordingly this system is proof against rain, snow and dust and an accidental contact with conductors is impossible.

The standard housing can accommodate conductor rails with a continuous current capacity up to 535 amps. Besides the standard system we supply a larger housing – see dimensions in brackets – capable to take conductor rails up to 900 amps.

Systems to clients specification, also with multiple control conductors, are available.



Engineering Data

Enclosure:

Housing of 6, 8, 10 or 12 mm steel sheets 6 m long

Detachable front covers of 3 mm steel sheets, 2 m long

Neoprene sealing strip 4 x 100 mm

Support centers: max. 6 m

Current collector trolleys:

CPW 120 A, CPW 240 A, CPW 360 A

Conductors:

330 Amp. 3 x L 20/ 50
1 x F 35/ 50

450 Amp. 3 x L 20/100
1 x F 35/ 50

535 Amp. 3 x C 20/200
1 x F 35/100

max. 600 V

Insulator centers: 1 m



QUESTIONNAIRE FOR VAHLE CONDUCTOR TRENCH SYSTEMS



Customer: _____ Attention of: _____

Address: _____

Questions regarding Conductors:

1. Type of crane/equipment to be electrified: _____
2. Length of track: _____ max. travelling speed: _____ m/min. _____
3. Number of cranes/equipment to be electrified by the one system: _____
4. Ampere load of each crane/equipment: _____

Motor Data	Crane 1			Crane 2			Crane 3		
	Power kW/PS	Current Amps	Duty factor %	Power kW/PS	Current Amps	Duty factor %	Power kW/PS	Current Amps	Duty factor %
Hoist motor									
Auxiliary hoist									
Travel motor-main-trolley									
Travel motor-aux.-trolley									
Main Travel									
Slewing									
Luffing									

5. Voltage: _____ Volt:~/=: _____ Phases: _____ c/s: _____

6. Number of conductors required: _____

Power lines: _____

Control lines: _____

Neutral (ground): _____

7. Number and position of feeder points: _____

8. Sectionalization and separate feeding of conductor system (provide prints and sketches): _____

9. Type of conductors preferably wanted: _____

Copperhead/solid copper conductor rails: _____

Insulated unipole conductor rails: _____

Multipole protected conductors: _____



QUESTIONNAIRE FOR VAHLE CONDUCTOR TRENCH SYSTEMS

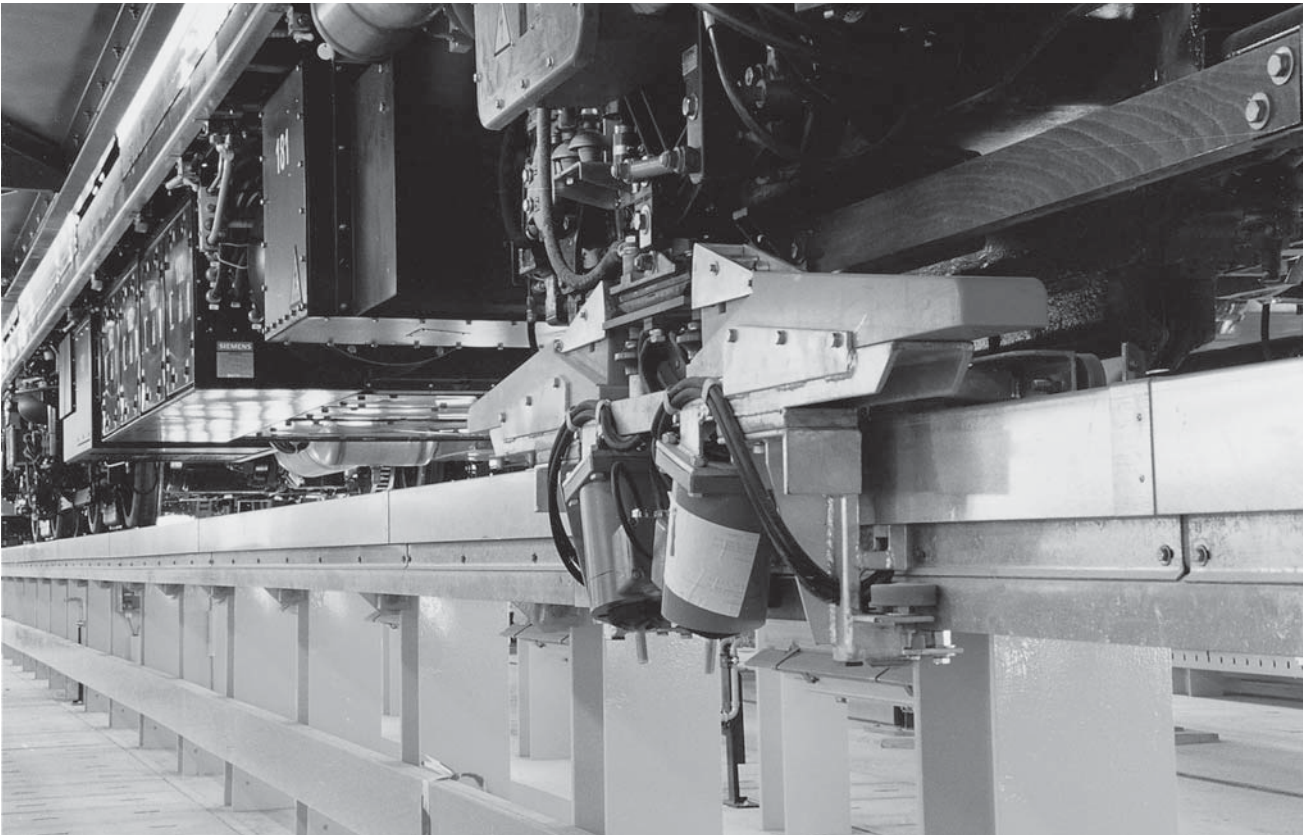
To our nearest local VAHLE-agency:

Questions regarding conductor trench:

1. Type: _____
Below floor level: _____
Surface mounted: _____
2. Indoor: Outdoor:
3. Special site conditions (Humidity, dust, chemical influence, subsidence): _____

4. Max. load on trench cover plates: _____
Pedestrians: _____
Type of vehicles: _____
Wheel load and dimension of wheels: _____
5. Curved run, radius (submit print or sketch): _____
6. Special safety requirements to be observed (mining, chemical industry, etc.): _____

Additional Information: _____



Steel enclosed conductor system for RTS maintenance shop



VAHLE-EID conductor trench for container terminal



Reg. No. 3140

Catalog No.

Copperhead Conductor Systems	1 a
Battery Charging Systems	1 b
Insulated Conductor Systems U 10	2 a
Insulated Conductor Systems U 20 – U 30 – U 40	2 b
Insulated Conductor Systems U 15 – U 25 – U 35	2 c
Aluminium Enclosed Conductor Systems LSV – LSVG	3 a
Steel Enclosed Conductor Systems SLG – HSL	3 b
Powerail Enclosed Conductor Systems KBSL – KSL – KSLT – KSG	4 a
Powerail Enclosed Conductor Systems VKS – VKL	4 b
Powerail Enclosed Conductor System MKLD – MKLF – MKLS	4 c
Heavy Enclosed Conductor Systems	5
Trolley Wire and Accessories	6
Cable Tenders	7
Cable Carriers for □-tracks	8 a
Cable Carriers for Flatform Cable on I-beams	8 bF
Cable Carriers for Round Cable on I-beams	8 bR
Cable Carriers for ◇-tracks	8 c
Conductor Cables and Fittings	8 L
Spring Operated Cable Reels	9 a
Overload Protection Systems	9 b
VAHLE POWERCOM® – Data Transmission Systems	9 c
CPS – Contactless Power Supply	9 d
SMG – Slotted Microwave Guide	9 e
Motor Powered Cable Reels	10

