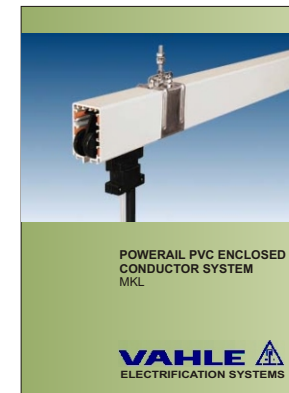
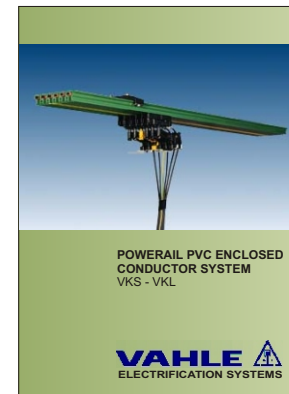
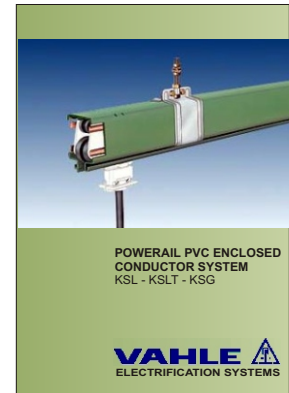


## Enclosed Conductor Systems User Documentation

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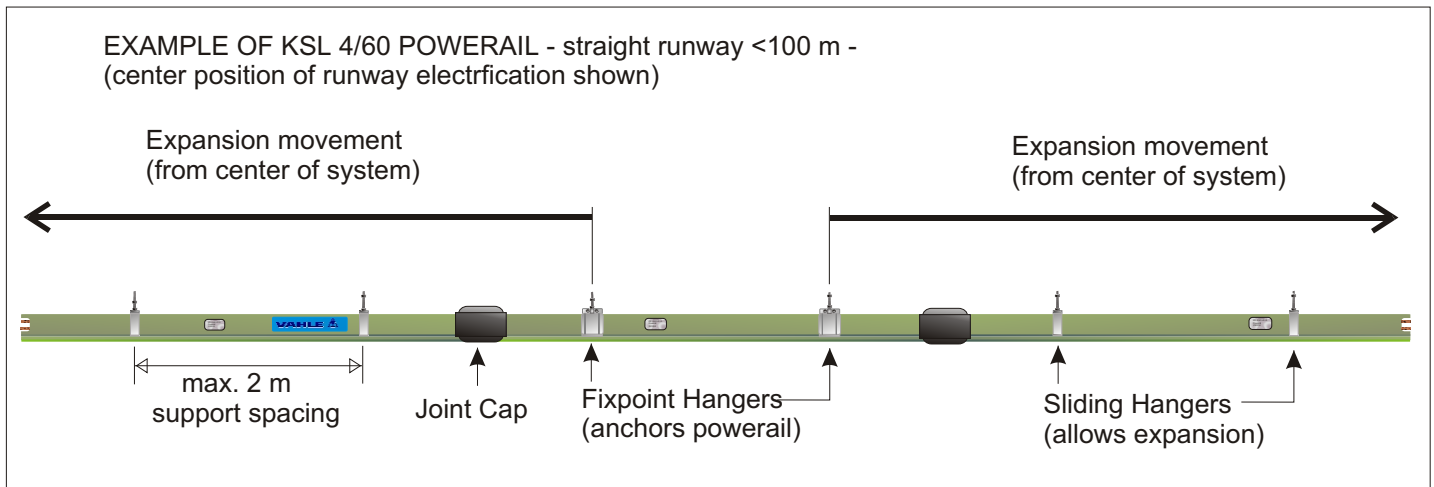
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\* The installation hints are not be used as a substitute for the installation instructions. You need to read, be familiar with and follow the installation instructions that are available for each conductor system. These hints are designed to assist with and make the installation process go smoothly.



## Enclosed Conductor Systems - Installation Hints

- When installing components, position the long lip side of the conductor housing towards the track or support structure.
- Install any curves, switches or other special sections first.
- For straight systems install the Feed Section first. Position the feed section as closely as possible to the power supply outlet. The connecting cables must not restrict free movement of the powerail system (expansion and contraction due to temperature changes).
- Anchor this first section with a temporary fixpoint hanger until the system is properly anchored at the recommended fixpoint (anchor) positions. Don't forget to remove the temporary fixpoint hanger afterwards.
- Position fixpoint hangers as per installation layout or general installation instructions. Fixpoint hangers are always placed at the center of a given run (see exceptions below).

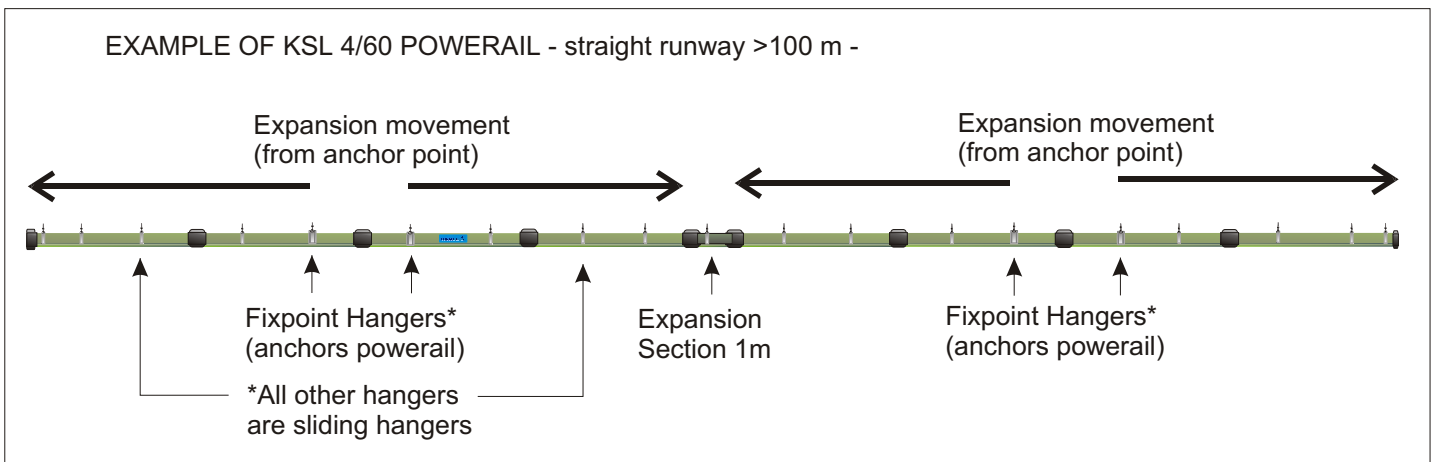


### EXCEPTION #1

Your system has Telescoping or Expansion sections. These components may be located in the middle of your installation but, for the purposes of hanger placement only, consider these components to be the beginning and ending of a run. You will need to place fixpoint hangers in the middle of each run. For example, if you have 1 expansion section, you will need to install 2 fixpoint hangers in the center of the 2 sections created (see layout below).

### EXCEPTION #2

Your system has Entry/Exit Funnels, Transfer Guides or between curves (i.e. closed oval). These components must be fixed in position (consult the instructions, layout drawing or a sales associate) for the placement of fixpoint hangers in these configurations.



- The standard support spacing for enclosed conductor systems is **every 2 m (6.5 ft)**. You may find that sometimes a hanger bracket will fall on or near a joint. *Never install a sliding hanger next to a fixed object (joint, feed box, stiffener clamp etc)*. The hanger should be moved away from the fixed object with a new hanger bracket or cantilever bracket extension. Sliding hangers allow for expansion and contraction of the powerail (due to temperature changes) out from the fixpoint hangers.
- The maximum allowable overhang of the powerail at the end of a system or at transfer sections (i.e. position of the first and last support hanger) is a maximum of 500 mm (20 in.) overhang.
- Make certain that bolted joint splices are tightened and that joint caps are installed inside the housing groves and positioned so that the inside ridges will lock into the housing notches.
- Do not force collectors into the powerail. Collectors are keyed to prevent them from being installed reversed (phase reversal)
- Consider using double collector assemblies (for redundancy) for systems where the slightest loss of contact will cause system problems (data signals, variable frequency drives etc.) Also for installations where the equipment remains stationary for extended time periods.

Also Remember to:

- Handle all materials carefully, especially non-metallic parts.
- All components must be kept clean.
- Make sure that joints and all other connecting points are clean of any residue.
- Tighten all hardware, using lock washers etc. carefully. Watch for proper alignment between conductor rails and runway (support structure).
- Install the conductor rails per installation instructions or layout plan if provided. Make sure that the position of expansion joints/section and fixpoint hangers is exactly per layout drawing and instructions.

When in doubt, contact VAHLE, Inc. at 800.725.9796 before proceeding. We are happy to assist you.

## Commissioning

Follow these 5 steps for system commissioning:

- 1) Check for the proper configuration and installation (refer to the Installation Procedures - consult VAHLE drawing if supplied). It is vital that the location of fixpoint hangers, sliding hangers, expansion sections etc. are per layout drawing and Installation Procedures.
- 2) Check the conductor alignment especially at transfer areas. (i.e. check tolerances with a ruler; make test runs and watch a collector travel across the gap)
- 3) Check that the proper collector is being used for the system configuration (consult the catalog or a VAHLE Sales Associate). All collectors are keyed to prevent reverse installation. It may be possible to *force* a collector in reversed but it will be difficult to move. Properly installed collectors will move freely.
- 4) Collectors should not vibrate or spark. In case of sparking check for excessive brush wear and/or check that the contact surface is clean.
- 5) Make test runs. Without power pull a collector assembly through the entire system. The collector should not grab, stick or jump; if this occurs inspect the area for proper installation. Start with low speeds and inspect all components for proper function.

## Maintenance

VAHLE conductor systems will provide reliable service when they are properly installed and maintained.

Maintenance is typically limited to checking the contact brushes for wear and periodic system inspections to check for damage due to outside influences. Always disconnect the power source and “lock it out” prior to performing system maintenance.

Basic Systems should be checked every 3 to 6 months. This depends on the environment, speed duty cycle of the equipment. Complex systems (systems with curves, switches, lift stations, turntables etc.) should be inspected every 1 to 3 months. The inspections should include the following:

Follow steps 1-5 under system commissioning.

Clean dust and debris from the conductor rail and/or conductor housing as required (see optional components for cleaning assemblies).

Remove carbon dust deposits especially in transfer guides and isolating assembly areas.

Check that the vertical and horizontal offset at switches, lift stations, etc. is within recommended tolerances (consult catalog).

Check that the housing alignment is level, straight and the housing is undamaged. If the powerail is wavy or pulling apart at the joints this indicates an installation issue (see troubleshooting notes).

Check that no joint covers are missing or cracked. In this event **DIS-CONNECT THE POWER** before attempting to replace.

Inspect the sliding hangers. The sliding hangers must not be cocked, bent or installed next to a joint cover, stiffener clamp or line feed (this would restrict the necessary movement due to expansion and contraction of the powerail).

Check that the proper gap setting is set (as per temperature consult product catalog) for any Expansion or Telescoping Sections

Check collector assemblies for mechanical integrity and brush wear. This can be done via a drop out/inspection section or per the instructions included with the Installation Procedures.

## Troubleshooting

We have been informed of, seen and inspected a number of VAHLE systems that have been improperly configured and/or installed (not per VAHLE Specifications). We feel it is a tribute to the quality of VAHLE components and design that these systems continue to operate reliably despite the incorrect installation. However, longevity may be reduced. There are systems that will not operate or function properly if the installation or configuration is not correct. It is our experience that operational issues can easily be fixed by reviewing the system configuration and/or adjusting the installation.

### EXPANSION AND CONTRACTION DUE TO TEMPERATURE CHANGE

The most common problem concerns allowances for expansion and contraction due to temperature changes. It is critical to use expansion sections as shown in our catalogs for certain configurations. The expansion sections will only work properly if fixpoint and sliding hangers are installed at their proper positions. Moreover, sliding hangers must not be installed cocked or against a joint or feed that will restrict the expansion/contraction of the conductor system. Symptoms of this issue include: warping or bending of the conductor rail, joints pulling apart.

### COLLECTOR (CONTACT) BRUSH WEAR

The contact brush is the “wear item” on the system. The contact brush is composed of copper graphite. As the brush wears carbon graphite dust can build up in the housing. The dust should be periodically removed as it is conductive and can cause shorts. If you choose to vacuum the dust you will need to use a vacuum that is designed so that the intake does not flow (designed for cooling) through the motor. We also offer cleaning components (see optional components).

### JOINT AND JOINT COVERS

The proper installation of joints and joint covers is critical to a properly operating system. After installing a joint (**and before powering up the system**) run your finger over the connection. The connection should be snug, secure and smooth. If there is an edge or burr use an emery cloth to remove it. An edge will act as a file on a contact brush causing it to wear quickly and cause a build up of graphite dust; in extreme cases an edge can cause a collector brush to jump or break. Joint covers must be in place for safety reasons. To identify problem joints on an existing system you can pull a collector through the housing. The collector should not snag, or jump (do not have power on the system when doing this) when passing over a joint.

If you have any operational issues regarding VAHLE components or systems please call us . Our experience is that problems can be easily and quickly resolved. Our goal is to provide you with maximum performance and minimum hassle. Call us at 800.725.9796; we can help!