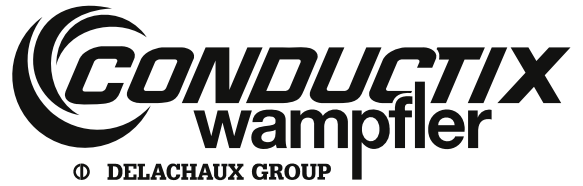


Operation Manual



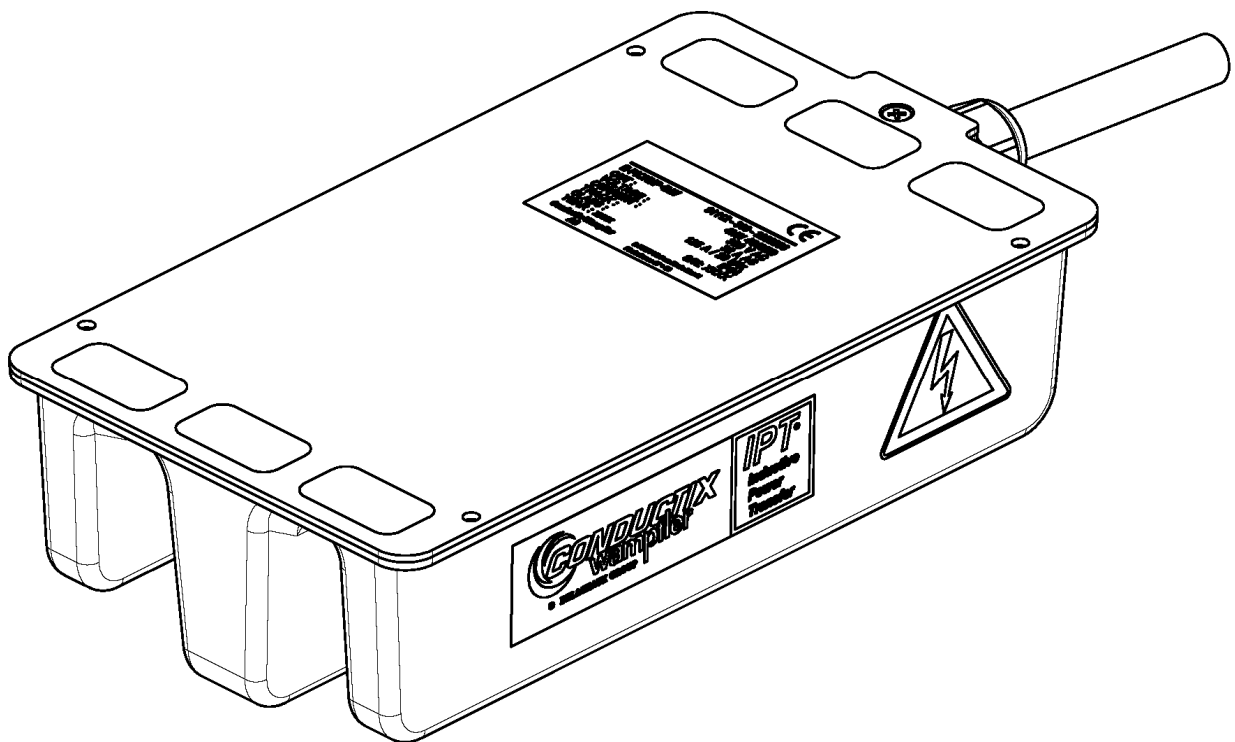
4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

Order-Number

91112-310-3090986: 4 kW E-Pickup, 40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

(Regulators must be ordered separately)



4 kW E-Pickup

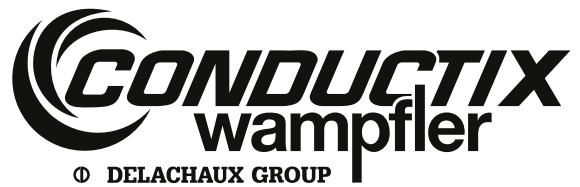
40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

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Operation Manual



4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

Important:

This document describes the components specified on the cover only. The manual does not include details about their interaction with other IPT® components within a system.

Document subject to change without prior notice.

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1 Symbols and Hints



Warning of voltage

This symbol can be found in several places of the operating instructions where special care has to be taken due to voltage presence which is a potential danger to the life of people. Please observe these instructions and be careful in those cases. Please carry out all health and safety regulations to other users as well.

Always disconnect the system from the main supply before working on the energy supply system.



Attention – some hints

This sign draws the attention to parts of the operating instructions where the regulations, advice and correct operational sequence must be observed to avoid any damage or destruction to the energy supply system and its components.



Temperature

This sign draws the attention to parts of the operating instructions, where special care must be taken on account of heating of surfaces or on account of inductive heating of ferromagnetic material and where other special measures have to be taken.

Please pass on the corresponding advice to other users too.

To achieve fault-free operation and any rights to claim guarantee it is necessary to observe and fulfill the information given in this manual or related documents at any time. Read the manual entirely before starting any work and operation of the device.

This manual contains operation related information. It is therefore recommendable to keep it in the vicinity of the device.

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2 Advisory Information for the User



This device contains life threatening voltages. Improper handling/operation or faulty installation can result in electric shocks and/or burns as well as material damages. There are no user serviceable parts in the device. Do not open, do not insert any objects inside.



All electric installation and commissioning work as well as repair work and disassembly have to be carried out by qualified staff (IEC 364 respectively CENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110 and national safety rules).



Qualified staff according to the safety regulations are persons that are familiar with the installation, assembly, commissioning and operation of the energy supply system and that have the appropriate qualifications.

Conductix-Wampfler GmbH cannot be responsible for damage and breakdown that have been caused by not observing this manual.

This manual contains exclusively details of the specified Pickup.

Observe all instructions and technical data given in this manual. Ensure that the device is operated under the specified conditions only.

Do not start up the device or related devices within the IPT® system until you have made sure that the machine/system it is integrated into complies with the applicable norms, standards and directives and that conformity is stated.

We reserve the right to carry out technical modifications of illustrations and statements in this instruction manual. References to other IPT® documents specifying the document number do not include the revision index. Refer to the project handbook when available for a list of relevant documents.

Unless specified differently, all data refer to the metric system, i.e. lengths are always in millimeter. Units used are based on European standards.

3 Intended Purpose

The intended purpose of this device is for use in conjunction with other IPT® components for the inductive transfer of electrical power.

A Pickup produces an AC voltage output from the AC magnetic field generated by an IPT® Track.

The device is not suitable for stand alone operation and must be used in conjunction with the appropriate IPT® components.

Qualified personnel only may operate this equipment.

4 kW E-Pickup

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4 Technical Data



The data specified in this section are valid only if the requirements regarding the environment of the device (nominal position, ambient temperature etc...) are respected.



For instance, the layout of the IPT® Track, the variations with respect to nominal position of a Pickup, or the ambient temperature around a Regulator, may lead to a reduction of the peak and/or continuous power available.



Regulators and Pickups are not designed for independent operation. Refer to both operation manuals together.

4.1 Electrical Data

- Input IPT® Track 125 A, 20 kHz
- Peak output power 4 kW
under adequate condition of operation (see chapter 7.4 and chapter 8).
- Continuous output power 1,6 kW at 40°C ambient = 40% duty cycle
2,5 kW at 20°C ambient
within 10 minute periods, air convection 0,1 m/s and nominal position
(see chapter 7.4)
- Output voltage 380 V AC at 40% duty cycle
100 V AC open circuit (disconnected from Regulator)
- Output current 32 A AC at 40% duty cycle
- Heat loss Approximately 150 W at full load
- Electrical protection Class II (reinforced internal insulation)
- Insulation to Ground Output to Ground tested at 5 kV DC / 5 s

4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

4.2 Environmental Data

- Storage temperature -20°C to +60°C
- Transport temperature -40°C to +80°C
- Ambient temperature +0°C to +40°C
Air temperature as measured in immediate vicinity of working device. Please note that the heat loss of the Pickup will raise the ambient temperature, especially in enclosed mounting spaces.

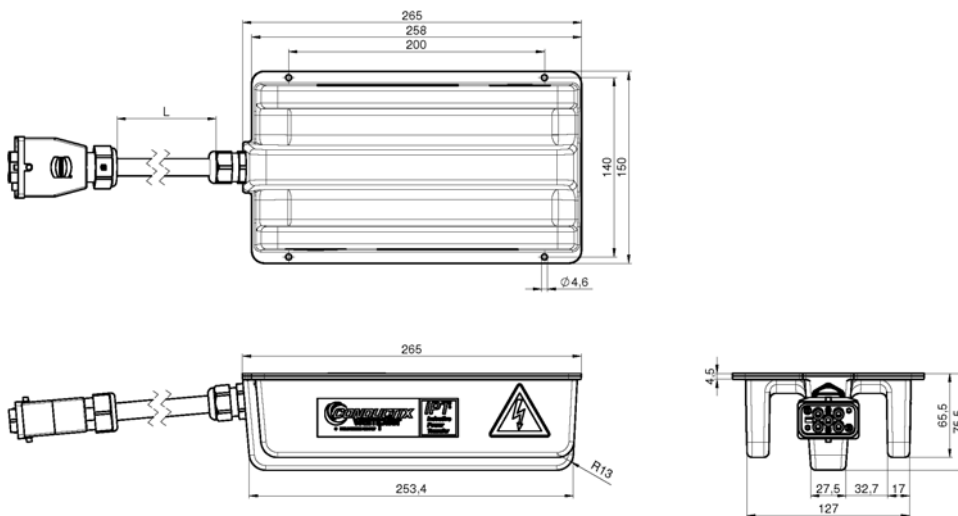
- Operation For indoor operation only.
- Humidity < 95%, non condensing
- Chemical resistance For industrial use without special conditions.
Any specific influences of chemicals must be checked.

- Protection rating IP54 when plug is in place
- EMC environment Pickups are designed for use in industrial environments (EN55011 Class A)
- Installation altitude Up to 1000 m; continuous output power must be derated for higher altitudes

The use in explosion-proof areas or in areas where the Pickup is exposed to harmful oils, acids, vapors, dust, gases, radiation, humidity, etc. is explicitly forbidden.

4.3 Mechanical Integration

- Dimensions See drawing. L = 1150 mm.
- Weight 4,2 kg
- Surface temperatures Surface temperature may reach up to 70°C depending on operating conditions



4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

4.4 Electrical Connections

4.4.1 Power Output

The output of the Pickup must be connected to a suitable Regulator. The use of an extension cable between the Regulator and the Pickup is generally not allowed.

For minimal interference and maximum electromagnetic compatibility, route the Pickup cable away from other cables, and at a minimum distance of 15 millimeters – one time the cable diameter – away from any metal structure.

4.4.2 Ground Connection

All electrical equipment must be connected together to the vehicle frame to ensure an equipotential bonding. The ground output of each plug must therefore be connected. In the same way, make sure to connect the housing of the device to the vehicle frame (GND) and not rely only on the connection to ground provided by the power connector. The reason is that if the connection with the Regulator is removed while the IPT® primary is active, then the device is still internally energized though the ground connection is broken.

5 Scope of Delivery

Mounting elements (screws...etc...) are not included in the scope of supply. No other parts are necessary for the connection of a Pickup to a Regulator.

6 Transport and Storage



The transport company must be advised about any damage that has been detected after delivery. Prior to installing or starting operation with damaged components please consult the supplier.

Refer to chapter 4 "Technical data" for required transport and storage conditions.

4 kW E-Pickup

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7 Installation

7.1 Who is Authorized to Carry out the Installation



All installation and commissioning work as well as maintenance work and disassembly have to be carried out by qualified staff (IEC 364 respectively CENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110 and national safety rules).



Qualified staff according to the safety regulations are persons who are familiar with the assembly and installation of the energy supply system and who have the appropriate qualifications.

7.2 General Advice for the Installation



After receipt of the components, and prior to starting the installation work:

- Unpack the components and check carefully for damage that may have occurred during transport or storage (damage to housings and insulation, missing parts etc.).
- Check data on the identification plate to make sure that the components meet the requirements with regard to nominal power and voltage and that they are matching parts to the Regulator used.
- Check completeness of the documents and conformity with the delivered components.

Pickups have to be installed on an even surface and in a permanently safe position. An improper installation of the energy supply system has a negative impact on the function, the efficiency and the lifetime of the device. It is therefore important to observe the specification for the choice and place of installation. The guarantee will expire if this is not observed.

Follow the instructions of chapter 7.4 for attaching a Pickup to a supporting structure. See also chapter 4.4.2 for making the connection to ground.

7.3 Electrical Regulations



The general electrical operating conditions according to VDE 0100 (installation and operation of electrical equipment up to 1000 V) have to be observed. If necessary apply the local regulations when they go beyond or differ from these requirements.

4 kW E-Pickup

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7.4 Place and Conditions of Installation



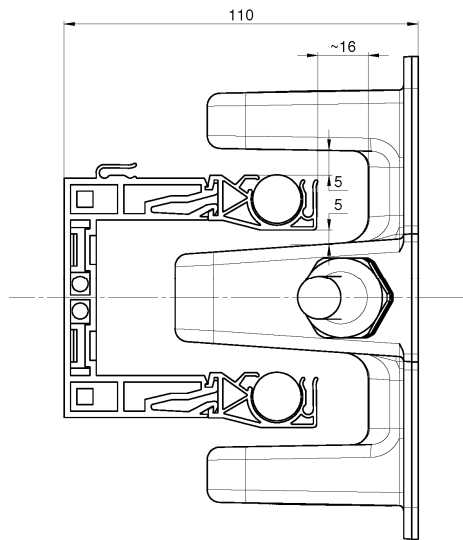
Install the Regulator in an environment and under conditions as specified in this document only. The Pickup is to be attached to a solid base, ensuring free space around the device to provide sufficient cooling air circulation.

The available output power as specified in this document strongly depends on the ambient conditions of the device. Refer to chapter 4.1 for more information.

7.4.1 Position



Maximum tolerances are given in the illustration below in the case of an installation in nominal position over a straight IPT® Track.
Tolerances must be defined taking into account the whole system design, i.e. curves, bifurcations or obstacles in order to avoid any risk of collision.



Technical data stated in this manual are given for Pickups when mounted in their nominal position:

- horizontal: 110 mm*
- vertical: centered between the IPT® Track cables
- parallel to the primary Track (see below)

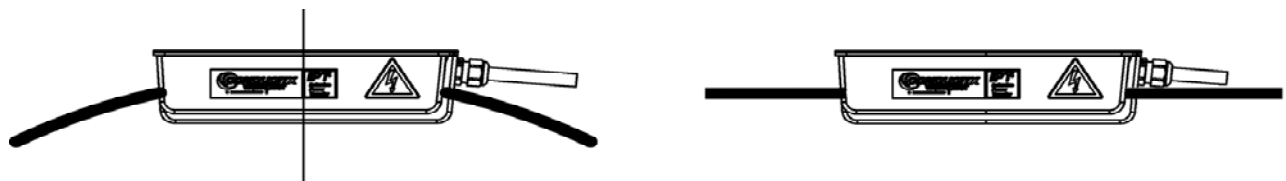
Tolerances:

- horizontal: +20 / -10 mm
- vertical: ± 5 mm

The vertical tolerance is for mechanical purpose only, in order to avoid collision. The horizontal tolerance will strongly affect the output characteristic; refer to chapter 8 for more information.
The non variable parameter is understood to be at nominal value.

*: between the supporting structure for the cable holders and the aluminum plate of the Pickup (see illustration).

The nominal position of a Pickup on a straight Track as well as in curves is parallel to the IPT® Track cables.



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7.4.2 Air Flow Required

The heat power of the Pickup is dissipated by convection and radiated cooling only. Ensure that free flow of air is guaranteed around the device at all times. It is essential to make sure that the air flow is not hindered in any way by objects and that the device is protected from additional heating, i.e. exposure to sun light or hot air flow from inverters, proximity to brake resistors.



Confined areas must be adequately ventilated, allowing also for the heat generated by the Pickup which can reach about 150 W under full load conditions.



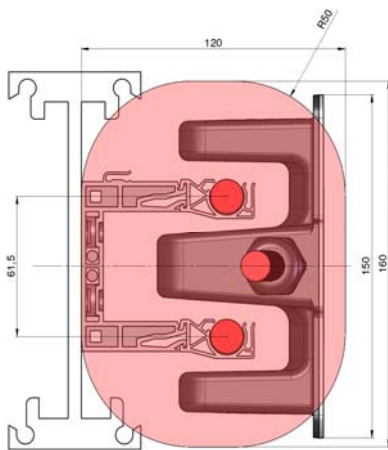
Failure to satisfy these requirements may result in reduced performance, damage and/or reduction in lifetime.

7.4.3 Proximity to Iron / Steel

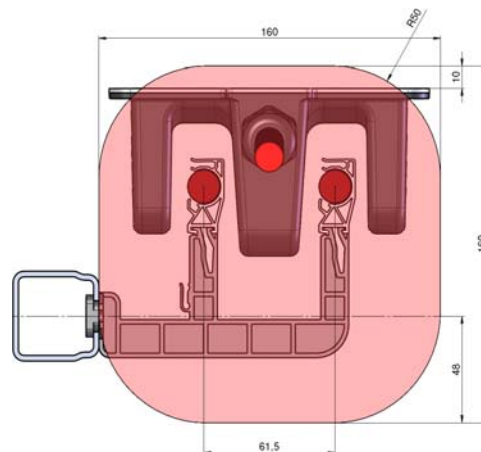


Ferromagnetic material (iron, steel...) will influence the characteristics of the Pickup, i.e. lower output power, production of additional heat/losses, etc. We strongly recommend to respect the specifications for areas free of ferromagnetic material as shown in the illustration below for Pickups, and even to go beyond these requirements whenever possible.

For recommended areas free of ferromagnetic material around the Track cables, please refer to the entire documentation related to the installation of an IPT® system.



For use with Regulator "EMS" version.



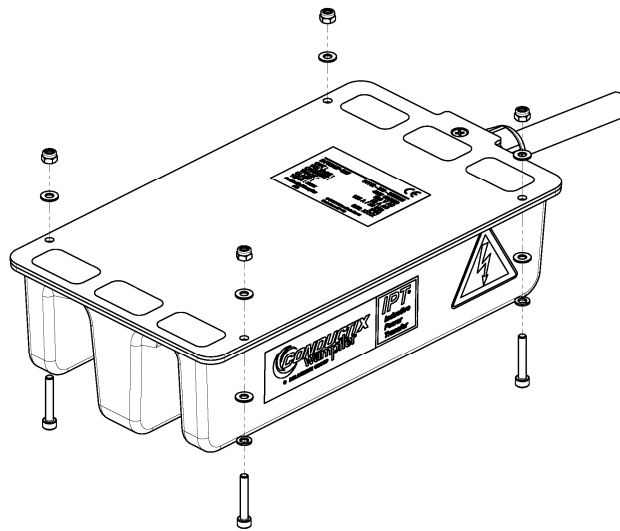
For use with Regulator "AIR" version.

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7.4.4 Attachment Points

Use the four holes available on the plate to attach the Pickup to a supporting structure. We recommend the use of washers on both sides of the plate. The positions and dimensions of the holes are shown in chapter 4.3 "Mechanical Integration".



4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

8 Positional Tolerances

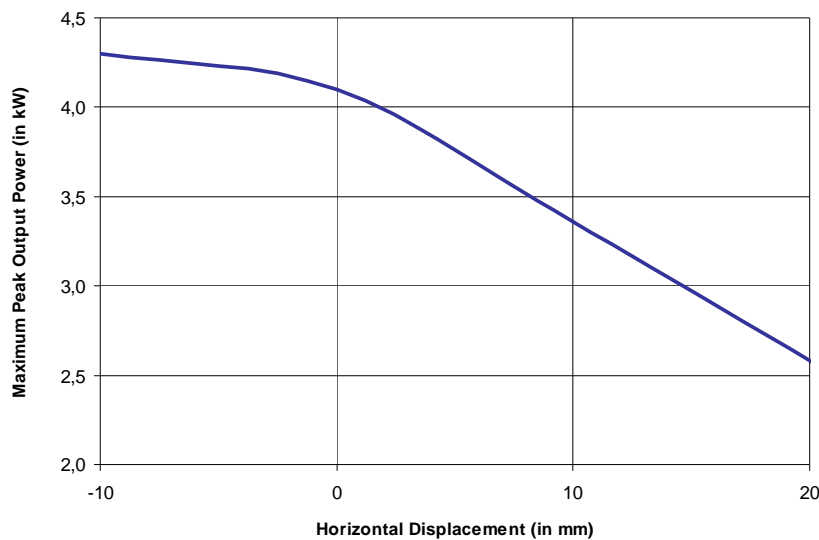
The data concerning Pickups specified in this documentation strongly depend on the interaction with the attached Regulator. The validity of these specifications depends on the respect of the nominal position of a Pickup and its environment (see chapter 7.4), but also relies on the adequate environment of the Regulator attached to it. Always refer together to the operating instructions of a Regulator and of its designated Pickup.

The power ratings - peak power as well as continuous power - of the combination Pickup and Regulator will be affected by the relative position of the Pickup to the IPT® Track and therefore by the layout of the Track, i.e. bifurcations, curves, influence of ferromagnetic material, etc. See chapter 7.4.

The following curve shows the typical output power over a straight IPT® Track as a function of displacement for use with both:

- Regulator 91012-411-3090871 for electrified monorail systems or similar → EMS
- Regulator 91012-411-3090872 for other systems without aluminum or ferromagnetic structure in close proximity → AIR

The nominal position is taken as reference and is shown as 0 mm. A positive displacement i.e. +20 mm is when the Pickup is further away from the Track cables. A negative displacement is when the Pickup is closer. Please refer to chapter 7.4.1 for the definition of the nominal position.



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9 Warnings and Cautions



All electric work has to be carried out by qualified staff (IEC 364 respectively ENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110 and national safety rules).

Qualified staff, according to safety regulations, are persons that are familiar with the installation, commissioning and operation of the energy supply systems and that have the appropriate qualifications.



The devices are only foreseen to be operated in conjunction with matching IPT® components. If you are not sure whether components match, contact Conductix-Wampfler. Do not put into operation before.



Do not use the output of the Pickup for any other reason than to connect it to a corresponding Regulator. Connecting the Pickup to a Regulator should only take place when the IPT® Track is not under power.

Route power and control cables separately so that no interference can occur.

Do not install an obviously damaged device. Do not take damaged devices into operation. Severe damage may result. Ensure that protection device and other preventive measures taken comply with the applicable regulations. Make sure that all connected circuits fulfill at least the same safety standards as the Pickup and fulfill requirements for safe operation.

During or after operation surfaces of Pickups may be hot. Use caution! Prevent access to hot surfaces if necessary. Refer to chapter 4.3 "Mechanical Integration" for more information.

Ensure adequate ventilation. Refer to chapter 7.4 "Place and Conditions of Installation".

Do not open Pickups, do not insert any objects inside, do not touch connection terminals. The only safe means of working on circuits connected to the device is to ensure that the primary Track is switched off and then to disconnect physically the plug. Make sure that connections are not removed under dangerous conditions, i.e. under load. Improper handling can result in electric shocks or burns as well as damage to the devices!

Do not perform any work on or around the device while in operation. **Life threatening danger of electrical shock!**

4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

10 Maintenance



There is no specific maintenance required other than checking regularly that a free air flow for cooling is given and that there are no damages visible from the outside which could indicate collisions.

Strong soiling or obstacles that would prevent sufficient cooling conditions must be avoided.



Caution: metallic parts may be heated by induction. The presence of small ferromagnetic parts must be avoided along the travelling path of the Pickup.

Any repair work is only possible at Conductix-Wampfler.

11 Repair



If a fault cannot be attributed to external conditions of operation the device needs to be repaired by a specialist.

Unless otherwise arranged return parts to your nearest Conductix-Wampfler facility or to Conductix-Wampfler GmbH for repair. Before returning any parts contact Conductix-Wampfler for specific instructions. Be sure to include the following information when returning parts to Conductix-Wampfler:

- Product name
- Material number
- Serial number
- Application/Installation, in case with a brief description
- Wiring schematic of overall system, if at hand
- Fault description
- Circumstances the fault occurred at, especially if any unusual events preceded the fault
- Presumption what could have caused the fault
- Photo, if available

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12 Disassembly and Re-use



If it is necessary to exchange a Pickup due to damage or to install it in another place, verify that no damage will occur during disassembly.



For installation in another place observe the described mounting and commissioning instructions. Improper application, installation or operation involve the danger of severe injuries to persons and damage to objects.

All electric work has to be carried out by qualified staff (IEC 364 respectively, CENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110 and national safety rules).

Qualified staff, according to the safety regulations, are persons that are familiar with the installation, assembly, commissioning and operation of the energy supply system and that have the appropriate qualifications.

12.1 Safety Advice for Disassembly and Disposal

1. Disconnect the IPT® system from the mains voltage.
2. Make sure the system cannot be powered up again accidentally.
3. After disconnecting the Track Supply from the supply voltage wait at least 5 minutes for internally stored energy to discharge.
4. Dismount the device.
5. Dispose of components in a specific way → Recycling.

12.2 Recycling

The unit contains components that have to be disposed of in a specific way. If it is not used any longer, it will have to be recycled properly.

Dispose of the materials separately in accordance with the current regulations, i.e. separate, aluminum plate, copper, plastic housing etc. or hand over the unit to a recycling specialist.

4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

13 Accessories

The output of a Pickup must be connected to a suitable Regulator. The use of an extension cable between the Regulator and the Pickup is generally not allowed.

Both Regulator and Pickup strongly depend on each others. Please refer to both operation manuals together. Limiting conditions for one device limit the operation of the other, i.e. if the ambient temperature around a Regulator is higher than the one specified, the maximum continuous power available will be decreased even if the Pickup itself is sufficiently cooled.



Corresponding Regulators must be ordered separately through Conductix-Wampfler, i.e. typically:

EMS Version is material number: 91012-411-3090871

AIR Version is Material number: 91012-411-3090872

For details on the version to order, please refer to the product documentation or contact Conductix-Wampfler.

14 Tools

There are no special tools required.

Operation Manual



4 kW E-Pickup

40% Duty Cycle, 1150 mm Cable, Q4/2 Plug

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