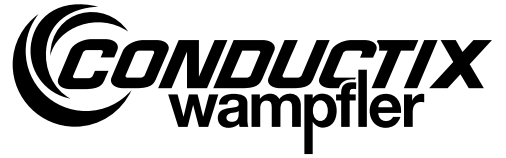


# Operating Instructions

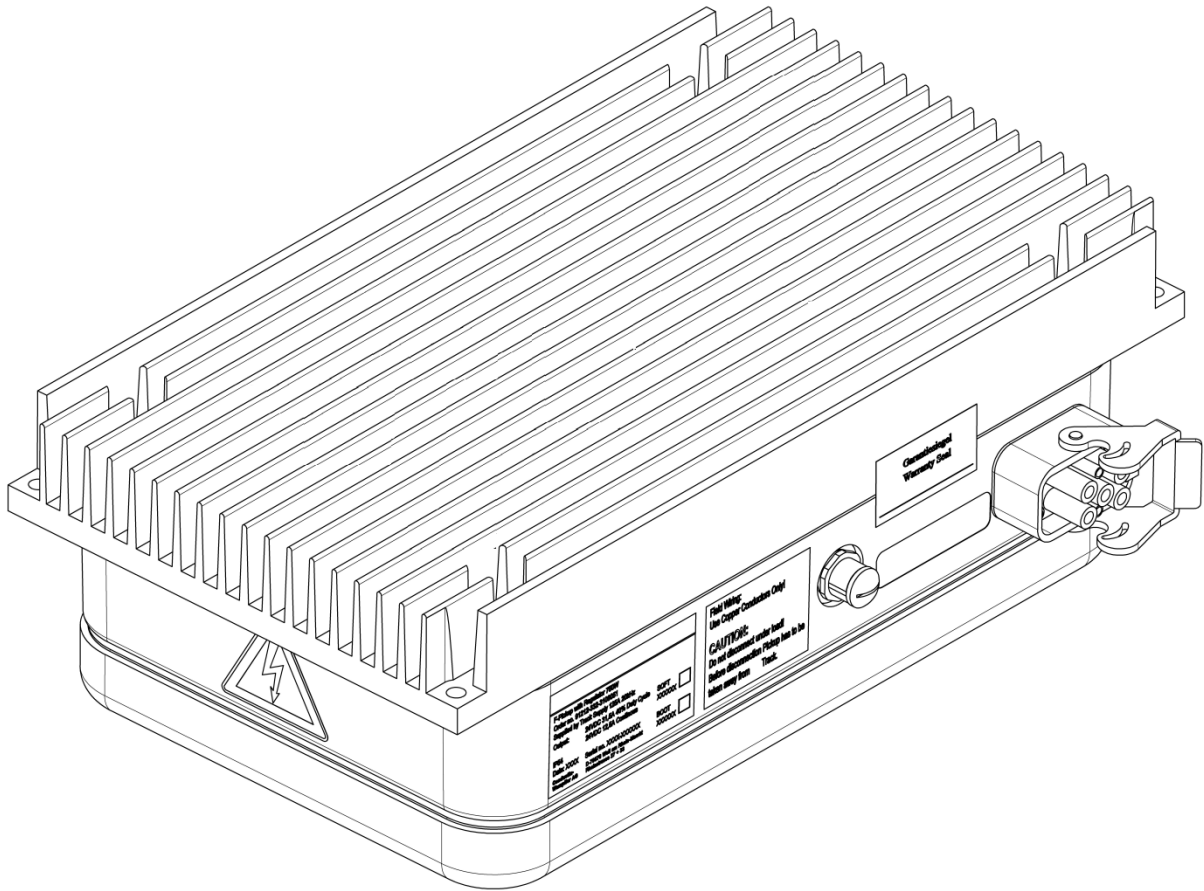


750 W 27 V pickup  
CQF 04/2 + Interface M12

## Order number

91212-332-3124850

F-Pickup 750 W 27 V DC CQF 04/2 Controller IV



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### Note:

The names used in the following document are protected by copyright and are the property of their respective companies. We reserve the right to make technical changes to the illustrations and specifications in this document in order to improve the energy supply system and its functions. For system details, please refer to the corresponding documentation. Please take note of the system documentation during any work on the system or when operating the system.

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## **1 General notes**

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### **1.1 Information about these operating instructions**

These operating instructions make it possible for you to work with the device safely and efficiently.

The operating instructions are a part of the device, and must be kept accessible to personnel, in the immediate vicinity of the device, at all times. Personnel must read these instructions carefully and understand them before starting any work. A basic prerequisite for safe work is compliance with all safety and operating guidelines in these operating instructions.

Local accident protection regulations and general safety guidelines for the area of use of the device also apply.

Illustrations in this documentation are provided for basic understanding and may deviate from the actual implementation of the unit. All given values are based on the metric system. Dimensions without a unit of measurement are generally given in millimeters (mm).

Supplementary instructions for specific applications in the installation instructions, e.g. MV9100-0032 or MV9100-0037 for floor installations and especially the EHB installation instructions must be observed if relevant for installation and operation of the device.

Design, adjustments and commissioning may only be carried out by trained specialist personnel from Conductix-Wampfler.

### **1.2 Limitation of liability**

All data and information in these operating instructions have been compiled while taking the valid standards and regulations as well as the state-of-the art and our many years of experience and knowledge into consideration.

Conductix-Wampfler accepts no liability for damage resulting from:

- Failure to comply with operating instructions
- Improper use
- Use by untrained personnel
- Unauthorized modifications
- Technical changes
- Use of unauthorized replacement parts or accessories

The actual scope of delivery may differ from the explanations and descriptions provided here if the model in question is a special one, if additional equipment has been ordered or due to recent technical changes.

The obligations agreed upon in the delivery agreement and our general terms and conditions of business apply, as do the delivery conditions of Conductix-Wampfler and the legal regulations applicable at the time the contract was concluded.

All products are subject to technical modifications, within the context of improvement of function and further development.

## 1.3 Copyright

These operating instructions are subject to copyright, and exclusively intended for internal use by the customer.

Provision of the operating instructions to third parties, reproductions in any form – even in part – as well as the reuse and/or disclosure of their content are not permitted without the written approval of the Conductix-Wampfler, except for the customer's internal use.

Breach or infringement will result in liability for damages. Our right to further claims remains unaffected.

## 1.4 Replacement parts



**WARNING!**

**Incorrect replacement parts are a safety hazard!**

Incorrect or faulty replacement parts can impair safety and result in damage, malfunctions or complete failure.

→ Only use original Conductix-Wampfler replacement parts!

Replacement parts can be ordered an authorized dealer or directly from Conductix-Wampfler.

## 1.5 Material defects

The terms governing material defects can be found in the General Terms and Conditions of business.

## 1.6 Technical support

Our customer support staff is available for technical support. See the last page of these operating instructions for contact information.

We are also always interested in new information, experiences and feedback from the field that can help us improve our products.

## 2 Safety instructions

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### 2.1 Explanation of symbols

Safety and hazard information is identified in these operating instructions by symbols. Safety instructions are introduced by signal words that indicate the degree of the hazard. Always observe safety and hazard instructions, and work carefully to avoid accidents, bodily injury and damage to property!



**DANGER!**

... indicates an immediately hazardous situation, which if not avoided, may result in death or serious injury.



**WARNING!**

... indicates a possibly hazardous situation, which if not avoided, may result in death or serious injury.



**CAUTION!**

... indicates a possibly hazardous situation, which if not avoided, may result in moderate or minor injury and property damage.



**NOTE!**

**Tips and recommendations:**

... provide useful tips and recommendations as well as information for efficient and trouble-free operation.

#### Special safety notes

The following symbols indicate special risks:



**DANGER!**

This combination of symbol and signal word indicates an imminently dangerous situation due to electrical current and/or electrical voltage. Failure to observe any such notice will result in death or serious injury.



**WARNING!**

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.

### 2.2 Personnel requirements

#### 2.2.1 Qualifications



#### WARNING!

##### **Inadequately trained persons are at risk of injury!**

Improper use can result in serious injury to persons and property.

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

The following qualifications are mentioned in this operating instructions for different areas of operation:

##### ■ **Adjustments**

Design, adjustments and commissioning may only be carried out by trained specialist personnel from Conductix-Wamplier.

##### ■ **Trained personnel/operators**

have been instructed in an instruction session by the operator with respect to the tasks assigned to them and the potential dangers arising from improper actions.

##### ■ **Specialist personnel**

consists of persons capable of performing assigned tasks and independently identifying and avoiding potential hazards based on their specialist training, knowledge and experience as well as their understanding of the applicable regulations.

■ Only persons who can be expected to perform their work reliably are acceptable personnel. Persons whose responsiveness is influenced by drugs, alcohol, or medications, for example, are not permitted.

■ When selecting personnel, all age- and occupation-specific regulations applicable at the place of use must be observed.

#### 2.2.2 Unauthorized personnel



#### WARNING!

##### **Danger due to unauthorized personnel!**

Unauthorized persons who do not meet the requirements described here are not acquainted with the dangers in the working area.

→ Keep unauthorized persons away from the working area.

→ In case of doubt, address the person and direct them away from the working area.

→ Stop working as long as unauthorized persons are in the working area.



### 2.3 Advisory information for the user



**DANGER!**

**Electric shock and/or burns as well as other damages may occur due to improper use!**

- This device contains life-threatening voltages.
- There are no user-serviceable parts in the device.
  - Do not open and do not insert any objects inside.
  - Do not manipulate the plug connections!



**WARNING!**

**Inadequately trained persons are at risk of injury!**

Improper use can result in serious injury to persons and property.

- All installation and commissioning as well as maintenance and disassembly has to be carried out by qualified personnel (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 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.

These operating instructions contain only information on the specified pickup. Observe all data and instructions given in this document. Ensure that the device is operated under the specified conditions only.



**NOTE!**

Do not operate the device unless it is ensured that the machine/system in which it is integrated complies with the relevant standards and regulations.

Conductix-Wampller cannot be responsible for damage and breakdown that have been caused by not observing these operating instructions.

We reserve the right to make technical changes to the illustrations and information in these operating instructions. References to other documents refer to the document number and do not include the currently valid revision index. Refer to the project handbook when available for a list of relevant documents.

### 3 Intended use

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The device is intended for operation in conjunction with other Inductive Power Transfer components intended for contactless transmission of electrical energy. A pickup generates a DC voltage from an AC-generated magnetic field of a primary track. The device is not suitable for stand-alone operation and must be used in conjunction with the appropriate components. The device may only be used in conjunction with input components manufactured by Conductix-Wampfler GmbH. Only qualified personnel may operate this equipment. Repairs must be made exclusively by Conductix-Wampfler employees.



#### WARNING!

#### Hazard due to improper use!

Any application that deviates from or goes beyond the intended use of the devices can result in hazardous situations.

- The device may only be used as intended.
- Follow all information in these operating instructions strictly.
- The following uses of the device are forbidden.

Non-intended use particularly includes the following:

- Using the device with unapproved accessories not authorized by the Conductix-Wampfler.
- Operation of the device by untrained personnel
- Operation of the device outdoors.
- Operation of the device in areas at risk for explosions
- Operation of the device outside of the specifications
- Operation of damaged components
- Misuse of the device e.g. as a climbing aid
- Use of the device without additional measures to charge batteries or other energy storage devices (The device is **not** a charger and therefore has no corresponding sensors, protective measures and charging algorithms!)

We do not accept any liability for damage arising from improper use. The operator bears sole liability for all damage that result from improper use.

## 750 W 27 V pickup CQF 04/2 + Interface M12

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### 4 Technical data

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#### NOTE!

The data given in this chapter is valid only if the environmental conditions (nominal position, ambient temperature, etc.) are complied with.

For example, deviations in the environmental conditions of the tracks, such as nominal position and ambient temperature at the pickup, may lead to a reduction in output peak and continuous output power or other variations. As a rule, an attempt should be made to guide the device to the nominal position with a tolerance of  $\pm 20$  mm and, if possible, not to swing the device too far out of the area of the field around the track cables.

#### 4.1 Electrical data

- Input Track: 125 A 20 kHz, conductor distance 100 mm
- Output voltage 27 V DC  $\pm$  7%
- Maximum output current 27.8 A DC
- Output peak power 750 W 40% ED\*
- Output continuous power 450 W @ min. 24V DC  
(track: 125 A)
  - at 20°C ambient temperature
  - averaged over a period of 10 minutes
  - with an air flow of min. 0.1 m/s in nominal position  
  - 300 W @ min. 24V DC
  - at 40°C ambient temperature
  - averaged over a period of 10 minutes
  - with an air flow of min. 0.1 m/s in nominal position
- Power loss <50 W at full load
- Electrical protection Class II (reinforced insulation)
- Insulation to ground Output to ground tested at 3.7 kV DC/10 sec.  
*EN 50178*
- Max. current isolated 24 V 150 mA (not suitable for external users)  
Supply (interface connector)
- Standby consumption approx. 10 W (switched on) or approx. 5 W (switched off)  
(without load)

\*max. 4 minutes (see chapter 7.4 and 8.3)

## 750 W 27 V pickup CQF 04/2 + Interface M12

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### 4.2 Ambient conditions

- **Storage temperature**                    -25°C to +55°C  
*EN 60721 | Class 7K3*  
*EN 60721 | Class 7K3*
  
- **Transport temperature**                -25°C to +70°C  
*EN 60068-2-1 | Class 7K3*  
*EN 60068-2-2 | Class 7K3*
  
- **Ambient temperature operation** +5°C to +40°C  
IEC 60068-2-1; IEC 60068-2-2  
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.  
The use in explosion-prone areas or in areas where the pickup is exposed to harmful oils, acids, vapors, dust, gases, radiation, humidity, etc. is explicitly forbidden.
  
- **Humidity**                                    < 85%, non-condensing  
*EN 60068-2-78*
  
- **Vibration**                                    IEC 60068-2-64; IEC 60068-2-6; IEC 60068-2-27  
*EN 60721-3-7 | Class 7M1*
  
- **Chemical resistance**                    For industrial use without special conditions.  
Any specific influences of chemicals must be checked.
  
- **Protection**                                    IP20 / IP54 (with plug connected)
  
- **EMC**    The device is intended for use in industrial environments.  
*EN 55011 | Class A*  
*EN 61000-6-2*  
*EN 61000-6-4*
  
- **Installation height**                    Up to 1000 m. Above this height, only a reduced output power is available.
  
- **Transport**                                    *EN 60721-3-2 | Class 2M2*
  
- **EMF**    < 6.25  $\mu$ T  
*EN 50413:2008*

### 4.3 Device protection

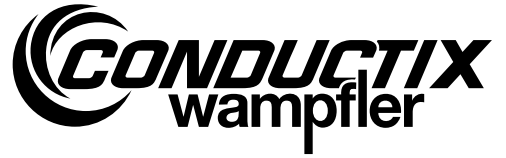
The device is equipped with the following functions which protect the device:

- Overload Automatic shutdown at an output voltage > 32 V DC.  
Output protected up to 100 V (protection against reverse polarity)
- Interlock DC output Automatic switch-off with unplugged plug
- Overload/undervoltage Hiccup mode, see chapter 8.6
- Energy recovery Protected up to 50 V against energy recovery.
- Excessive temperature Automatic shutdown by internal temperature monitoring.  
e.g. by exceeding the permissible ambient temperature and/or the maximum permissible output power

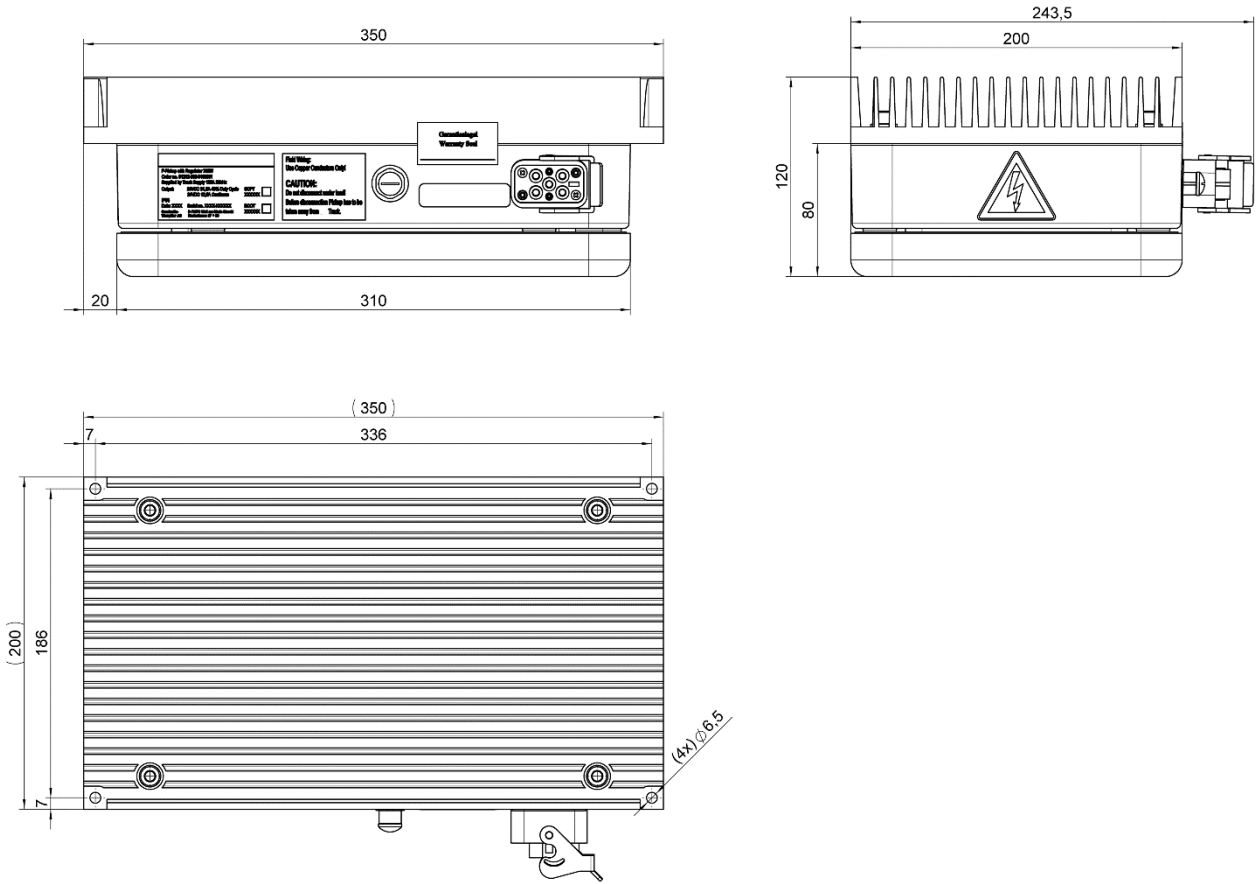
### 4.4 Mechanical integration

- Dimensions See drawings
- Weight approx. 10.2 kg (without connecting cables)
- Surface temperature Heat sink surface temperature max. 70°C, depending on operating status
- Nominal air gap All given data refer to a nominal air gap of 10 mm between the lower edge of the pickup and the ground surface.  
Observing the installation instructions MV9100-0032 and MV9100-0037 for floor installation, this results in an effective distance of 15 to 16 mm between the lower edge of the pickup and the upper edge of the track line. Please refer to 8.3 regarding further relevant tolerances.

# Operating Instructions

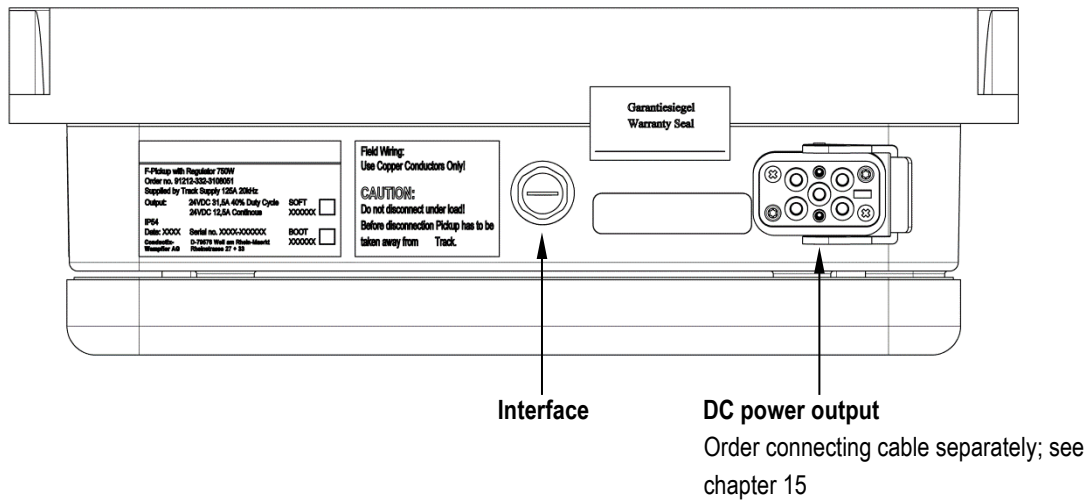


## 750 W 27 V pickup CQF 04/2 + Interface M12



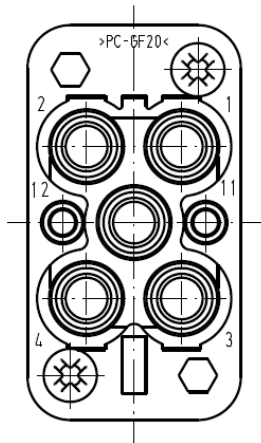
### 4.5 Electrical connections

- DC power output CQF 04/2 (ILME) or comparable



## 750 W 27 V pickup CQF 04/2 + Interface M12

### 4.5.1 DC power output connection



PIN 1	+ 27 V DC
PIN 2	+ 27 V DC
PIN 3	0 V
PIN 4	0 V

PIN 5  Ground

PIN11 pilot contact 1  
PIN12 pilot contact 2

(Shown: socket side at the pickup)

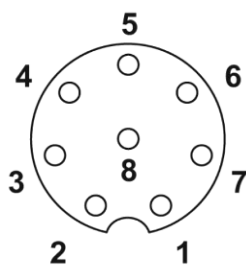
Source: Harting



Make sure that all output lines are dimensioned according to the maximum output current. The output leads must have sufficiently large cross-sections to keep the voltage drops on the leads as small as possible.

The device is connected to the load using all four outputs, two positive and two negative. The cable lengths of the connecting cables of the same polarity must be within 2% of their total length so that the current is divided equally.

### 4.5.2 Interface connection



(shown: socket side)

PIN 1	24 V DC isolated
PIN 2	0 V DC isolated (150 mA max. No external supply: see section 8.1)
PIN 3	COM (Together for the 3 output relays "Warning," "Error" and "Status")
PIN 4	Release (Must be connected for starting up the pickup! See section 8.1)
PIN 5	Warning
PIN 6	Error
PIN 7	Status (Relay with potential-free contacts, for 30 V DC/5 A max.)
PIN 8	Ground

### 4.5.3 Ground connections



**DANGER!**

#### **Risk of electric shock!**

Any electrical equipment on the vehicle must be at a common potential (e.g. the vehicle frame). All ground connections must therefore be connected.

- Make sure that the heat sink is also grounded in a corresponding manner.
- Do not rely on the connecting cables alone, as the pickup will not be de-energized and without voltage even without connecting cables, as long as the primary side of the IP® system is active.

### 4.5.4 ESD protection



**DANGER!**

#### **Risk of electric shock!**

Because the inductive power transmission system is an isolated system, depending on the vehicle design, ambient conditions, etc., charges can build up on the vehicle and be stored there.

- Make sure to provide an appropriate solution to dissipate this energy above ground on the system side (e.g. conductive floor coating and discharge brushes, conductive rollers or similar) to avoid building up such energy in order to ensure protection against the effects of electrostatic discharge.

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## 5 Scope of delivery

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Cables and plugs are not part of the scope of delivery. Additional information can be found in chapter 14.



## 6 Transport, packaging and storage

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### 6.1 Transport

#### 6.1.1 Safety instructions for transport



#### CAUTION!

##### Possible damage from improper transport!

Improper transport can result in substantial property damage.

- Unload packaged parts upon delivery and during internal transport with care, and observe the symbols and the hazard information on the packaging.
- Only remove packaging just before installation.
- The handling of the device must be carried out within the approved parameters (see chapter 4.2).
- The devices must always be shipped and transported in suitable packaging.

#### 6.1.2 Transport inspection

Check the delivery for completeness and transport damage immediately on receipt.

If transport damage is externally visible, proceed as follows:

- Do not accept delivery, or accept it only with reservations.
- Note the scope of damage on the transport documents, or on the transporter's delivery note.
- File a complaint.



#### NOTE!

File a complaint on every defect as soon as it is detected. Damage compensation claims may only be made within the applicable claim periods.

### 6.2 Packaging

The individual packages are packed and marked according to the expected transport conditions for truck transport (closed). If deviating transport is to be used or special packaging and labeling regulations are to be observed, these must be communicated to us in advance.

The packaging is designed to protect the individual components from transport damage, corrosion and other harm until installation. As a result, do not destroy the packaging; remove it only shortly before installation. For subsequent transport or return, it must be ensured that at least equivalent packaging is used and the packing unit is marked as required.

## 750 W 27 V pickup CQF 04/2 + Interface M12

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### Handling packaging materials:

Dispose of packaging material according to applicable legal regulations and local guidelines.



#### CAUTION!

#### Environmental damage due to improper disposal!

Packaging materials are valuable resources and can be reused or usefully processed or recycled in many cases.

→ Dispose of packaging materials in an environmentally appropriate manner.

→ Comply with locally applicable disposal guidelines; if necessary, engage a specialist company to handle the disposal.

## 6.3 Storage of packed parts

### Store packed parts under the following conditions:

- Do not store outdoors.
- Store in a dry, dust-free place.
- Do not expose to aggressive media.
- Protect from direct sunlight.
- Avoid mechanical vibrations.
- Storage temperature: -20°C to +60°C.
- For longer storage, check the proper condition before use.



#### CAUTION!

If the storage temperature or ambient temperature is below 10°C or if the storage or ambient temperature deviates by more than +/-15°C from the operating temperature, the device must be left de-energized and switched off for at least 12 hours at operating temperature. We generally recommend a 12-hour rest period in the de-energized and off state at operating temperature prior to installation and commissioning. Ideally, installation and commissioning should be carried out in the temperature range of 10°C to 30°C.

## 7 Installation

---

### 7.1 Who is authorized to carry out the installation?



**WARNING!**

**Inadequately trained persons are at risk of injury!**

Improper use can result in serious injury to persons and property.

- All installation and commissioning as well as maintenance and disassembly has to be carried out by qualified personnel (IEC 364 respectively ENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110 and national safety rules).

Qualified personnel, 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.

### 7.2 General advice for the installation



**WARNING!**

**Injury due to improper installation and initial commissioning!**

Improper installation and commissioning can result in serious personal injury and/or material damage.

- Unpack components after they are received or before starting the installation.
- Carefully check the components for any transport or storage damage (damaged packaging, damage to housings and insulation, missing parts, etc.).
- Check the specifications on the nameplates and make sure that the respective components correspond to the desired application in rated power and voltage.
- Check completeness of the documents and conformity with the delivered components.
- Mount the device on a level area.
- Make sure that permanent secure attachment is possible.



**NOTE!**

Incorrect or faulty installation can have a negative impact on the function, efficiency and life of the device. Therefore, strictly follow all instructions for installation in this document. Failure to observe these points may void the warranty.

Follow the instructions in chapter 7.4 when you attach the pickup to a receiver. Note chapter 4.5.3 “Ground connections”.

### 7.3 Electrical standards



**NOTE!**

The general connection conditions of VDE0100 apply (installation and operation of electrical systems up to 1000 V). If necessary observe the local regulations when they go beyond or differ from these requirements.

## 7.4 Recommendations about the connections

### 7.4.1 Connection of the pilot contacts at the interlock output

On the socket side (device side), two shortened contacts are installed as pilot contacts to generate a signal. The interruption of this connection signals the device to shut down before the main contacts are pulled out. In this way, the emergence of DC arcs is avoided when pulling out the plug under load (see also chapter 4.3).

If the pilot contacts in the connector half are bridged on the device side, the device cannot detect if the connection cable on the load side is unplugged or interrupted. In this case, protection against DC arcs is not possible. The pickup output is also not de-energized (locking) when the connection line to the load is interrupted. This can lead to unsafe operating conditions.

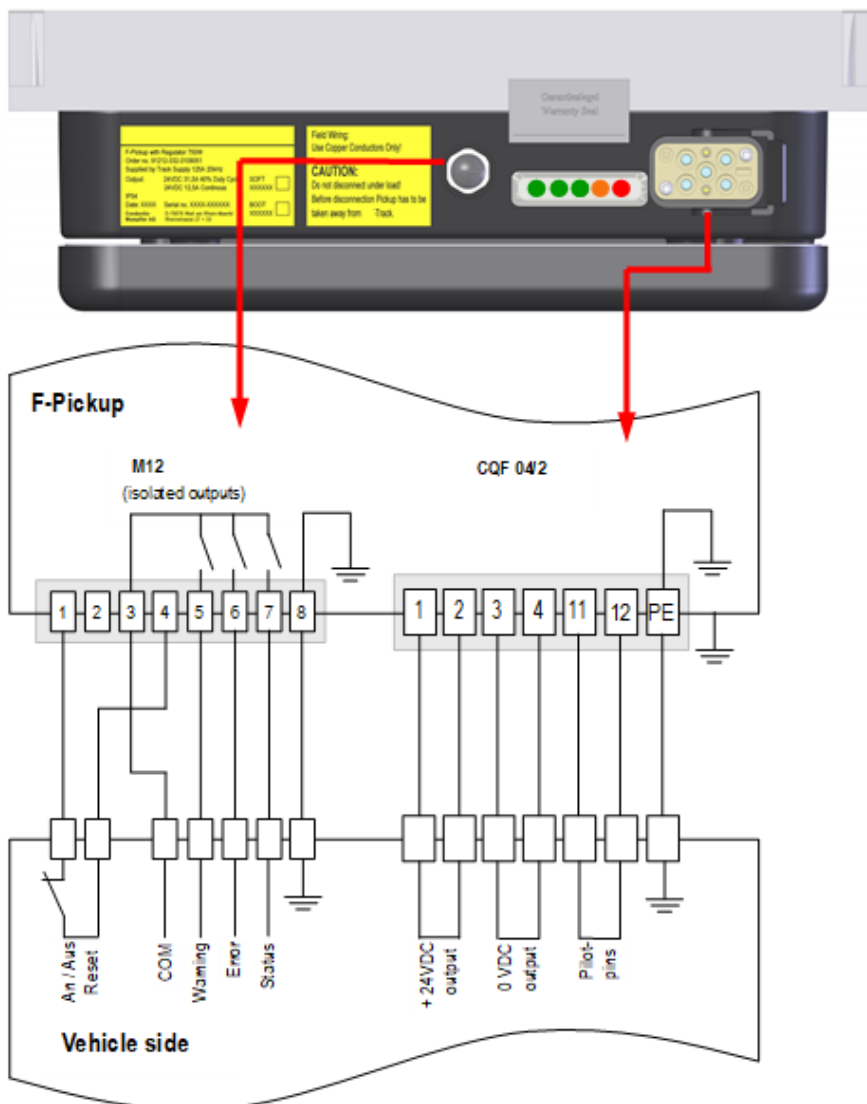
In order to get the full benefit of the pilot contact function, we recommend always making the bridge circuit on the load side. This ensures that the device goes into a safe state, no matter at which point the connection between the load and the device is interrupted. Please note the examples given below.

## 750 W 27 V pickup CQF 04/2 + Interface M12

### 7.4.2 Example: Use of the interface (recommended!)

The following is an example of the connection of the device 91212-332-3108051, if both the power output and the interface are connected (recommended!).

The interface makes it possible to power up and shut down the device under load. It also allows a simple reset of the device in the event of a detected error or protection condition. The basic reset function is achieved by a switch between contacts 1 and 4 on the vehicle side. Due to the low voltage and the isolated design of the interface, a small sized switch can be used (24 V DC / 0.1 A).



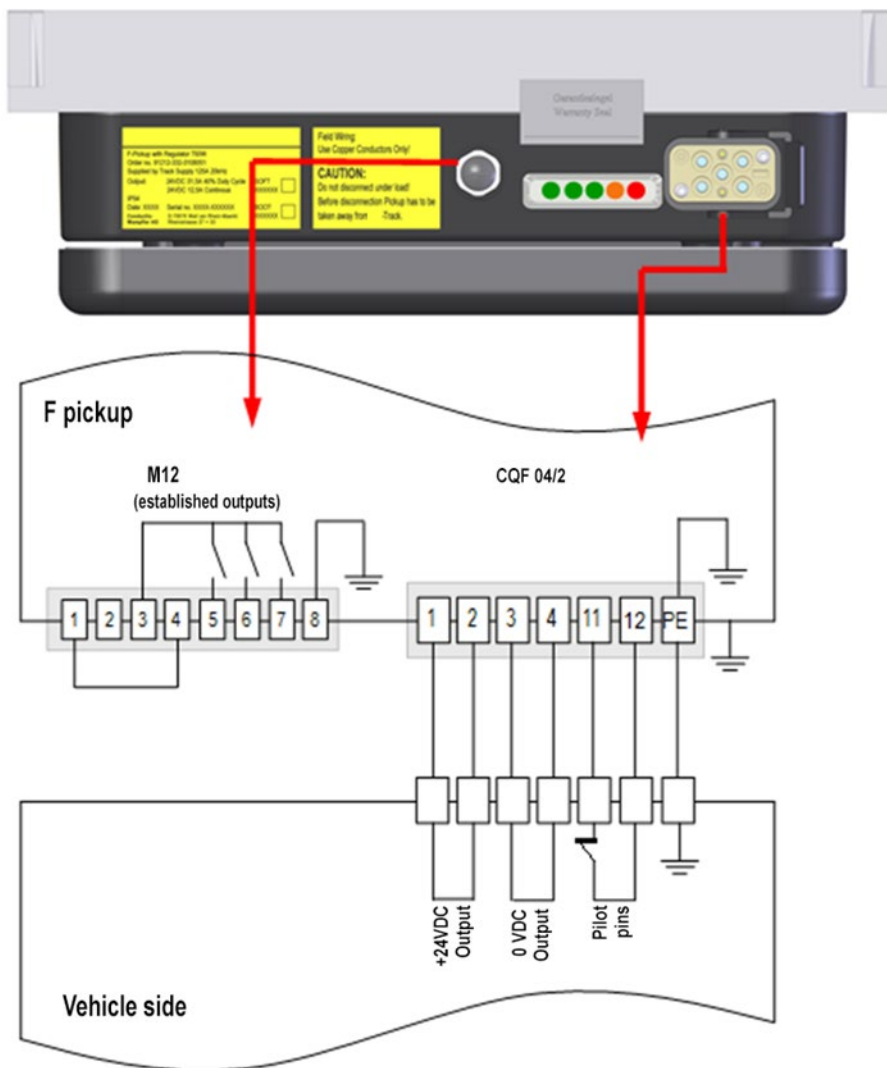
For details on the relay status during startup please refer to chapter 10.

## 750 W 27 V pickup CQF 04/2 + Interface M12

### 7.4.3 Example: Interface not used

Below is an example of the connection of a device 91212-332-3108051 without using the interface. **Even if the signals of the interface are not used, it is necessary to bridge contacts 1 and 4 in order to operate the device (e.g. with “Enable plug set” 91000-400-3089971).**

The pilot contacts are not intended to serve as on/off switches. It is therefore not recommended to interrupt pilot connection under load. The purpose of the switch shown below between the contacts 11 and 12 is resetting in case of error or in the protective state. Further information can be found in chapter 10. The voltage on the pilot contacts is not isolated from the power output, so it must be ensured that the switch used is sufficiently insulated against ground. 24V DC/0.1A is to be dimensioned between the contacts.



For details on the relay status during startup please refer to chapter 10.

### 7.5 Installation location and conditions



#### WARNING!

##### **Risk of injury from improper installation!**

Improper installation can result in serious injury to person and property.

- Install the device in an environment and under conditions as specified in this document only.
- Mount the unit in a horizontal position with the heat sink facing upwards on a solid support structure/surface.
- Make sure there is enough space around the unit to both limit the influence of ferromagnetic material and provide adequate ventilation for cooling.



#### NOTE!

The available output power as specified in this document strongly depends on the ambient conditions of the device. Follow the instructions in this document.

#### 7.5.1 Position

A horizontal position maximizes the efficiency of convection cooling. With inclined mounting, the possible output power must be reduced. Mounting with the heat sink pointing downwards is not permitted.

The devices must be mounted parallel to the primary track and centered over the lines (see drawing). A nominal distance of 10 mm between the underside of the device and the ground surface must be ensured. Correct installation of the primary track, according to the installation instructions, is required to ensure the specified output power in this case.

#### 7.5.2 Required air flow

The thermal loss of the pickup is dissipated by convection and radiated cooling only. Make sure that the air is free to flow around the device or through the cooling fins at any time at min. 0.1m/s. It is also important to protect the device from additional heating, e.g. by sunlight, by the warm exhaust of other devices such as frequency converters or braking resistors, etc.



#### WARNING!

##### **Risk of injury from improper mounting!**

If the device is mounted improperly, the performance of the device will be restricted. Damage can occur and the service life may be reduced.

- Design enclosed installation situations so that adequate ventilation is provided and that the heat released by the unit, up to 50 W under full load, will not cause any damage.

## 750 W 27 V pickup CQF 04/2 + Interface M12

### 7.5.3 Proximity to iron/steel (ferromagnetic materials)

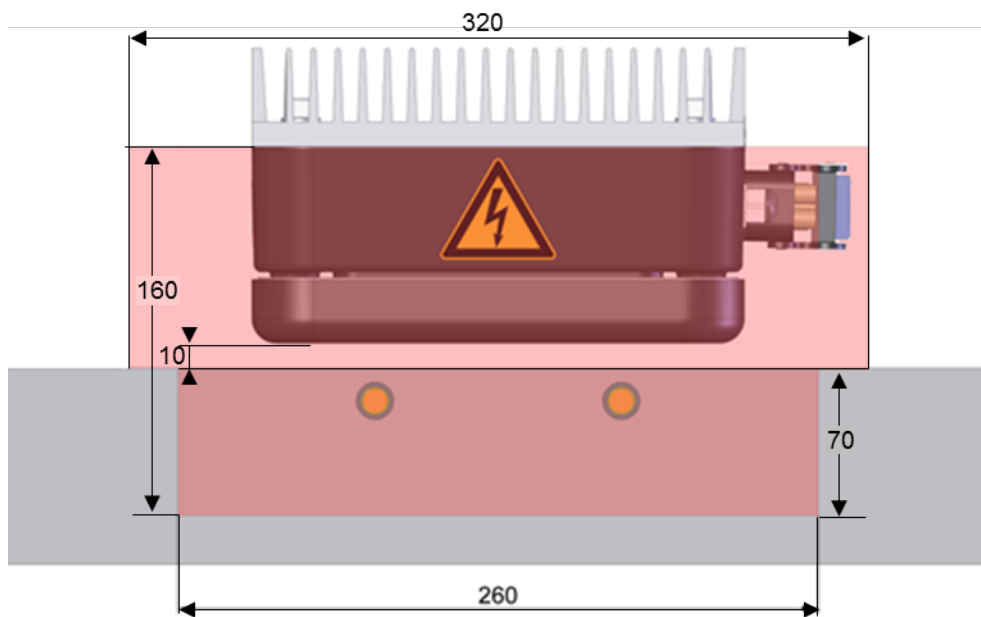


#### WARNING!

#### Impairments due to ferromagnetic materials!

Ferromagnetic materials in the vicinity of the device will affect the behavior of the device; lower output power, higher heat losses, etc. are possible.

- Observe the corresponding notes in our installation instructions for floor installation of systems to ensure that no such material in the ground or on the vehicle has a negative impact on the device.
- We recommend that you observe the "iron-free" range defined in the following drawing. If possible, you should go beyond these requirements.

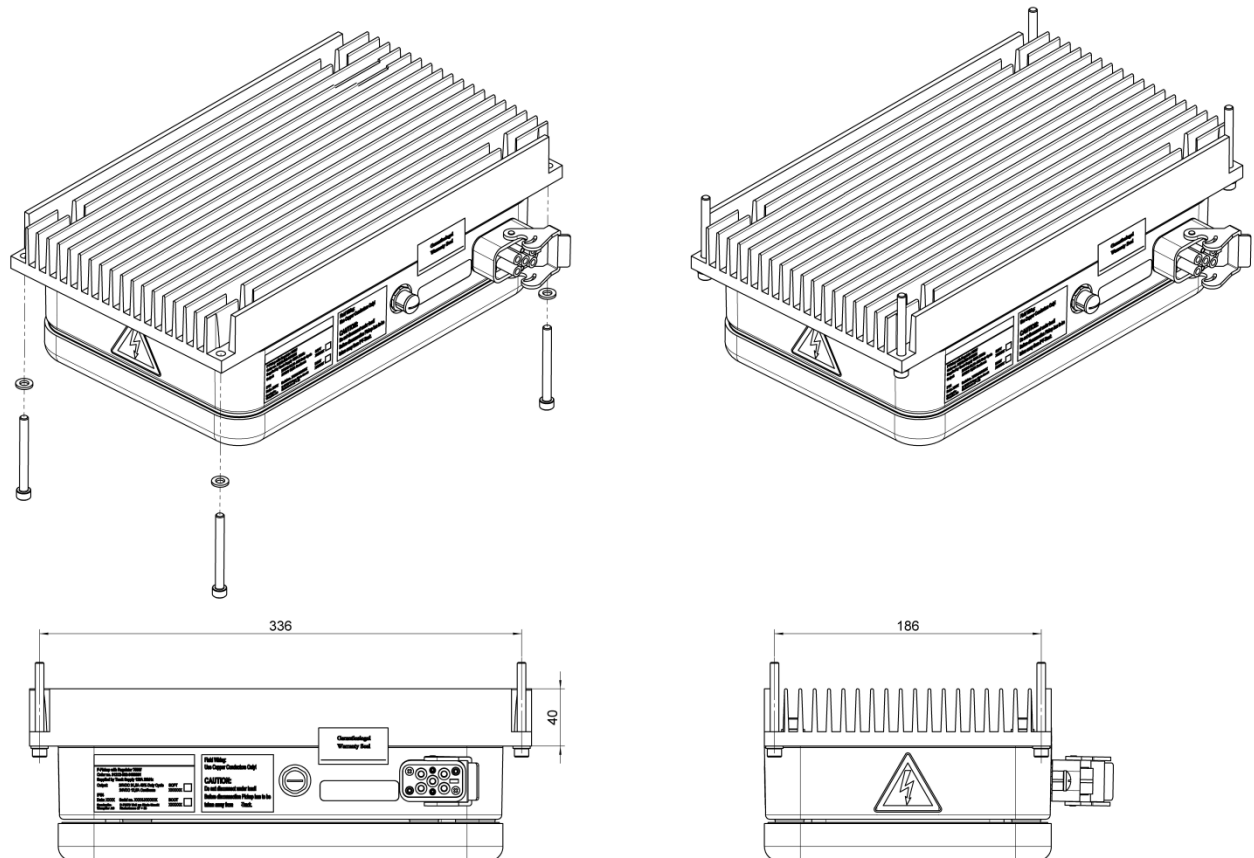




## 750 W 27 V pickup CQF 04/2 + Interface M12

### 7.5.4 Attachment points

The device must be installed in a system without opening the housing. Opening the housing invalidates any warranty claim.



It is important to ensure that the device is mounted properly and cannot be adversely affected by shock or vibration.

It is also important to ensure that the convection cooling is not restricted by installation on the vehicle.

### 7.5.5 Additional mechanical protection measure



#### WARNING!

#### Risk of burns due to hot, metallic objects!

Metallic objects can be heated inductively. Small parts in particular can get very hot.

- Always remove small parts, especially those made of ferromagnetic materials, which lie on the ground in front of the device.
- For example, integrate a cleaning brush on the vehicle in front of the device to free the inductive transmission path of small metallic parts.

## 8 Operation

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### 8.1 Start-up

When the primary track is turned on and a sufficient magnetic field is detected and the pilot contacts 11 and 12 are bridged, the device is ready to start. However, an output voltage is only available at the power output when the device is activated via the interface. Activation of the device can be done in two ways:

- Via a bridge of contacts 1 (internal isolated 24 V) and 4 (release),
- by connecting an external 24 V supply to the contact points 2 (0 V isolated) and 4 (enable).  
The positive pole must lie on contact 4.

Note that in locked mode (contacts 1 and 4 not connected), the internal isolated 24V supply is sufficient only to generate an internal start signal for the device. This must not be used externally as a 24 V supply! If the device is in release mode and the status relay is closed (contacts 3 and 7), the max. permissible current is 150 mA.



#### NOTE!

**If the interface is not being used:**

Even if the existing possibilities of the interface are not being used, it is still necessary to connect the contacts 1 and 4 to start the device!

### 8.2 Shut-down

After switching off the primary side, the devices in this section are also switched off. Individual shutdown of the devices before turning off the primary side is not necessary. To reset the error for a single device, the primary side does not have to be switched off; the device in question can be shut down in a targeted manner. For further details on resetting the device, please refer to chapter 10.4.

If it is absolutely unavoidable to switch the device on and off under load, the best way to do this is via the interface. To do this, briefly disconnect the connection between contacts 1 and 4. Never use the pilot contacts for this purpose.

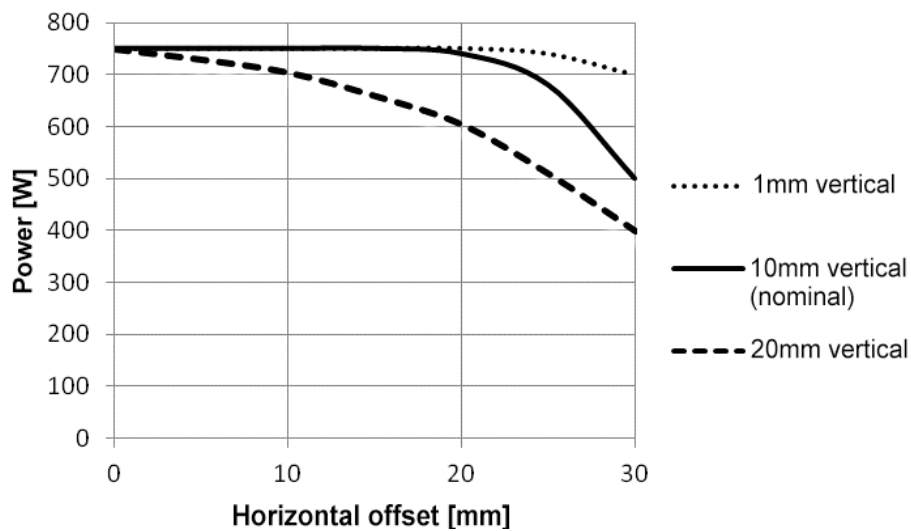
Shut-down (e.g. switching off the pickup via the interface) discharges the energy stored in the device.

## 750 W 27 V pickup CQF 04/2 + Interface M12

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### 8.3 Position tolerances

The available power of a device depends on the strength of the primary field; i.e. the position in which the device stands above the track is important. The power specifications are based on a nominal air gap of 10 mm (floor surface to the lower edge of the device) and positioning above the primary track horizontally in the middle. The following graphs show the typically available output powers over a straight track as functions of a 1. vertical offset (horizontal offset constant at 0 mm) and 2. horizontal offset (vertical offset at 10 mm). The non-variable parameter should be understood as compliant with the nominal position. The output power is also influenced by the layout of the tracks, e.g. branches, curves, ferromagnetic materials in the environment, etc. Further information can be found in the chapter 7.5.



### 8.4 Parallel operation of several devices

Up to three (others on request) of the devices described here can be operated in parallel. Parallel operation refers to the merging of the power outputs (with the exception of the ground connection, see chapter 4.5.3) of several devices. This means the contacts 2, 4, 11 and 12 are to be connected individually for each device.



**DANGER!**

#### **Risk of electric shock!**

If several devices are connected via a bus, the connecting cables can be live, even if they are unplugged on the device side. However, the interface makes it possible to detect when a device is unplugged while other devices are still operating.

- Do not rely on the connecting cables alone, as the device will not be de-energized and without voltage even without connecting cables, as long as the primary side of the IP® system is active.
- Turn off the primary side.
- Check that the status LEDs of all devices are not lit.
- Make sure that the manifolds are de-energized and without voltage.

#### **When using the interface:**

The isolated structure makes it possible to connect the interfaces in series. However, we recommend connecting each port separately to pinpoint and locate exactly where a signal is coming from and to initiate the necessary responses. It may be possible to selectively reset a single device in error mode without having to shut down the entire vehicle.

As mentioned above, it is possible to detect a disconnected/broken connection line. A closed “alert relay” and an open “status relay” while the “on” signal is present is the characteristic feature of such an unsafe condition when other devices are still in operation.

## 750 W 27 V pickup CQF 04/2 + Interface M12

### 8.5 Tips for operating the interface

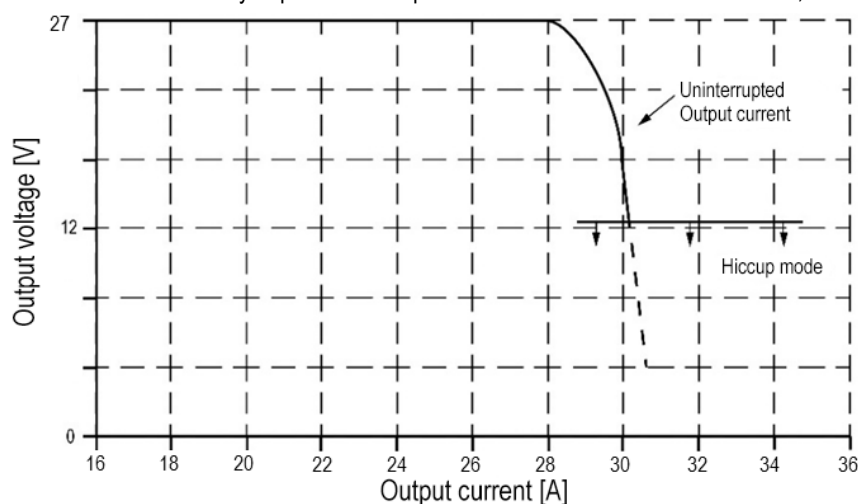
The signals available via the interface (M12 connector) are described below. Additional information about the information states and the diagnosis can be found in chapter 10:

- Error relay (contacts 3 – 6)  
The error relay closes when there is a primary field sufficient for the operation of the basic functions of the device and no faults are present. However, this is no guarantee that the full output power is available (see also chapter 7.5). The error relay opens when there is a error or a track is switched off.
- Alert relay (contacts 3 – 5)  
Is normally opened. It closes upon approach of critical operating conditions (e.g. temperature, overload) and allows the vehicle controller to respond appropriately and avoid automatic shutdown, which could, for example, cause the vehicle to stop in a critical area or critical operating condition. In conjunction with the other relay outputs, conclusions can also be drawn about the pilot contact functions (see chapter 8.5).
- Status relay (contacts 3 – 7)  
Is normally opened. It closes when the power output has been activated (enable) and the device is ready for operation. However, the status of the relay does not guarantee the level of the output voltage. For example, in the case of an overload, the output voltage may be below the nominal value.

### 8.6 Hiccup mode

If the output voltage falls below 12 V or if there is a heavy overload (depending on the position – see chapter 8.3) or in the event of a short-circuit in the output, the device continues to supply output current for a few 100 ms. Thereafter, the output is turned off for about 500 ms before automatically restarting. This cycle is called the hiccup mode and repeats as long as the overload exists. As soon as the overload situation is resolved, the device will operate normally again.

The following diagram shows the typical behavior of the output voltage over the output current in nominal position. The maximum available current actually depends on the position of the device over the track line; see also chapter 8.3.



## 750 W 27 V pickup CQF 04/2 + Interface M12

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In certain operating situations, in particular outside the intended operating window, for example in case of too large offset and/or slight overload, a situation may arise in which the hiccup mode is no longer left. This is recognizable by the fact that power is available sporadically at the output over a longer period of time. It will generally no longer be possible then to supply a drive in such a way that a drive or a lifting movement is possible.

If the offset and/or load continues to increase, the device will exit the hiccup mode and will no longer produce output voltage because there is no sufficient primary field left.

If the hiccup mode is not left, this does not constitute a defect of the device. The device is designed so that the hiccup mode can be applied over a longer period of time without causing damage to the device.

If it is recognized that, for example, insufficient power supply to drives is possible, the device should be returned to a regular state. This can be achieved by eliminating the overload situation by (temporarily) reducing the load or returning the vehicle to its intended tolerance and allowing the device to exit the hiccup mode. If such situations repeat, in particular repeatedly at specific points of the path, the load design and/or possibly the tracking must be checked there.

### 8.7 Caution during operation



**DANGER!**

#### **Risk of death by electrical shock!**

The devices are not intended for independent operation. They are to be operated in conjunction with other, appropriately sized components.

- Never operate a device if damage is detectable or if it is in a condition that makes contact unsafe.
- Do not carry out any work on a device while it is in operation.



**WARNING!**

#### **Risk of burns from hot surfaces!**

During or after operation, surfaces of the device may be hot.

- Make sure that hot surfaces cannot be touched (see also chapter 4.4 for further information).



**WARNING!**

#### **Danger of injury due to improper operation!**

Improper operation can result in serious injury to persons and property.

- Never disconnect the device from its load during operation. This creates massive arcs.
- Make sure the system cannot be started up again accidentally.
- Never connect a charged or live device directly to batteries. The connection may only be made in a discharged and shut-down condition.
- Connect batteries with the correct polarity.
- Avoid negative voltages on the device as this will damage it.
- If the device is connected to a battery, it will draw some power out of this - even when it is switched off - and the battery will be discharged.
- Make sure there is sufficient air flow of min. 0.1 m/s around the device (see also chapter 7.5).

## 9 Warnings and cautions

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**DANGER!**

### **Risk of death by electrical shock!**

Devices can also be live in the off state (locking) and when the LEDs are not lit. Improper handling can result in electric shocks or burns as well as damage to the devices!

- No work may be carried out during ongoing operation.
- Do not open terminal pins; do not insert any objects inside, do not touch connection terminals.
- Make sure that connections are not removed under dangerous conditions, i.e. under load.
- To work safely on the device or attached peripherals, turn off the primary track and disconnect all power connectors.
- Wait at least 5 minutes before touching pins to ensure that all energy stored in the device is discharged.



**WARNING!**

### **Inadequately trained persons are at risk of injury!**

Improper use can result in serious injury to persons and property.

- All installation and commissioning as well as maintenance and disassembly has to be carried out by qualified personnel (IEC 364 respectively ENIEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110).
- Observe the national accident prevention regulations.

Qualified personnel, 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.



**DANGER!**

### **Hazard due to improper use!**

The devices are only intended to be operated in conjunction with appropriate components.

- If you are not sure whether this is the case, contact Conductix-Wampller. Do not put the pickup/system into operation in this case!
- Route power and control cables separately so that no interference can occur.
- Use only cables with sufficient cross section for the given currents.
- Observe the polarities when connecting peripherals to the pickup.



**WARNING!**

### **Risk of burns from hot surfaces!**

During or after operation, surfaces of the device may be hot.

- Make sure that hot surfaces cannot be touched (see also chapter 4.4 for further information).

## 750 W 27 V pickup CQF 04/2 + Interface M12



**DANGER!**

### Danger due to unsafe operation!

Damaged equipment can cause serious damages.

- Do not install a damaged pickup.
- Do not put damaged devices into operation.
- Ensure that all protection devices 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 device and meet all requirements for safe operation.

## 10 Error and diagnosis

### 10.1 Basics



<b>Definition of LEDs:</b>		(Red LED)	→	Error LED
		(LED orange)	→	Warning LED
		(LED green)	→	Status LED
		(LED green)	→	5V LED
		(LED green)	→	12V LED

The interface M12 contains three potential-free relay contacts with a common contact (contact 3). More information about the relay contacts can be found in the chapter 8.5.

- **Error relay** (contacts 3 - 6): Open if there is not enough primary field or if the device is in error status. Closed in normal operation.
- **Alert relay** (contacts 3 - 5): Normally open. Closes only to signal a warning.
- **Status relay** (contacts 3 - 7): Open at the beginning, closes when the device is ready (release) and switched on.

The operating status of a device can be determined via the LEDs and interface shown above. Relay contacts and LEDs provide the same basic information. However, additional information is provided via the LEDs by continuous lighting or flashing.



**DANGER!**

### Danger due to unsafe operation!

Damaged equipment can cause serious damages.

- Do not operate devices that are or could be defective.








## 750 W 27 V pickup CQF 04/2 + Interface M12






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### 10.2 Normal status

If a device is off (lock) (primary track is active, device is off), the following displays are present:

-  (Red): "Error" LED **off** + "Error relay" (contacts 3 - 6) closed
-  (Orange): "Alert" LED **off** + "Alert relay" (contacts 3 - 5) open \*
-  (Green): "Status" LED **flashing** + "Status relay" (contacts 3 - 7) open
-  (Green): "5V" LED **on** (5V supply available)
-  (Green): "12V" LED **on** (12V supply available)

When a device is turned on (primary track active and device powered on (release)) and in normal operating condition, the following displays are present:






-  (Red): "Error" LED **out** + "Error relay" (contacts 3 - 6) closed
-  (Orange): "Alert" LED **off** + "Alert relay" (contacts 3 - 5) open \*
-  (Green): "Status" LED **on** + "Status relay" (contacts 3 - 7) closed
-  (Green): "5V" LED **on** (5V supply available)
-  (Green): "12V" LED **on** (12 V supply available)

\* = Attention: in addition, a warning can be shown via a closed alert relay and the orange warning LED. This does not necessarily mean that the device is being operated under incorrect conditions. However, it may be that the device is operating at its limit. Additional information on the "Alert" topic can be found in the chapter 10.3.

### 10.3 Signals and their meaning

Alert signals provide detailed information ("on," "flashing," "off") depending on how and in what context (LEDs, relay outputs) they occur. For details on the respective relay status, please refer to Table 1 and to the respective LED status Table 2.

Note that if the input converter is off or the device is not positioned correctly over the primary track, all LEDs are off and all relay outputs are open:

-  (Red): "Error" LED **off** + "Error relay" (contacts 3 - 6) open
-  (Orange): "Alert" LED **off** + "Alert relay" (contacts 3 - 5) open
-  (Green): "Status" LED **out** + "Status relay" (contacts 3 - 7) open
-  (Green): "5V" LED **off** (5 V supply not available)
-  (Green): "12V" LED **off** (12 V supply not available)

## 750 W 27 V pickup CQF 04/2 + Interface M12

	Status relay closed	Status relay open	Error relay open
<b>Alert relay closed</b>	See a) or b)	See c)	See d)
<b>Alert relay open</b>	Normal operation: See chapter 10.2	Normal operation: See chapter 10.2	See e)

Table 1 Relay outputs and their meaning







	 <b>Green LED on</b> (Status relay closed)	 <b>Green LED flashes</b> (Status relay open)	 <b>Red LED on</b>
<b>Orange LED on</b> (Alert relay closed) 	See a)	--	--
<b>Orange LED flashes</b> (Alert relay closed) 	See b)	See c)	See d)
<b>Orange LED off</b> (Alert relay open) 	Normal operation: See chapter 10.2	Normal operation: See chapter 10.2	See e)

Table 2 LED displays and their meaning

- The maximum available peak power has been exceeded. Set according to the chapters 4.1, 7.5 and 8.3 ensure the retrieved performance matches the possible performance.
- The internal device temperature is approaching the maximum. If the average retrieved performance does not exceed the specified values according to the sections 4.1, 4.2, 7.5, the alert will have no immediate consequences and operation will continue. If, on the other hand, such an alert persists for a long period of time and has never been present before, this can be indicative, for example, of severe soiling of the heat sink (note also chapter 11). Without corrective action, this can result in a temperature error (see case d).
- Automatic shutdown via the pilot contact function, with disconnected connecting cable.
- The max. permissible internal device temperature has been exceeded. The alert (LED flashing and alert relay closed) persists until it falls below a reasonable temperature value. The device itself remains in error status until a reset has occurred (see chapter 10.4). Set according to the chapters 4.1, 4.2 and 7.5 ensure the retrieved performance matches the possible performance.
- The device has been shut down automatically. More about this in the chapter 4.3. If the cause of the error is detected and eliminated, carry out a reset (see chapter 10.4). If the error cannot be attributed to external influences, the device is not ready for operation and must be examined by a specialist. Details on the procedure can be found in the chapter 12.

### 10.4 Reset

**If the interface is used:**

If the interface is used, a device reset can simply be done by switching off (opening contacts 1 - 4) and then switching back on (release, closing contacts 1 - 4).

**If the interface is not used:**

If the interface is not used, a reset of the device can be carried out via the pilot contacts, that is, disconnecting and reinserting the connection cable of the DC power output.



**NOTE!**

The pilot contacts are not intended as on-off switches; therefore disconnecting them under load should be avoided. See chapter 7.4.3.

**In all cases:**

If the device departs from the position tolerances described in chapter 8.3 or it is overloaded with increased horizontal/vertical offset, an automatic reset occurs. The device will then automatically restart, provided contacts 1 - 4 are closed or the release signal is present.



**NOTE!**

Removing the device from the magnetic field of the primary track or turning off the primary track will also reset the device.

## 11 Maintenance

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### NOTE!

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 or corrected.

## 12 Repair

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### WARNING!

#### **Danger due to improperly executed repair work!**

Improper repair work can result in serious injury to persons and property.

→ Repair work may only be performed by trained personnel or Conductix-Wampfler technicians.

Generally, error analysis or repair on-site is not possible so dispatch to the Conductix-Wampfler factory is necessary. Before returning any parts, contact Conductix-Wampfler for specific instructions.

**The following information is required to decide on the procedure:**

- Product name
- Product code
- Serial number
- System data (technical and system-specific data)
- Wiring schematic of overall system (if available)
- Photo (if available)
- Description of the error or failure scenario
- Idea of what could have caused the error

## 13 Disassembly and Re-use

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### WARNING!

#### Danger of injury due to improper disassembly!

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

- When installing at a different location, observe the installation and commissioning instructions described.
- 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.

### 13.1 Notes on disassembly

1. Disconnect the system from the mains voltage.
2. Make sure the system cannot be powered up again accidentally.
3. After disconnecting from the mains voltage, wait at least 5 minutes for internally stored energy to discharge.
4. Remove the device.
5. Return components for reuse or dispose of them separately in → recycling

### 13.2 Recycling



### CAUTION!

#### Environmental damage due to improper disposal!

The device contains components that must be disposed of separately.

- Ensure that the device is recycled properly after is no longer in use.
- If necessary, dispose of the materials separately (cables, circuit boards, heat sinks, etc.).

## 750 W 27 V pickup CQF 04/2 + Interface M12

### 14 Accessories

#### 14.1 Power output



The output cable, which leaves the device, can be ordered from Conductix-Wampller on request. Generally, however, the requirements with respect to the choice of the cable cross-section described in chapter 4.5.1 apply.

Connecting cable 2.5 m one-sided with plug: 91212-339-3124279

Details about this connecting cable can be found in the table below. The materials required to connect the power output using a plug are listed. Please refer to chapter 15 for the tools required for assembly. On-site conditions may require additional material.

Description	Required quantity	Material number ILME	Material number Harting
Sleeve housing (plastic)	1	CQ 08VK	19 12 008 0429
Screw connection (plastic)	1	CRQ 16	19 12 005 5157
Male insert	1	CQM 04/2	09 12 006 3041
Crimp contact pins male 4 mm <sup>2</sup> / AWG12	5	CXMA 4.0	09 32 000 6107
Crimp contact pins male 1.5 mm <sup>2</sup>	2	CDMA 1.5	09 15 000 6101

## 750 W 27 V pickup CQF 04/2 + Interface M12

### 14.2 Interface



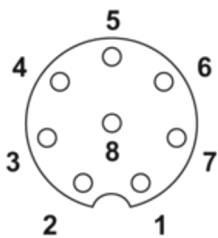
Source: Phoenix contact

The cable for this interface, which comes from the device, can be ordered separately from the following manufacturers. For details, please refer to the table or the manufacturer's website.

Alternatively, a compact enable plug is available that allows the device to auto-start. Enable plugs (set of 5) can be ordered from Conductix-Wampfler under the material number 91000-400-3089971.

Please note that the enable plug does not allow external on/off switching, nor can it be used for diagnostic purposes. For details, please refer to the product documentation.

Description	Conductix-Wampfler material number	
Enable plug set	91000-400-3089971	
	Material number "Phoenix contact" <a href="http://www.phoenixcontact.com">http://www.phoenixcontact.com</a>	Material number "Binder connector" <a href="http://www.binder-connector.de">http://www.binder-connector.de</a>
5 m shielded cable Pre-assembled 1 plug (customer side)	1407848	79 3579 3508
5 m unshielded cable Pre-assembled 1 plug (customer side)	–	79 3479 3508
Plug with pre-terminated wire ends	1523492	09 3481 700 08
Plug with solder terminals	1542758	–



The following listing is for informational purposes. It refers to the 2012 manufacturer information and applies only to the material specified in this section. If in doubt or if any other material should be used, it is important to ensure that the pin number and color code match the line to avoid possible damage to the connected equipment.

PIN 1	→	White	PIN 5	→	Gray
PIN 2	→	Brown	PIN 6	→	Pink
PIN 3	→	Green	PIN 7	→	Blue
PIN 4	→	Yellow	PIN 8	→	Red or shielded

# Operating Instructions



750 W 27 V pickup  
CQF 04/2 + Interface M12

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## 15 Required tools

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Description	Manufacturer	Order number
Crimper tool	Han C and HAN D contacts Harting	09 99 000 0021
Extraction tool Han C contacts	(Crimp contacts power) Harting	09 99 000 0305
Extraction tool Han D contacts	(Crimp contacts control) Harting	09 99 000 0052

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