Installation and User Manual

MiniEth

Slip Rings

Contents

Declaration of incorporation of partly completed machinery

(Type 1 B statement following the annex II of the Machinery Directive)

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DECLARES THAT THE EQUIPMENT

Adhesive label

COMPLIES WITH THE FOLLOWING
Low Voltage Directive 2014/35/EU

FORBIDDEN

Starting the machine until the machine where it will be incorporated and the machine that will become component is identified and declared as complying with the Instruction Machine.
Further states that have respected the following basic safety requirements: 1.1.1, 1.1.2, 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.5.4, 1.5.6, 1.5.8, 1.6.4, 1.7.2
The technical file of this equipment, which is established according to annexe VII, Part B of the Machinery Directive 2006/42/EC, is available in our premises and could be supplied on justified request of the National Authorities.
The EU marking has been affixed because responding to the Low Voltage Directive 2014/35 / EU and not to the Machinery Directive 2006/42 / EC.

The technical file is made at Conductix-Wampfler s.r.l. Via De Capitani 14/16 - 20864 Agrate Brianza (MB).

Agrate Brianza _____
Gotelli Alessandro (General Manager)

Document revisions

Revision	Date	Description
0	April2023	Initial edition

1. Use and preservation of the manual

The manual refers to the essential aspects of the directives, standards and laws relevant to the use of the slip ring. Failure to take the precautions described in the manual can cause injury and even death. In addition to the service instructions, you are also required to obey occupational safety and environmental protection laws and regulations. This notwithstanding, the product can cause injury if used by persons who are not specifically trained and instructed and/or not in conformity with its allowed use.
Persons assigned to mount and maintain it must read the service instructions before beginning the operating cycle. The Italian language version of this publication will be relied on for the resolution of any disagreements over the interpretation of translations into the languages of the European Community.
Conductix-Wampfler SRL reserves the right to make changes and improvements to any product described in this document without advance notice.
In no case will Conductix-Wampfler be liable for any special, incidental, consequential or indirect damage in any way caused by the use of any product described in this handbook.
Conductix-Wampfler reserves the right to modify or withdraw this document at any time.

1.1 Use of the manual

The manual is an integral part of the product and must be preserved until it is dismantled.

The manual reflects the technical status of the product at the time it was sold.
Conductix-Wampfler reserves the right to modify the product and, as a consequence, the manual, without any obligation to update previous editions. However, the user may request information and updates, which will become an integral part of the manual when issued.
Conductix-Wampfler reserves the right to make changes to the product, and consequently to the manual, without the obligation to update previous editions. However, the user can request information and updates which, when released, become an integral part of the manual.

1.2 Meaning of the symbols used in the manual

Warning for safety on workplaces.
This symbol is mentioned in service instructions whenever major risks for people's safety may occur.

Electric danger.
Covers bearing these signs must be removed by Qualified Personnel only after disconnecting voltage.

Prohibition. This symbol appears with reference to prohibition indications. In case these are not observed, the manufacturer cannot respond for guarantees.

Danger of possible crushing. This symbol appears with reference to all operations that might cause hands or feet to be crushed.

Danger of hanging loads.
Staying in such areas might cause severe injuries or death to persons.

Prohibition of handling by means of electric cables.
This symbol is reported on the outside of the product to prohibit the handling and the lifting by means of electric cables wired on the slip ring.

Prohibition of using as a standing base.
This symbol is reported on the outside of the product to prohibit to use it as a standing base and/or stair to lift people.

1.3 Safety instructions

Conductix-Wampfler prohibits the use of the slip ring until the machine into which it has been incorporated as a component has been identified and declared conforming to the dispositions of European Directive 2006/42/EC.

The electrical wiring of the slip ring must be performed by qualified and trained personnel only, observing electro-technical standards. All measures and warnings regarding safe operation, as well as general safety instructions for the prevention of accidents to be adopted before, during and after commissioning, must be rigorously followed. The slip ring may only be used if all protective devices are installed. Modifications and transformations are forbidden.

The slip ring must be immediately disconnected in the case of anomalies.

Read the manual carefully before working on the slip ring.
All operations and interventions on electric parts under voltage must be executed after disconnecting the main switch on the control panel, so the slip ring must be disconnected.

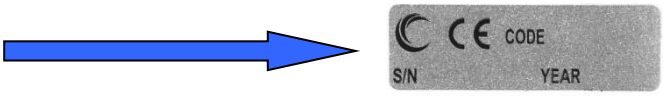
No service of the slip ring is anticipated and/or necessary during use.
Do not apply voltage to the machine on which the slip ring is installed unless all required safety covers are installed.

When using the device, you must not:

- deliberately avoid the safety protections.
- alter the performance of the slip ring by changing its design and plate data.
- remove danger warnings or make them illegible.
- use non-original spare parts.
- remove or make illegible the identification plate.

1.4 Identification plate

Identification plate



1.5 Manufacturer's responsibility

Conductix-Wampfler is subjected to be responsible for damages to people or to things given to the manufacturer through Italian Laws as long as they are known and in force at the moment of the order, with the essential statement that all Conductix-Wampfler products are exclusively foreseen for installation and use in the industrial environment by expert and acquainted personnel (in charge of the customer, with Conductix-Wampfler cooperation, if requested) about the problems and the dangers which could be coming from the use of rotating electric machines. Moreover, Conductix-Wampfler's responsibility will lapse if the rules of the present instructions are not respected. Finally, Conductix-Wampfler excludes its responsibility in case of tampering of the products, for reparation or every other cause, from third parties who are not expressly authorised.

1.6 Manufacturer's liability Waivers

The manufacturer is to be considered waived from liability in the following cases:

- improper use, or usage by professionally untrained personnel
- usage not complying with specific national regulations.
- incorrect installation
- power faults
- unauthorised modifications or interventions
- usage of unoriginal spares, or unspecific for that model
- total or partial in observance of instructions
- unpredictable events
- use of the slip ring with electric and mechanic parameters which are different from the ones of the project

The following works and operations are not allowed when using the machine:
It is not allowed to avoid safety protections voluntarily
It is not allowed to alter the slip ring's performances
It is not allowed to remove danger panels and/or signs, or to make them illegible.
It is not allowed to use unoriginal spares

2. Use of the slip ring on-board machine

2.1 Application range

The slip ring is a passive element of a machine, expressively designed and manufactured for data transmission between rotating users. It implies that this component is always integrated in a machine.
The machine where the slipring is assembled drives and controls the slipring.
The maximum rotational speed is 100 rpm.

According to the model, the Ethernet transmission can be at:
100Mbps
1Gbps o 2 x 100Mbps*

* 2 x 100Mbps by means of an external splitter selected and provided by the customer.

2.2. Reference standards

The slipring is designed according to the following standards, that are the reference for the operators of the machine as well:
a- EN 50173-1 Information technology - Generic cabling systems.
b- IEC 60204-1 Safety of machinery – Part 1: General requirements.

2.3. Allowed uses

The only allowed use is data transmission between rotating users.
Th slipring can be assembled vertical or horizontal.
The slipring is suited to be connected to shielded cables (the continuity of the shield is managed inside the slipring).

- **The slip ring cannot be used as a support element for mechanical parts.**
- **The slip ring cannot be used as a joint or towing element of other components.**

2.4 Application limits

2.4.1 Installation restrictions

The slip ring must be installed in compliance with the conditions specified on enquiry. Different installations could cause problems to its working and in particular cases also damage to people.

The maximum total lengths of the cables connected to the slipring is 60 m, with cables cat. 5 for 100Mbps and cat. 6A for 1Gbps. Cables and connectors different from those tested may lead to different results.

The cables connected to the slipring and the slipring itself must be protected from electromagnetic interference. Please find below some rules, just as an example:

- Power cables must be placed sufficiently far from the slipring and the cables connected to it.
- Power cables must cross the cables connected to the slipring at an angle of 90°.
- Metal screens must be placed between power cables and the cables connected to the slipring, including the slipring itself.

2.4.2 Operational restrictions

It is absolutely forbidden to use the slip ring for other applications then the foreseen ones.

2.4.3 Environmental restrictions

The slipring must not work in environments with high explosion risk!
The slip ring must not work in environment not repaired from freeze and bad weather. We prescribe the installation in environment that must have the following characteristics:

Temperature:	between	+5°C	and	+60°C
Relative humidity (not condensing):	between	30%	and	90%
Altitude:	up to	1000m (above the sea level) apart from different certification.		

The protection degree of the slip ring is IP20.

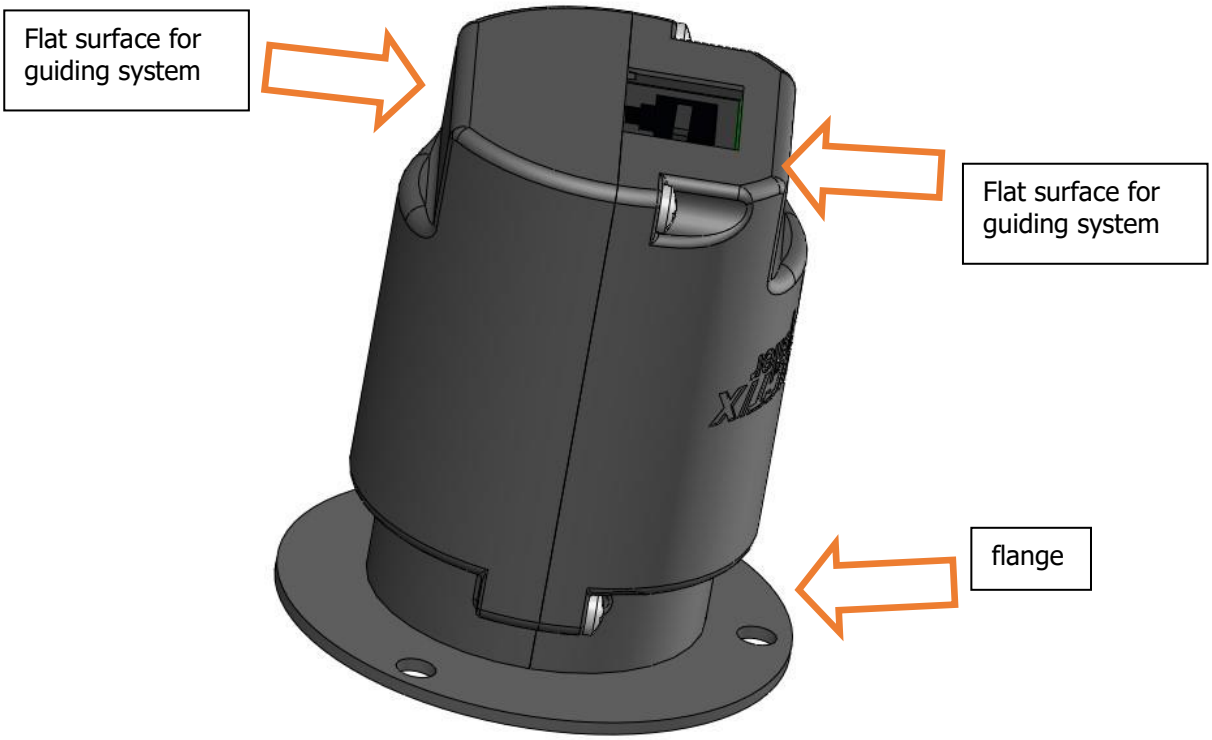
2.5 Plant restrictions

Electrical feeding restrictions. The plants for energy transportation must comply with the DM 37/08. The characteristics of the energy source must comply with the indications at par. 4.3.2 of IEC 60204-1.
Protection against electrical risk. The device complies with the protection requirements foreseen by IEC 60204-1. The Customer must also install a protection system with automatic interruption, in order to get protection against indirect contacts.

2.6 Installation directions

The following direction for installation must be respected:

- Be sure that the fixation of the slip ring is stable to avoid vibrations.
- The slipring could be blocked in a rigid way on the stator or on the rotor; one of the two has always to be loosened to allow self-aligning between the rotor and the stator.
- The stator and the rotor bodies have not to be contemporarily blocked in any way.
- The direction of rotation could be either clockwise or counterclockwise.
- The rotor or, alternatively, the stator, could receive the motion by means of the two flat surfaces in the body (to be used for an external fork-like type guiding system).
- Avoid applying radial/axial loads to the slip ring.



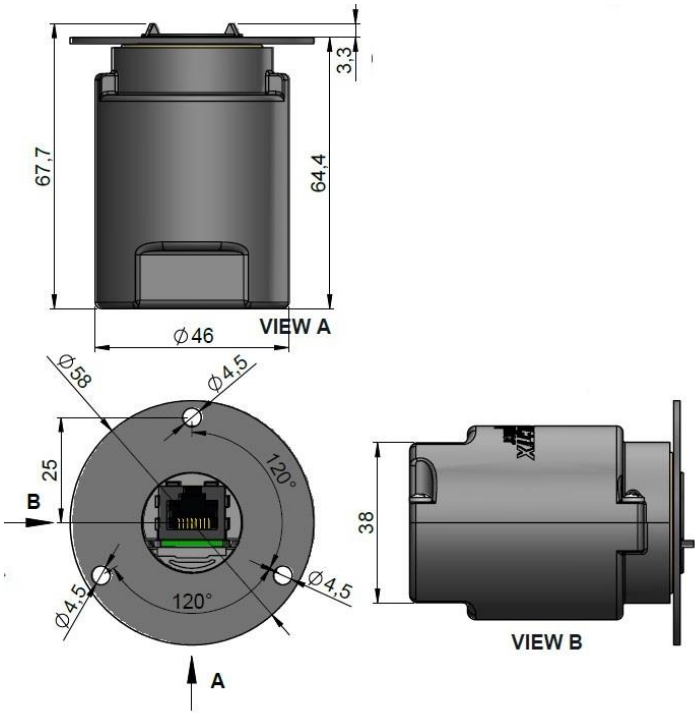
2.7 Technology implemented

The transmission of data in rotation is based on sliding contacts. The type of contact is gold-on-gold.

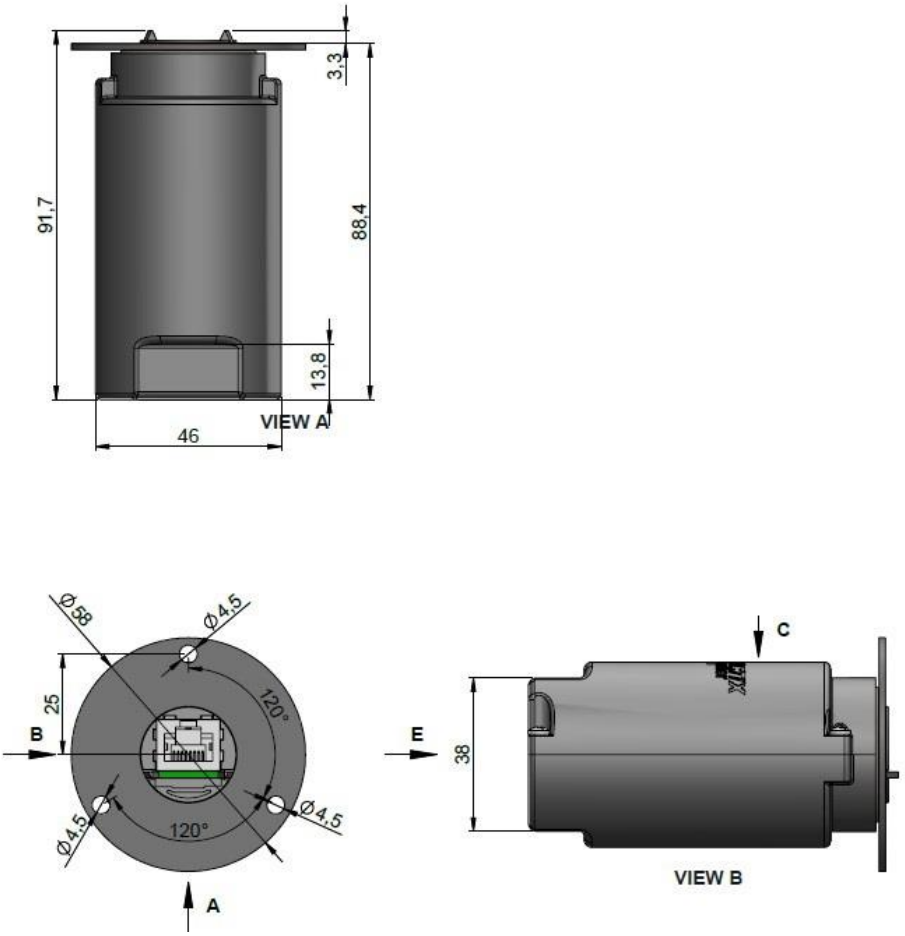
An application for patent has been filed for the slipring (patent pending).

2.8 Dimensions

100Mbps



1Gbps



3. Commissioning and disassembly

3.1 Commissioning

Since the slip ring is a machine component, its overall safety is a function of the safety of the machine itself.
Before commissioning, make sure that:
1) the slip ring is of the ordered type.
2) all slip ring enclosures are mounted (electric and mechanic safety).
3) turn the machine's main switch or isolator to OFF.

Grounding can be avoided only if PELV (Protective Extra-Low Voltage) is used. PELV circuits shall satisfy all the following conditions:

- the nominal voltage shall not exceed 25 V AC r.m.s. or 60 V ripple-free DC when the equipment is normally used in dry locations and when large area contact of live parts with the human body is not expected;
  OR
- 6 V AC r.m.s. or 15 V ripple-free DC in all other cases;
- one side of the circuit or one point of the source of the supply of that circuit shall be connected to the protective bonding circuit;
- live parts of PELV circuits shall be electrically separated from other live circuits. Electrical separation shall be not less than that required between the primary and secondary circuits of a safety isolating transformer.

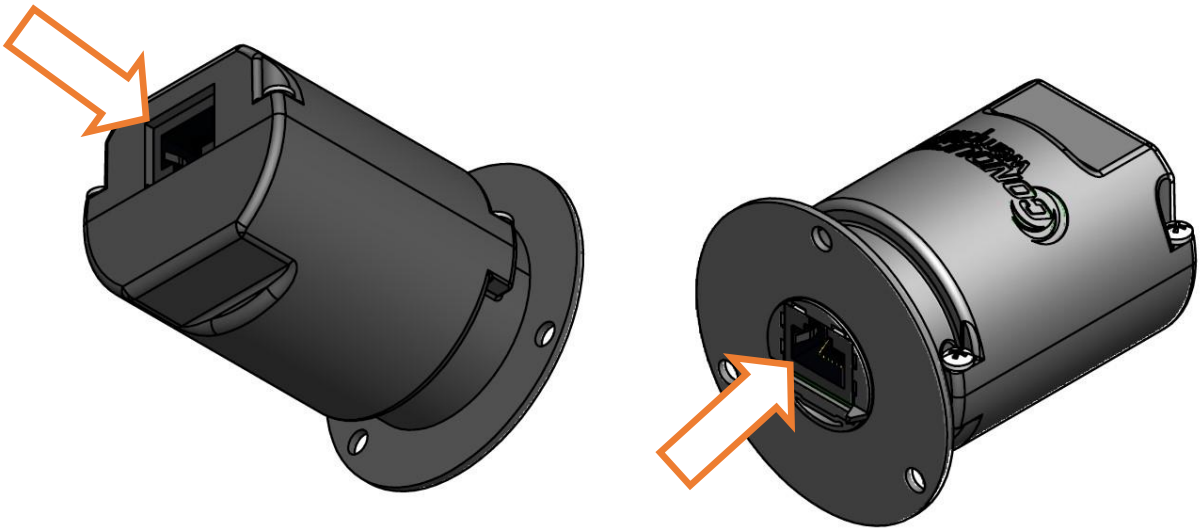
Unless otherwise specified by the customer, the voltage values considered for the design of the slipring are assumed with use of PELV circuits provided by the customer.

5) for the commissioning operations, if the supplier's personnel is not used, it is necessary apply to trained and qualified personnel for technical and mechanical operations. It has to be absolutely excluded the use of production or casual personnel.
6) make sure that the machine housing where the slip ring is mounted, or the space reserved to the slip ring, is clean and that there is no hindrance to the rotating movement of the slip ring. The wiring cables of the slip rings have not to be obliged or exposed to rubbing danger.
7) verify that the slip ring is placed to assure the dissipation of heat arisen by other possible electric components. Moreover, verify that the working temperature is never exceeded.

Please refer to what written in the section 2 for environmental restrictions.

3.1.1. Electrical connections

Electrical connections are realised by means of two RJ45, one for the rotor and the other for the stator. In case of use for transmission of two 100Mbps channels (two twisted pairs each), a splitter on the customer wiring can be used.



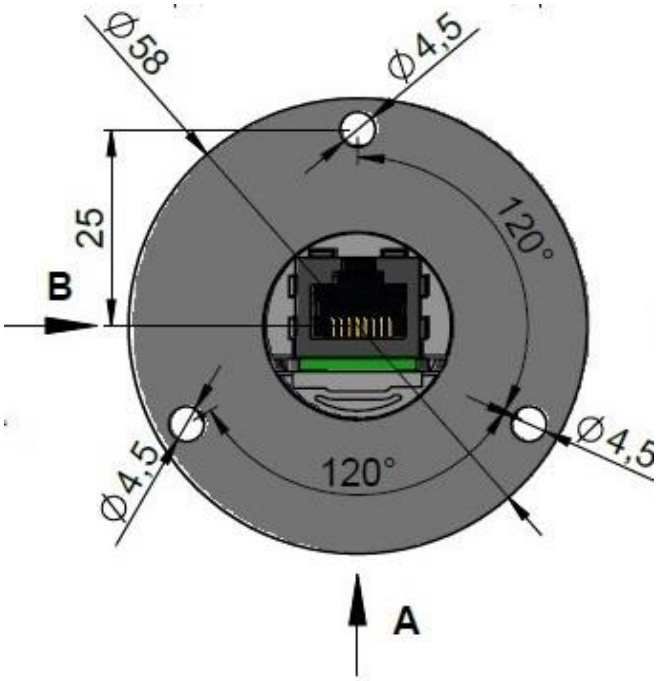
3.1.2 Inspections before starting the slipring.

Before setting to work the slip ring or after a long period of inactivity, it is necessary to carry out the following verifications.

- Presence of dust. The dust which is not greasy could be removed by means of a clean and dry cloth, or better by means of a vacuum cleaner. The dust on inaccessible parts could be removed by a clean and dry light air jet (0,1 bar).
- Presence of grease or of oil. Wipe over the stains by means of a cloth moistened (not soaked) with solvent deriving from the petroleum of a safe kind. Let dry in a dry environment at 20°C at least for 24 hours.

3.1.4 Mechanical coupling

Before mounting the coupling device, clean accurately the parts. The coupling tolerances must be respected. The assembly is realised by means of 3 through holes of diameter 4,5 mm in the flange:



3.2 Decommissioning

For the decommissioning of the slip ring at the end of a usual production cycle, it is enough to disconnect the electric voltage from the machine on which the slip ring is mounted.
For the decommissioning, followed by storage of the slip ring for a long period of time, it is necessary to:
1) put in OFF position the interrupter or the general disconnecting switch of the machine.
2) remove the slip ring from the machine.
3) carry out the general cleaning outside the slip ring.
4) wrap the slip ring in a cellophane bag inserting hygroscopic salts, before closing it.
5) stock it indoors, sheltered from rain or sprinkles, at a temperature between -5°C……+60°C.

3.3 Demolition and disposal of the slipring

The disposal of the slipring must follow the specific laws that each country has on the matter of disposal of industrial waste. The customer is responsible for the scrapping and the consequent disposal of waste and nothing can be indicted to Conductix-Wampfler.

The slipring complies with RoHS and RAEE Directives.

4. Maintenance and repair

The slipring does not need preventive maintenance.
When the end of life is reached, please contact Conductix-Wampfler for slipring replacement.

In case of breakdown, it is necessary to get in touch with Conductix-Wampfler.
It is fundamental to disconnect the electric feeding and that the slipring is put out of service, in non-dangerous conditions (please use also warning signs).

The useful life of the slipring is 50 million rotations in the operational conditions indicated.

5. Handling and transportation

The product is shipped ready to be installed, except for particular cases to be agreed upon. The shipment is carried out with an appropriated packaging or, if demanded by the customer during the phase of order, with special packaging. Check that during transport the slip ring has not been damaged, so that its functionality may have been jeopardised.

Caution: it is forbidden to handle the slip ring by means of electric cables, which are going out from it. If this instruction is not respected, it can cause serious damages within the slip ring.

The slip ring must be kept inside its packaging until it is assembled on the machine, in horizontal position, at a temperature between -5°C and +60°C, away from rain, water sprays, and excessive humidity.

We recommend the utmost attention during the handling of the slip ring, as accidental shocks and hurts may cause faulty operation.

If the slip ring is not immediately put into service, it is necessary to store it indoors, in a clean and dry environment.

6. Spare parts

When the end of life is reached, or in case of damages, contact Conductix-Wampfler to replace the complete slipring.

Each request for spare parts must be accompanied by the following information:

- type, model, serial number of the slip ring as indicated in the identification plate.
- number of spare parts required.
- shipping procedure and delivery times.
- company name, address, tax details of the applicant, and shipping address.

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