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1.1 INTRODUCTION:

The Slip ring can be used in any electromechanical system that requires rotation, intermittent or continuous, during the transmission of electricity or data. It can improve mechanical performance, simplify system operation, and eliminate damage-prone wires hanging from moving joints.

It has a contact system through brushes and rotating collector ring, the brushes are interchangeable and easily replaceable, making the equipment reusable and maintainable when changing the brushes.

The transmission between the stator and rotor is made through electromechanical contacts, and they are extremely reliable. The construction is modular and offers greater flexibility in a wide variety of applications, in addition to the possibility of maintenance and replacement of all parts.

Flexible and robust, it can vary from 4 to 12 contact channels, which can be combined as desired.

This manual deals with the model with 4 channels, for models with different number of channels, please consult us.

1.2 BENEFITS

- System with replaceable brushes.
- Equipment subject to maintenance and replacement of parts.
- Low torque.
- High conductivity.
- High service life.
- Compact design.
- Bearing support (exchangeable).
- Bar transmission (Absence of internal wires in the product).
- Low noise.
- 360° continuous rotation.
- Good impact resistance.

1.3 APPLICATION AREAS

- Packaging and sealing machines;
- Textile Machines;
- Electric generators and turbines;
- Inspection of pipeline systems;
- Surveillance equipment;
- Bottling units;
- Rotating tables.

2.1 SAFETY INFORMATION

It is recommended that the user read all safety and operating instructions before installing and using the equipment.



WARNING

The equipment must be installed with electrical protection devices, always respecting the maximum values of current and voltage for each respective channel. Thus, preventing against electric shocks, overheating or electrical surges, according to the Brazilian technical standard NBR 5410.

Installation, repairs, parts replacements and measurements must be done only by qualified professionals using appropriate tools.

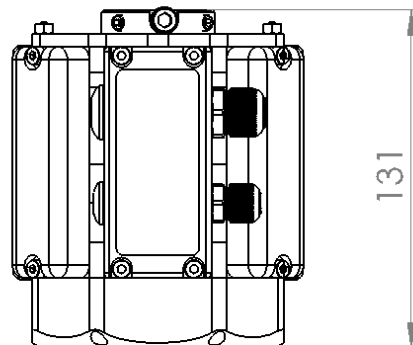
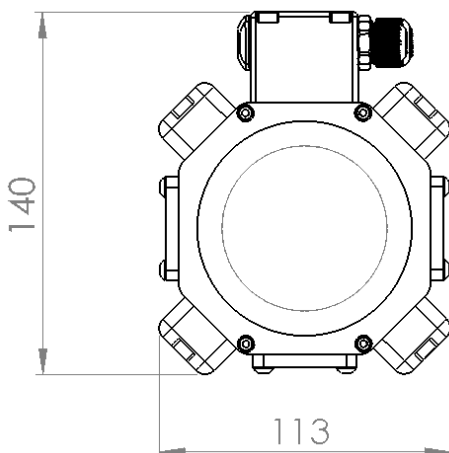
2.2 RISKS

The non-compliance of the safety standards, poorly dimensioned electrical design and irregular operation can cause, among others:

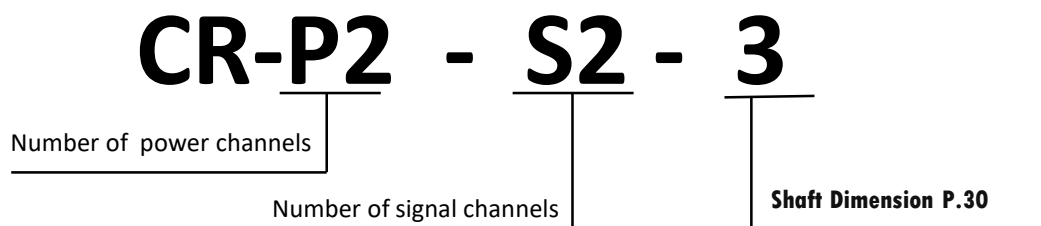
- Risk of electric shock;
- Risk of fire in electrical wiring;
- Decrease the lifespan of machines and equipment;
- Burning and irregular operation of equipment;
- Sanctions and fines for non-compliance with safety standards;
- Unscheduled stops due to accidents or imminent risk of accidents;

3.1 TECHNICAL DATA

Rotational speed	≤800rpm
Working Temperature	-20°C a +80°C
Protection level	IP60
Electric current (load channels)	20 Amperes
Electric current (signal channels)	6 Amperes
Voltage	220 volts
Lifespan of brushes and bearings	≈400 million rotations
Cleaning cycles	35 million rotations
Contact material	Cooper/Electrographite
Dimensions (mm)	103x128x156
Dielectric strength	≥180kV a 60Hz
Insulating resistance	400MΩ
Contact resistance	≤5Ω
Weight	≈1,8kg
External Dimensions	



3.2 CHANNEL CONFIGURATION



The channels of the rotary connectors can be configured between channels for power and channels for signal, with the quantities of each channel as needed:

TYPE OF CHANNEL	CURRENT MAX.	QTY OF BRUSHES BY CHANNEL	TERMINAL ID COLOR
POWER (P)	20A	04 BRUSHES	RED
SIGNAL (S)	6A	02 BRUSHES	BLUE

1. First select the number of power and signal channels (0 to 12);
2. Select the number of channels for power or signal (CR-Pxx-Sxx)
3. Size the coupling to be fitted to the shaft (pg.30);

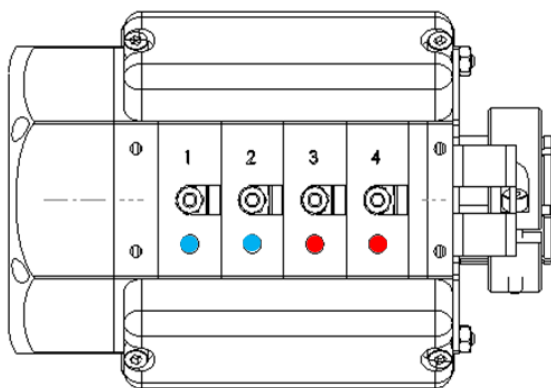
CHANNEL CONFIGURATION EXAMPLES	CODE
4 CHANNELS FOR POWER	CR-P4-S0-X
4 CHANNELS FOR SIGNAL	CR-P0-S4-X
2 CHANNELS FOR POWER, 2 FOR SIGNAL	CR-P2-S2-X
3 CHANNELS FOR POWER AND 2 FOR SIGNAL	CR-P3-S2-X
8 CHANNELS FOR POWER AND 4 FOR SIGNAL	CR-P8-S4-X
6 CHANNELS FOR SIGNAL	CR-P0-S6-X
3 CHANNELS FOR POWER AND 4 FOR SIGNAL	CR-P3-S4-X

Example: to select the model with 4 channels, 2 channels for power and 2 for signal, enter the code CR-P2-S2-X.

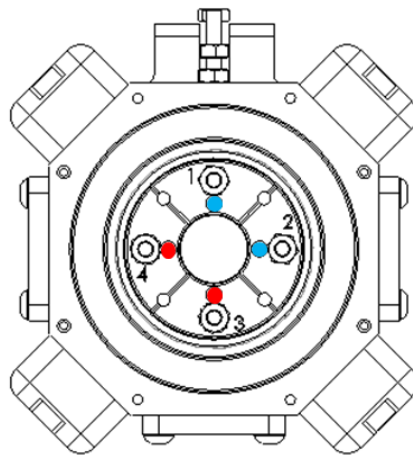
3.3 TERMINALS CONFIGURATIONS

When the connector model is mixed (2 channels for signal and 2 channels for power), attention must be paid to the identification and connection of the terminals.

INPUT CHANNELS (STATOR)

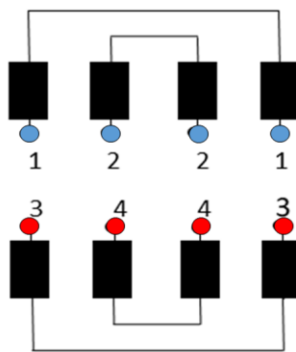


OUTPUT CHANNELS (ROTOR)



SIGNAL	TERMINALS 1 AND 2
220 V 6A	BLUE COLOR

POWER	TERMINALS 3 AND 4
220V 20A	RED COLOR

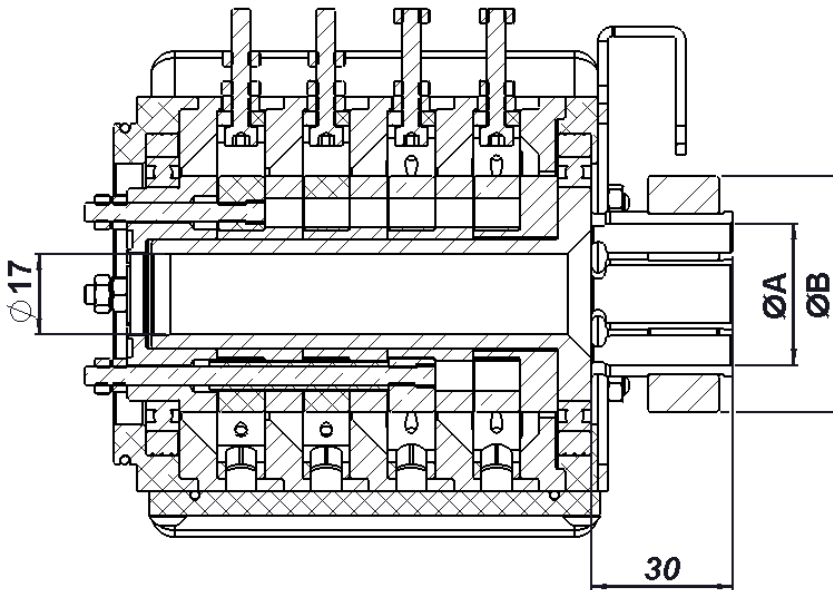


TYPE CR-P2-S2-X (2/2 CHANNELS)

TERMINALS	COLOR	VOLTAGE	CURRENT(máx.)
1	BLUE	220V	6A
2	BLUE	220V	6A
3	RED	220V	20A
4	RED	220V	20A

3.4 SPINDLE DIMENSIONS

The spindle to be installed the connector must have a minimum length of 25mm for fixing the coupling, in addition, the diameter must be machined with nominal tolerance h10 *.



A	B	CODE
20mm	40mm	CR-Px-Sx-1
25mm	45mm	CR-Px-Sx-2
30mm	50mm	CR-Px-Sx-3
35mm	55mm	CR-Px-Sx-4
40mm	60mm	CR-Px-Sx-5

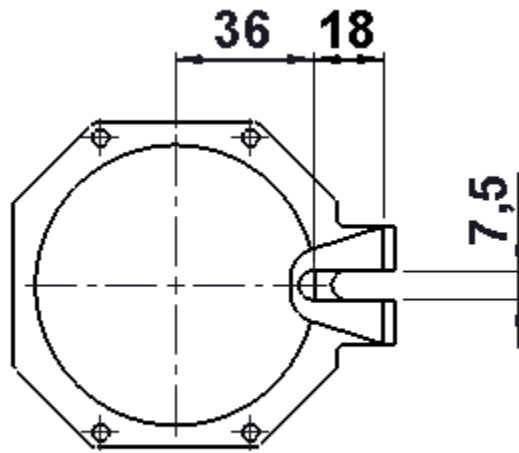
Example: to select the model with 4 channels for power, with a 30mm plug-in spindle dimension, enter the code CR-P4-S0-1

For other spindle measurements, please contact the SCHRELI technical department.

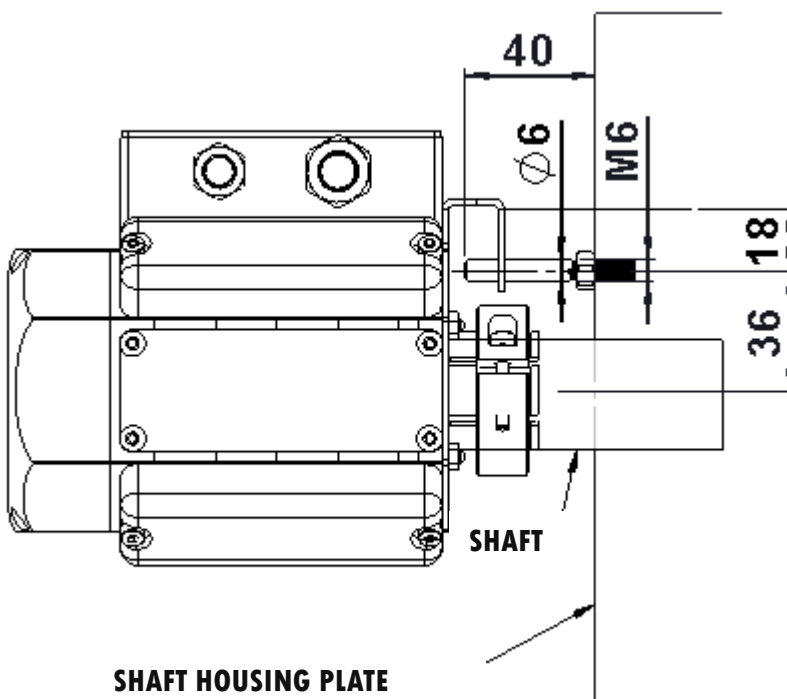
*tolerance h10 : Ø18-30 max. +0/ min. -0,084
 Ø30-50 max. +0/ min. -0,100

3.5 DIMENSIONS OF THE TORSION ARM AND TORSION SPINDLE

TORSION ARM



TORSION SPINDLE ASSEMBLY



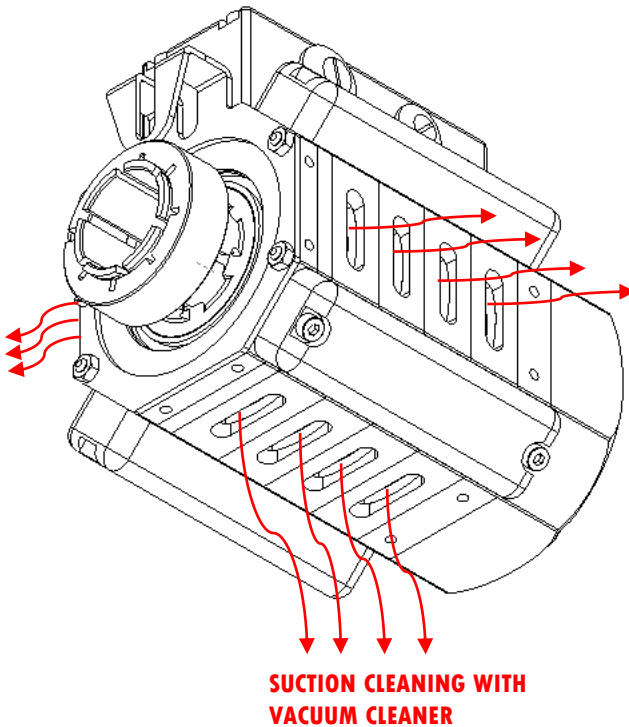
3.6 ACCESSORIES

When receiving your equipment, please check the following accessories:

- Instruction manual;
- 2,5mm Allen screwdriver;
- 3mm Allen screwdriver;
- 7mm cannon wrench.

4.1 PREVENTIVE MAINTENANCE

SCHRELI recommends making an internal cleaning of the equipment at least once every 30 days, or when completing 30 million rotations, avoiding the risk of current leakage and short-circuit, which can be generated by the accumulation of dust from the brushes contact.



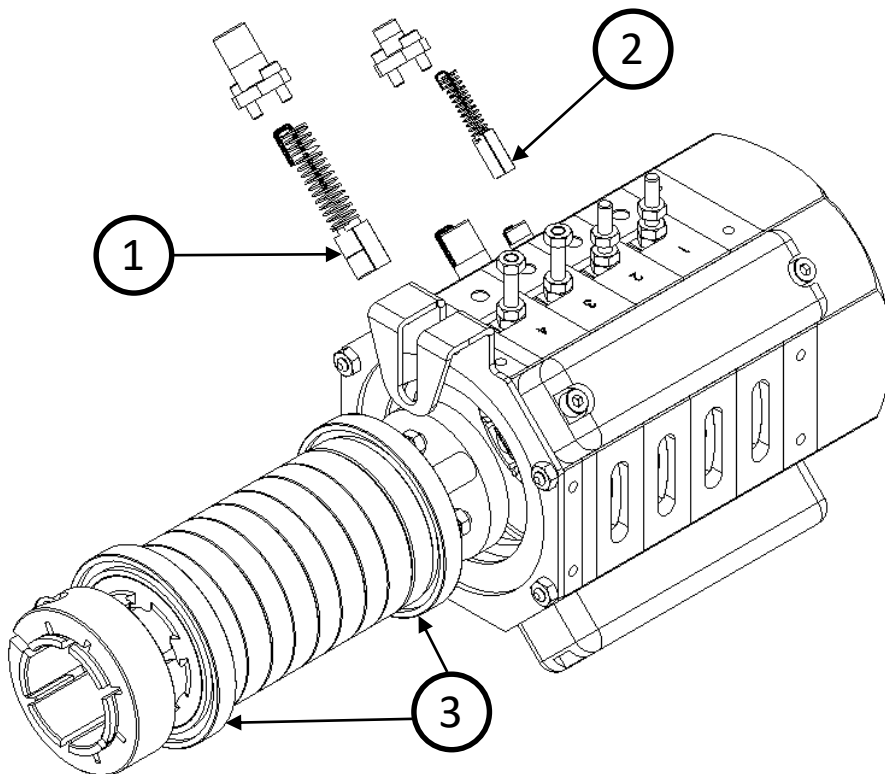
The connector has twelve slots for cleaning and dust removal. To access them, simply remove the three side covers, using a 2.5mm Allen screwdriver.

After that, clean all crevices through suction with a vacuum cleaner

NOTE: Do not use compressed air, and any type of chemical product to clean the equipment.

4.2 WEAR PARTS

PARTNUMBER	COMPONENTS	QTY	CODE
01	POWER BRUSHES SET	08	CR04-130933
02	SIGNAL BRUSHES SET	04	CR04-130932
03	RADIAL BEARING	02	CR04-130942



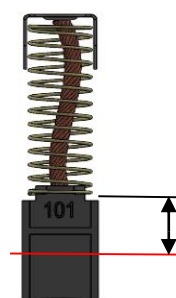
4.3 BRUSH FAILURE

As it is a mineral product, and with constant friction with the slip rings, it is normal that, over time, the natural wear of the brushes will occur, reducing their length. They must be changed when they reach the minimum length of 6,5mm (figure below).

The brushes have a service life of approximately 400 million rotations, which results in almost 2 years at a rotation of 400 rpm.

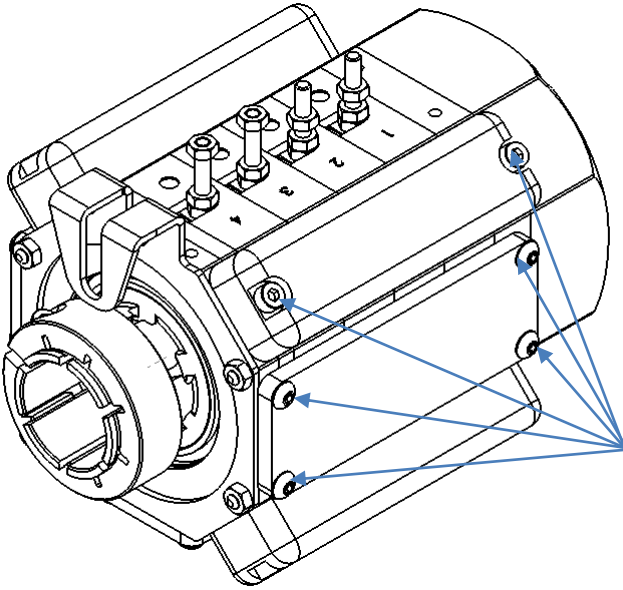
Note: Never change only one of the brushes, they must be changed all at once, in order to obtain a better use of the equipment and avoid risks of overload.

The brushes must be original, following a high quality standard in their manufacture. If the brush is made with low quality raw material it tends to be more rigid, which can cause wear problems in the slip rings, among others. In addition, they may not be the right size for fitting in the brush holder, or have different loads on the spring, interfering with the conductivity of the brush and damaging other components.

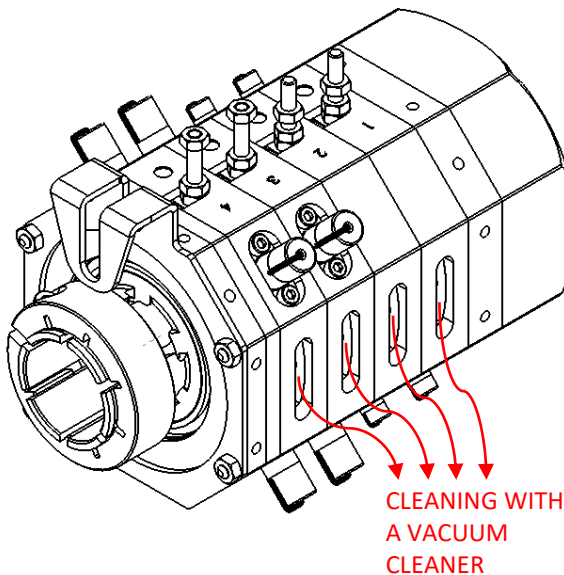


Brush wear limit measurement
Min. = 6,5mm

4.4 BRUSH REPLACEMENT



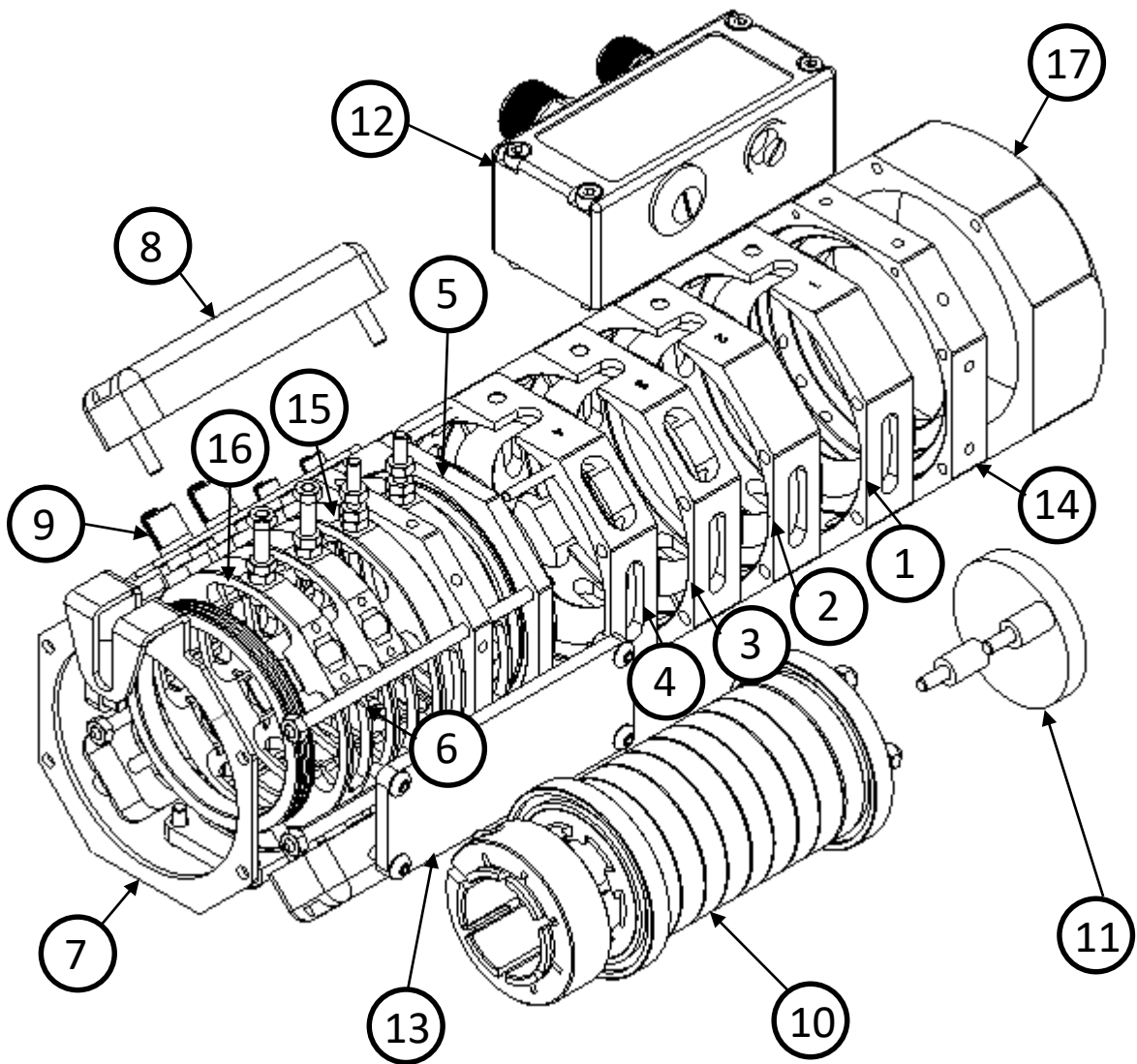
With the help of the 2.5 and 3mm Allen wrench, removes the brush isolation caps, side cleaning caps, brush cups and the brushes to be replaced.



Perform the internal cleaning of all equipment with compressed air, directing the air through the 12 cleaning channels. Replace all brushes, fitting in channel correctly (signal and load), then fix the brush cups, and then the insulation caps and side cleaning caps.

4.5 SPARE PARTS

The company provides separately supplies spare parts for the slip ring, for eventual replacement in case of breakage or damage. Below is the list of available parts



Below is the list of available parts:

PARTNUMBER	COMPONENT	CODE
01	INSULATING HOUSING CHANNEL 1	CR04-130910
02	INSULATING HOUSING CHANNEL 2	CR04-130909
03	INSULATING HOUSING CHANNEL 3	CR04-130908
04	INSULATING HOUSING CHANNEL 4	CR04-130903
05	ARRINSULATING WASHER	CR04-130907
06	FRONT ALUMINUM HOUSING	CR04-130906
07	TORSION ARM	CR04-130914
08	EXTERNAL CUPS COVER	CR04-130901
09	BRUSHES CUPS	CR04-130912
10	COMPLETE ROTOR SET	CR04-130931
11	WIRE PROTECTION COVER	CR04-130927
12	TOP COVER	CR04-130929
13	SIDE COVER	CR04-130911
14	REAR ALUMINUM HOUSING	CR04-130902
15	BRUSH HOLDER 4 CHANNELS (POWER)	CR04-130904
16	BRUSH HOLDER 2 CHANNELS (SIGNAL)	CR04-130905
17	BACK COVER	CR04-130913

5.1 QUALITY CONTROL

In order to maintain an excellent quality of our products, we maintain rigorous quality tests, individual for each slip ring manufactured.

5.2 TESTS

Each item that makes up our equipment undergoes dimensional control tests during its manufacture, in addition to tests, after the assembly is completed, the following functional tests are carried out:

- Insulation resistance test - test carried out between non-energized current conductors and ground, in order to obtain the value of the insulation resistance and protection against short-circuit and leakage currents. (minimum value of 400M Ω).
- resistive contact test - test between the terminals, which guarantees the maximum stipulated value and avoids reading errors in the transmission of data and signals to devices connected to the slip ring (maximum value of 5 Ω).
- Functional test - all equipment undergoes a practical function test of at least 24 hours, connected with electrical load and with constant measurement in the stator and rotor channels, ensuring full electrical and mechanical functioning of the components.

6.1 WARRANTY PERIOD

This equipment has a 1 year warranty against manufacturing defects arising from material flaws or flaws arising from the product's manufacturing process.

To be entitled to the guarantee, the stamped guarantee certificate must be presented.

6.2 LOSS OF WARRANTY

This warranty does not include damage caused by accidents, misuse, use of improper accessories for this equipment, use in severe environmental conditions, in addition to:

- Replacement of non-original components;
- Connection of currents and electrical voltages beyond the maximum limits specified for the channels;
- Use with speed of rotation faster than the specified limit, or temperatures higher than those shown in this manual.

Product manufactured by SCHRELI industries, according to ISO 9001 standards, ensuring quality and reliability.