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## 1.1 INTRODUCTION:

The Slip ring type CR04 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 a rotating collector ring, the brushes are interchangeable and easily replaceable.

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.



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:

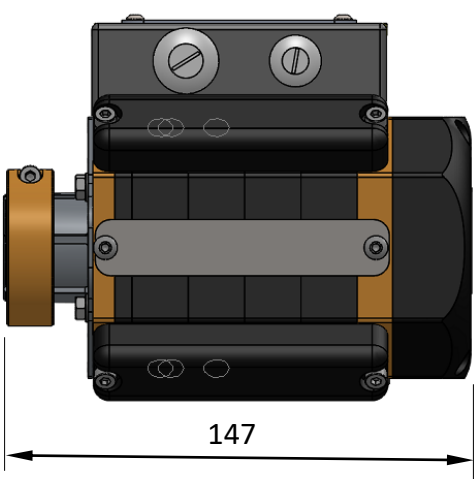
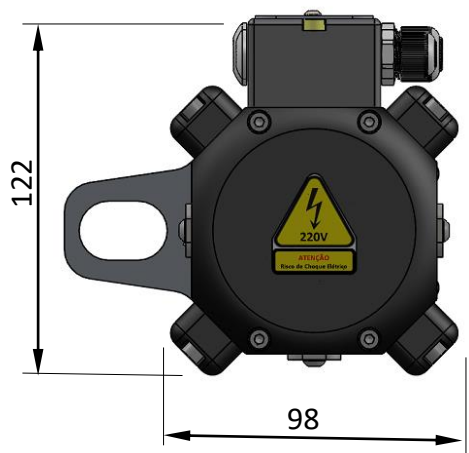
- Risk of electric shock;
- Risk of fire in electrical wiring;
- Decrease the lifespan of machines and equipment;
- Burning and irregular operation of equipment;
- Sanctions and fines for non-compliance with safety standards;
- Unscheduled stops due to accidents or imminent risk of accidents;

# 3. TECHNICAL CHARACTERISTICS



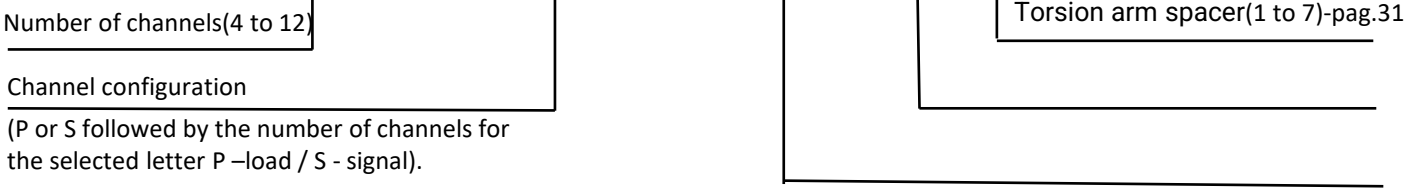
## 3.1 TECHNICAL DATA

Revolution speed	≤1000rpm
Working Temperature	-20°C a +80°C, on the connector
Protection level	IP64
Electric current (load channels)	25 Amperes
Electric current (signal channels)	2 Amperes
Voltage	220 volts
Lifespan of brushes and bearings	≈500 million revolutions
Cleaning cycles	30 million revolutions
Contact material	Cooper/Electrographite
Dimensions (mm)	98x122x147
Dielectric strength	≥180kV a 60Hz
Insulating resistance	400MΩ
Contact resistance	≤1Ω
Weight	≈1,8kg



## 3.2 CHANNEL CONFIGURATION

**CR04 - P02 - 3 1 6**



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
LOAD (P)	25A	04 BRUSHES	RED
SIGNAL (S)	2A	02 BRUSHES	BLUE

1. First select the number of channels (04 to 12);
2. Select the number of channels for load or signal (PXX or SXX) (when the number of channels for load is selected, the remaining channels will automatically be channels for signal and vice versa);
3. Dimension the coupling to be fitted on the spindle (page 30);
4. Dimension the torsion arm and spacer according to the application and installation location (page 31).

CHANNEL CONFIGURATION EXAMPLES	CODE
4 CHANNELS FOR LOAD	CR04-P04-XXX
4 CHANNELS FOR SIGNAL	CR04-S04-XXX
2 CHANNELS FOR LOADE 2 FOR SIGNAL	CR04-P02-XXX
3 CHANNELS FOR LOAD AND 2 FOR SIGNAL	CR05-P03-XXX
8 CHANNELS FOR LOAD AND 4 FOR SIGNAL	CR12-P08-XXX
6 CHANNELS FOR SIGNAL	CR06-S06-XXX
3 CHANNELS FOR LOAD AND 4 FOR SIGNAL	CR07-S04-XXX

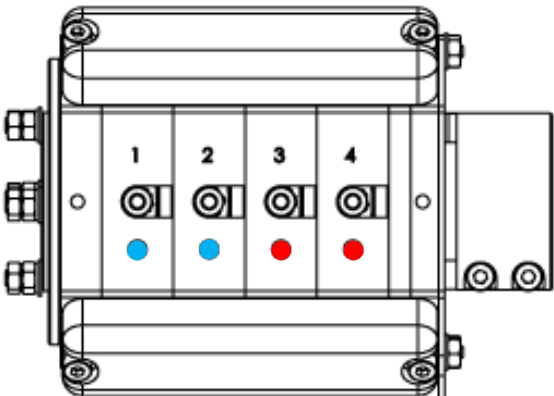
Example: to select the model with 4 channels, 2 channels for load and 2 for signal, enter the code CR04-P02-XXX.

# 3. TECHNICAL CHARACTERISTICS

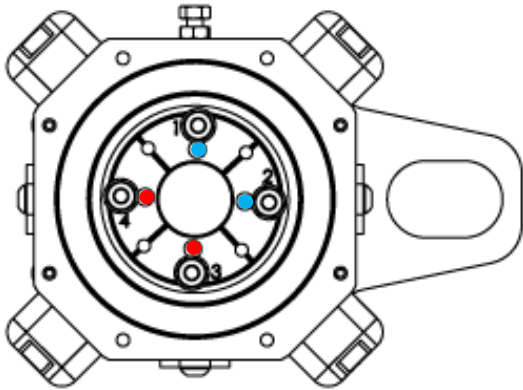
## 3.3 TERMINALS CONFIGURATIONS

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

INPUT CHANNELS (STATOR)



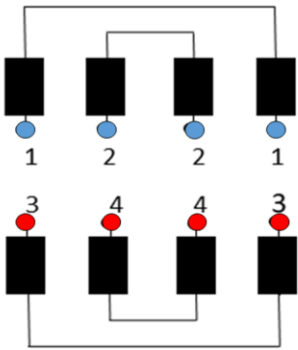
OUTPUT CHANNELS (ROTOR)



SIGNAL	TERMINALS 1 AND 2
220 V 2A	BLUE COLOR

SIGNAL	TERMINALS 3 AND 4
220V 25A	RED COLOR



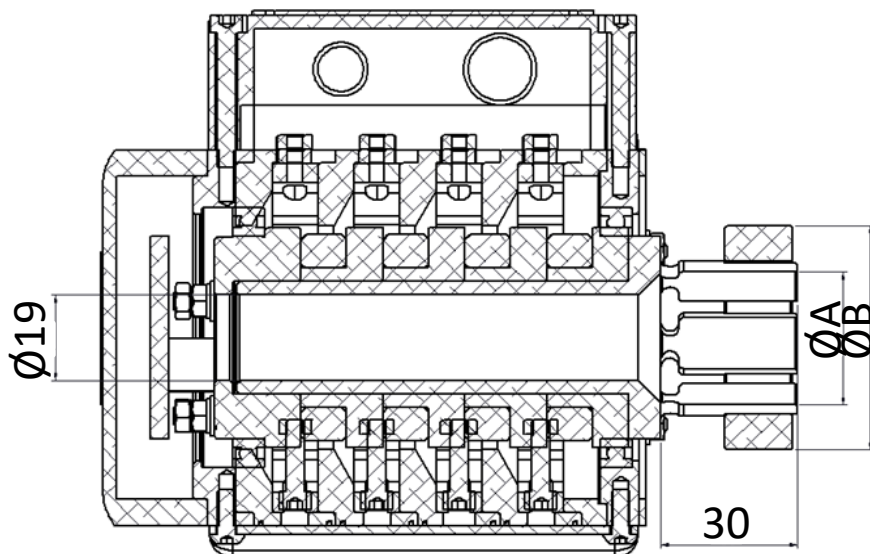
### TYPE (M) CR04-MXXX (2/2 CHANNELS)

TERMINALS	COLOR	VOLTAGE	CURRENT(máx.)
1	BLUE	220V	2A
2	BLUE	220V	2A
3	RED	220V	25A
4	RED	220V	25A

### 3. TECHNICAL CHARACTERISTICS

#### 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 \*.



AISI 304 STAINLESS STEEL AXIS

ØA	ØB (Ø flange)	CODE
20mm	40mm	CR04-PXX-1XX
25mm	45mm	CR04-PXX-2XX
30mm	50mm	CR04-PXX-3XX
35mm	55mm	CR04-PXX-4XX
40mm	60mm	CR04-PXX-5XX

Example: to select the model with 4 channels for load, with a 30mm plug-in spindle dimension, enter the code CR04-P04-3XX

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

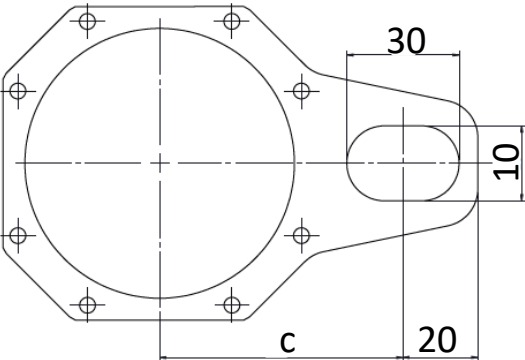
\*tolerance h10 : Ø18-30 max. +0/ min. -0,084  
 Ø30-50 max. +0/ min. -0,100



# 3. TECHNICAL CHARACTERISTICS

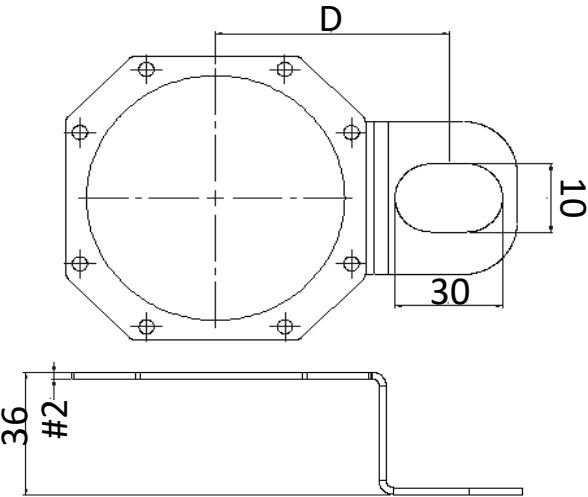
## 3.5 DIMENSIONS OF THE TORSION ARM

### TORSION ARM – STRAIGHT MODEL



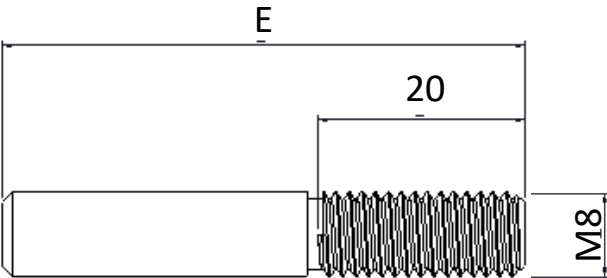
MEASURE "C" (STRAIGHT MODEL)	CODE
65mm	CR08-PXX-X1X
80mm	CR08-PXX-X2X
100mm	CR08-PXX-X3X
130mm	CR08-PXX-X4X
150mm	CR08-PXX-X5X

### TORSION ARM - FOLDING MODEL



MEASURE "D" (FOLDING MODEL)	CODE
45mm	CR08-PXX-X6X
55mm	CR08-PXX-X7X
70mm	CR08-PXX-X8X
85mm	CR08-PXX-X9X
105mm	CR08-PXX-X0X

### TORSION ARM SPACER



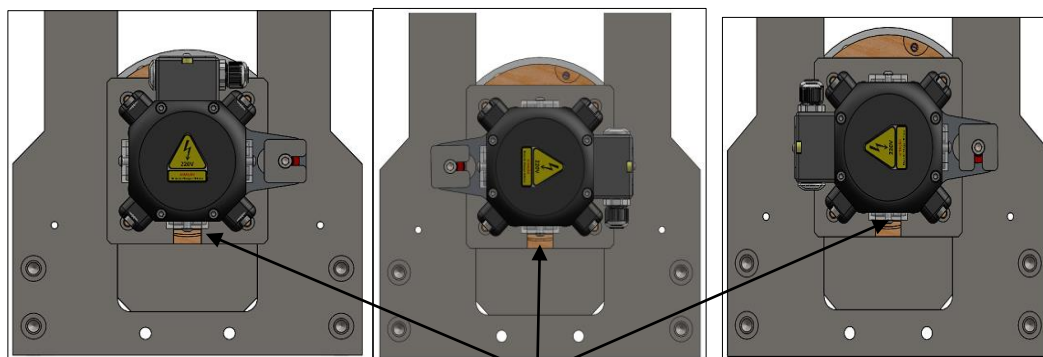
MEASURE "E"	CODE
30mm	CR04-PXX-XX1
40mm	CR04-PXX-XX2
50mm	CR04-PXX-XX3
60mm	CR04-PXX-XX4
70mm	CR04-PXX-XX5
80mm	CR04-PXX-XX6
100mm	CR04-PXX-XX7

Example: to select the model with 4 channels, 2 for power and 2 for signal, with a 30mm spindle axis measurement, with a 65mm straight model torsion arm and a 40mm spacer, enter the code CR04-P02-312. For other measures of the torsion arm please contact the SCHRELI technical department.

### 3. TECHNICAL CHARACTERISTICS

#### 3.6 ASSEMBLY AND INSTALLATION

The connector must be installed directly on the shaft, and the torsion arm at a fixed point in the rotation set, in order to give the stator rotation sustainability. The position of the equipment must have one of the 3 cleaning windows facing downwards (fig.1) and never in any different position (fig.2). The torque arm can be mounted configured in four positions (fig.3):



cleaning cap (down)



Figure 1

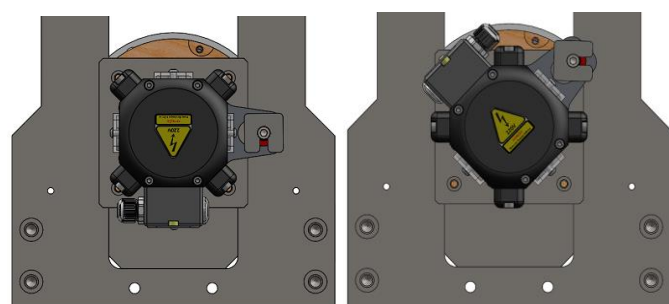


Figure 2

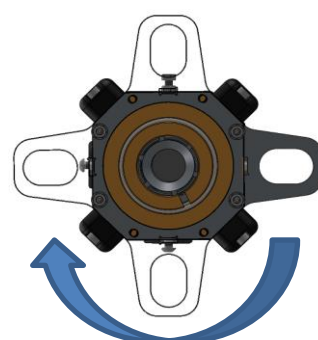


Figure 3

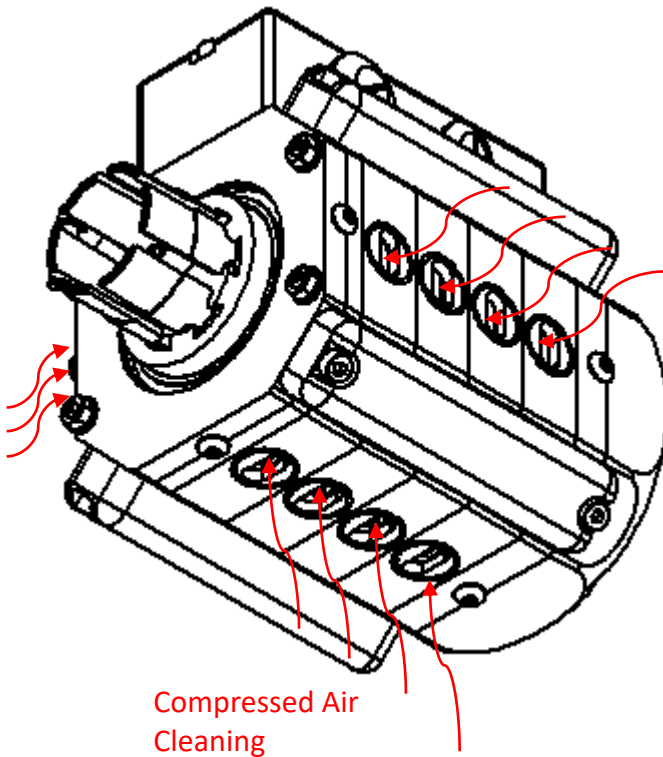
#### 3.7 ACESSORIES

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, perform the cleaning with compressed air gun in all cracks

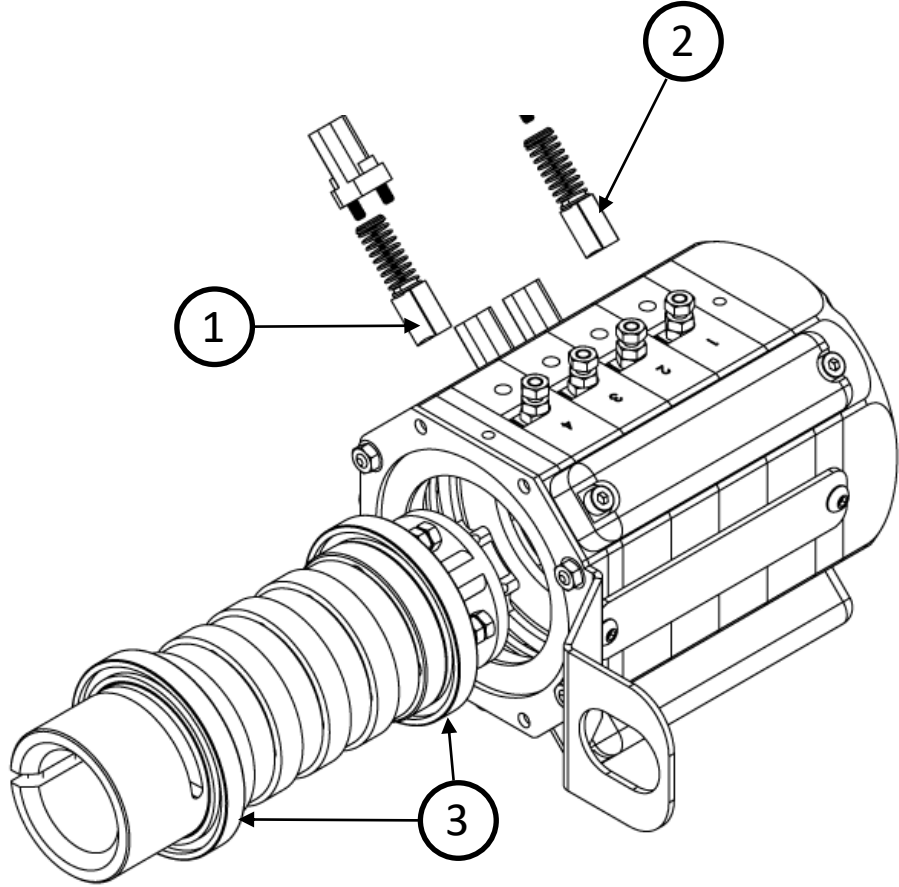
NOTE: the compressed air used must be free of contamination and water.

Do not use any type of chemical to clean the equipment.

# 4. MAINTENANCE

## 4.2 WEAR PARTS

PARTNUMBER	COMPONENTS	QTY	CODE
01	LOAD BRUSHES SET	08	CR04-130933
02	SIGNAL BRUSHES SET	04	CR04-130932
03	RADIAL BEARING	02	CR04-130946



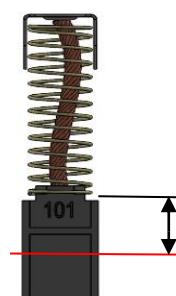
### 4.3 BRUSH FAILURE

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 9mm (figure below).

The brushes have a service life of approximately 500 million revolutions, which results in more than 1 year at max. 1000rpm, in the event of lower speeds, the brushes will have a longer service life time.

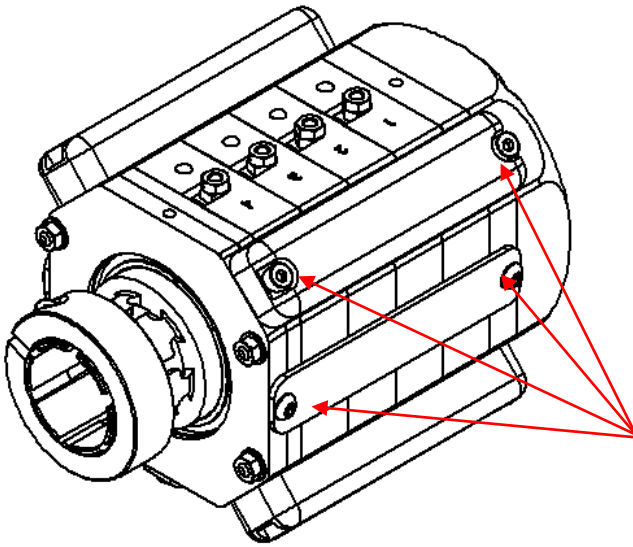
Note: Never change only one of the brushes, they must be changed all at once, in order to obtain a better use of the equipment and avoid risks of overload.

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.

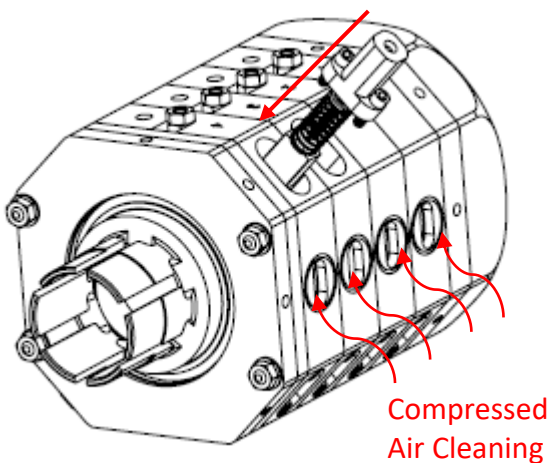


Brush wear limit measurement  
Min. = 9mm

### 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.

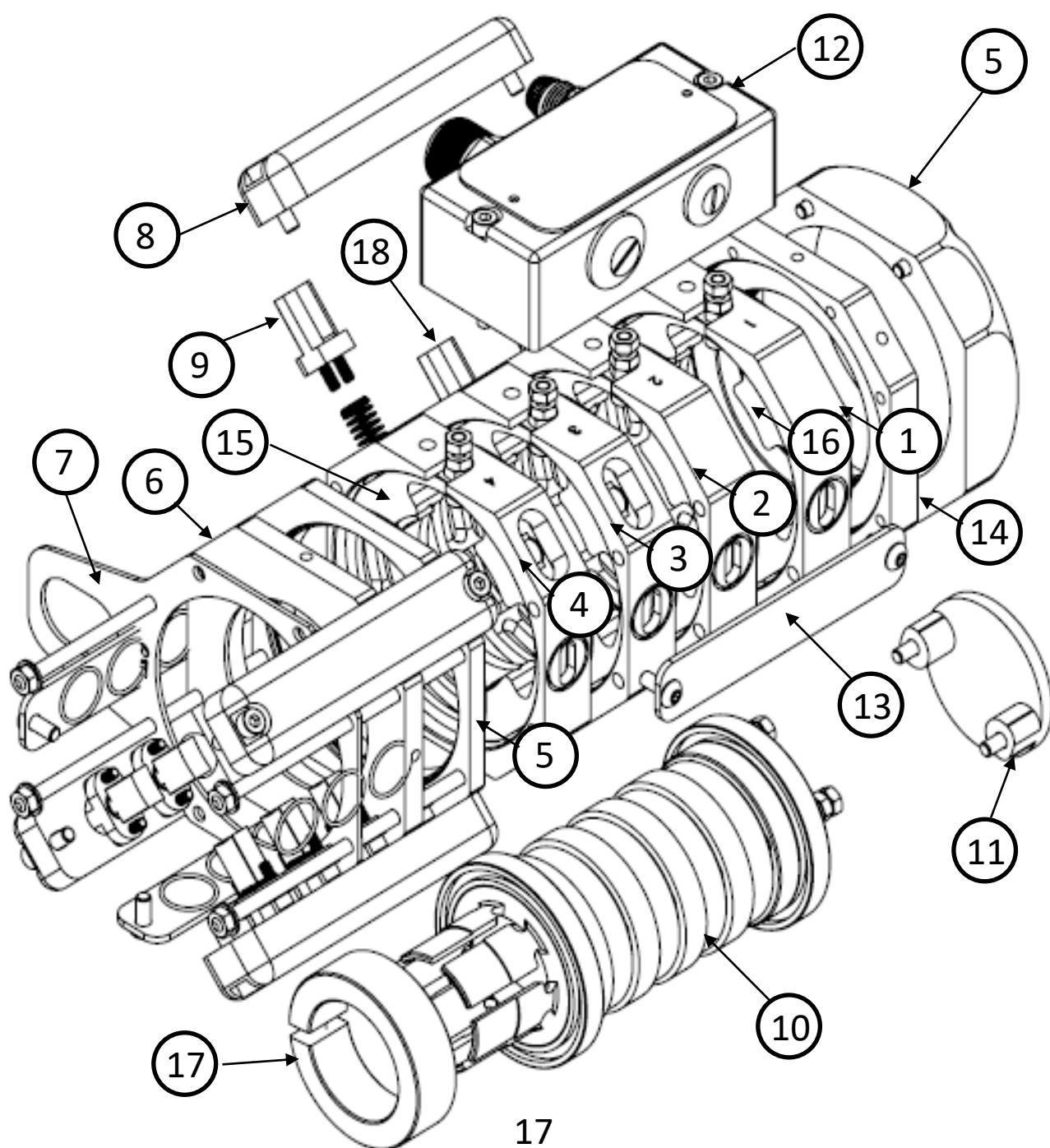


Perform the internal cleaning of all equipment with compressed air, directing the air through the 12 cleaning channels. Replace all brushes, fitting in channel correctly (signal and load), then fix the brush cups, and then the insulation caps and side cleaning caps.



### 4.5 SPARE PARTS

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



## 4. MAINTENANCE

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	INFORM MODEL
08	EXTERNAL CUPS COVER	CR04-130901
09	LOAD BRUSHES COVER	CR04-130912
10	COMPLETE ROTOR SET	CR04-130931
11	WIRE PROTECTION COVER	CR04-130927
12	TOP COVER	CR04-130929
13	ACRYLIC SIDE COVER	CR04-130911
14	REAR ALUMINUM HOUSING	CR04-130902
15	BRUSH HOLDER 4 CHANNELS (LOAD)	CR04-130904
16	BRUSH HOLDER 2 CHANNELS (SIGNAL)	CR04-130905
17	SHAFT CLAMPING FLANGE	CR04-130942
18	SIGNAL BRUSHES COVER	CR04-130945



### 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 $\Omega$ ).
- 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 $\Omega$ ).
- 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.

All the results of the tests carried out are in the Quality Certificate that is on page 41 of this manual.

### 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.



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