

# SLIP RING



IP 67

EXPLOSION PROOF



*Transfer analog or digital energy signals*

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# The company



## PHILOSOPHY

**HBS** bases its development on the synergy with the customer

Since 1967 **HBS Group** operates in the production and marketing of hydraulic and electromechanical components. The constant search for technical solutions, the constant improving the quality of product and process, in addition to the efficiency and flexibility of the production allow **HBS** to the continued success in the global market. The presence of **HBS** with unit production and trade in different continents, alongside a qualified distribution network, provides customer assistance it needs. **HBS** is your partner for the development and supply of hydraulic components and electromechanical.

With its technical staff **HBS** is able to realize and customize, in synergy with the customer, highly innovative Slip Ring for each type of use, from transport to construction, from construction machinery to agriculture, from ecology to industrial systems.



## R&D

**HBS** is able to anticipate the needs of the changing market and to develop customized products





# Slip ring series

The Slip ring Series SR130, SR200 have been designed not only to transfer energy signals AC and DC type from a rotating platform to a stationary structure and vice versa, but also to transfer analog or digital

ones. This happens, for example, in case of remoted systems P/T, analog or digital type, according to the transfer of control signals for drive motors, and of feedback ones from the transducers of angular position.

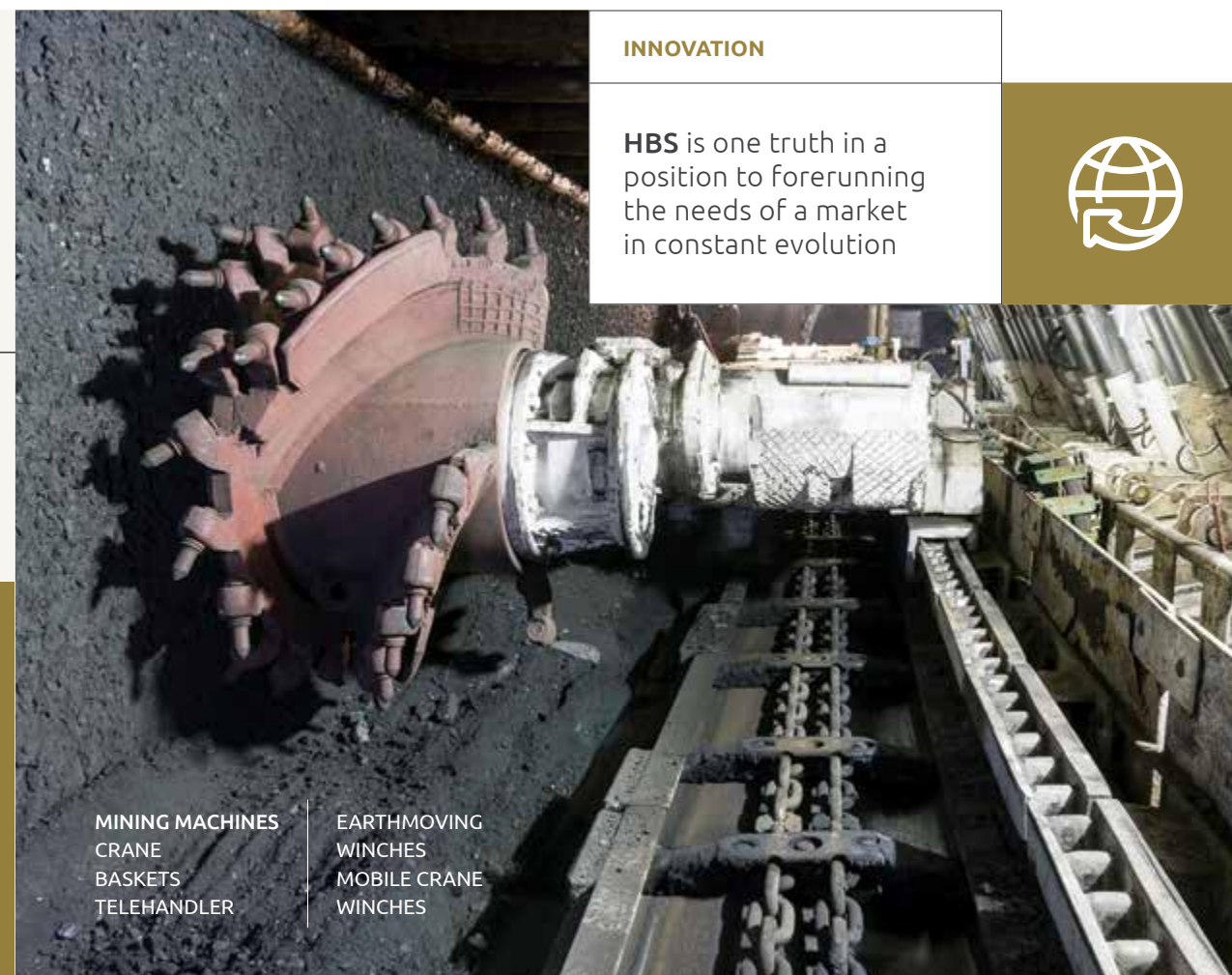


To choose technology **HBS**, mean to entrust themselves to a sure, synonymous partner of quality



## INNOVATION

**HBS** is one truth in a position to forerunning the needs of a market in constant evolution



MINING MACHINES  
CRANE  
BASKETS  
TELEHANDLER

EARTHMOVING  
WINCHES  
MOBILE CRANE  
WINCHES

## Application fields

With the unit planning, **HBS** is in a position to devise, realize and customize, in synergy with the customer, Slip Rings highly innovated for every type of employment,

from the transports to the earth movement, from the building to agriculture, from the ecology to the industrial systems.

# Slip ring SR130



IP67  
CE

## GENERAL SPECIFICATIONS

|   |
|---|
| Slip ring with variable size  |
| Sizes under cover 30-260mm  |
| Max 50 ring   |
| Suitable for analog-to-digital, and auxiliary power   |
| Maximum operating voltage 680Vac / Vdc.   |
| Test voltage 2000 Vac.  |
| Intensity max current monofilament: 20A continuous loop                                     |
| Intensity max current electrografite: 12A continuous loop                                   |
| Contact resistance brushes / rings <20 mhm  |
| Degree of protection IP55/IP67  |
| Mounting Position Vertical / Horizontal   |
| Operating temp: -40/+60°C<br>(under -20°C it's recommended to use anti-condensation heater) |
| Direction of rotation CW / CCW  |

## STANDARD CONSTRUCTION

|  |  |
|--|--|
| Slip ring body: aluminium anticorodal  |  |
| <b>Internal rings</b><br><i>Power:</i> brass with nickel plating   | <i>Signals:</i> brass with gold plating                                      |
| <b>Type of brushes</b><br><i>Power:</i> metal coal with a high content of copper or monofilament in beryllium copper with nickel plating treatment | <i>Signals:</i> monofilament in beryllium copper with gold plating treatment |
| Mechanics and screws: stainless steel  |  |
| Rotating shaft on ball bearings: sealed and lubricated for life  |  |
| Cable glands for multi-core cables   |  |
| Rating plate on the basis of the slip ring   |  |

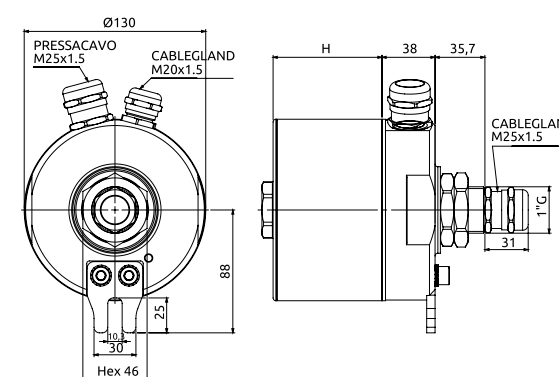
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## REFERENCE STANDARDS



Machinery Directive  
2006/42 (Annex B)  
Standards EN 60309-1-2  
Plugs and sockets for  
industrial use  
EN 60204-1 for electrical  
systems on board  
60947-1-1 Low-voltage  
switchgear  
Part1: General rules

## Standard dimensions



| RING    | H      |
|---------|--------|
| 1 - 12  | 80 mm  |
| 13 - 36 | 160 mm |

| IP rating | Cable exit                              |
|-----------|---|
| IP55      | Conduit flexible<br>PVC corrugated tube |
| IP67      | Multipolar cable<br>cable glands        |

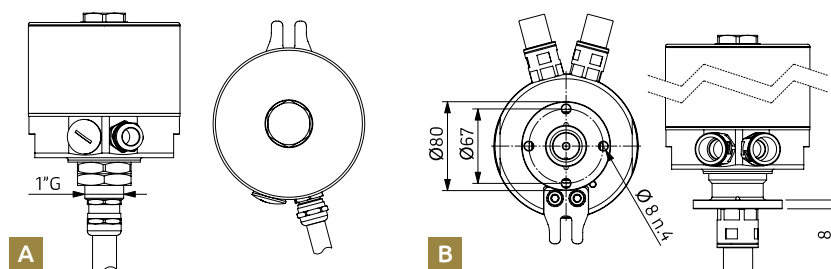
## Max capacity of the cables (CEI-UNEL)

| Cable cross-section (mm <sup>2</sup> ) | 0.5 | 1   | 1.5 | 2.5 | 4   | 6   | 10  | 16  | 25   | 35   | 50   |
|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| Max Temperature on cable = 70 C°       | 3A  | 10A | 16A | 20A | 30A | 37A | 46A | 60A | 105A | 130A | 155A |

# Version monofilament

## brush standard versions

| Version | Type        | N. Ring   | Rated current (A) | Cable (mm <sup>2</sup> ) L=2.5mt | VAC maximum voltage supply | Rpm Max | Protection class | Output type                |
|---------|-------------|-----------|-------------------|----------------------------------|----------------------------|---------|------------------|----------------------------|
| A       | S0541049900 | 1Earth+3  | 16                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable4G1.5 pur  |
| A       | S0541069900 | 1Earth+5  | 16                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable7G1.5 pur  |
| A       | S0541089900 | 1Earth+7  | 16                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable12G1.5 pur |
| A       | S0541129900 | 1Earth+11 | 16                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable12G1.5 pur |
| A       | S0541169900 | 1Earth+15 | 16                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable18G1.5 pur |
| A       | S0541189900 | 1Earth+17 | 16                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable18G1.5 pur |
| A       | S0541259900 | 1Earth+24 | 16                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable25G1.5 pur |
| B       | S0541309900 | 1Earth+29 | 16                | 1.5                              | 680                        | 12      | IP55             | Conduit / Unipolar cables  |
| B       | S0541369900 | 1Earth+35 | 16                | 1.5                              | 680                        | 12      | IP55             | Conduit / Unipolar cables  |

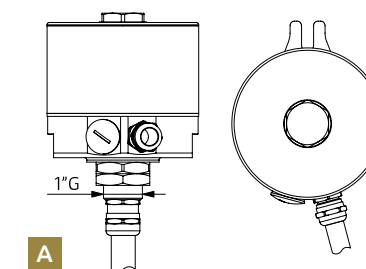


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# Version electrografite

## brush standard versions

| Version | Type        | N. Ring   | Rated current (A) | Cable (mm <sup>2</sup> ) L=2.5mt | VAC maximum voltage supply | Rpm Max | Protection class | Output type                |
|---------|-------------|-----------|-------------------|----------------------------------|----------------------------|---------|------------------|----------------------------|
| A       | S0542049900 | 1Earth+3  | 12                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable4G1.5 pur  |
| A       | S0542069900 | 1Earth+5  | 12                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable7G1.5 pur  |
| A       | S0542089900 | 1Earth+7  | 12                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable12G1.5 pur |
| A       | S0542129900 | 1Earth+11 | 12                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable12G1.5 pur |
| A       | S0542169900 | 1Earth+15 | 12                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable18G1.5 pur |
| A       | S0542189900 | 1Earth+17 | 12                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable18G1.5 pur |
| A       | S0542259900 | 1Earth+24 | 12                | 1.5                              | 680                        | 12      | IP67             | Multipolar cable25G1.5 pur |

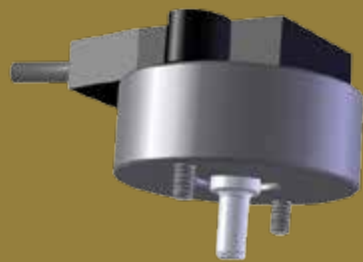


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# Accessories for special application

## ACCESSORIES

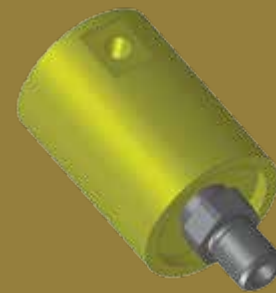
**HBS** offers a range of accessories for special applications associated with the series Slip ring SR130



**ROTARY SENSOR  
WITH SUPPORT BASE**  
*(internal installation)*

*Version available:*

- output can bus redundant
- single output can bus
- analog
- analog current



**AIR SWIVEL JOINT**  
*(internal installation)*

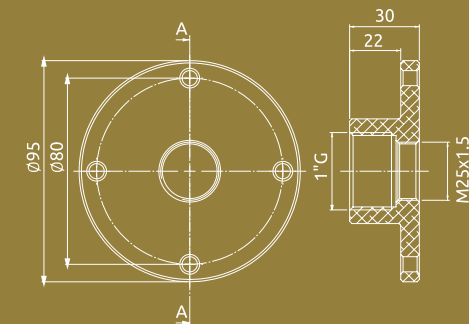
*Version available:*

- 1/4"G
- 3/8"G



**ANTI-CONDENSATION  
HEATER**

For applications ambient  
temperatures -20 to -40 °C



**FLANGE 1"G**  
*(available for standard  
models)*

To convert the 1"G  
connection in flanged connection

# Slip ring explosion proof SR130EX



## REFERENCE STANDARDS



Machinery Directive 2006/42 (Annex B)  
Standards EN60309-1-2 Plugs and sockets for industrial use  
EN 60204-1 for electrical systems on board  
60947-1-1 Low-voltage switchgear Part 1: General rules  
94/9/EC Atex Directive (Atmospheres Explosibles)  
Technical protection for electrical equipment according to EN60079-0 and EN60079-1  
13 ATEX 11X CESI Certificate Number EC Type-Notification of EC quality of production in accordance with Annex VII to Directive 94/9EC (ATEX)



Exd IIC T5 Gb (gas)  
Tamb -40 +55 °C



13ATEX11X

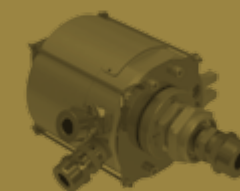
|                               |   |
|-------------------------------|---|
| <b>GENERAL SPECIFICATIONS</b> | Slip ring with variable size  |
|                               | Sizes under cover 80/160/240mm  |
|                               | Max 50 ring   |
|                               | Suitable for analog-to-digital, and auxiliary power   |
|                               | Maximum operating voltage 680Vac / Vdc.   |
|                               | Test voltage 2000 Vac.  |
|                               | Intensity max current 20 A continuous loop  |
|                               | Contact resistance brushes / rings <20 mhom   |
|                               | Degree of protection IP55/IP66  |
|                               | Mounting Position Vertical / Horizontal   |
|                               | Operating temp: -40/+60°C<br>(under -20°C it's recommended to use anti-condensation heater) |
|                               | Direction of rotation CW / CCW  |

|                              |  |  |
|------------------------------|--|--|
| <b>STANDARD CONSTRUCTION</b> | Slip ring body: aluminium anticorrosional                                    |  |
|                              | <b>Internal rings</b>  |  |
|                              | <i>Power:</i> brass with nickel plating                                      | <i>Signals:</i> brass with gold plating                                      |
|                              | <b>Type of brushes</b>   |  |
|                              | <i>Power:</i> monofilament in beryllium copper with nickel plating treatment | <i>Signals:</i> monofilament in beryllium copper with gold plating treatment |
|                              | Mechanics and screws: stainless steel  |  |
|                              | Rotating shaft on ball bearings: sealed and lubricated for life              |  |
|                              | Wiring cables: special explosion-proof                                       |  |
|                              | Barrier cable glands for multi-core cables                                   |  |
|                              | Protective sheath: special explosion-proof                                   |  |
|                              | Rating plate on the basis of the slip ring                                   |  |

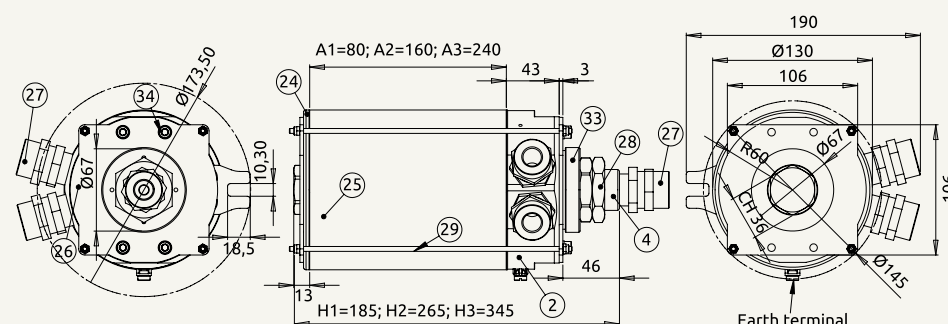
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# Slip ring explosion proof SR130EX



## Standard dimensions



| Size       | A  | mm  |
|------------|----|-----|
| PDEX01-000 | A1 | 80  |
| PDEX02-000 | A2 | 160 |
| PDEX03-000 | A3 | 240 |

| IP rating | Cable exit                                  |
|-----------|---|
| IP66      | Multipolar cable / NPT<br>ATEX cable glands |

| Part            | Pos  |
|-----------------|------|
| Basic body      | 2    |
| Shaft           | 4    |
| Earth terminal  | E.T. |
| Cover           | 24   |
| Cover tube      | 25   |
| Closing plate   | 26   |
| NPT cable gland | 27   |
| Closing device  | 28   |
| M4 screw        | 29   |
| Brass shaft     | 33   |
| M4 bolts        | 34   |

## Use of Slip ring SR130EX

The Slip Ring Series SR130EX are used in potentially explosive atmospheres. We must therefore ensure that the slip ring is suitable for the area classification and the characteristics of the system to which it is intended. The essential safety requirements against the risk of explosion in hazardous areas with regard to the devices are set by European directives 94/9/EC of 23 March 1994 (1999/92/EC of 16.12.1999 for the plant).

Areas with a potentially explosive atmosphere are classified according to EN60079-10, while the technical requirements of electrical installations in hazardous areas are given in standard EN 60079-14. Technical protection for electrical equipment according to standards EN60079 and EN60079-0-1.

Based on these technician requirements and laws, the should be chosen taking into account the following factors:

- type of plant equipment group II surface;

- category Gas 2GD dust protection high use areas of zone 1 and zone 2 are present;
- the characteristics of the combustible materials present in the form of gas, vapor or mist;
- subgroup: IIB (ethylene), IIC (hydrogen);
- temperature class: T5 (300), T1 (450).

### **Note:**

The slip ring of the group IIC are also suitable for areas IIB IIA (propane).

The slip ring with a given temperature class are also suitable for all substances with higher temperature class;

For example collectors T5 are also suitable for all substances with temperature class T4 (135), T3 (200), T2 (300), T1 (450).

### **Slip ring SR130EX**

These series are suitable for the passage of signals of power.

**The peculiarity of this series of slip ring is the radial dimension extremely content that allows its use in very small spaces.**



# Power Slip ring SR220



Machinery Directive  
2006/42 Annex B

The sliding contacts of SR220 Series slip rings are designed to carry electrical signals AC and DC by a rotating platform to a stationary structure and vice versa, or with the same contacts with a galvanic gold plating surface treatment they are also suitable for the transport of analog or digital signals. The main characteristics of the six Series Slip Ring power that the sliding contacts are realized according to a technology in the form of monofilament with different types of surface treatments which give the best mechanical and electrical performance compared to the traditional metal graphite. 1) Of the monofilament point of contact with the rotating ring surface 2)

Contact surface that does not require lubrication, and low contact dynamic resistance (noise). 3) Long service life and low contact force. 4) High compaction of the rotor and stator. 5) High permissible current density and wide dynamic range of low electrical resistivity current job. 6) Very low generation of debris. Wide operating temperature range, good environmental conditions (no oxidation) high scroll speed. The structure is entirely in aluminum Marine Anticorrosive. The product for its ease in construction can be assembled to 'internal modulated' with different sizes of rings and sliding contacts, in such a way as to optimize space and installation time.



## GENERAL SPECIFICATIONS

- Slip ring with variable size
- suitable for analog-to-digital, and auxiliary power
- maximum operating voltage 690Vac / Vdc.
- test voltage 2500 Vac.
- intensity max current A continuous loop.
- contact resistance brushes / rings <0.5 mhm.
- degree of protection IP 66.
- maximum operating speed 17.5 rpm
- mounting Position Vertical / Horizontal.
- operating temperature - 40°C - +60°C
- direction of rotation CW / CCW

## STANDARD CONSTRUCTION

- slip ring body: Aluminium anticorrosive. Rings slip ring; silver or gold for signals
- brushes: power - metal coal with a high content of copper monofilament to beryllium copper with nickel plating treatment
- signals: monofilament treatment of browning
- mechanics and screws: stainless steel
- rotating shaft on ball bearings: sealed and lubricated for life
- cable glands for multi-core cables
- the rating plate on the basis of the slip ring

# Test schedule

## Power Slip ring SR200

|    | Type of test                                      | Reference   | Standard                        | Date       | Executed                  |
|----|---|---|---------------------------------|------------|---------------------------|
| 1  | Degree of protection IP67                         | Degrees of protection provided by enclosures (IP Code)  | EN 60529                        | 03/05/2012 | int.                      |
| 2  | Degree of impact IK                               | Plugs and sockets for industrial use  | CEI EN 60309-1                  | 05/04/2012 | int.                      |
| 3  | Overheating and test current (thermal) $\Delta T$ | Low voltage equipment   | CEIEN 60947-1                   | 14/05/2012 | int.                      |
| 4  | Insulation resistance                             | Plugs and sockets for industrial use  | CEI EN 60309-1                  | 21/05/2012 | int.                      |
| 5  | Verifications of voltage drop                     | Low voltage equipment   | CEIEN 60947-1                   | 14/05/2012 | int.                      |
| 6  | Rigidity test                                     | Plugs and sockets for industrial use  | CEI EN 60309-1                  | 21/05/2012 | int.                      |
| 7  | Earth resistance                                  | Plugs and sockets for industrial use  | CEI EN 60309-1                  | 21/05/2012 | int.                      |
| 8  | B10 tests of wear                                 | Safety of machinery   | EN13489-1                       | 29/05/2012 | int.                      |
| 9  | Tear-proof terminals                              | Low voltage equipment   | CEIEN 60947-1<br>CEI EN 60204-1 | 21/05/2012 | int.                      |
| 10 | EMC test  | Electromagnetic compatibility (EMC)   | EN61000-6-4:2007+A1 (2011)      | 20/05/2014 | External NEMko            |
| 11 | Test aging  | Plugs and sockets for industrial use  | CEI EN 60309-1                  | 28/06/2012 | int.                      |
| 12 | Corrosion proof enclosure & electrical contact    | Plugs and sockets for industrial use  | CEI EN 60309-1                  | 12/09/2012 | External institution      |
| 13 | Thermal test casing housing                       | Non-electrical equipment for potentially explosive atmospheres  | UNI EN 13463-1                  | 25/06/2012 | int.                      |
| 14 | ATEX Explosion proof type tests                   | Electrical apparatus for explosive atmospheres due to the presence digas Part 1: explosion proof enclosures "d" | EN 60079-1/<br>EC:2008-03.      | 15/04/2013 | External institution CESI |





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