

Speed Sensor 3 Gainses Standard Axial 20X40 (600Amp)

EARTHING RETURN CURRENT UNITS (ERCU)

PULSE GENERATOR



An angular pulse generator which is used in speed sensors, based on phonic wheel or turning cable technologies, is installed inside the ERCU box and transmits information to an electronic system to:

- Detect whether the train is running or stopped, in order to trip or release safety systems such as door locks
- Measure the speed of the train
- Detect which way the train is traveling
- Detect when a train is braking, with possibilities of skidding/sliding/locking of individual axle. In these cases adhesion between the rails & wheels is crucial. Above situations can cause damage to wheel sets with increased braking distance. The Speed sensor will detect the speed of the wheel and inform the Wheel Slide Protection System which main purpose is to optimize the available adhesion.

Mersen innovate in adapting two different speed sensor technologies in our Earth Return Current Units range.

First one is based on a non-contact sensor counting of RPM of a phonic wheel, the second speed sensor technology is based on a cable connected to junction box.

These 2 in 1 solutions bring you many advantages (compactness, weight, cost) and they are based on two proven technologies in railway applications.

Some references :

Railway : MANILLA (PH)

FEATURES & BENEFITS

- Saving in Mounting time with this 2 in 1 single device instead of ERCU + Pulse generator
- Saving Space and modification (holes) on the bogie
- Saving Weight on the bogie
- Two technologies available (phonic wheel or cable connection) adaptable on radial ERCU's (3 or 4 gainses 12,5 x32 or 20x40)
- Cost effective, proven technologies and simple fixing on the bogie
- The Axial contact 3 brushes 20 x 40 Earth Return Current Unit is installed at the end of the axle, to provide an effective shunt around the bearings.
- There is a possibility to supply a complete adaptation including the contact disc, the support of the contact, the adapter, etc...

APPLICATIONS

- Speed sensor for all kind of trains and Metro



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TECHNICAL DATA

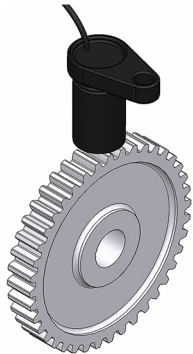
| 600 Amp 3G 20x40 | |
|------------------------------------|--|
| Mounting | Axial |
| Rated current | 600 A |
| Number of brushes | 3 |
| Cross section of the brushes | 20 x 40 mm |
| Short time withstand current 100ms | 10 kA |
| Short time peak withstand current | 27 kA |
| Resistivity | 5 mΩms |
| Constant brush pressure | 34 kPa |
| Material of body | Stainless Bronze, connection tinned |
| Material of cover | 3 mm thick zinc plated (15 microns) steel cover plate or Aluminium Alloy |
| Material of spring and screws | stainless steel |
| Material of insulating ring | Compound polyester; Polyester thermoplastic; Polyester glass fibre |
| IP | 547 |
| Pulse per meter | 172 pulses/meter |
| Speed measurement | 0.2 ... 400 km/h |

DIMENSIONS

Dented wheel + sensor - principle

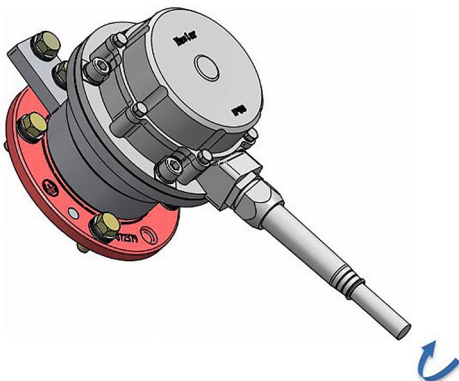
The sensor system is based on non contact type of counting of RPM.

This is ensured with the help of phonic wheel & sensor probe fitment with some air gap.



Turning cable - principle

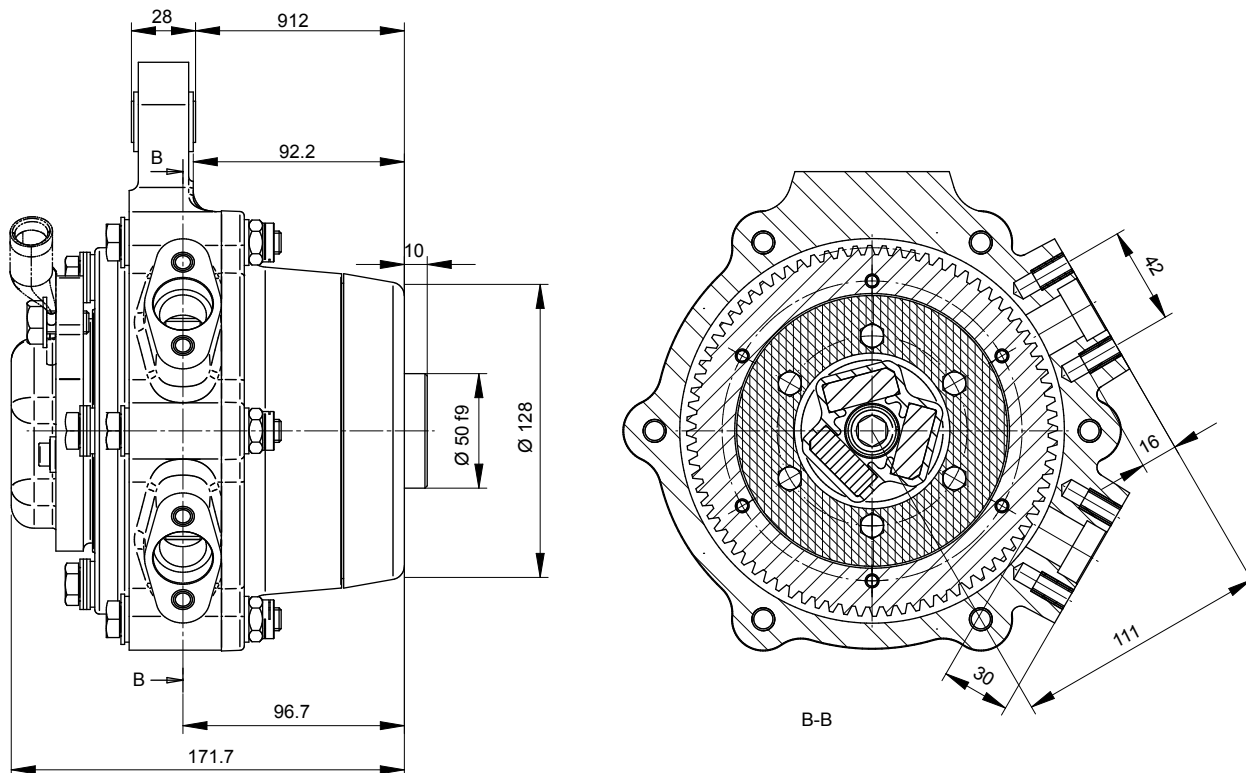
The function of speed sensor is to relay the signals with the rotation of the cable mounted on axle end and convey WSP system.



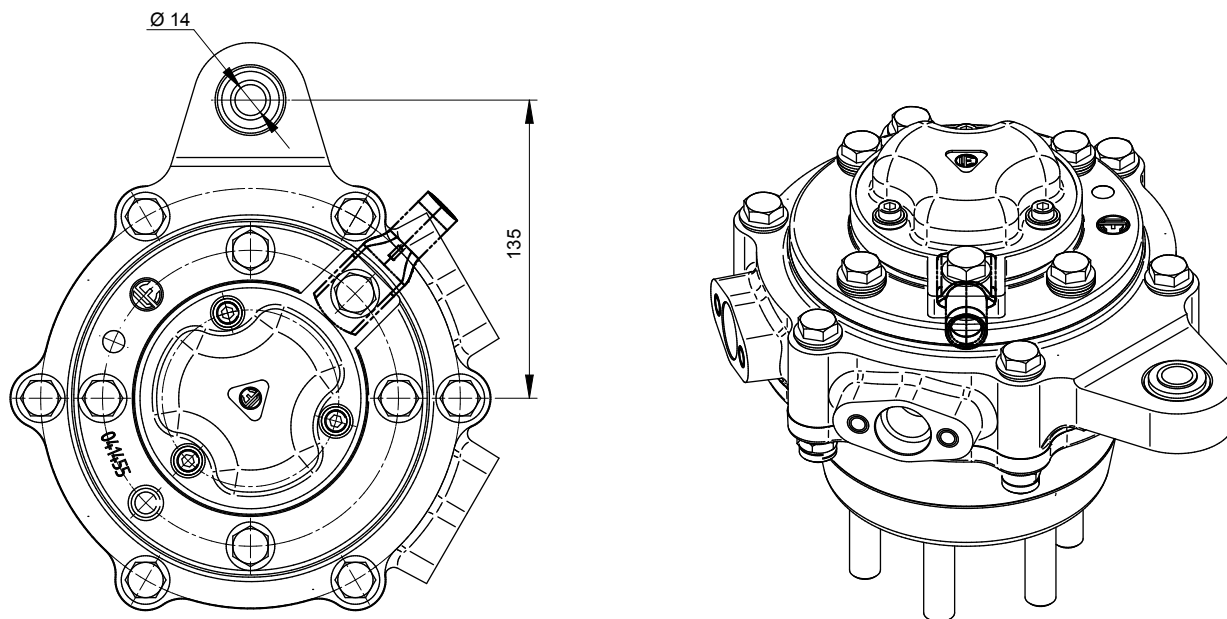
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DIMENSIONS

Earth Return Current Unit - 3 brushes with Dented wheel speed sensor - view 1
(dwg 1048133)



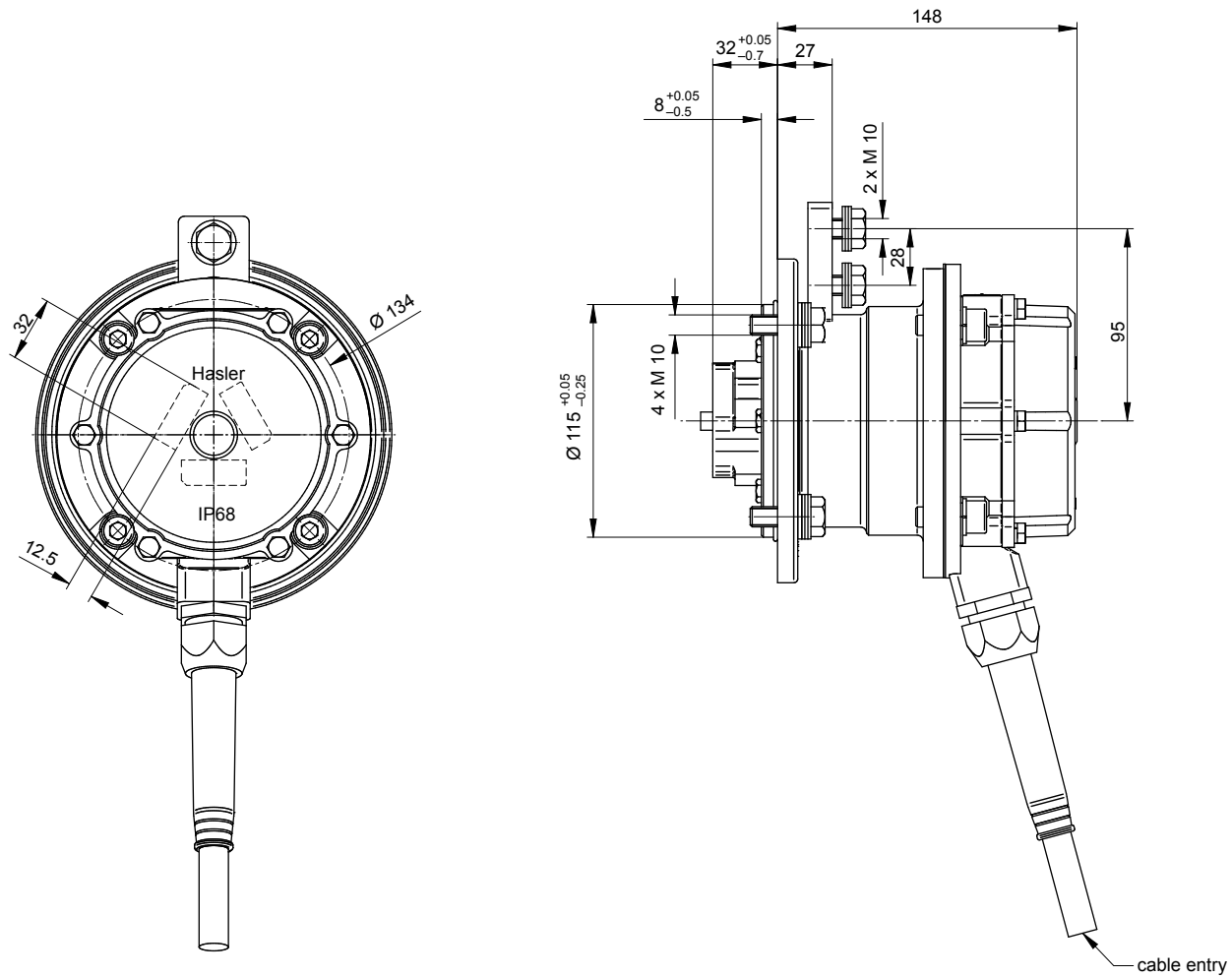
Earth Return Current Unit - 3 brushes with Dented wheel speed sensor - view 2
(dwg 1048133)



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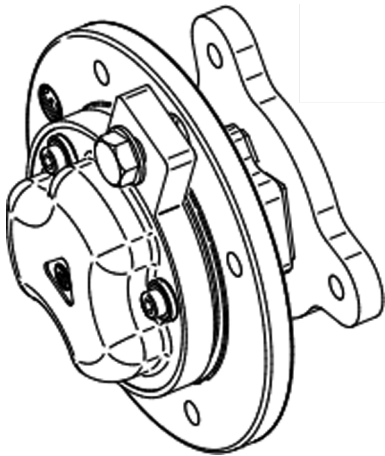
DIMENSIONS

Earth Return Current Unit - 3 brushes with Turning cable speed sensor
(dwg 1032852)



Speed Sensor 3 Gaines Standard Axial 20X40 (600Amp)

FUNCTIONS



Operations

In the patented Earth Return Current Unit the contact is made to the axle end by means of 2 independent brushes guided in 2 boxes of rectangular section in the radial direction of the axle. Two independent pressure systems of the close coiled roller spring type without inertia, apply a constant pressure to each of the 2 brushes.

The Earth Return Current unit is fitted to the axle by means of an adaptation part which replaces the axle box end cover, and is therefore easily accessible. For the inspection purposes, it is a simple matter of undoing 3 screws removing the cover/spring assembly for access to the brushes. An insulating support positioned between the Earth Return Current Unit and part ensures the effective shunting of the roller bearing by the unit.

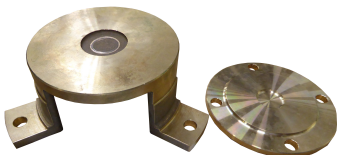
The connection lug for the electrical connection is an integral part of the unit.

The rotating contact face is a disc fitted to the axle end and possibly protected against lubricants emanating from the axle box bearing by a guard.

Due to the simplicity of the device and the very slow rate of brush wear (about 1 to 3mm per 100'000 km or 190'000 miles after patina creation), maintenance required is virtually zero. With the appropriate brush grade the formation of the skin on the surface of the contact disc can be observed and no evidence of hammering nor bevelling appears on the brush contact faces. The brushes are generally a metal graphite mixture grade manufactured by Mersen.

Contact disc - Slip disc

Mersen can study, design and supply the slip disc adapted to your axel end (material is CuSn8Ni3P)



Brushes

For the maintenance, the replacement brushes designed and dedicated to your Ground Brush can be provided by Mersen



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FUNCTIONS



Connexion cables + Braided cable

Connexion cables or braided cables are studied for your application.

Mersen can supply and guarantee them.

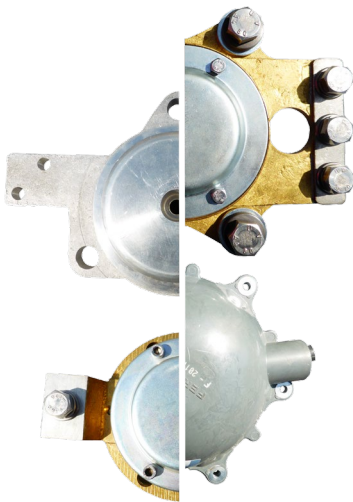
They are delivered with the possibility to customized the total length plus the adapted hardware for bolted connection.



Electrical isolation

ERCU are sealed to offer electrical isolation and a perfect protection from outside aggression and dirty environments.

On a regular basis, they offer IP547 but they can be modified to offer IP65



Connexion plate

Connection plate can be designed for “external” or “internal” connections to meet your requirements.

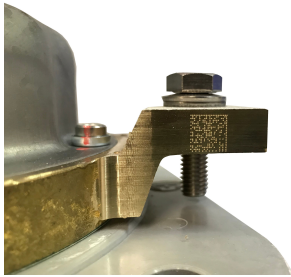
Also the cover of the ERCU can be electrically isolated



Salt mist protection

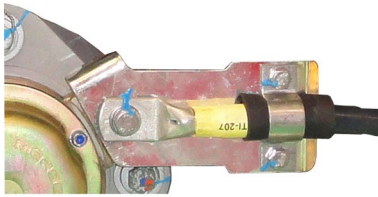
Standard version of ERCU offer 96 hours protection against salt mist but Mersen can propose higher protection with Zinc Nickel coating on the cover for 500 hours protection and a cataphoresis coating on the cover for a protection up to 1000h against salty mist.

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Personal identification

Mersen can add identification like data Matrix or QR code on each product



Cable support

Cable supports system can be studied to hold the cable and enlarge its life.



Painting of Steel covers

We can paint the metal covers on your ERCUs to the color specified as per the RAL chart, for purely cosmetic reasons.



Training and commissioning

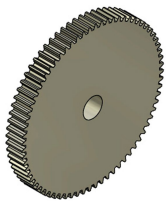
Mersen team can help you for training your Maintenance team and for commissioning your new installations all around the world



LCC; RAMS; Type tests

Mersen teams can supply Life Cycle Costs “LCC” and Reliability Availability Maintainability Safety “RAMS” and Faillure Mode and Effect Analysis “FMEA” studies. They can operate Qualification type tests.

ACCESSORIES



Indented Wheel

Indication facilities

| Catalog number | Package | Weight |
|-----------------------|---------|--------|
| Indented Wheel 128188 | 1 piece | 600 kg |

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ACCESSORIES



ERCU Cover

Covers/cover caps

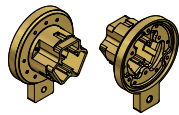
| Catalog number | Package | Weight |
|---------------------|---------|--------|
| ERCU COVER | 1 piece | 2 kg |
| ISOLATED ERCU COVER | 1 piece | 1.5 kg |



20 X 40 mm Brush

Brushes

| Catalog number | Package | Weight |
|-----------------|---------|--------|
| Brushes 20 X 40 | 24 | 30 g |



3G 20 X 40 Axial Brush Holder

Brush Holder

| Catalog number | Package | Weight |
|-------------------------------|---------|---------|
| Brush Holder 3G 20 X 40 Axial | 1 piece | 1.25 kg |



O Ring and Gaskets

Seal

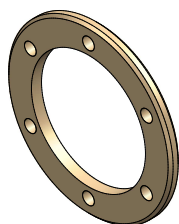
| Catalog number | Package | Weight |
|----------------|---------|--------|
| O-Ring seal | 1 piece | 5 g |
| Gasket | 1 piece | 10 g |



Insulating Spacer

Insulating spacer

| Catalog number | Package |
|-------------------|---------|
| Insulating Spacer | 1 piece |



Clamping plate

Clamping plate

| Catalog number | Package | Weight |
|----------------|---------|--------|
| Clamping Plate | 1 piece | 0.2 kg |



Slip Disc

Slip disc

| Catalog number | Package | Weight |
|----------------|---------|--------|
| Slip Disc | 1 piece | 0.3 kg |

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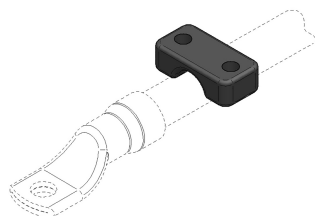
ACCESSORIES



Insulating bushing

Insulating bushing

| Catalog number | Item number | Package | Weight |
|------------------------------|-------------|---------|--------|
| ISOLATING SPACER DIAM 7 | D116383 | 1 piece | 20 g |
| ISOLATING SPACER DIAM 8,5 | Y116861 | 1 piece | 20 g |
| ISOLATING SPACER DIAM 17 | Q109471 | 1 piece | 25 g |
| ISOLATING SPACER TGV DIAM 11 | G041314A | 1 piece | 25 g |
| ISOLATING SPACER DIAM 9 | T118559 | 1 piece | 20 g |



Cable Clamp Strain Relief

Cable clamp strain relief

| Catalog number | Package | Weight |
|---------------------------|---------|--------|
| Cable Clamp Strain Relief | 1 piece | 0.1 kg |



Silohm resistances

Silohm resistances

| Catalog number | Item number | Package | Weight |
|--------------------------------|-------------|-----------|--------|
| RD6 R0,04/10 EPAIS.11 | N1048421A | - | 40 g |
| RD6 R0,010/10 EPAIS.11 | P1048422A | - | 40 g |
| RD6 R0,04/20 EPAIS10 | X202443A | - | 40 g |
| RD6 R0,05/20 EPAIS.11 | Y202444A | - | 40 g |
| PAPYEX WASHER EP:0,4 48MM | Z202445A | - | 5 g |
| STAINLESS STEEL WASHER 12X50 | T154002 | - | 50 g |
| STAINLESS STEEL WASHER 17X50 | A154008 | - | 50 g |
| INSULATING BUSHING 16X19 | W1048428 | 10 pieces | 25 g |
| INSULATING BUSHING 30X18 | G154014 | - | 25 g |
| STAINLESS STEEL WASHER DIAM 50 | X1048429 | - | 60 g |
| COVER 8x53 | Y1048430 | - | 10 g |

Cables



Connexion cables

| Catalog number |
|------------------|
| Braided cables |
| Connexion cables |