

Speed Sensor 3 Gaines Standard Axial 12,5X32 (300Amp)

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 two
- 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 gains 12,5 x32 or 20x40)
- Cost effective, proven technologies and simple fixing on the bogie
- The Axial contact 3 brushes 12,5 x 32 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

300 Amp 3G 12,5x32

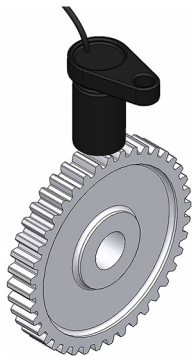
Mounting	Axial
Rated current	300 A
Number of brushes	3
Cross section of the brushes	12,5 x 32 mm
Short time withstand current 100ms	7 kA
Short time peak withstand current	19 kA
Resistivity	5 mΩms
Constant brush pressure	34 kPa
Material of body	Stainless Bronze, connection tinned
Material of cover	3 mm thick zinc plated (15 microns) steel cover plate
Material of spring and screws	stainless steel
Material of insulating ring	Compound polyester
IP	547
Pulse per meter	172 pulses/meter
Speed measurement	0.2 ... 400 km/h

DIMENSIONS

Dented wheel + sensor - principle

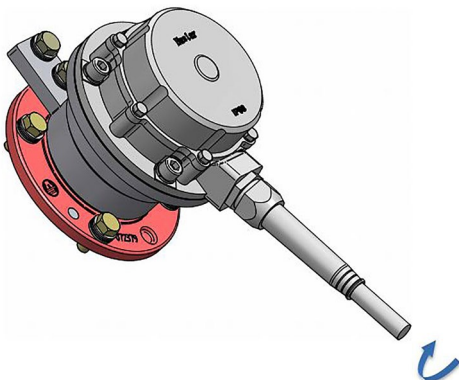
The sensor system is based on non contact type of counting of RPM.

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



Turning cable - principle

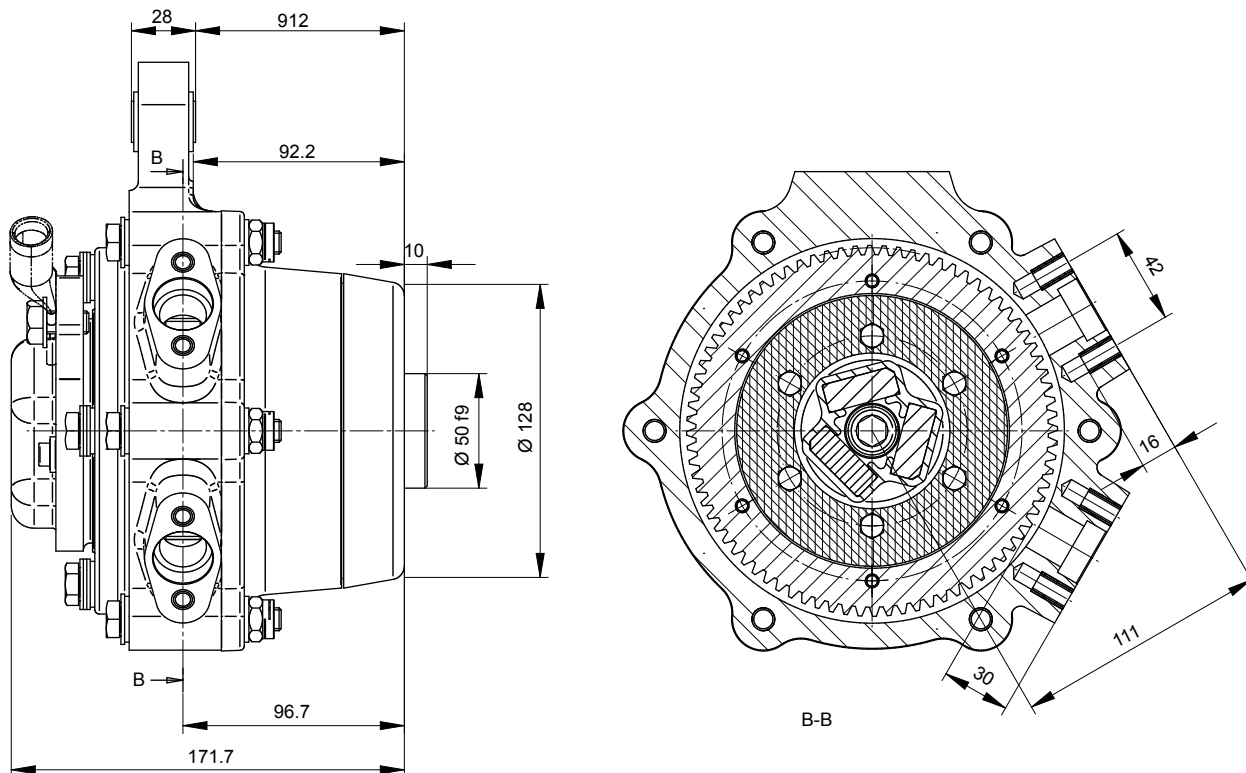
The function of speed sensor is to relay the signals with the rotation of the cable mounted on axle end and convey WSP system.



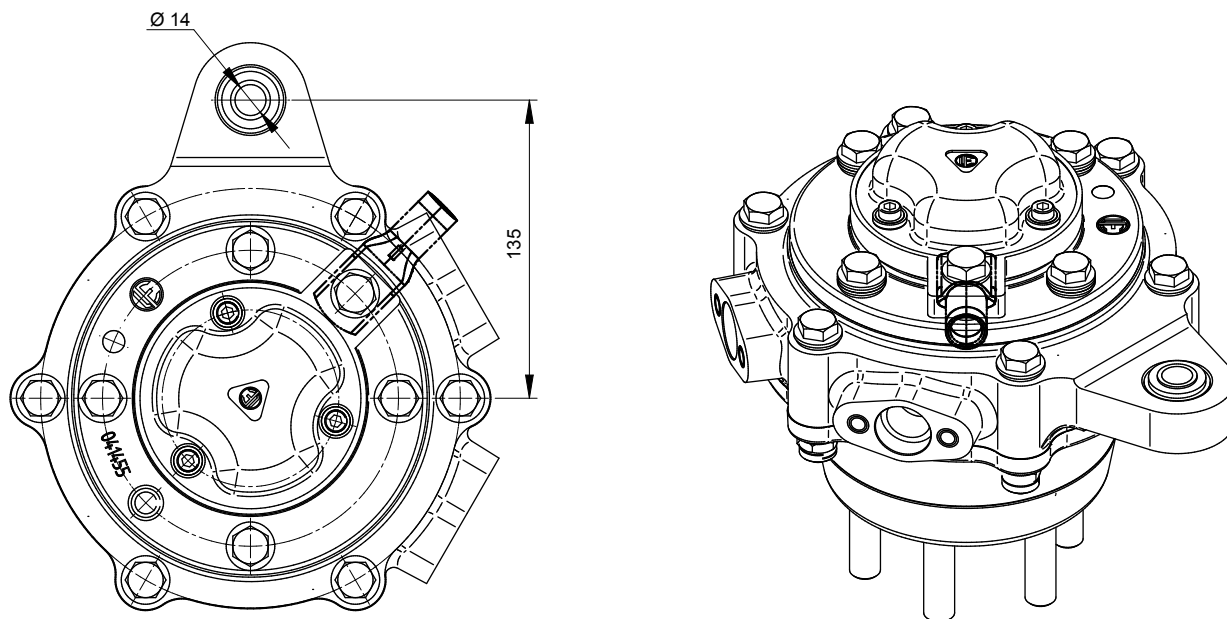
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DIMENSIONS

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



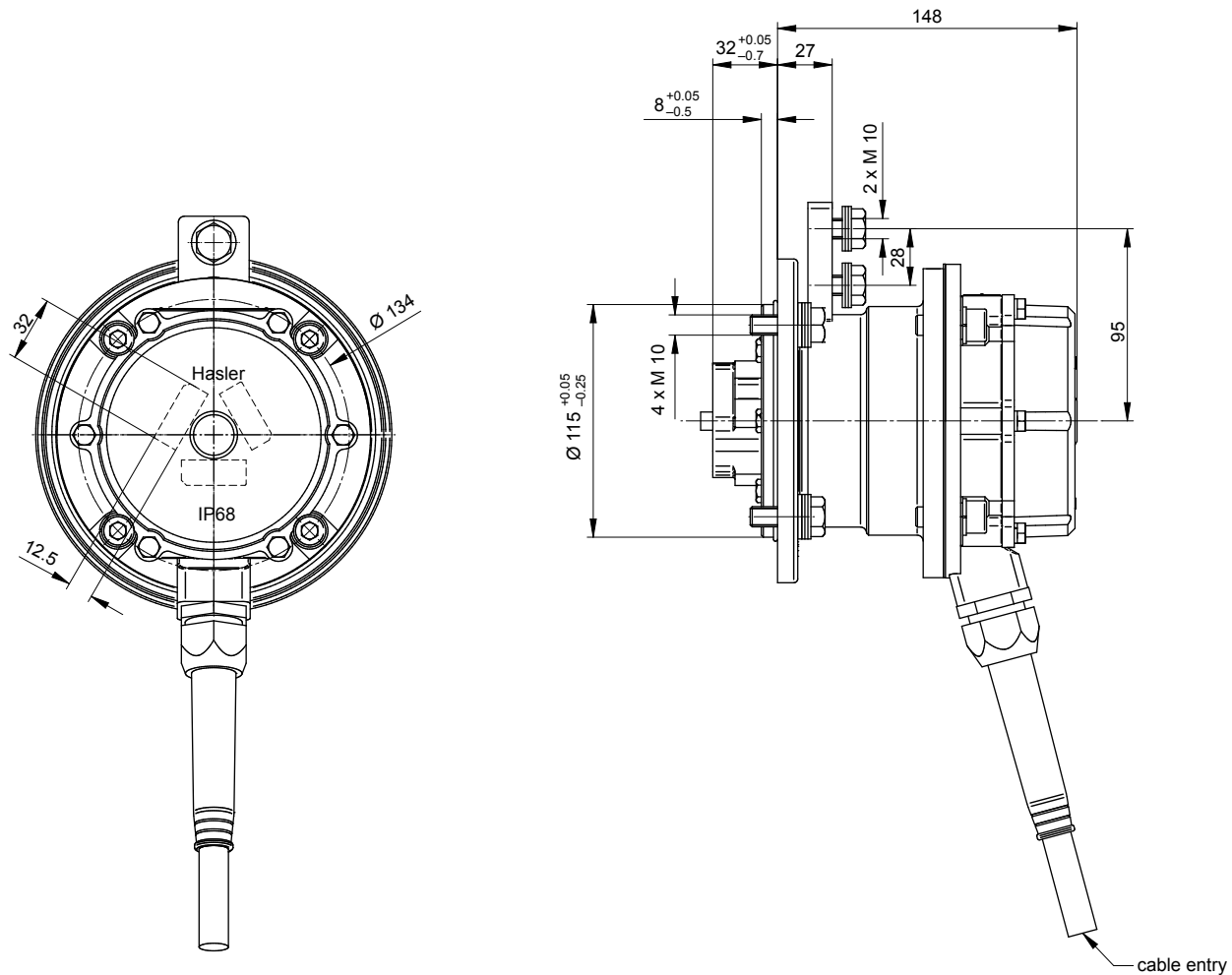
Earth Return Current Unit - 3 brushes with Dented wheel speed sensor - view 2
(dwg 1048133)



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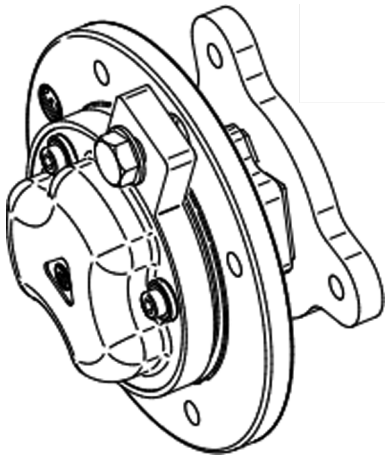
DIMENSIONS

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



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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.

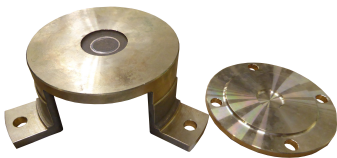
The connection lug for the electrical connection is an integral part of the unit.

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.

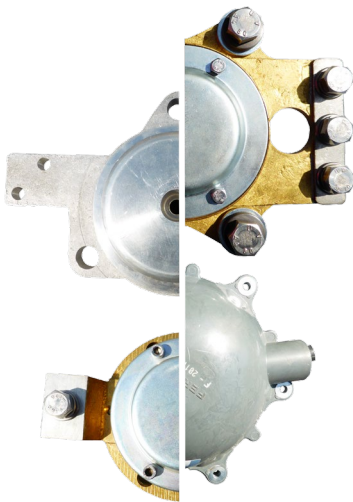
They are delivered with the possibility to customized the total length plus the adapted hardware for bolted connection.



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.

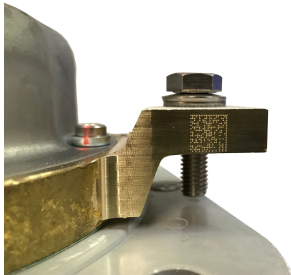
Also the cover of the ERCU can be electrically isolated



Salt mist protection

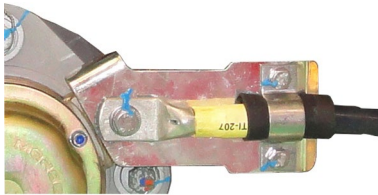
Standard version of ERCU offer 96 hours protection against salt mist but Mersen can propose higher protection with Zinc Nickel coating on the cover for 500 hours protection and a cataphoresis coating on the cover for a protection up to 1000h against salty mist.

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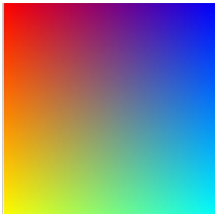
Personal identification

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.