

2 Gains into isolated wheel Axial 16X25 (200Amp)

EARTHING CURRENT UNITS (ERCU)

EARTHING CONTACTS FOR METRO AND TRAM



The flow of electric current through the axle box roller bearing of railway vehicles is one major problem for the safety and reliability of rolling stock.

The electrification of networks, the increase of power installed on board vehicles and higher speeds lead to an increase of risks of bearings damaged by electric current flow. As a result, the use of Earth Return Current Units, already indispensable on electric locomotives, is being extended to other vehicles by the large European railway companies.

Since 50 years, Mersen devices by virtue of their effectiveness (low contact resistance, permanence of contact), are very well suited for the protection of such bearings.

On all the vehicles of a train, the currents that can flow through the axle box roller bearing have various origins and their magnitude varies from the first to the last vehicles. The origins are :

- The electric locomotive or power car : Traction current in the return current path and current supplied in the return path from trailer vehicles. This latter origin also applies to diesel electric traction.
- The trailer vehicles equipped with generators supplying power to several trailers of a train where the return path is formed by earthing of the vehicles.
- The track : return current of trains running on the same track; signalling currents; stray currents emanating from industrial trackside installations.

In the 3 cases above, train and track are parallel conductors.

- Accidental : faulty insulation on one or more pieces of electrical equipment on board any of the vehicles; overhead line falling onto the train.

The flow of current through roller bearings whilst the vehicles are

FEATURES & BENEFITS

- Protected against dust penetration, water splash and shock
- Permanence of contact
- Very Low maintenance cost
- Fast and easy brush replacement
- Low cost and simple fixing on the bogie
- The Axial contact 2 brushes 16 x 25 Earth Return Current Unit is installed into an isolated wheel, the cross section is making the contact with the part of the wheel which is in contact with the rail 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

- Earth Return Current Unit for isolated wheel (comfort and noise) Low Floor Tramways



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stationary or running, produces damages characterized by craters or scoring (washboarding) respectively and whose development is dangerous. This result in substantial overheatings leading to the destruction of the roller bearing or seizure of the axles.

To avoid such damages, it is necessary to use devices shunting the greatest part of the current through the axles and wheels without flowing through the roller bearings.

Some references :

Tramway :

Düsseldorf, Melbourne, Budapest, ...

TECHNICAL DATA

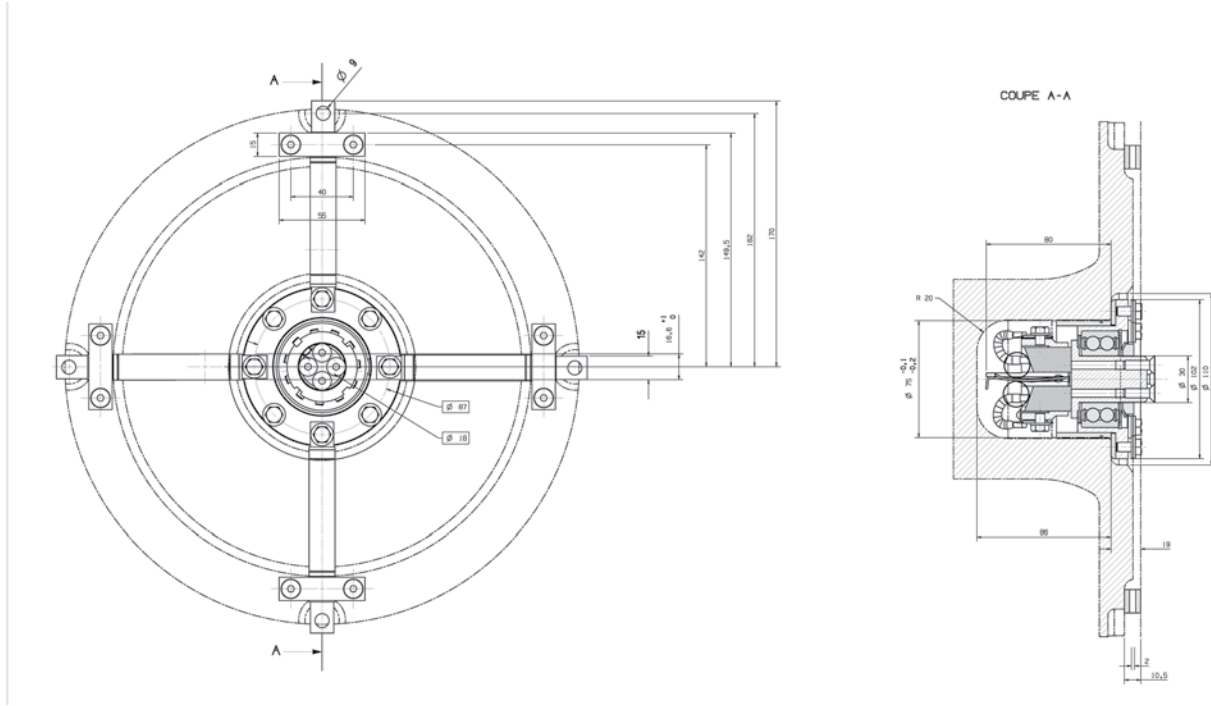
200 Amp 2G 16x25	
Mounting	Axial
Rated current	200 A
Number of brushes	2
Cross section of the brushes	16 x 25 mm
Short time withstand current 100ms	6 kA
Short time peak withstand current	16 kA
Resistivity	5 mΩms
Constant brush pressure	34 kPa
Material of body	Stainless Bronze, connection tinned
Material of spring and screws	stainless steel
IP	547
Weight	2 kg

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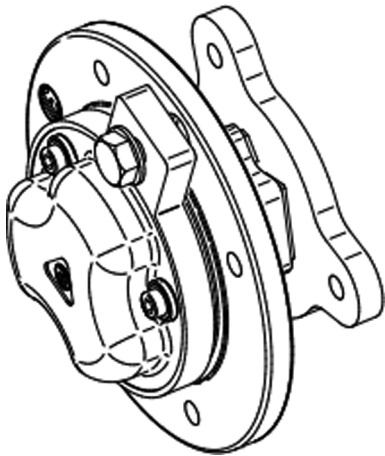
DIMENSIONS

Earth Return Current Unit - 2 brushes 16 x 25 - into isolated wheel
(dwg 1016519)



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FUNCTIONS



Operations

In the patented Earth Return Current Unit the contact is made to the axle end by means of 3 independant brushes guided in 3 boxes of rectangular section in the axial direction of the axle. Three independant pressure systems of the close coiled roller spring type without inertia, apply a constant pressure to each of the 3 brushes.

The Earth Return Current unit is fitted to the axle box body 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 positionned 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 mm per 100'000 km or 190'000 miles per 1/8 inch Paris metro for exemple), maintenance required is virutally 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.

Brushes

Replacement brushes dedicated to your ERCU can be provided for maintenance



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 joint.

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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



16 X 25 mm Brush

Brushes

Catalog number	Weight	Package
Brushes 16 X 25	30 g	24



O Ring and Gaskets

Seal

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



Silohm resistance

Silohm resistances

Catalog number	Weight	Package
RD6 R0,04/10 EPAIS.11	40 g	-
RD6 R0,010/10 EPAIS.11	40 g	-
RD6 R0,04/20 EPAIS10	40 g	-
RD6 R0,05/20 EPAIS.11	40 g	-
PAPYEX WASHER EP:0,4 48MM	5 g	-
STAINLESS STEEL WASHER 17X50	50 g	-
INSULATING BUSHING 16X19	25 g	10 pieces
INSULATING BUSHING 30X18	25 g	-
STAINLESS STEEL WASHER DIAM 50	60 g	-
COVER 8x53	10 g	-