

## Dry-type transformers

# RESIBLOC® Rail traction transformers

Available up to 25 kV - with integrated cooling too

Breakthrough oil-free, high efficiency, traction transformer that optimizes operations and improves safety.

The enhanced safety provided by the completely dry (oil-free) operation of the RESIBLOC® Rail traction transformer improves the operational efficiency and reliability of rail vehicles. Its performance is nearly maintenance-free with up to 99% efficiency and energy cost reduction potential of up to 10% at train level.

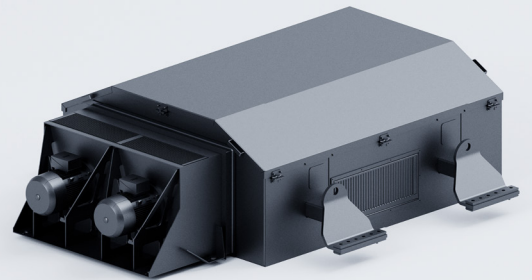
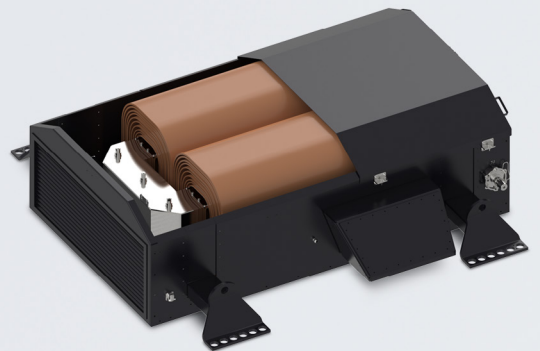
Hitachi Energy has been successfully developing and supplying the high-performance technology of RESIBLOC® dry-type transformers for more than 30 years.

With unsurpassed mechanical strength, and superior application capabilities under harsh climatic conditions, RESIBLOC® transformers have been used for many applications in extreme environments like marine vessels, offshore oil and gas platforms, and underground mining operations.

Hitachi Energy applied the RESIBLOC® technology to rail traction transformers and introduced RESIBLOC® Rail in 2012. Initially introduced with a rating of 6.5kV and gradually upscaled; the RESIBLOC® Rail traction transformers are now available for ratings up to 25 kV.

RESIBLOC® Rail are dry-type traction transformers that ensure complete protection of people, property, and the surrounding environment. They are made with eco-efficient materials and contain fewer parts. The absence of oil and pumps in RESIBLOC® Rail ensures leakage free operations. This patented, oil-free RESIBLOC® technology is a world first for sustainable mobility, enabling the transformer to operate at high efficiency.

Significantly safer and more cost-effective to operate, maintain and recycle at the end of their lifespan, these transformers deliver as much power as liquid-filled traditional transformers, but with up to 45% lower winding losses and efficiency as high as 99%.



RESIBLOC® Rail enables reduction of total train operating costs and the high efficiency significantly reduces energy consumption. RESIBLOC® Rail traction transformers lower carbon dioxide (CO<sub>2</sub>) emissions significantly.

The fiberglass and epoxy resin insulation in a RESIBLOC® transformer protect the transformer by preventing moisture, dirt, or aggressive environmental influences from entering the winding.

These transformers have also passed the vibration test according to IEC 61373 and comply with the requirements of EN 45545.

Even after the end of their long service life, RESIBLOC® Rail transformers still demonstrate a positive ecological balance as they do not contain hazardous substances. This makes recycling the transformers very easy.

## RESIBLOC® Rail with integrated cooling

Hitachi Energy further enhanced the capabilities of RESIBLOC® Rail traction transformer and has introduced RESIBLOC® Rail up to 25 kV with integrated cooling system. It is a breakthrough technology of plug-and-play, dry-type traction transformer that has never been seen before. It is result of a strong effort in innovation by the leaders of this technology.








This traction transformer comes with an in-built cooling system that is integrated in the design of the traction transformer. Thus, offering a 'never-before' possibility of a 'plug and play' solution

of dry-type traction transformer to the customer. By efficiently integrating a cooling system with its widely trusted, RESIBLOC Rail, dry-type traction transformers, Hitachi Energy has significantly reduced design & installation complexity for the train manufacturers while retaining the benefits of dry-type transformer.

In effect, RESIBLOC® Rail with integrated cooling system offers reduction in Total Cost of Ownership (TCO) & reduction in CO<sub>2</sub> emission combined with ease of use & installation as well as improved safety.

## RESIBLOC® Rail benefits

Hitachi Energy's RESIBLOC® technology with epoxy insulation and glass fibre for safety, energy-efficiency and low environmental impact.

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|  New level of safety   |  Eliminates risk of fire, oil spills and leaks                              |
|  Highest level of efficiency by up to 99%                      |  Reduced maintenance  |
|  Reduces rail operation energy costs by up to 10%              |  Safe and easy recycling of materials at end-of-life                        |
|  Significantly lowers CO <sub>2</sub> emissions <sup>1</sup> |  Unsurpassed mechanical strength for applications in extreme environments |

1. Compared to traditional liquid-filled traction transformer

## Technical specifications examples

For 25 kV, 50 Hz<sup>#</sup>

<b>Capacity/ Power (in kVA)</b>	Primary 3200, Traction 2x1660, Filter 1
<b>Voltage (V)</b>	Primary 25000, Traction 2x1050, Filter 400
<b>Current (A)</b>	Primary 128, Traction 2x1524, Filter 2,5
<b>Cooling system</b>	Included
<b>Approximate weight (in kilograms)</b>	3050 kg (all included)
<b>Dimension all included (L x W x H) (in mm)</b>	2915 x 2300 x 850
<b>Standard</b>	EN 60310-2016

<sup>#</sup>Can also be designed for 60Hz frequency.

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