

Railway Market

Electrical Protection
Solutions

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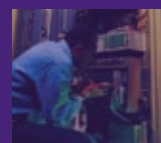
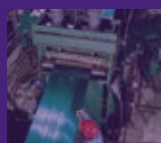
Transportation

Power conversion

Power generation
& distribution

Industrial
controls

Power
quality



“ By 2015 the **Chinese railway system** is expected to run **100,000 km** ”

Transit market | **is booming**

Some key trends:

- A renewed interest for tramways in Europe
- An expanding subway network in China
- The development of high speed train projects around the world
- The traintram concept

Transporting people imposes ever strengthening safety requirements

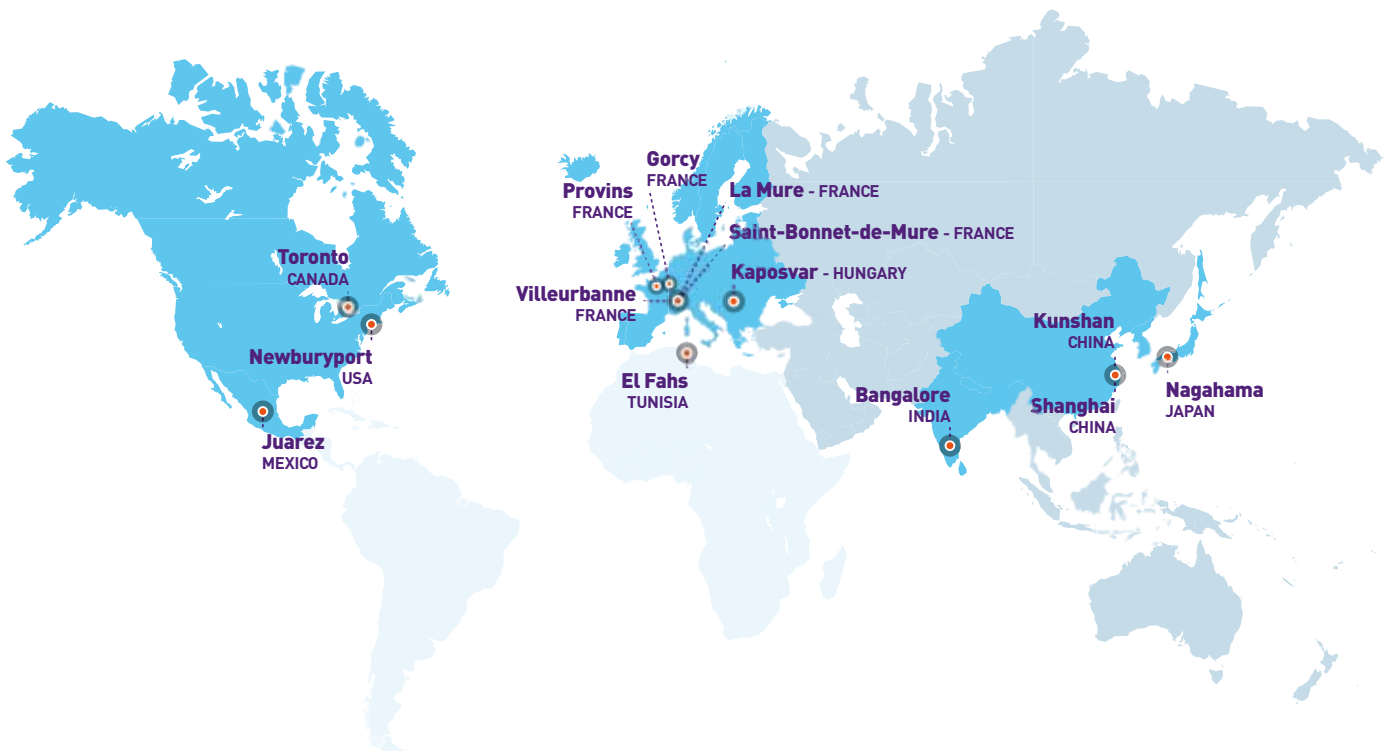
Equipment reliability and low cost of ownership are essential

After-sales service is critical and must be guaranteed for periods of 20 years or more



3 reasons to choose the Ferraz Shawmut partnership

- We are partnering with major OEMs to design, bring to production and maintain complete electromechanical systems.
- We integrate protection components and power interconnection solutions to meet targeted functions and performance.
- We support our clients over the long term with:
 - A combined global/local organization always close to the customer.
 - An expertise based on long experience.
 - A highly specialized product offering tailored around the fuse.
 - A reliability proven by battery of extremely severe tests.



Railway Market rolling vs fixed stock



Transit Authorities



Sub-station electrical cabinet

← Rolling

← Maintenance

← Fixed Stock ←

Engineering

Function	Components	Systems
Protecting & Feeding Power	• Fuses	• Fuse Boxes
	• Disconnectors	• Arresters in Enclosures
	• Contactors	• Electrical Cabinets
	• Surge Arresters	
	• Current Collectors	
Thermal Management	• Earth Return Current Units	
	• Cold Plates	• Cooling Loops
	• Heat Sinks	



Cold wall (auxiliary)



Rail Trainsets Designers (OEMs)



Cold plate (traction)



Current collector



Roof-fuse box



Enclosed surge arrester



Earth return current unit



Low voltage fusegear

Stock ←

← repairing

→ Original equipment →

Component & System Manufacturers



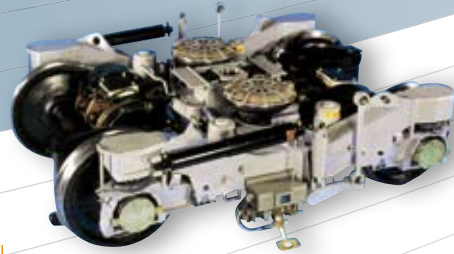
Success stories

50,000 times around the world every year!...

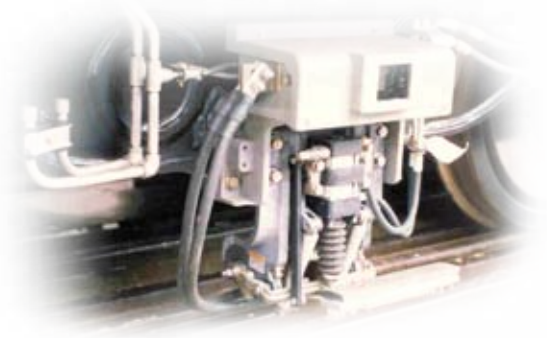
Would not it be even more impressive if this product would:

- **Ride on the ground** and not fly;
- **Operate in conditions as extreme** as the brutally cold winters of Canada, the steaming hot and humid afternoons of South-East Asia, or the dusty environment of large urban metropolis;
- **Help safely and comfortably** transport millions of people daily;
- **Enhance the environment** by eliminating the need for obtrusive and ugly infrastructures...

The little marvels that carry this duty on and on, sometimes for more than thirty years, are the unique **Current Collecting Devices**, or CCDs, designed, manufactured and distributed by Ferraz Shawmut.



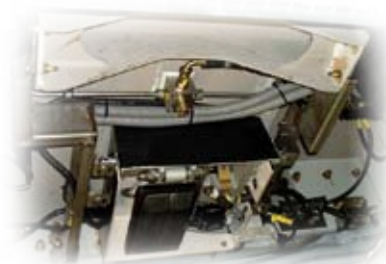
What would you say of a product that travels 50,000 times around the world every year? Quite amazing, isn't it...!?



Carefully engineered to answer the precise specifications of customers in the railway and urban transport equipment industries, these CCDs operate as a sliding contact that picks up the current needed to power the trains from a third rail, and also protects the whole traction chain by incorporating a fast-acting fuse that will open the circuit in case of electrical fault.

Built for high reliability and low overall cost of ownership
Ferraz Shawmut CCDs are in use in more than fifty cities worldwide.

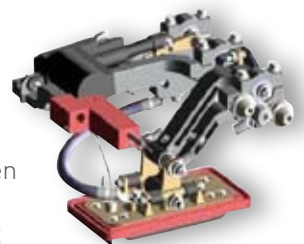
Part of the trip... for innovation



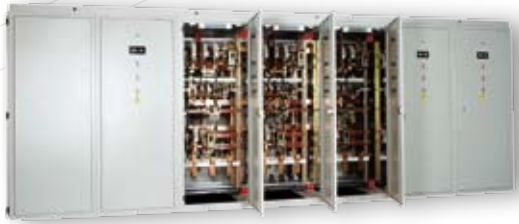
Innovative light rail vehicle system

This solution is spreading to many cities throughout the world.

Ferraz Shawmut is part of the innovation while providing the third rail current collector for the Bordeaux tram. In Bordeaux, the third rail for ground power supply is between the tracks and energized only beneath the length of the tram set then fully safe for people.



Lenoir Elec



Designed to equip power circuit under voltages from 750 to 1 500V, **Lenoir Elec contactors** ensure the supply of many public transportation networks: **Metros, Trolleybuses or Tramways.**

Designed to operate under extreme conditions, those are as performing for fixed substations as for rolling stock.



The Shanghai metro



The Shanghai metro cars of the Shanghai Pearl Line (Line 3) are equipped with our roof-fuse boxes



The Maglev

The Maglev (Japanese project of Magnetic Levitation train) is equipped with on-board power rectifiers. They are protected by our 1 000 Amp PSC fuses.



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