
ENVILINE™

Reliable and efficient solutions
for DC rail transportation



ENVILINE

For metro, light rail and intercity transportation

ABB's ENVILINE product portfolio offers a full spectrum of solutions and systems for DC wayside infrastructure. Today, energy savings and environmental impact are priority topics on the agenda of rail transit authorities. With our latest developments you will achieve higher energy efficiency, increase your assets' reliability and meet the environmental standards.

DC power supply

To power trains, metros or trams, it is necessary to use an electronic power converter - the traction rectifier that will convert alternating current into direct current. Whether these are diode rectifiers, controlled rectifiers or power supply packages, we provide the most reliable, flexible and cost-effective solution.

Energy management

Recycling, or managing, the surplus braking energy of the train economically can reduce the overall power consumption by as much as 30 percent*, yet without the need to invest in new cars or network control systems. ABB's ENVILINE portfolio has the right solution for each network environment.

*The level of savings will depend on the operating conditions of the train system. ABB can assist in determining the expected level of energy savings for specify scenarios.

Protection technologies

Electric transit systems conduct the return traction power over the running rails, isolated from the ground to prevent corrosion of metallic structures. However, this can make clearing of ground faults problematic and unsafe voltages may develop. Our protection solutions manage these conditions and ensure the safety of passengers and maintenance personnel.

Key benefits

- High reliability with proven technology and know-how
Over 50 years of experience in the area of DC wayside infrastructure
- Complete portfolio covering all customer's needs
Power supply, energy management and protection solutions and systems
- High energy efficiency
Energy management expertise
- Whole life cycle support
Predictable and reliable operation of your assets with optimum performance



Product portfolio

Maximizing the reliability and efficiency of DC rail transportation

ABB is the largest independent provider
of DC wayside power solutions

DC power supply



ENVILINE TDR (Traction Diode Rectifiers) converts alternating current into direct current. This is the most typical, highly reliable and cost-effective power supply solution.



ENVILINE TCR (Traction Controlled Rectifiers) is used where the voltage versus current characteristic has to be adjusted to meet individual needs. DC voltage control allows longer distances between substations and can prevent interruptions caused by under-voltages.

ENVILINE TPS (Traction Power Supply) stands for holistic packages for DC wayside substations, which include transformer-rectifier units, switchgear, energy management systems and protection equipment.

Protection technologies



ENVILINE VLD (Voltage Limiting Device) incorporates the features demanded by rail operators to ensure the highest degree of safety in their isolated DC traction power system.

Installed at substations and passenger stations, VLD detects the presence of hazardous voltage conditions and dynamically shorts the running rails to ground to remove the condition in a timely, effective and safe manner.

ENVILINE

Reliability and efficiency on track

The energy management systems offer additional advantages (e.g. power quality improvement, emergency power supply, etc.) and can be used individually or in combination.

Energy management



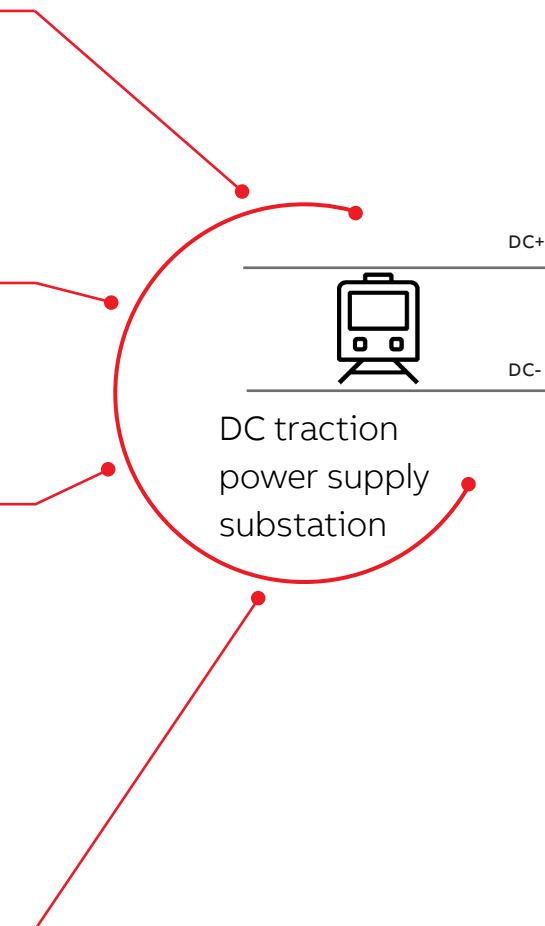
ENVILINE ERS (Energy Recuperation System) saves the surplus braking energy by returning it back to the AC network or by feeding local auxiliary systems. ENVILINE ESS (Energy Storage System) stores and recycles the surplus braking energy, returning it to the line to assist the acceleration of the train.



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ENVILINE ARU (Automatic Receptivity Unit) ensures track receptivity during regenerative braking by dissipating all surplus energy that cannot be absorbed by other onboard loads / nearby trains, nor recovered by the ERS or ESS.



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Reliability and efficiency on track

over **50**
years
of experience

Warsaw metro, Poland

For the new Warsaw metro line 2, that connects the eastern and western parts of the capital city, ABB supplied seven ENVILINE TPS medium voltage substations to power the new line.

ABB has supplied four combined ENVILINE TPS and auxiliary substations rated at 15 kV / 825 VDC / 400 V_{AC} and three auxiliary substations rated at 15 kV / 400 V_{AC}. One of the substations is equipped with 3 MW / 40 MJ (megajoule) ENVILINE ESS energy storage system with double-layer super capacitors. The wayside ESS decreases the total power consumption, stabilizes the traction line voltage, reduces the peak demands on the grid and provides emergency reserve in case of power interruption. The substations are equipped with 17 units of ENVILINE TDRs.

Southeastern Pennsylvania Transit Authority (SEPTA), USA

SEPTA is one of the major US transit authorities, serving almost four million people in and around the Philadelphia city. The company selected ABB to provide a solution to capture, and recycle the surplus braking energy, and generate additional revenues by participating in the local energy markets with frequency regulation services. The system has been in operation since April 2012.

The solution is based on ENVILINE ESS using a lithium-ion battery system. This storage medium is capable of storing large quantities of excess braking energy, which can modulate the power demand of the rail network, helping regulate the local electricity grid. The system recycles more than 1200 MW and generates up to \$440,000 annually in combined savings and revenues.

Toronto Transit Commission (TTC), Canada

ABB supplied and commissioned an ENVILINE TPS for the Toronto Transit Commission's new Ashbridges Bay Maintenance and Storage Facility.

ABB's scope of supply included four 2 MW / 600 V_{DC} transformer and traction rectifier units, DC switch-gear and various DC distribution equipment. For this project ABB also provided technical support and commissioning services. The installation of ABB's ENVILINE TPS enables TTC operators to manoeuvre new, low-floor modern streetcars within the state-of-the-art maintenance and storage facility.

up to **30**
percent
energy savings



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