

BROCHURE

Enviline™ ARU

Automatic Receptivity Unit
for DC rail transportation



Enviline ARU – Automatic Receptivity Unit

The most reliable and low cost solution for braking energy receptivity in DC rail systems

When a train brakes, the kinetic energy is regenerated into electrical energy and returned to the line. This electrical energy will cause an increase in the line voltage if it is not absorbed. Because onboard loads consume typically only 10 percent of this electrical energy, the surplus energy must be absorbed by nearby trains or limited by mechanical braking.

Enviline ARU is a wayside automatic receptivity unit, which ensures track receptivity during regenerative braking. ARU dissipates all surplus energy that cannot be absorbed by other onboard loads / nearby trains, nor recovered by the Enviline ERS or ESS, avoiding the need to use (and wear out) the mechanical brakes.

The ARU is a DC wayside energy dissipation system that consists of an indoor power control cabinet and an external resistor bank for outdoor installation. The system ensures track receptivity during regenerative braking by dissipating all surplus energy, which cannot be absorbed by other onboard loads or nearby trains.

The ARU is compatible with any new, or existing, DC traction power substation. It can also operate in coordination with wayside energy storage and/or energy recuperation systems to ensure that the braking energy is recycled effectively and that any dissipation into resistors occurs only as a last resort. The controller cabinet can be mounted directly in the DC switchgear lineup or separately with other equipment such as negative disconnects and automatic grounding switches. Additionally, the resistor bank is placed outside the substation, where the heat can be dissipated economically.

Key benefits

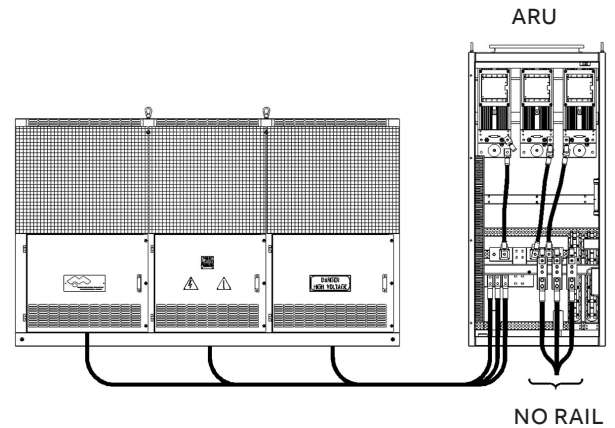
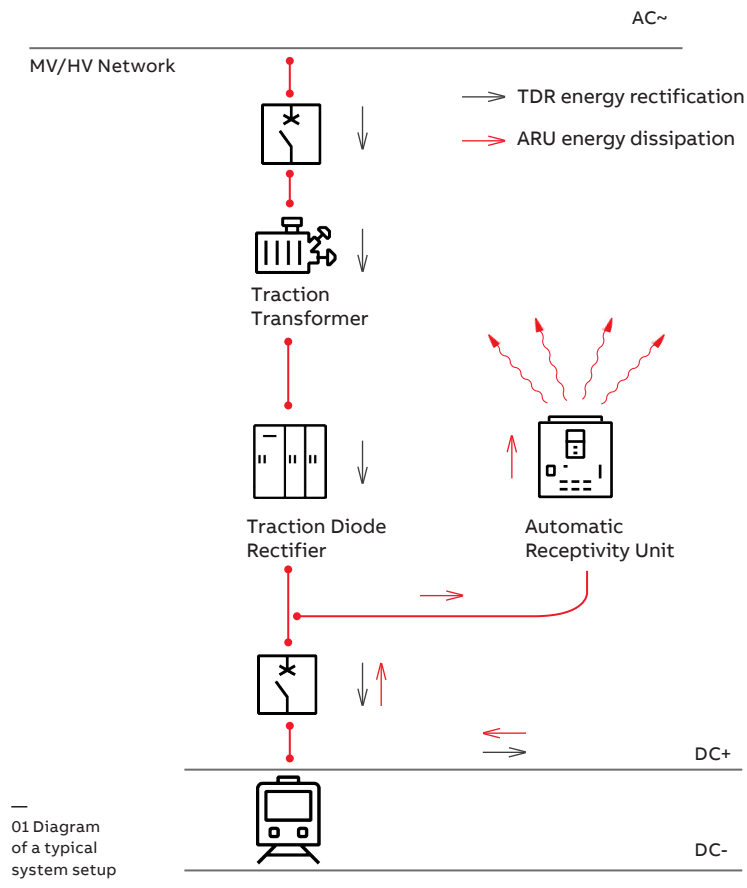
- Highest reliability at low operational and maintenance costs
- Elimination of on-board resistors
- Moving the heat out of the tunnel
- No EMC or audible noise
- Protects on- and off-board equipment against overvoltage
- Compatible with new and existing systems
- Easy deployment
- Over 50 years of experience

Key features

- Operates on 600, 750 and 1500
- Proven technology ensures highest reliability
- Lower operational and maintenance costs than onboard units
- Compatible with all train systems with regenerative braking
- Passive cooling eliminates noise and ensures low service need
- Easy maintenance with remote monitoring and access, fast data capture
- Top or bottom cable entrance for flexible and easy installation
- Advanced controls with remote testing capability and programmable firing parameters (ON / OFF voltage, ON / OFF delay, OFF interval, OFF traction current) to ensure optimum performance and to avoid false triggering
- Parallel operation with energy recovery systems to maximize energy efficiency with assured braking energy receptivity
- Time balancing of the GTO and resistor operation to share operational wear and maximize life expectancy
- Energy flow monitoring according to customer needs
- Provides an understanding of the surplus energy losses

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Reliability and efficiency on track



The ARU needs to only read the traction voltage and current in order to operate optimally within a new or existing traction power system.

Technical data	Enviline ARU 750	Enviline ARU 1500
Nominal TPS (Traction Power Supply)*	600 / 750 V _{DC}	1500 V _{DC}
Operating voltage range	500 to 1000 V _{DC}	1000 to 2000 V _{DC}
Current capacity @ 20% duty cycle	2700 A (3 GTO) / 5400 A (6 GTO)	2700 A (3 GTO) / 5400 A (6 GTO)
Control power voltage	110 or 220 V _{DC}	110 or 220 V _{DC}
Cabinet dimensions (W x H x D)	1.0 x 2.2 x 0.8 m	1.0 x 2.2 x 0.8 m
Weight	400 kg (control cabinet)	400 kg (control cabinet)
Cooling	Natural convection (controller)	Natural convection (controller)
Storage temperature	-20° to 60°C	-20° to 60°C
Operating temperature	0° to 40°C, no derating	0° to 40°C, no derating
Elevation	1000 m	1000 m
Enclosure	NEMA 2 / IP30	NEMA 2 / IP30
Remote access	TCP/IP and RS485 (Modbus)	TCP/IP and RS485 (Modbus)
SCADA output	6 contacts (form C)	6 contacts (form C)
EMC	EN 50121-5	EN 50121-5
Standards	C37.20.1, EN 60146-1	C37.20.1, EN 60146-1



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