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ELECTRIFICATION SOLUTIONS

## Rolling stock NAM

Service-proven product  
and solution offering



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**Working with leading vehicle manufacturers, sub system suppliers, consultants and transit agencies, ABB offers a broad range of low and medium-voltage solutions, for rolling stock to suit each of your applications and increase the efficiency of your equipment.**



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# Innovative, safer and smarter solutions for sustainable mobility

Whether for a new build or retro-fit, ABB delivers a perfect, competitive and on time solution for any onboard challenge according to technical requirements and space limitations.

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01 MTA NYCT subway

With over 30,000 passenger cars actively using ABB components, we understand the need for the design and the integration of specialized and optimized electromechanical solutions when spare parts are no longer available or improvement in energy efficiency, weight reduction and space limitations are required.

Designing, updating and/or improving electrical control systems to the latest standards and state-of-the-art technologies improves the life cycle costs (LCC) of rolling stock. Reliability will improve and long-term availability of technology is guaranteed by ABB. We design easy maintainable products and solutions that comply to the latest

health and safety standards using the latest eco-friendly materials for the most sustainable applications. Optimized energy consumption contributes to a cleaner environment.

With over 100 years of rail history, our service-proven experienced engineering teams have thorough knowledge of train components and technologies. We design, develop, test and deliver your solutions to the latest railway standards and regulations. All R&D, engineering, manufacturing, assembly and testing are done inhouse at ABB's Center of Excellence Rolling Stock NAM factory supported by our global teams.





### Circuit breakers

ABB molded case circuit breakers guarantee high-performance. Their small size, simplicity to install and high

safety rating make the best choice for your application.

Our exhaustive range covers all applications from 15A to 3200A at voltages up to 1000VAC/DC, with a wide range of accessories.

Main features/applications are:

- Up to 1000Vdc for floor heater protection
- Battery/power supplies protection up to 800A
- Ring tongue or busbar connections
- NFPA-130, ASTM E662, ASTM E162, ASTM E1354, UL94-V0, IEC 61373, EN45545
- Field installable accessories: Auxiliary and bell alarm contacts, shunt trip, undervoltage release, padlocking devices, jumpers, protective covers, rear connections, and more.



### Cable protection system

ABB is a market leader in flexible conduit systems. ABB PMA offers one of the world's broadest range of cable protection products and solutions for the railway industry. The range of non-metallic flexible conduit

systems for the protection of critical power and data cables.

Applications include:

- On the carriage roof, couplings and intercar jumper connections, under the carriages, on bogies, inside carriages and passenger zones, underground railways and braking systems.
- Fire and smoke tests
- NFPA-130 (ASTM E 162, ASTM E662, ASTM E1354) BSS 7239/SPM 800-C, EN45545-2 HL2 requirement set R22/R23
- Shock and vibration withstand NFF 16-101, NFF 16-102
- Temperature variation; NFF 62000; -50°C to +95°C (+150°C short term) or -58°F to +200°F (+300°F short term)



### Miniature circuit breakers and residual current devices

ABB offers a wide range of MCB – RCBO and DIN rail traction approved components

for protecting and switching. MCB protect rolling stock electrical installations against overloads and short circuits, guaranteeing reliability and safety for

operations. ABB offers a wide range of MCB's in 1, 2, 3, and 4 pole version, from 0.2 up to 125 Amps, and various tripping curves including B, C, D, K and Z. The System pro M compact S200 and S800 series are current limiting overcurrent protective devices. They have two different tripping mechanisms: A delayed thermal tripping mechanism for overload protection and a magnetic tripping mechanism for short circuit protection.



### Flexible braids

Flexible braid for grounding, bonding and continuous current applications. Tin-plated copper braids and ferrules for high conductivity and corrosion resistance. Flexible braids allow for linear expansion, equipment vibration and offset connections. A wide range of insulation products are available depending

on the application, voltage and temperature ratings. UL listed 467/486 and CSA certified C22.2 No. 41 as grounding and bonding equipment, CEI60694, ASTM-B33. ABB can design and build the flexible connectors to your exact specifications. Dimensions, wire equivalent 6AWG up to 1250 MCM. Current rating 200A up to 6000A.







### Contactors and overload relays

ABB contactors and control relays offer an exhaustive selection of products for simple and extreme applications. AF contactor technology revolutionizes contactor use and

enables functionality in all rolling stock AC/DC applications.

Our service proven range fulfills requirements, including:

- International standards and approvals, IEC 60077 and EN 50155
- UL, CSA, IEC 60947-1/60947-4-1
- Shock and vibration withstand IEC 61373 (category 1, class B)
- Temperature variation; NFF 62000 -40°C to +70°C or -40°F to +158°F
- Fire and smoke tests; NFPA-130 (ASTM E662 density of smoke, F index and ASTM E1354 inflammability I index), EN45545 (H2, HL3 hazards levels), UL94-V0
- Electronic coil interface accepting wide DC control voltage range 0.7...1.25Unom, 24-60 VAC/DC, 48-130 VAC/DC, 100-250 VAC/DC et 250-500VAC

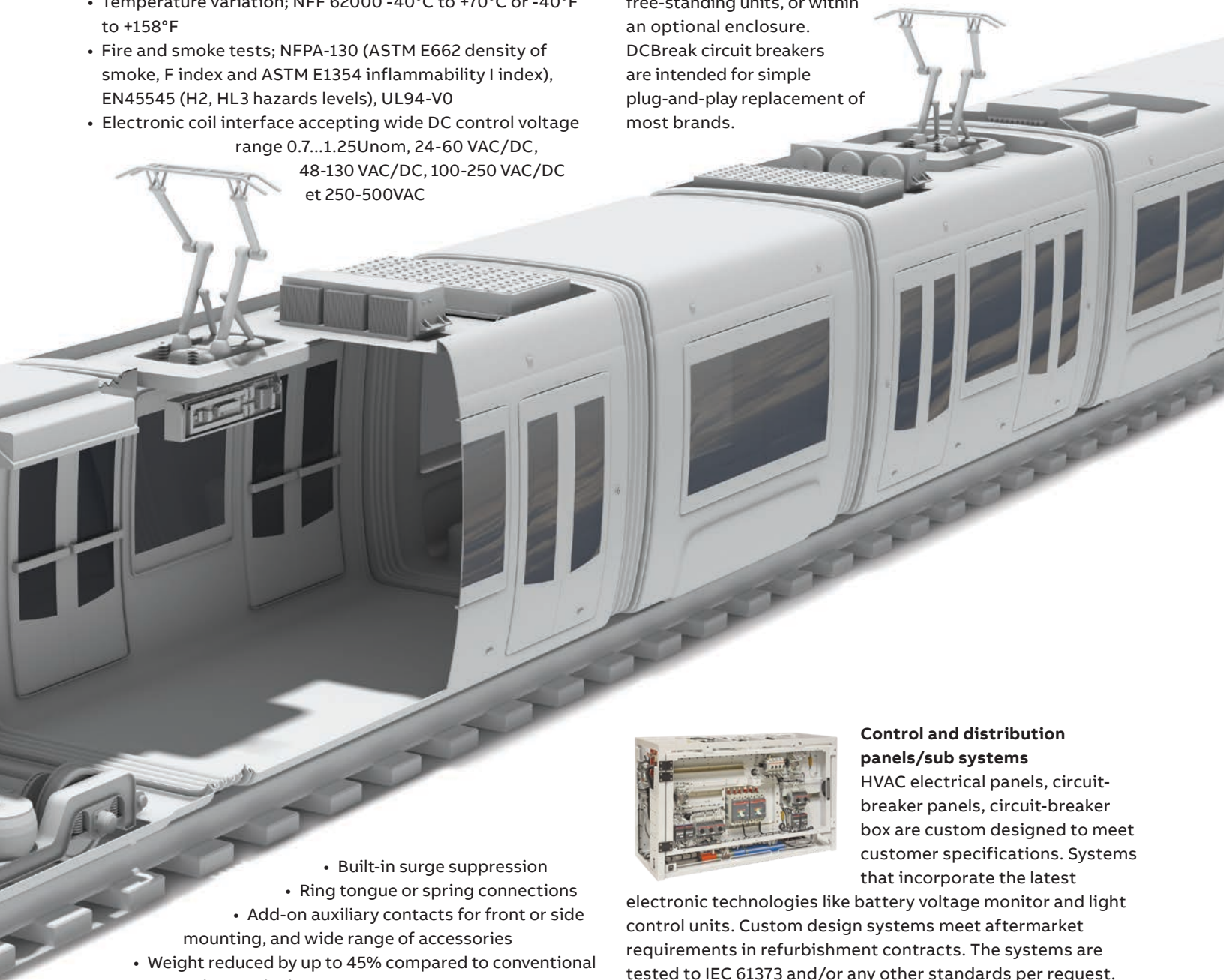


### DCBreak

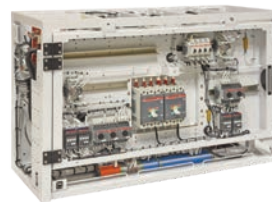
ABB DCBreak 915 and 1815 circuit breaker family combines a small footprint, reduced weight, high flexibility and reliable operation with minimal maintenance. High speed bi-directional circuit breaker for DC applications. The DCBreak

range is rated 1500A, 900V/1800V. Rated short circuit making and breaking 30 KA. Type tested according to the latest IEC 60077-3 and IEC 61373 standards. Particularly suitable for on board applications for metro, tramway and light rail. Available as free-standing units, or within an optional enclosure.

DCBreak circuit breakers are intended for simple plug-and-play replacement of most brands.



- Built-in surge suppression
- Ring tongue or spring connections
- Add-on auxiliary contacts for front or side mounting, and wide range of accessories
- Weight reduced by up to 45% compared to conventional contactors and control relays



### Control and distribution panels/sub systems

HVAC electrical panels, circuit-breaker panels, circuit-breaker box are custom designed to meet customer specifications. Systems that incorporate the latest

electronic technologies like battery voltage monitor and light control units. Custom design systems meet aftermarket requirements in refurbishment contracts. The systems are tested to IEC 61373 and/or any other standards per request.

# Standards and compliance

## **ABB railway products meet all main rolling stock standards**

- IEC 60571 electronic equipment used on rail vehicles is the standard used for electronic equipment development and testing.
- IEC 61373 railway applications rolling stock equipment – shock and vibration tests.
- ABB products comply with category 1 (body mounted) class B.
- EN 45545-2 railway applications fire protection on railway vehicles – Requirements for fire behavior of materials and components.
- ABB railway products plastic materials are rated HL3 R22 (the highest hazard level). They can be used on vehicles for subway, tube, sleeping and couchette.
- NFPA 130 (North America) standard fixed guideway transit and passenger rail systems.
- Most plastic materials in ABB products comply with NFPA130 per ASTM E 162 and ASTM E 662 standards tests. Also complies with FRA238.103 and BSS 7239/SMP800-C standards.
- Designed in accordance with IEC 60947-4-1, IEC 60947-5-1, IEC 60077 standards and applicable parts of EN 50155 standard.

Rail vehicles are subjected to extreme environmental conditions (high vibration and shock), corrosion (underground applications or tunnels). All ABB products listed in this brochure are tested in accordance with the latest and most demanding standards for rolling stock applications. ABB adhered to IRIS certification in 2009 (International Railway Industry Standard certification created by the European Union of railways industry).

## Partial list of completed projects

Projects	Vehicle type	Car builder	Transit Authority	Cities	Products	Systems/solutions
NEC Acela	High-Speed train	Bombardier	NEC	Philadelphia PA	Relays, contactors and breakers	HVAC, battery and heater circuit protection
Avelia Liberty	High-Speed train	Alstom	NEC	Philadelphia PA	Relays, contactors and breakers	HVAC, battery and heater circuit protection
R142, R179	Subway	Bombardier	MTA/NYCT	New York NY	Relays, contactors, breakers and electromechanical assemblies	Transfer relay contactor assemblies, HVAC, battery and heater circuit protection
R142A, R143, R160, R188, R211	Subway	Kawasaki	MTA/NYCT	New York NY	Relays, contactors, breakers and electromechanical assemblies	Transfer relay contactor assemblies, HVAC, battery and heater circuit protection
CTA5000, Bart D/E, STM/STM2, Rocket	Subway	Bombardier	CTA, BART, STM, TTC	Chicago IL, San Francisco CA, Montreal QC, Toronto ON	Relays, contactors and breakers	HVAC, battery and heater circuit protection, train line, car controls
PATH, WMATA 7K	Subway	Kawasaki	PATH, WMATA	New York NY Washington DC	Relays, contactors, breakers and electromechanical assemblies	Transfer relay contactor assemblies, HVAC, battery and heater circuit protection
MARTA CQ310/311/312 WMATA 2K/3K/6K, PATCO	Subway	Alstom	MARTA, WMATA, PATCO	Atlanta GA, Washington DC Baltimore MD	Relays, contactors, breakers, HVAC control box assembly (MARTA)	Trainline protection for heater circuit, battery and doors
LIRR & MNR M7A, M7B Single Level	Commuter	Bombardier	MTA (LIRR, MNR)	NYC NY	Relays, contactors, breakers and electromechanical assemblies	Auxiliary power unit, HVAC, battery and heater circuit protection
Bilevel cars (series 1-9) – other 1200 cars	Commuter	Bombardier	AMT, Metrolinx, MRCOG, UTA, DART and others	30+ cities across North America	Relays, contactors, breakers and electromechanical assemblies	Auxiliary power unit HVAC, battery and overhead and floor heater protection and ground fault protection
M8, M9, MBTA Greenbush	Commuter	Kawasaki	MTA (LIRR, MNR) MBTA	NYC NY Boston MA	Relays, contactors, breakers and electromechanical assemblies	Auxiliary power unit HVAC, battery and overhead and floor heater protection and ground fault protection
FLIRT, KISS platforms	Commuter	Stadler USA	TEX-RAIL, Capital Metro, DCTA, Caltrain, OCTA, DART, BART, NJT	Tarrant/Austin/Dallas TX, Denton TA, San Francisco CA, Toronto ON, San Francisco CA, New-Jersey NJ	Relays, contactors, DC breakers, miniature circuits breakers and drives	Auxiliary power unit HVAC, battery and overhead and floor heater protection and ground fault protection
COMET V, Via Rail Renaissance	Commuter	Alstom	NJT, Via Rail	New Jersey NJ, Montreal QC	Auxiliary HVAC motors, distribution transformers, relays, contactors, breakers and electromechanical assemblies	HVAC units overhaul, DC and AC transformer distribution, control panels for various systems such as door, battery, train line etc.
Highliner 1/2, METRA, SMART, Metrolinx UP Express (Pearson- Downtown link), NICTD, VRE	Commuter	Nippon Sharyo	METRA, SMART, Metrolinx, NICTD, VRE	Chicago IL, Sonoma CA, Toronto ON, Northern Indiana IN, Virginia VA	Relays, contactors and breakers	Auxiliary power unit, HVAC, battery and heater circuit protection
ETS, Metrolinx (Waterloo, GTA, Finch), Hiawatha Corridor	LRV-LRT	Bombardier	Metrolinx, ETS	Toronto ON, Edmonton AB Minneapolis MN	Relays, contactors, DC breakers and terminal block	Trainline relays, HVAC control and protection, battery and doors etc.
Citadis (Confederation Line), Metrolinx, MTA Baltimore MD	LRV-LRT	Alstom	OCTA, Metrolinx, MTA	Ottawa/Toronto ON Baltimore MD	Relays, contactors, DC breakers and terminal block	Trainline relays, HVAC control and protection, battery and doors etc.
Valley Metro Rail, Sound Transit, MBTA Type 7, Hudson Bergen	LRV-LRT	Kinkisharyo	VMR, Sound Transit, MBTA, NJT	Phoenix AZ, Seattle WA Boston MA, New Jersey NJ	Relays, contactors and breakers	Trainline floor and overhead heater, battery, HVAC, door AC and DC protection
MBTA Type 8	LRV-LRT	Ansaldo Breda/ Hitachi Rail	MBTA	Boston MA	Relays, contactors and breakers	Trainline floor and overhead heater, battery
JFK, Yongin, Newark Air Train, King Abdula FD, LAX, CX100, Innovia 300, Innovia 300R, Sao Paulo Line 15, Jacksonville monorail	ART/PM/ Monorail		MTA, Seoul (S.Korea), Los Angeles CA, Vancouver BC, Miami FL, Kuala Lumpur, etc	MTA, Seoul (S.Korea), Los Angeles CA, Vancouver BC, Miami FL, Kuala Lumpur, Jacksonville, Brazil etc.	Relays, contactors and breakers	HVAC, battery, power management, system protection
ALP 45DP, ALP46	Locomotive	Bombardier	AMT EXO, NJT	Montreal QC, New Jersey NY	Relays, contactors and breakers	Cabin components
MP40, MP54, R34156	Locomotive	Wabtec/MPI	Metrolinx, NYCT	Toronto ON, New York NY	Relays, contactors and breakers	Cabin components
F40, P42 Genesys	Locomotive	CAD Rail	Via Rail	Montreal QC	Relays, contactors, breakers and electromechanical assemblies	Cabin components



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## **ABB Electrification**

### **Center of Excellence Rolling Stock NAM**

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