





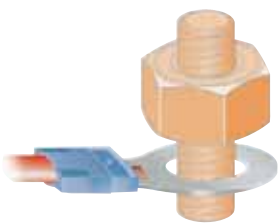
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Terminal Blocks entrelec® for railway applications

ABB France expert in the railway field (rolling stock and fixed equipment) for more than 30 years, has extensive knowledge in all connection technologies, recognized throughout the world.

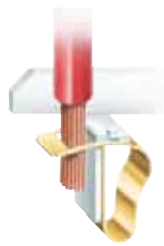
Terminal blocks entrelec®: the larger choice of connecting systems



Stud



Quick-connect



Spring



ADO System®

Our terminal blocks perfectly comply with specific requirements of the rolling stock

- Continuous vibrations stress
- Shocks, when the trains are formed
- Corrosive stresses in polluted environment
- Fire and smoke withstand.
Special care being taken for plastic materials for which specific tests are required.
- Wide variation of temperature:
Range of - 40°C to + 110°C to cover all climates in the world

Our terminal blocks meet, and even exceed the requirements of IEC 60947-7-1 standard, like the French national standards **NFF (Normes Françaises Ferroviaires)** which are still used as reference for the French national company SNCF (a world leader for the safety and the reliability of the trains and the rail network) and a lot of other countries.

The products described in this catalogue are in accordance with the main standards listed in the opposite page (see "Reference Standards").

Numerous projects using **ABB France** products have been worldwide realized. Some examples:

- Engines: Loco fret (SNCF France), Loco (Iran)
- Metros: Circleline (Singapore), Nanjing (China), Jubilee line (London, UK), MF 2000 (RATP France)
- Commuter trains : Hillside X-Trapolis (Melbourne, Australia), Merval (Valparaiso, Chile)
- Tramways: Citadis (Alstom): Bordeaux, Valenciennes, Paris, Strasbourg (France), Dublin (Ireland), Barcelona (Spain), Rotterdam (Netherlands)
Train/Tram, Alicante (Spain)
- Intercity trains: TER 2N ng (SNCF France), Coradia X 40 (Sweden), AGC (SNCF France)
- High speed trains: TGV-A, TGV-R, TGV-PSE (SNCF France), Thalys (SNCF/SNCB), TGV Korea, Transmanche train (Eurotunnel)

This catalogue assembles all information needed to make the best choice for the connection technology in accordance with the application and its environment



Reference Standards

● Rolling stock

- NF F 61017 :** Terminal blocks and component holder blocks. Connections by mean of quick connect (tabs) or threaded elements (studs).
- NF F 16-101 :** Directive relative to selecting materials in relation to their fire resistance in terms of its behavior in a fire, the opacity of smoke and the toxicity of the gas released.
- NF F 16-102 :** This standard complements NF F 16-101 standard. Its purpose is to specify the application of NF F 16-101 to electrical equipment and especially to individual apparatus.
- NF F 61030 :** Mechanical strength.
- EN 50155 :** Electronic equipment used on rolling stock - Shock and vibration tests.
- EN 61373 :** Electronic equipment - Shock and vibration tests.
- ASTM E 1354 :** Tests of fire, smoke and toxicity of plastic materials (American standard).

● Fixed equipment

- NF F 55-251** Devices for connection or disconnection - Screw terminal blocks.

● Low voltage controlgear

- IEC 60947-1 :** General rules.
- IEC 60947-7-1 :** Link terminal blocks for copper conductors.
- IEC 60947-7-2 :** Ground terminal blocks for copper conductors.
- UL 1059 :** Terminal blocks. (American standard).
- CSA C22-2 No 158 :** Terminal blocks. (Canadian standard).
- UL 94 V0 :** Tests of flammability of plastic materials. (American standard).

● Environment

- IEC 60068-2-1 :** Cold.
- IEC 60068-2-2 :** Dry heat.
- IEC 60068-2-3 :** Damp heat, steady state.
- IEC 60068-2-6 :** Vibrations.
- IEC 60068-2-11 :** Salt mist.
- IEC 60068-2-14 :** Change of temperature.
- IEC 60068-2-27 :** Shocks.
- IEC 60068-2-30 :** Damp heat, cyclic.
- IEC 60068-2-61 :** Tests Z/ABDM (climatic sequences).
- ISO 6988 :** SO₂ test with general condensation of moisture.

● Conductors

- NF F 63808 :** Conductors and electrical cables with thin insulation halogen free.
- NF F 63826 :** Conductors and electrical cables with thick insulation halogen free.

Note: from 2008 NF F 63808 and NF F 63826 standards will be replaced by EN 50306 standard.

● Information for "Fire and Smoke" classification

According to NF F standards:

The general directive NF F 16-101 (1988) concern the material selection, in terms of its flammability (mark I) on the one hand, the opacity and toxicity of smoke (mark F) on the other hand.

The standard NF F 16-102 (1992) complete the standard NF F 16-101. It explicit its application for the electrical equipment and products. **The thermoplastic insulation materials of the Terminal Blocks entrelec® are at the severity level 3.** This level concern a products mounted inside a room for passengers or running crew.

According to US standards :

The **UL 94** standard (June 1991, rev. 1994) describe the flammability tests of plastic materials, for controlgear and products.

Principle: measuring of the combustion time of a test piece according to its thickness. This classification is divided in 4 parts: HB for the most flammable materials, then V2, V1, then **V0** for the least flammable.

All terminal blocks in this catalogue has thermoplastic insulation materials classified UL 94 V0.

The **ASTM E 1354** standard describe the test method of the oxygen consumption, using a calorimeter for determine as a function of heat, the smoke emission rate for materials and products.

All terminal blocks in this catalogue comply with this standard.

Their individual surface is below 16 inch², consequently they are not concerned by ASTM E 162 and 662 standards.



PANORAMA

Terminal blocks IEC / NF :

These terminal blocks of beige color are compatible with conductors in appliance with international standards IEC, and French Railway Standards (NF F 61017). SNCF and RATP french logos are printed under products that have obtained the using approvals. NF F 61017 is stated for all products complying to this standard (terminal blocks with stud terminals and quick connect tabs).

IEC 60 947-7 and NF F 61017...

FEED THROUGH

COMPONENT HOLDER

PLUGGABLE

FEED THROUGH

ADO - ADO IDC TERMINAL BLOCKS



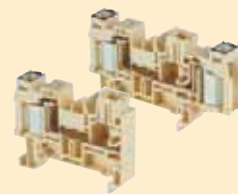
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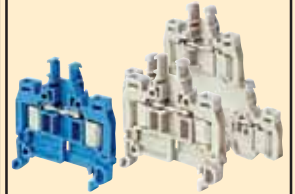
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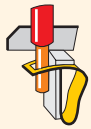


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SPRING TERMINAL BLOCKS



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TERMINAL BLOCKS WITH QUICK-CONNECT TABS



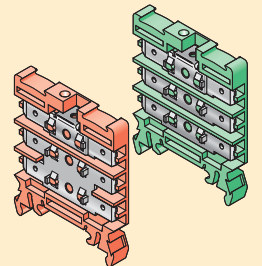
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TERMINAL BLOCKS WITH STUD TERMINALS



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ACCESSORIES

Mounting rails

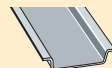
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End stops

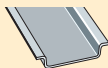
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PR30



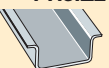
PR3.Z2



PR3.G2



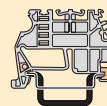
PR4



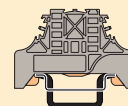
PR5



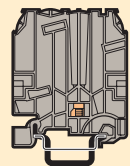
PR1.Z2



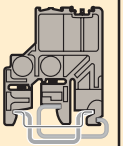
BADL



BAM2



BADH



BAMH

Terminal blocks IEC :

Grey color for the standard blocks, they comply exclusively to international standards (IEC 60 947-7...). These products agree on a large number of railway applications.

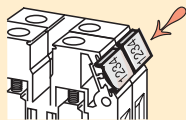
IEC 60 947-7...

GROUND	FUSE HOLDER	COMPONENT HOLDER	SWITCH	PLUGGABLE
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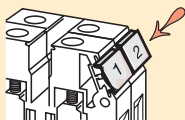
MARKING

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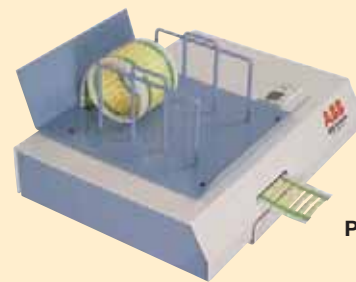
Vertical marking



Horizontal marking



Marking table



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Partial shrink module