



HIGH RELIABILITY INTERCONNECT SOLUTIONS FOR RAILWAY APPLICATIONS

HIGH PERFORMANCE INTERCONNECT SOLUTIONS FOR RAILWAYS

ABOUT US

Hypertac is a world leading provider of high performance electrical connectors and interconnect solutions for the most demanding applications. Together with IDI and Sabritec, Hypertac is part of the Connector Technology Group of Smiths Group – a global technology business listed on the London Stock Exchange.

OFFERING VALUE ADDED CUSTOMER SOLUTIONS

Hypertac utilises the superior Hypertac Hyperboloid contact technology which offers unrivalled performance in harsh environments encountered in railway applications.



We add value to our customers by offering:

- Unique technically superior and flexible solutions that utilise the ultimate in contact performance and reliability.
- Products which are fully project managed from initial concept through to final development.
- Expert application knowledge ranging from specific products to system architecture.
- European Industry specialist knowledge and expertise to maximise the value of our solutions to our customers.

QUALITY AND ENVIRONMENT

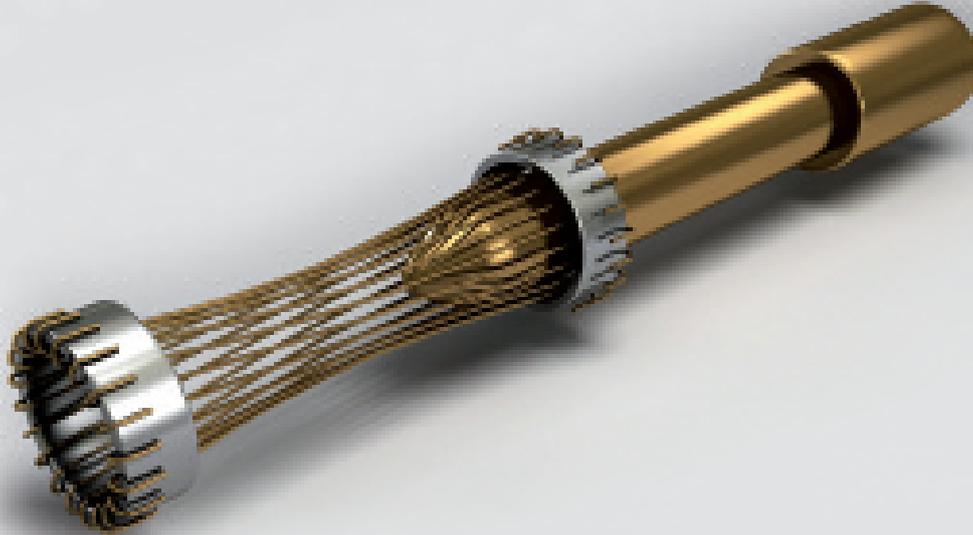
First-class material, state-of-the-art development methods, advanced know-how and exact processing are the essential ingredients of our quality. Our focus on growth is balanced by respect for the environment. We continually strive for quality and maintain our commitment to making improvements towards the environment and pollution.

Hypertac has been awarded the ISO 9001, ISO 14001 and OHSAS 18001 quality, environment and health & safety assurance certifications.

SUPERIOR CONTACT TECHNOLOGY

UNRIVALLED SYSTEM PERFORMANCE

HYPERTAC INTERCONNECT SOLUTIONS FOR RAILWAYS ARE BUILT UPON THE UNIQUE HYPERTAC HYPERBOLOID CONTACT TECHNOLOGY



THE HYPERTAC HYPERBOLOID CONTACT

The Hyperboloid socket has a number of spring wires, the position of which is defined by a wire carrier. This is fitted to an outer sleeve or shank that carries the termination of the socket.

The spring wires within the socket are set at a small angle to the centre line and are deflected when the mating pin contact enters. Each spring wire is deflected at its elastic limit and makes a line contact with the pin. A smooth wiping action reduces wear of the plating surfaces of the pin and socket wires. This construction allows a very tight control of the spring forces and hence the insertion and withdrawal forces.

The Hypertac Hyperboloid contact design ensures unrivalled performance in terms of:

- Multiple line contacts of low resistance maintained under high levels of shock and vibration
- Low insertion forces
- Low wear of plating surfaces for long life
- Uniform electrical and mechanical characteristics over a high number of mating operations
- High current rating

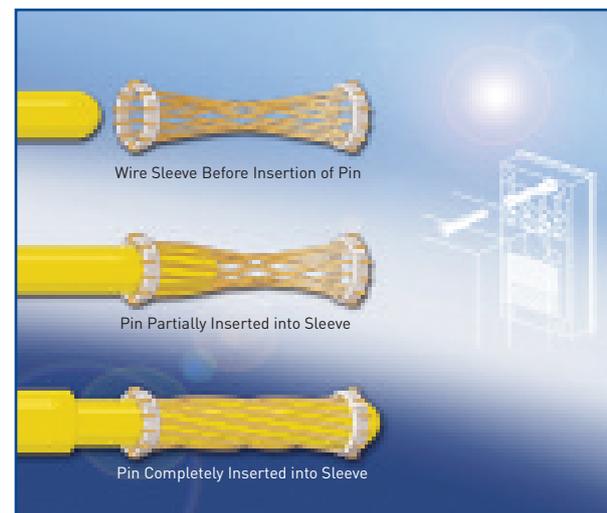
Hypertac contacts and connectors have been tested to:

- Sine vibrations (according to CEI 68-2-6) 20 g from 10 to 2,000 Hz.
- Random vibrations (according to CEI 68-2-35) 0.5 g² / Hz from 10 to 2,000 Hz.
- Shock (according to CEI 68-2-27) 250 g during 0.4 ms (1/2 sine-wave).

The results of the tests carried out on Hypertac contacts show no discontinuity when measured down to 2ns and a stable contact resistance.

The Hypertac Hyperboloid contact provides the following commercial benefits:

- Low cost of ownership – does not need replacement during equipment life.
- Reduced system costs – equipment design is less critical.
- Reduced qualification costs – no re-testing due to contact failures.



DELIVERING RELIABILITY TO

RAIL APPLICATIONS

OUR OPTIMUM SOLUTIONS

The Hypertac range includes PCB, modular, rectangular and circular connectors, rack and panel, power connectors and couplers. High speed connectors and contacts (Fibre channel, Firewire, Fibre Optics, Ethernet) are also available. Hypertac also offers a number of value added services to customers, including cable assembly, prototyping, instrumentation housing, electrical modelling and testing, and equipment qualification. Hypertac has the capabilities to supply complete jumper solutions according to customer specifications.

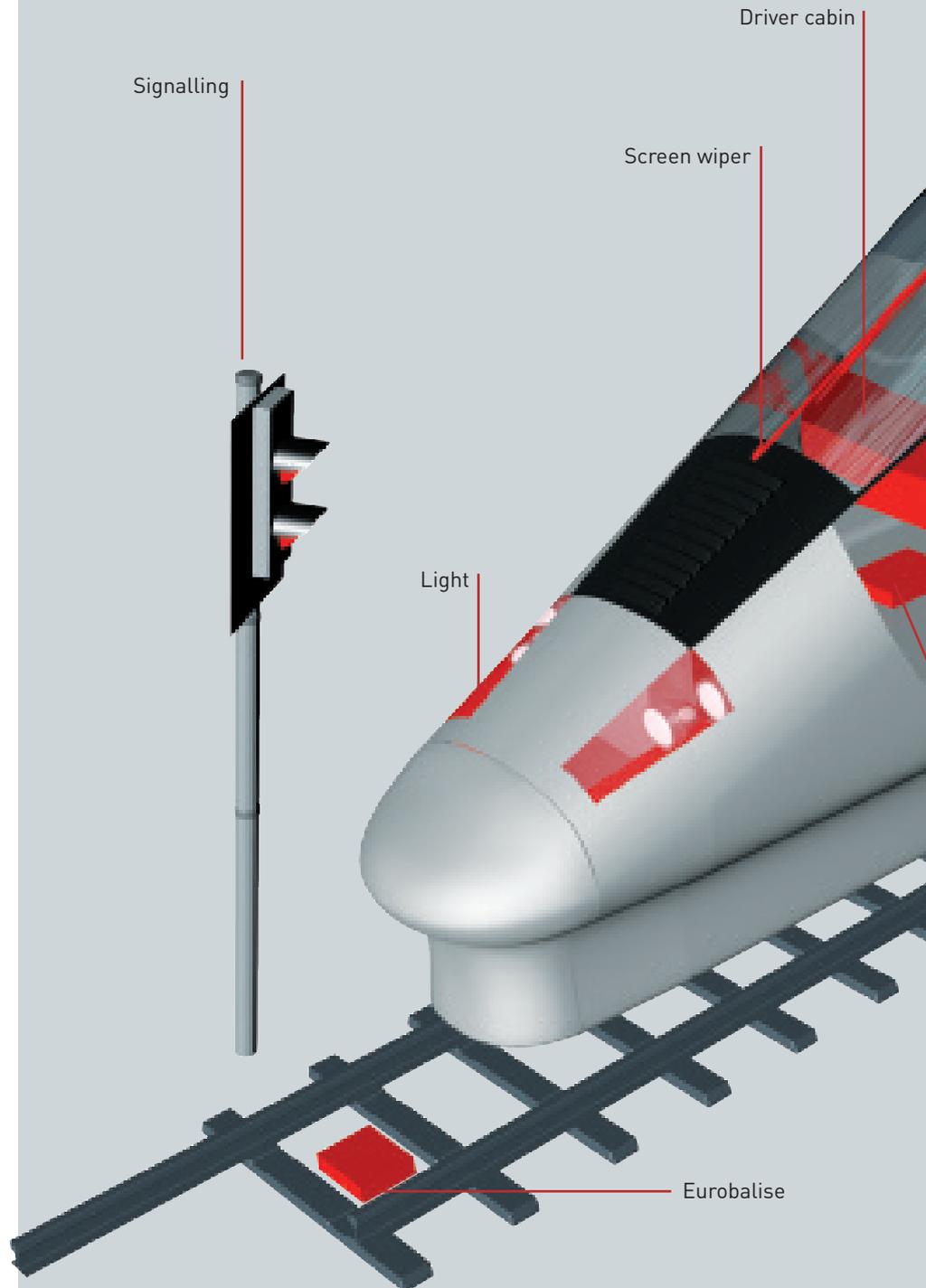
OUR CAPABILITIES

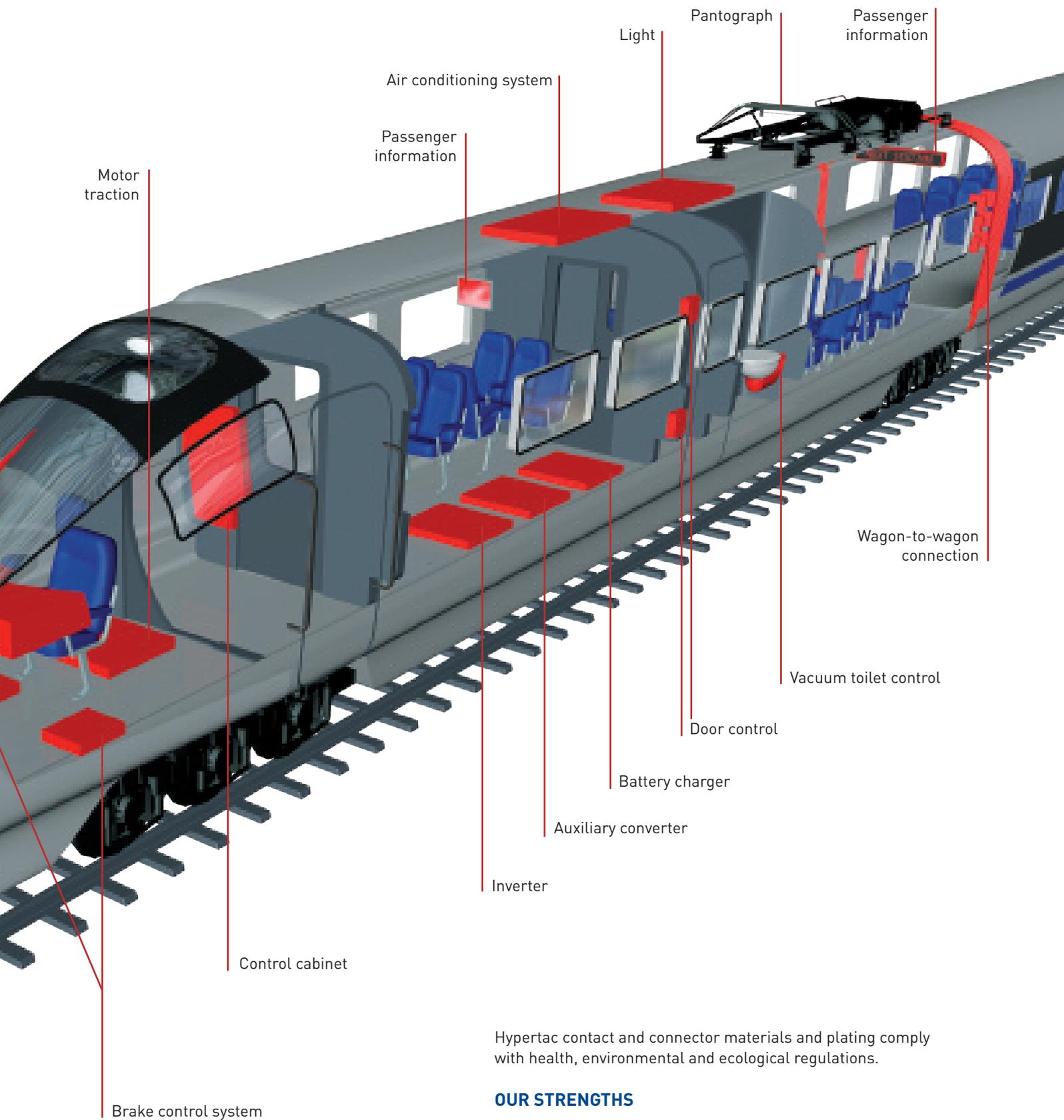
- Engineering, Design and Development
- CAD/CAM and Solid Modelling
- Prototyping
- Finite Element Analysis
- Extensive Machine Shops
- Contact Manufacturing
- Connector and Cable Assembly
- System Integration
- Qualification, Electrical and Mechanical Testing
- Project Management

OUR APPROVALS / CONFORMITY

Our products conform to the main international standards and have earned the trust of the railway industry.

- IRIS
- NF F 61-030; 032
- NF F 16-101; 102
- NF-C 93421
- IEEE-1101.2 -'92
- IEC 1076-4 101
- DIN 41612
- DIN 43652
- HE 501
- HE 704
- UTE C93-425
- RoHS





Hypertac contact and connector materials and plating comply with health, environmental and ecological regulations.

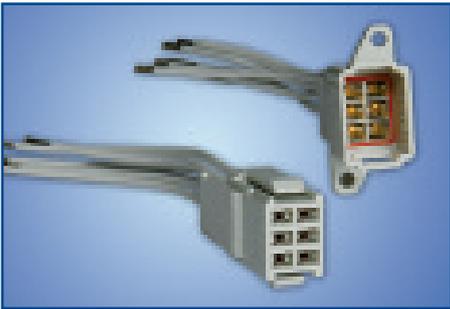
OUR STRENGTHS

- Leading Edge Technologies
- Standard and Custom Interconnect Solutions
- Global Presence, Local Support and Design-in
- Flexible Manufacturing
- Strong Parent Company

RAIL TRACTION

QUALITY RANKS FIRST

The extreme operating conditions within railway applications demand the highest performance components offering ultra high reliability. Our experience in signal, power and high speed connectors for rolling stock applications result in customer-driven, reliable solutions that are optimised to mitigate the effects of shock, vibration and fretting corrosion.

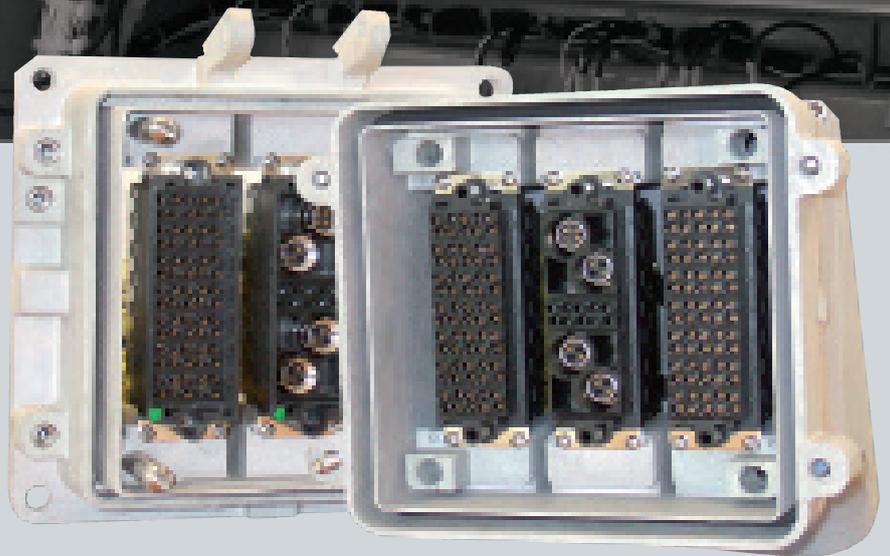


REP Series - Environmentally sealed quick interconnect solution

HIGH DENSITY

Our spring probes are designed to optimize contact performance in high reliability, multiple cycle applications. With 0.4 mm pitch and compressed heights of less than 2 mm, combined with electrical performance up to 6 GB/s and 20 GHz RF, our spring probe contact technology can provide the best interconnections when your application demands:

- Consistent performance, first stroke, every stroke
- Million-cycle mechanical lifetimes
- Low, consistent resistance
- High current capacities
- Constant contact when exposed to shock, vibration and acceleration
- Z Axis compliancy
- Extremely high density
- Solder free and quick-swap interconnect enabler



FH Series - Hybrid rectangular couplers, 200 x 200 mm



FG Series - Hybrid rectangular couplers, 100 x 100 mm



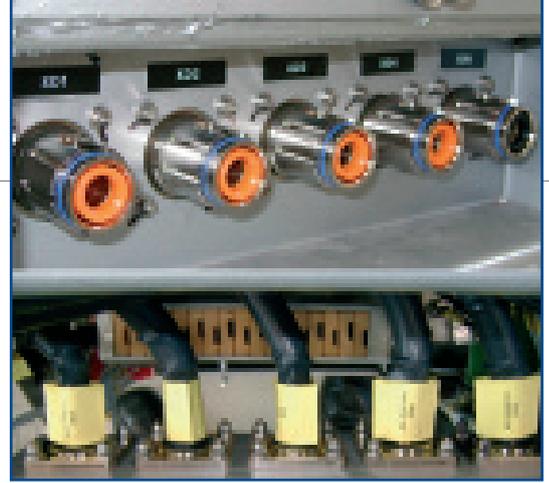
B Series – Modular rectangular connectors



HyperMod Series – Heavy duty modular connectors



L Series – 300A high power connectors



Rail converter application with HBC connectors

HIGH POWER

High power applications, especially in rail market, can create extreme demands on the termination technology. Hypertac's high power contacts, based on the proven Hyperboloid contact technology, are available with wire crimp termination, male and female threaded termination and with R/A thread post (male, female or crimp termination).

Hypertac's know-how in producing connectors for the harshest environments gives us the unique experience needed to design and manufacture cost effective, high power connectors for railway engineering to be used in converter, battery supply and junction box applications.



HBC Series – 300A / 500A high power connectors



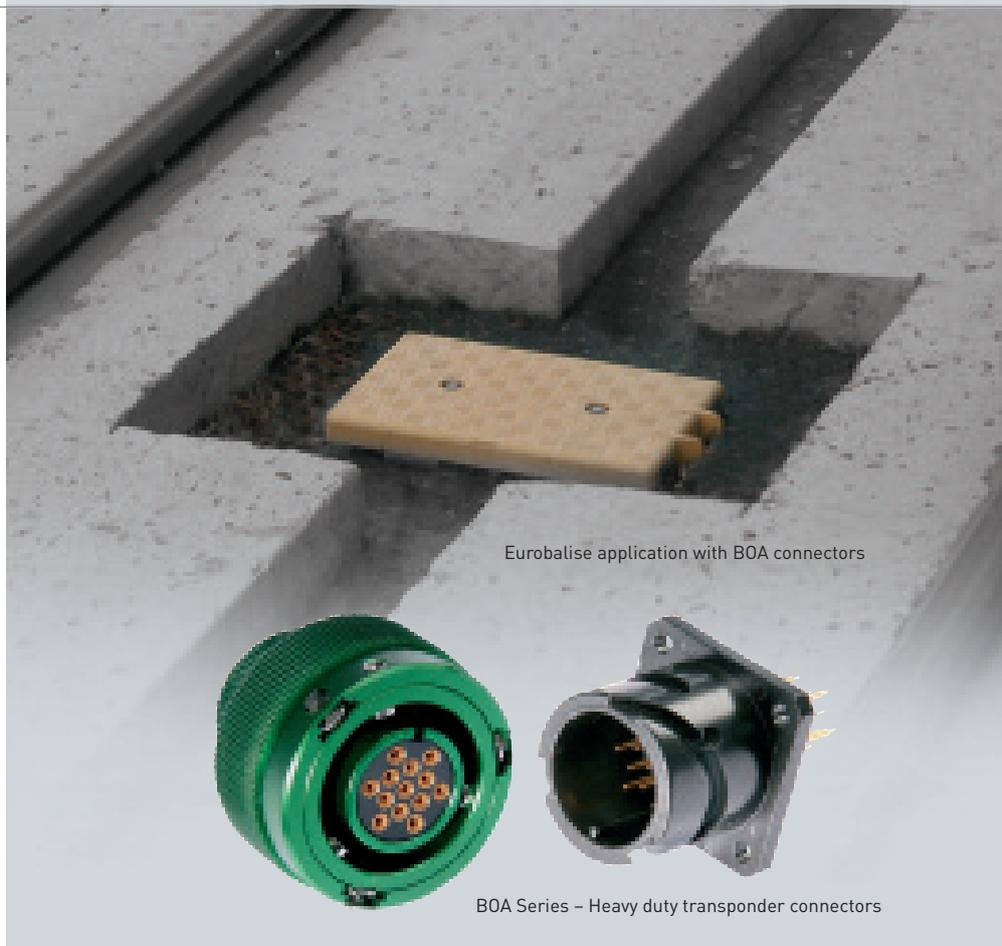
HBB Series – 300A, 2/3 pole high power connectors

INFRASTRUCTURES

SUPERIOR PERFORMANCE

The Hyperboloid contact technology has been specifically designed to withstand extreme shock and vibration for ultimate circuit integrity and extended in-service life. Hypertac connector solutions ensure the performance requirements of communication systems alongside the track and rail infrastructure. The extensive range of Hypertac products and value-added solutions has been used within rail systems globally.

The volume of information required within railway systems has increased substantially and traditional connection technologies can no longer support the transmission requirements for speed, integrity and distance. To address this issue, for both infrastructure and carriage-to-carriage applications, Hypertac offers a wide range of modules for its circular and rectangular connector series to fit with high speed quadrx contact technology which supports high speed communication protocols.



D Series – Signal and power plastic connectors



CEA Series – D-Type rectangular connectors



K Series – 26 way signal connectors



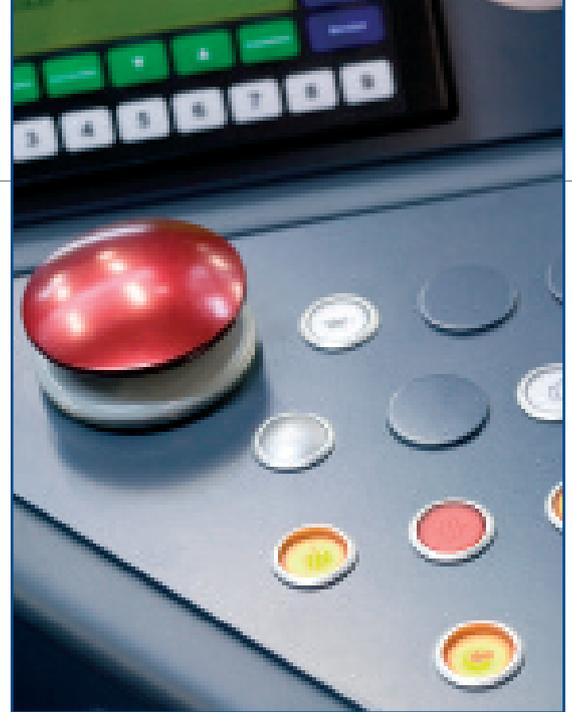
C165 Series – D-Type shielded rectangular connectors

SIGNALLING

ENSURING SAFETY

Hypertac is actively involved in the development of standard and custom connectors for signalling applications, with particular reference to the ERTMS project (European Railway Traffic Management System), targeted to ensure interoperability throughout the European rail network.

Hypertac connectors comply with the European normative of cable sizes. This is an important value that Hypertac adds to its offering since cable assembly is part of the chain that ensures that ERTMS equipment will be compatible with the various transmission systems (GSM, radio, etc) encountered when travelling in different European countries.



LHS Series – Flat floating modular connectors



HyperMod Series – Signal, power, high speed monobloc connectors



High Speed Contacts – 1.2GHz, CAT 7



M12 Series – D-coded, 4 way connectors



L Series – Modular connectors for rack and panel applications

VALUE ADDED SOLUTIONS

OUR GLOBAL APPROACH

Hypertac offers the benefits of a large global business while maintaining its geographic presence. The customer is supported by design and manufacturing sites in America, Europe, Africa and Asia and by a global network of agents and distributors. This structure ensures that customers are able to interact with engineers and sales colleagues who speak their own language, have a comprehensive knowledge of the range of products available throughout the group and can draw on experience from working in particular application environments.



Intercoach application with FH connectors

As the Railway industry has evolved, so has Hypertac development of connectors within this market.

Hypertac relies not only on the development of connectors, but even more on "added value" solutions. A specialized engineering team from the fields of plastics and process engineering offers the development of innovative interconnect solutions. From a mechanical connector construction up to over-moulding, complete electronic systems and qualification capabilities, Hypertac offers all the benefits of a one-stop-shop for customized interconnections.



PCB application with REP connectors



HYPERTAC IS A MEMBER OF THE ALSTOM LP150 PROGRAMME

The proven Hypertac Hyperboloid contact technology is the main factor for high reliability, high quality and well balanced price cost/performance ratio.



Integrated interconnect systems



Interconnect solution for ERTMS – Coding functions via embedded printed circuit

FILTER & TRANSIENT SUPPRESSION - RF & HIGH SPEED

OUR EMI FILTER KNOWLEDGE ENABLES US TO:

- Specify/recommend optimum filter style (e.g. C, LC, Pi) and value (up to 1microFarad) on receipt of signal type and data rate.
- Provide insertion loss simulations/prediction that account for actual source and load impedances.
- Verify insertion loss performance across entire frequency range.
- Combine EMI Filter and Transient Protection within a wide variety of connectors.
- Provide Transient Protection in accordance with RTCA D 160F waveform and level specifications.
- Adopt the most appropriate filtering technology for the application.

Higher customers expectations and severe application requirements have helped drive new levels of integrated product solutions between Hypertac and the sister organisation Polyphaser/Transtector.



RF lightning protection – 24VDC surge suppressions

OUR RF & HIGH SPEED KNOWLEDGE ENABLES US TO:

- Design and manufacture contacts operating at frequencies up to 40 GHz and above 5 Gbps.
- Optimise contact design for specific cable characteristics.
- Provide insertion loss, VSWR and Eye Pattern and S Parameter simulations.
- Verify high frequency and data transmission performance across entire frequency range.

The fibre optics contact technology has become in the last few years the main reference for high speed data transmission applications. Its main advantages over the copper technology are that it avoids sensitivity to electric perturbations and it increases the speed of transmitted information.

Hypertac has therefore developed a range of modular connectors with fibre optic contacts that can be mixed with signal, power and coax/twinax/triax/quadrax.

Hypertac connectors allow a flexible mix of cable styles for signal, power and optical terminations. Within a single connector it is possible to have:

- Coax, Triax, Quadrax contacts alongside signal and power contacts.
- Transient protection and EMI filtering.
- All cable shields grounded directly to connector shell.



Fibre optic connectors and contacts

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