MAKING A CONNECTION in the rail industry

Components designed for use in the rail industry often need to be robust enough to withstand harsh conditions, highly reliable, and yet compact enough to fit into small spaces. Here we take a look at the latest connectors suitable for applications in this sector

Development and modernisation in the rail industry are creating many opportunities for designers and suppliers of products. Here, components not only need to be robust enough to withstand the conditions faced, but they often need to be compact enough to fit in small spaces, and offer the highest levels of reliability.

Take connectors as one example. These components are used throughout the rail industry for a vast range of applications.

According to Harting, manufacturers of rail vehicles are faced with increasing constraints on available space to house a rising number of electrical components. So to meet demands, the company has recently introduced a new connector which is said to be ideally suited to use in high-power motor connections in the restricted spaces available in the underfloor areas of rail vehicles.

The Han 22 HPR slim (pictured, right), a high-current device optimised for up to four 250A contacts, is new to the company's Han HPR connector series. It was originally developed for a tram project in Vienna. Working in close co-operation with the customer, Harting was able to fit the connector into a gap of around 8cm between the carriage body and the bogie. Other housing dimensions were also optimised, with the result that the space requirement was reduced by some 40% compared to conventional solutions.

WITHSTANDING HARSH CONDITIONS

TE Connectivity (TE), meanwhile, has launched a new range of M12 rail connectors for field assembly. The M12 X-Code Series connectors enable data transmission rates of up to 10Gb per second (according to IEC 802.3an Cat 6a). These have full-metal shells which provide all-round shielding against EMI/RFI interference, and they are sealed against dust and water to IP67 level. Furthermore, the connectors have an operating temperature range of -40°C to 70°C (with grip cap) or -40°C to 85°C (without grip cap).

The new connectors feature machined gold-plated crimp contacts and resist high-vibration environments. All non-metal components (apart from the connector boot) are made in materials that obtain an HL3 rating in the European fire performance standard for materials and components on railway vehicles, EN45545-2. The crimp flange and crimp barrel are both qualified to match the chosen cable. Contacts are available for wire size AWG 22-28.

Suitable applications include data and sensor networks, train door control assemblies and rail vehicle HVAC systems.

"The future of transportation is only getting faster and more connected. Modern railway networks are all about speed and reliability," commented Egbert Stellinga, TE's global product manager for the M12 Rail X-Code connector series. "Our compact new connectors can be assembled quickly in the field and, once in place, they help ensure very high data transmission rates and avoid network interruptions."

TE Connectivity

HIGH PERFORMANCE

Another solution suitable for reduced space applications in the rail industry is Amphenol Socapex's RJ Field & USB Field range of rugged connectors. The two new 'reduced flange' versions – RJF TV6 and USB3F TV – are said to combine space and weight savings with performances equal to standard RJF TV6 and USB3F TV receptacles.

According to the company, their design reduces the panel surface footprint by 40%, and they are also 15% lighter than the standard RJFTV or USBFTV connectors. These receptacles are said to be ideal for applications requiring a maximum number of RJ45 or USB connectors to fit in a small space or when there are weight constraints.

The RJF TV6 reduced flange connectors support data acquisition and transmission over Ethernet Category 6 for 10 BaseT, 100 BaseTX and 1000 BaseT networks in harsh environments. The reduced flange version is compatible with standard RJF TV and RJF TV6 plugs and caps. It also guarantees the same levels of performance and resistance to corrosion, shocks and vibrations as the standard version.

CamCirc products from CamdenBoss will not disconnect when the cable is put under stress or load

The USB3F TV, reduced flange, follows USB 3.0 performances and specifications. Compatible with USB3F TV and USBF TV plugs and caps, this also guarantees the same levels of performance and resistance to corrosion, shocks and vibrations as the standard version. The connectors can also be used in military applications.

A rugged, high quality and high-performance interconnection solution is provided by the CamCirc range of circular multi-pole connectors from CamdenBoss, which can be used in harsh conditions. Suitable for use in the rail industry (as well as military, automotive, medical and many more), these offer IP68 waterproof sealing and feature multiple options encompassing various body sizes and styles, as well as contact configurations from two to 19 poles.

According to the company, CamCirc products will not disconnect when the cable is put under stress or load. These are based on push-pull technology that creates a vacuum seal when mating halves are plugged together to ensure that cables cannot be disconnected even if the cable is pulled. Disconnection is only achieved by pulling back the outer sleeve of the connector.

The range comprises six types of receptacle sockets – four fixed (types B, E, L and M) and two cable mounting (types S and T).

Amphenol's reduced flange connectors

HARTING www.harting.co.uk
TE Connectivity www.te.com
Amphenol Socapex www.amphenol-socapex.com
CamdenBoss www.camdenboss.com