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DELPHI Innovation for the Real World

Commercial & Specialty **Vehicles Connection Systems** DELPHI Innovation for the Real World



Commercial & Specialty Vehicles Connection Systems

Delphi Connection Systems has a global reputation for producing high quality electrical/electronic connectors and connection systems that meet and exceed customer requirements around the world. The technology and processes developed for our connection systems products are the result of our extensive customer focus and drive for innovation. It is our commitment to continue to work with customers to develop and deliver connection products that meet the everincreasing standards of quality and performance for the commercial vehicle markets.

Delphi employs leading edge manufacturing technologies and a comprehensive range of design services to produce high performance, cost-effective connection systems available either off-the-shelf or custom designed. We design, manufacture, assemble, validate and deliver electrical/electronic connection products to meet customer's stringent manufacturing and performance requirements.

Delphi Advantages:

- Extensive multi-industry product portfolio
- Global collaboration with local execution
- Global participation on standard committees
- Global Electrical/Electronic architecture supplier
- Integrated systems approach
- Development of customer focused solutions

Delphi offers an extensive Portfolio of product solutions for our global customers. Our comprehensive product line ranges from signal-level through high-power connection systems. These include both unsealed and sealed, ergonomically designed connections for in-line, device and header applications. This varied portfolio positions us to be a single-source provider.











Connector Family	Sensor Connectors	G-Lock	Lamp Connectors	Lamp Sockets
Connector Type	- APEX SensoMate 1.2 mm sealed 3 and 4 way - APEX SensoMate 2.8 mm sealed 2 and 3 way - DCS SensoMate 2.8 mm sealed 2 and 3 way	- DCS G-Lock 2.8 mm sealed connectors	- HIR2/HB3/HB4 sealed - PG18.5 sealed & unsealed versions - PG20 sealed version - PGJ19 sealed version	- Sealed and unsealed versions - W1 base type - W2 base type - W3 base type - B1,C1,C2 bayonet socket
Features/Benefits	- High vibration resistance single wire sealing - For heavy duty diesel engine applications - Terminal position assurance (TPA) - APEX Sensomate compliant to USCAR guidelines	- Axial sealing and single wire sealing - Mechanical coding - Terminal position assurance (TPA) - Steel spring connector locking - Several coding versions available - Suitable for high vibration and high temperature	PG18.5 & PG20 - Easy unmating thanks to robust rear latch - Housing locking principle - Front Terminal Position Assurance (TPA) PGJ19 - Safe mating and unmating thanks to robust and protected front and rear latch - Housing locking principle APEX HIR2 - Built around High- Performance APEX 2.8 Terminal System HIR2 mates to standard industry bulbs of the increasingly popular halogen infrared variety	- All conventional lamps - Accomodate virtually every size and type of light bulb, as well as all varieties of bulb mounting features
Typical Markets	- Commercial vehicles - Construction, agricultural, marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles	- Vehicles lighting	- Vehicles lighting
Typical Application	Fuel injector, Actuator, Pressure sensor applications	Suitable for engine mount applications	Fog Lamps, Daytime Running Lights	



















Connector Family	APEX	MCS	Panel Through Sealed Connectors	СМС	Relay Holders
Connector Type	- In-line sealed connectors - APEX 150: 10, 14, 16 and 24 way ErgoMate™ - APEX 2.8 mm: 2, 3, 4, 6, 10 & 14 ways	- Housings using 1.8 mm terminals - 1 to 4, 6, 8, 10, 14, 18 & 20 ways	- Connector solutions for Door to Body connections using Sicma 1.5 and 2.8 mm terminals connector solutions - 14, 16, 24, 34 and 50 ways	- Full interconnect sealed solutions for engine managment solutions using 0.64 and 1.5 GTS terminals - CMC (Connecteur Modulaire pour Calculateur) is one of the most popular interfaces for Engine - Management Electronic Control Units - 32, 48, 64 & 112 ways	- Relay interconnections offering a range of connector solutions - 4, 7, 8, 9 and 11 way sealed and unsealed connectors - 2.8mm, 4.8/6.3mm and 9.5mm terminals
Features/Benefits	- High performance in-line connectors for vibration, high temperature, moisture or harsh assembly environment - Fulfill USCAR performance specifications - 2-piece APEX terminal technology - Clean Body Terminal design - No polarization needed - Tin, Silver and Gold plated versions available - Temperature range: -40 to 155 °C degree - Single Wire Seal (cable seal) compatible	- Cost effective solution for unsealed applications - User friendly with integrated secondary lock device allowing for detection of unseated terminals (TPA) - Easy and quick connection system with latching lock principle	- Suitable for a combination of low and medium current applications - Mating assistance system with slider to minimize mating force and allowing blind mating - Male terminals can be protected from hazardous damage of male blades thanks to a front grid protection	- Accepts reversible wire dress cover - Right or left mountable rotating lever for mate assistance - 15 g sinus vibration resistant with Tin terminals - 1.5 Bar pressure proof sealing	- Single wire sealing opportunity - Mechanical coding -Terminal position assurance (TPA) - Slider for connector mating force reduction (9 & 11 way, also optional version in 7 and 8 way with slider)
Typical Markets	- Commercial vehicles - Construction, agricultural, marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles
Typical Application	Suitable for harsh environments	Cockpit of any vehicle	Particularly suitable for door to body or engine to cockpit passthrough applications	- Suitable for harsh environments - Powertrain Electronic Control Units	- Preheating diesel engine, lightning relays, EOBD for emission control



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TTI, Inc., a Berkshire Hathaway company, is a world leading specialist distributor of passive, connector, electromechanical and discrete components.

TTI Europe is headquartered in Maisach-Gernlinden near Munich, Germany. Our purpose-built facility occupies 19,000m², with 16,000 m² of dedicated warehouse space on all three levels, and services all European regions.

Globally, TTI is headquartered in Fort Worth, Texas and has over 100 locations across North America, Europe and Asia. TTI's philosophy is "Lead by Design", and the company differentiates itself by focusing on people, parts and process.

TTI in Europe strives to be the distributor of choice for customers and suppliers alike by introducing new product technologies and by stocking broad and deep inventory across its franchise base.

TTI's sophisticated inventory management system ensures the ability to service changes in demand due to fluctuating markets and supply chains.













Connector	Harsh Environment Series (HES)	Power Pack 1000/2000	Weather Pack	GT
Connector Type	Circular connector size 24 shell Terminal patterns 19, 21, 23, 29, 31, 47 50 and 60 way Headers Terminals 1.0, 1.6, 2.4 mm	High current sealed connectors 1 and 2 ways – Inline – Right Angle	Sealed pin and sleeve system 1 to 6 and 22 ways	In-line sealed and unsealed 2 to 16 ways connectors using GT 1.50 and 2.80 mm terminals, sealed GT lever lock series for word class ergonomics
Features/Benefits	- Terminal designed for lower insertion forces - 3-rib design provides better sealing capability up to 50% compared to existing designs - Environmentally sealed to IP67 - Robust, specialized finger design virtually eliminates terminal unseats - Fully interchangeable with industry standards terminals and connections - Frontward/backward compatibility - Rugged construction to withstand harsh environments - Sonic welded design provides 360 degrees of contact to withstand high vibration to meet J-2030 standards - Validated to SAE J-2030 and various other customer specifications	- High-current carrying capability - Power Pack 2000 – 250 A - Power Pack 1000 – 145 A - Hand engage/disengage eliminates the need for tools and reduces manufacturing time - Individually sealed terminal cavities for sealing protection - Terminal system can mate in the in-line or right-angle direction - Connector Position - Assurance (CPA) and Terminal Position Assurance (TPA) for superior connection reliability - Robust vibration performance in harsh environments	- Sealed system specifically designed to withstand exposure to extreme temperatures, chemicals, and fluids - Pin and sleeve configuration to alleviate stress relaxation - Secondary lock and Connector Position Assurance (CPA) for improved system design - Dual-locking tangs on terminals help prevent backing out - Terminal plugging requires no orientation - Positive locking indexing prevents mismating of connectors - Low energy, low voltage capability for vehicle electronics	- Tangless terminals - Low engagement force - Pump-handle primary lock - Secondary lock, Connector Position Assurance (CPA), and Terminal Position Assurance (TPA) capabilities - Mates to ISO, SAE blades - Conforms to USCAR design footprint - Cam lever/mechanical assist or hand engage/ disengage - Optimized content packaging for space efficient terminations - Pre-staged male blade stabilizer or superior male blade protection - Mixed terminal capability or design flexibility - Protected seal interface - Enhanced terminal
Typical Markets	- Commercial vehicles - Construction vehicles - Military vehicles - Marine vehicles	Commercial vehicles Construction/Agriculture vehicles (heavy duty trucks)	- Commercial vehicles (medium duty vehicles) - Construction/Agricultural vehicles	- Commercial vehicles - Marine vehicles
Typical	- Ideally suited for making connections in a vehicle sheet metal firewall pass-through location Intended for use in any high density, in-line application.	Ideal fit for high-current/high-power sealed and unsealed applications - Electrical center power feed - Electric power steering - Front wall pass-through - High-current module interface - Hybrid vehicle modules - In-line for battery cable	Proven harsh environmentally sealed connections	Ergonomic connections for in-line, device, header, and bulkhead applications















Connector Family	Metri-Pack	PCS Power Connectors	ocs	Mini Sealed	DCS Power Sealed
Connector Type	Device and in-line connectors sealed and unsealed 150, 280, 480, 630 and mixed series, unsealed 800 series and junction systems	Device and in-line sealed and unsealed connectors, 0.8, 1.5, 2.8. 4.8, 6.3 and mixed series	In-line sealed and unsealed connectors; 0.64, 1.2, 1.5 and 2.8 mm terminals	- High sealing performance in-line connectors using Sicma 1.5 and 2.8 mm terminals - 2, 3, 4, 5, 6 ways	- Solutions for power Interconnection using 2.8mm, 4.8mm and 9.5mm DCS Power terminals - 2, 3, 4 ways
Features/Benefits	- Enhanced products for high performance/high vibration - Validate to SAE J2030 - Tangless terminals for durable design - Silver and gold plating - Used in high current to low energy circuits - Strength and stability of terminals help assure correct alignment - Utilizes internationally standard male blade sizes for design flexibility - Connector Position - Assurance (CPA) and - Terminal Position - Assurance (TPA) for superior connection reliability - Sealed version for excellent resistance to temperatures, chemicals, and abrasion - Silver and gold platings	-Two-piece terminal, tin, tin-silver, silver and gold plating available, multiple contact point technology - Excellent resistance to temperature, chemicals, corrosion and vibration - 2 metal lance primary locking - High electrical performance: 116 A max. (9.5 size with 16mm² cable crimp, temperature limit 170°C) - High performance connections incorporating robust two-piece terminals	- Robust design features for enhanced warranty performance and designed-in durability - Clear and consistent audible click - Enhanced strain relief for blocked cavity configurations - Thumb grip incorporated to aid connector unmating - USCAR indexing - Cavity compatible with industry standard terminals - Validated to USCAR-2 Class III and other customer specifications - Small package size - Optional CPA	- High sealing performance ensured by rear block-seal and circumferential interface seal - Optimized size with 3.33 mm pitch for 1.5 mm terminals - Reduced size sealed housing - Easy and quick connection system with locking principle - Integrated secondary lock feature (TPA) allowing detection of unlocked terminals - Terminal Position Assurance (TPA) - Optional Connector Position Assurance for 2 and 6 ways (CPA)	- Connector position assurance (CPA - 2 ways) -Terminal position assurance (TPA) - User friendly with integrated secondary lock device allowing for detection of unseated terminals - Easy and quick connection system with terminal guiding system - Radial sealing and single wire sealing - Mechanical coding
Typical Markets	- Commercial vehicles - Marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles	Commercial vehicles, agricultural, marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles	- Commercial vehicles - Construction, agricultural, marine vehicles
Typical Application	Flat blade connections for electronic through high current applications	Engine compartment (Power steering)	Suitable for body & engine compartment applications	Suitable for body, engine compartment and harsh environment applications	Cooling fans, AC



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