



PANKAJ ELECTRICALS
EXPERIENCE THE DIFFERENCE

Your Trusted Source
for **ABB Harnessflex**
Cable Management
Solutions



Providing Superior Protection For
Automotive Wiring Harnesses

Introduction



Conduit



Hinged fittings



Interfaces



Sealed fittings



Technical



Interface chart





ABOUT US

Your Premier Partner in Innovative Electrical Solutions

At Pankaj Electricals, we pride ourselves on being a leading provider of advanced electrical solutions in India. As a key channel partner of ABB and a specialist in Ty-Rap products from Thomas & Betts, we are dedicated to offering unparalleled service and expertise.

We recognized the need for a comprehensive source of top-quality electrical solutions, and we've built a reputation for delivering exactly that. Our extensive inventory and commitment to swift, reliable service ensure that you have access to the best products, exactly when you need them.

What Sets Us Apart:

Expertise and Innovation: With decades of industry experience, we deliver cutting-edge solutions tailored to the diverse needs of our clients.

Customer-Centric Service: Our approach is centered on understanding and meeting your unique requirements, ensuring top-notch support and professional advice.

Wide Range of Products: From transformers to electrical accessories, our extensive product range is designed to provide robust protection and performance for your projects.

At Pankaj Electricals, we're not just a supplier; we're your partner in powering progress. We offer bespoke solutions and proactive recommendations to enhance quality and cost-efficiency, making a real impact on your business.

With a reputation for excellence and a commitment to innovation, Pankaj Electricals is your trusted choice for all your electrical needs. Whether you're in the industrial, commercial, or residential sector, we are here to provide the solutions that drive your success.

Discover the Pankaj Electricals difference— where quality meets innovation.

Harnessflex® Specialist Conduit Systems

Company overview

Harnessflex® is a trusted designer and manufacturer of flexible conduit systems and connector interfaces.

Our success has come from our systematic commitment to providing an extensive range of high-grade quality components. Combining a full range of slit and un-slit conduit, fittings and connectors, we also offer a large range of hinged system components and connector interfaces, protecting critical electrical and electronic wiring assemblies in the automotive industry.

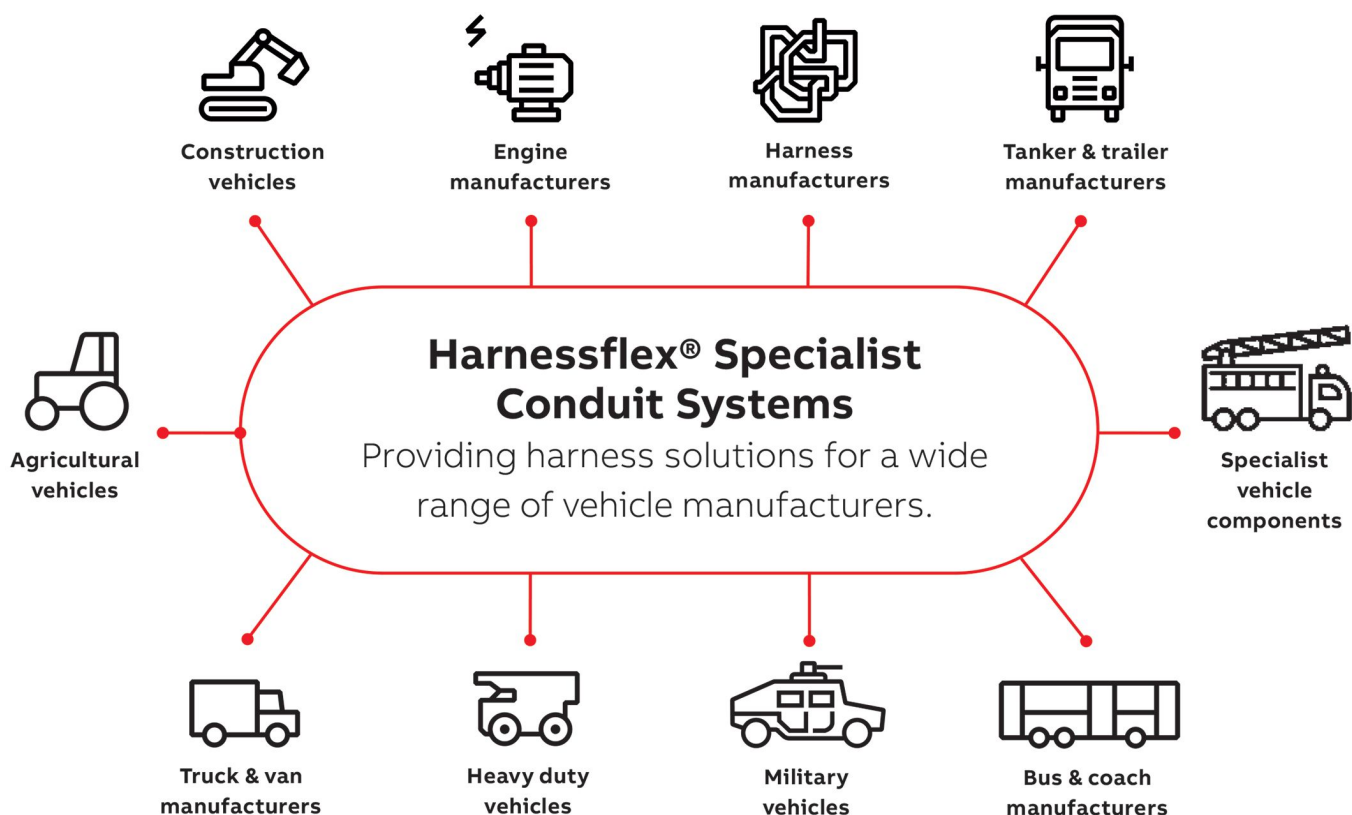
Our customers

Offering bespoke design that utilises our extensive range of interfaces, we can offer tailored and innovative solutions for a range of applications.

Quality approvals and standards

Manufacturing is controlled in accordance with BS EN ISO 9001, whilst ongoing testing is conducted to the highest international standards and approvals. This provides the confidence that Harnessflex® products can be used across the widest variety of automotive applications, including those in the harshest and most aggressive environments.

All components comply with End of Life Vehicle (ELV) directive EU2000/53/EC. Harnessflex® also comply to ISO14001 - Environmental Standard.





Electrical system risk factors & solutions

Applications

- LV / HV Cables
- Connectors & connectivity
- Delivering vehicle reliability and productivity

Mechanical

- Dust
- Dirt
- Impact
- Abrasion

Ingress

- Water
- Steam
- Material
- Chemical Attack

Environmental

- Temperature
- Humidity
- UV
- Operating conditions



Harnessflex® EVO™

Harnessflex EVO™ (Electric Vehicle Orange) conduit is flexible nylon (PA6) conduit suitable for electric vehicle applications. Able to withstand extremes of temperatures and resistant to automotive oils and solvents. It is extremely tough and has a very high impact strength and high fatigue life.

Features & benefits:

- High flexibility & fatigue life
- Very high abrasion, impact and shock resistance
- Temperature range: -40°C to +120°C
- Temperature range short-term: +150°C
- UV Resistance - Medium
- IP40 - IP68 (2 bar 30 mins) depending on fittings
- Available colours: Orange (RAL2003)
- Self extinguishing, low smoke toxicity & halogen free
- Available in slit variants



Harnessflex® X-Temp™

Built to operate at temperatures between -40°C to 200°C, X-Temp™ systems provide a complete extreme temperature resistant cable protection solution designed to withstand constant vibration, heavy flexing and movement.

Features & benefits:

- Extreme temperature resistance at -40°C to 200°C, offering greater protection for wiring
- Very high flexibility & fatigue life
- Protection from heat, abrasion, vibration and automotive fluids in all harness routing areas
- High temperature polyamide fittings and co-polyester conduit
- UL94 V2 certified fittings
- Tested for tensile and impact strength

Harnessflex® Specialist Conduit Systems

Our services

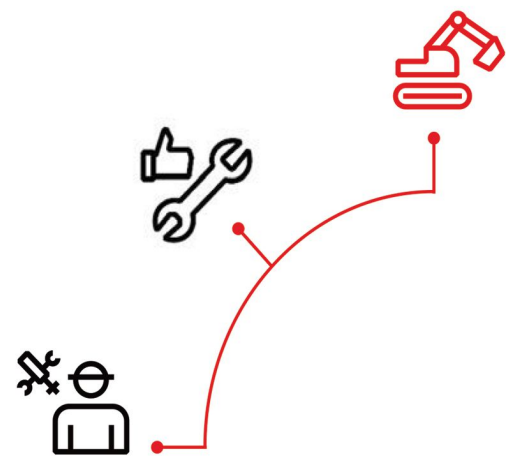
From bespoke design of innovative products to in-house performance testing to levels even above the highest global standards, at Harnessflex® we ensure quality at every step.



At Harnessflex®, we deliver specialist conduit systems suitable for use in a variety of applications, temperatures and environmental conditions. To achieve this, we work closely alongside OEMs and harness makers to deliver bespoke design systems that are built for purpose. In addition, all the products we manufacture are extensively tested in our in-house testing facility, ensuring they meet the highest levels of performance at all times.

Conduit systems designed to specification

Following a specification from the OEM, our technical team will draw up detailed final system designs, with 3D printed samples and prototypes for approval. Once signed off, the product will be commissioned for manufacture, with our technical team continuing to deliver engineering and design support throughout the process.

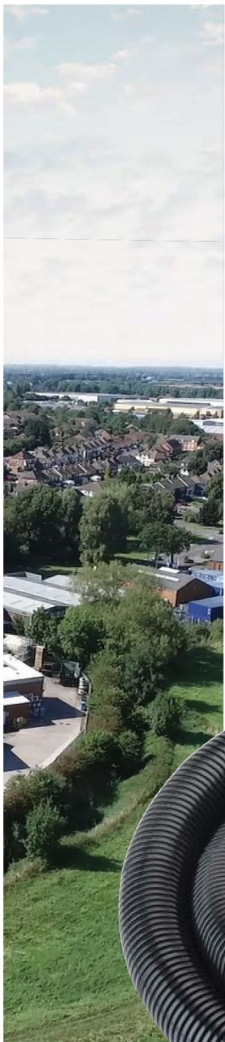


5YR

5 year warranty on your Harnessflex® system

As all Harnessflex products are intensively tested under the most extreme conditions, we can guarantee the durability of the systems we provide. That's why as standard, we offer a 5 year extended warranty on all Harnessflex® products that are installed as part of a complete, fully integrated Harnessflex system.

This gives you and your customers the peace of mind that once your Harnessflex® system is installed, it will deliver lasting protection of critical wiring over the vehicle's lifespan.



Product selection guide

Conduit systems

Product selection guide



Type	NC	CTPA	HTC	CPC	NCV	HNC	GPA
Conduit material	Polyamide 6	Polyamide 6	Modified Co-Polyester	Co-Polyester	FR Polyamide 6	Polyamide 12	Polyamide 6 / Polypropylene blend
Conduit weight	Standard	Light	Medium	Medium	Standard	Standard	Medium
Slit version available	•	•	•	–	–	–	–
Colour	● ●	● ●	●	● ●	●	●	●
Temperature range							
Long term static min.	-40°C	-40°C	-50°C	-50°C	-40°C	-60°C	-5°C
Long term static max.	+120°C	+120°C	+150°C	+135°C	+120°C	+105°C	+90°C
Short term (3000 hrs)	+150°C	+135°C	+175°C	+150°C	+150°C	+120°C	+105°C
Short term (200 hrs)	+175°C	+150°C	+190°C	+175°C	+170°C	+135°C	+105°C
Characteristics							
UV resistance	■■■■	■■■■	■■■■	■■■■	■■■■	■■■■	■■■■□
Flexibility	■■■■□	■■■■	■■■■	■■■■	■■■■□	■■■■	■■■■□
Fatigue life	■■■■	■■■■□	■■■■	■■■■	■■■■□	■■■■	■■■■□
Ext. wear resistance	■■■■	■■■■	■■■■□	■■■■□	■■■■	■■■■□	■■■■□
Fire performance							
Self extinguishing	•	•	•	•	•	•	•
Halogen free	•	•	•	•	•	•	•
Low smoke toxicity	•	•	•	•	•	•	–
UL94 V0	–	–	–	–	•	–	–
UL94 V2	–	–	–	•	–	–	–
UL94 HB	•	•	•	–	–	•	•
R118	•	–	–	–	–	–	–
Approvals							
CE	•	•	•	•	•	•	•
RoHS Compliant	•	•	•	•	•	•	•
ADR Approved	•	–	–	–	–	–	–
(ELV) EU200/53/EC	•	•	•	•	•	•	•
Chemical resistance*							
IRM 903 (ASTM Oil No.2)	S	S	S	S	S	S	S
Diesel Oil	S	S	S	S	S	S	S
Ethylene Glycol (Anti-freeze)	S	S	S	S	S	S	S
Lubricating Oil	S	S	S	S	S	S	S
Methyl Alcohol	L	L	S	S	L	S	S
Parafin Oil	S	S	S	S	S	S	S
Petrol	S	S	S	S	S	S	S
Sodium Chloride	S	S	S	S	S	S	S
Sodium Hydroxide (10%)	S	S	S	S	S	S	S
Transformer Oil	S	S	S	S	S	S	S
Urea	S	S	S	NT	S	S	S
Vegetable Oil	S	S	S	S	S	S	S
Sea (Water)	S	S	S	S	S	S	S

Key: S = Suitable / L = Limited Suitability / U = Unsustainable / NT = Not Tested / Maximum Performance = ■■■■

*All chemicals tested for resistance at 23°C.

Key features:

1

Compact design

Reducing distance between centres.

2

High pull-off strength

Conduit corrugations sit tightly into joiner junctions.

3

Integral retaining clips

Retains conduit in position during assembly.

Joiner



Elbow



Harnessflex® Cable routing

Harnessflex® conduit fittings and connector interfaces are designed to offer effective stable joints and connections in a wiring harness, that also shield against high pressure wash-down, excessive dust ingress, cable strain and mechanical abrasion.

Capabilities

Harnessflex® works closely with many OEMs to develop protection for critical electrical wiring through two-piece or hinged joints and junctions, sealed fittings and bespoke connector interfaces.

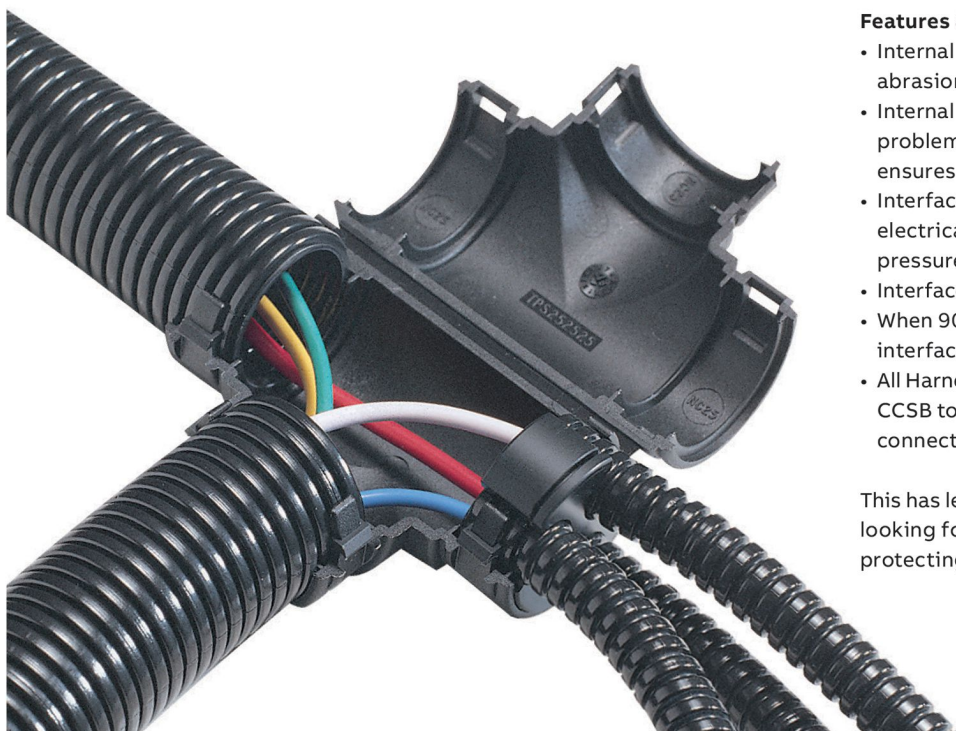
Our experienced internal design team uses 3D CAD modelling software to constantly develop innovative new solutions, as well as various bespoke concepts for customer approval.

Through our astute understanding of customer requirements, Harnessflex® products are designed and manufactured to integrate seamlessly into harnesses for various heavy automotive applications.

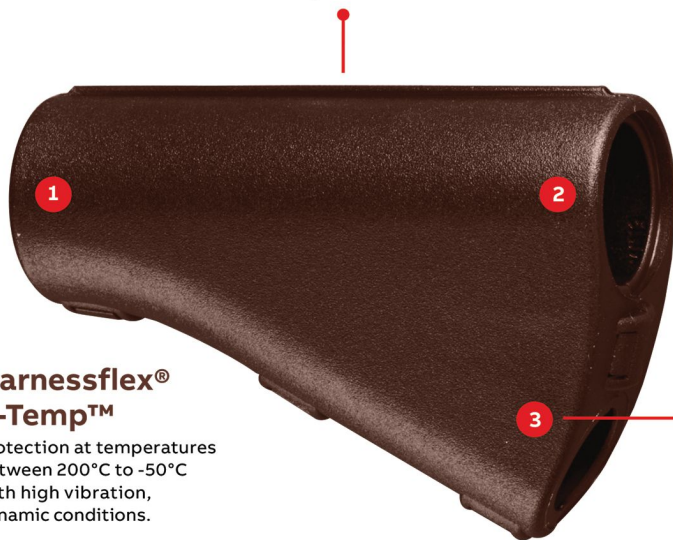
Features & benefits

- Internal form of fittings protects cables from abrasion
- Internal backstop alleviates any potential problems caused by unevenly cut conduit and ensures correct assembly
- Interfaces can be used in areas where electrical connectors are vulnerable to high pressure washing
- Interfaces offer strain relief to crimped contacts
- When 90° swivel elbows are used with interfaces they allow the harness to self-level
- All Harnessflex® Y, T and joiners can be used with CCSB to further enhance the conduit and connection's tensile and bending performance

This has led to the automotive industry actively looking for a complete and effective solution for protecting wiring and connectors in their engines.



Y-piece


Harnessflex®
X-Temp™

Protection at temperatures between 200°C to -50°C with high vibration, dynamic conditions.

x3 Junctions
For multiple conduit variations.

X-piece



x4 Junctions
For multiple conduit variations.



Harnessflex X-Temp™ conduits and fittings are a unique innovation designed to work specifically with high temperature wiring, allowing them to successfully operate at up to 200°C. Created from the outset for use as a full system, the range is made from specialist co-polyester and polyamide respectively, offering reliable protection for vital cable connections. The X-Temp™ system is manufactured from low smoke/zero halogen materials, and has also endured intensive long-term heat aging, tensile and impact strength testing to help ensure consistent performance.

Features & benefits

- High temperature range (up to 200°C) consisting of HTC conduit, T and Y-Piece fittings, straight and elbow joiners and common connector interfaces
- Safely protects against heat, abrasion, vibration and automotive fluids in all harness routing areas
- Very high fatigue life
- Made from high temperature Polyamide material
- UL94 V2 rated material
- Intensively tested for high tensile and impact strength

Standard fittings

Approvals	IP Rating	Appropriate fitting	Temperature range	UV resistance
CE Mark to the Low Voltage Directive		All Harnessflex conduits	-40°C to +120°C	Very high
RoHS Compliant to 2011/65/EU	IP40	Yes	Fire performance	
Conforms with End of Life Vehicle directive (ELV) EU200/53/EC			Self extinguishing	
			Low smoke toxicity	
			Halogen free	


Harnessflex X-Temp™ fittings

Approvals	IP Rating	Appropriate fitting	Temperature range	UV resistance
CE Mark to the Low Voltage Directive		For use with: All conduits in the Harnessflex range	-40°C to +200°C	High
RoHS Compliant to 2011/65/EU	IP40	Yes	Fire performance	
Conforms with End of Life Vehicle directive (ELV) EU200/53/EC			Self extinguishing	
			Low smoke toxicity	
			Halogen free	
			UL94 V2 / UL94 RTI 150 (Elec)	

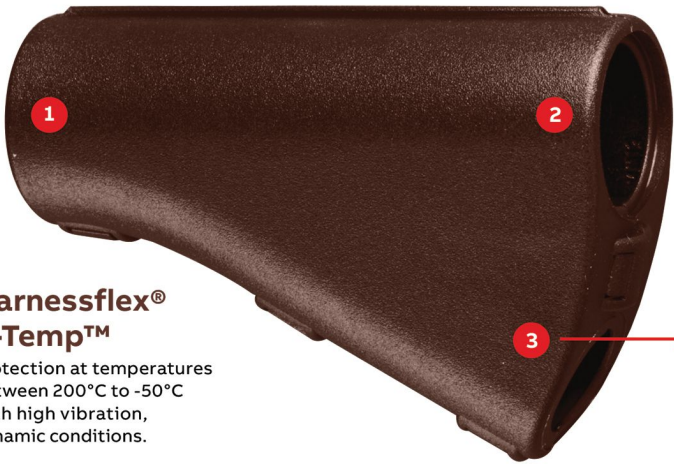


Y-piece

X-piece

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between 200°C to -50°C
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**x3
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For multiple
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RoHS Compliant to 2011/65/EU			Fire performance	
Conforms with End of Life Vehicle directive (ELV) EU200/53/EC	IP40	Yes	Self extinguishing	
			Low smoke toxicity	
			Halogen free	
			UL94 V2 / UL94 RTI 150 (Elec)	



Standard voltage connector interfaces

Providing high integrity connections

Harnessflex® works closely with many OEMs to develop protection for electrical connectors (a critical area of an engine harness).

External connector interfaces offer a compact and high integrity connection between automotive connectors and Harnessflex® conduit systems. These interfaces provide complete cable protection right up to the connector. They also provide strain relief and protection from high pressure washing, helping to maintain the sealing integrity of the connector.

Products include:

- **External hinged connector interfaces** - Tough and durable protection for OEM connectors against high pressure wash-down, excessive cable strain and mechanical abrasion.
- **External split connector interfaces** - Split type customised interfaces providing high integrity connections to the Molex SRC series of connectors and Harnessflex® conduit systems.
- **Special customised products** - Special hinged interfaces and blanking products.

Features & benefits include:

1. High pull-off strength

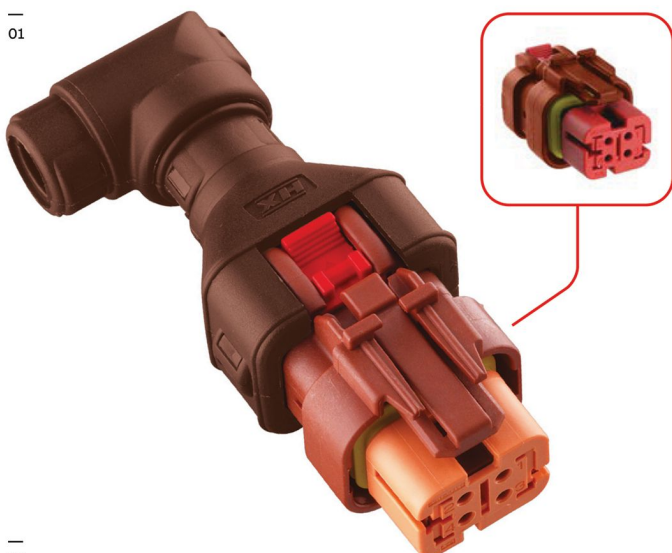
Internal conduit backstop provide insertion guide ensuring system integrity and high pull off strength.

2. Conduit size labels

Each junction indicates nominal conduit size to aid installation.

3. Straight or 90° elbow versions

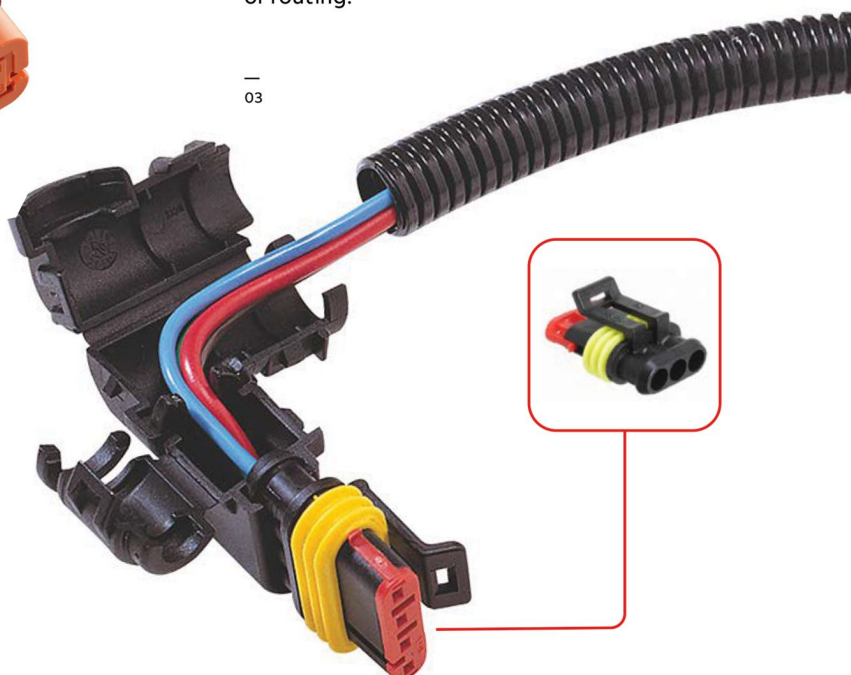
Compact design ideal for use where space is limited. Allowing 360 degree rotation for ease of routing.



01 TE Ampseal 16 & Harnessflex® X-Temp™ external connector interface.

02 HDSCS Heavy Duty Series plug and socket backshell interface.

03 TE AMP Superseal 90° & Harnessflex® external connector interface.



Connector interfaces

Quick reference chart



Type	TE AMP Superseal				TE AMP Superseal 90°				TE AMP Junior & Mini timer				TE AMP Junior & Mini timer 90°			
Part no.	X-Temp™ Part no.	Interface	Connector ¹	Part no.	X-Temp™ Part no.	Interface	Connector ²	Part no.	X-Temp™ Part no.	Interface	Connector ³	Part no.	X-Temp™ Part no.	Interface	Connector ⁴	
CI08-AS1	CIH08-AS1	1 way	282079-2*	CI08-90-AS1	CIH08-90-AS1	1 way	282079-2*	CI08-AM2	CIH08-AM2	2 way	347887-3*	CI08-90-AM2	CIH08-90-AM2	2 way	347887-3*	
CI08-AS2	CIH08-AS2	2 way	282104-2*	CI08-90-AS2	CIH08-90-AS2	2 way	282104-2*	CI08-AM3	CIH08-AM3	3 way	1-827578-1*	CI08-90-AM3	CIH08-90-AM3	3 way	1-827578-1*	
CI08-AS3	CIH08-AS3	3 way	282087-1*	CI08-90-AS3	CIH08-90-AS3	3 way	282087-1*	CI08-AM4	CIH08-AM4	4 way	281804-1*	CI08-90-AM4	CIH08-90-AM4	4 way	281804-1*	
CI08-AS4	CIH08-AS4	4 way	282088-1*	CI08-90-AS4	CIH08-90-AS4	4 way	282088-1*	CI10-AM2	CIH10-AM2	2 way	347887-3*	CI10-90-AM2	CIH10-90-AM2	2 way	347887-3*	
CI10-AS2	CIH10-AS2	2 way	282104-2*	CI10-90-AS2	CIH10-90-AS2	2 way	282104-2*	CI10-AM3	–	3 way	1-827578-1*	CI10-90-AM3	–	3 way	1-827578-1*	
CI10-AS3	CIH10-AS3	3 way	282087-1*	CI10-90-AS3	CIH10-90-AS3	3 way	282087-1*	CI10-AM4	–	4 way	281804-1*	CI10-90-AM4	–	4 way	281804-1*	
CI10-AS4	CIH10-AS4	4 way	282088-1*	CI10-90-AS4	CIH10-90-AS4	4 way	282088-1*	CI12-AM2	CIH12-AM2	2 way	347887-3*	CI12-90-AM2	–	2 way	347887-3*	
CI12-AS1	CIH12-AS1	1 way	282079-2*	CI12-90-AS2	CIH12-90-AS2	2 way	282104-2*	CI12-AM3	CIH12-AM3	3 way	1-827578-1*	CI12-90-AM3	CIH12-90-AM3	3 way	1-827578-1*	
CI12-AS2	CIH12-AS2	2 way	282104-2*	CI12-90-AS3	CIH12-90-AS3	3 way	282087-1*	CI12-AM4	CIH12-AM4	4 way	281804-1*	CI12-90-AM4	CIH12-90-AM4	4 way	281804-1*	
CI12-AS3	CIH12-AS3	3 way	282087-1*	CI12-90-AS4	CIH12-90-AS4	4 way	282088-1*									
CI12-AS4	CIH12-AS4	4 way	282088-1*													



Type	TE Econoseal				TE Econoseal Series 90°									Amphenol AT					
Part no.	X-Temp™ Part no.	Interface	Connector	8	Part no.	X-Temp™ Part no.	Interface	Connector	9	Part no.	X-Temp™ Part no.	Interface	Connector	10					
CI08-ES2P	–	2 way	174354-2		CI08-90-ES2P	–	2 way	174352-2		CI10-90-ES4P	–	4 way	174259-2						
CI08-ES3P	–	3 way	174359-2		CI10-90-ES2P	–	2 way	174352-2		CI12-90-ES4P	–	4 way	174259-2						
CI10-ES4P	–	4 way	174259-1		CI12-90-ES2P	–	2 way	174352-2		CI16-90-ES4P	–	4 way	174259-2						
CI08-ES2R	–	2 way	174354-2		CI08-90-ES3P	–	3 way	174359-2		CI08-90-ES2R	–	2 way	174354-2						
CI08-ES3R	–	3 way	368523-3		CI10-90-ES3P	–	3 way	174359-2		CI10-90-ES2R	–	2 way	174354-2						
CI10-ES4R	–	4 way	174257-2		CI12-90-ES3P	–	3 way	174359-2		CI12-90-ES2R	–	2 way	174354-2						
										CI08-90-ES3R	–	3 way	2822390-1						
										CI10-90-ES3R	–	3 way	2822390-1						
										CI12-90-ES3R	–	3 way	2822390-1						
										CI10-90-ES4R	–	4 way	174259-2						
										CI12-90-ES4R	–	4 way	174259-2						
										CI16-90-ES4R	–	4 way	174259-2						
																			
TE MCon					TE Levyseal														
Part no.	X-Temp™ Part no.	Connector			Part no.	X-Temp™ Part no.	Connector			Part no.	X-Temp™ Part no.	Connector							
CI12-MLK10	–	1-2282337-5			28-TV62	–	1-1718324-1												



TE MCon			TE Levyseal		
Part no.	X-Temp™ Part no.	Connector	Part no.	X-Temp™ Part no.	Connector
CI12-MLK10	–	1-2282337-5	28-TY62	–	1-1718324-1



FCI Automotive Apex 2.8				Type	FCI Automotive				Bosch Compact				Aptiv Series						
Part no.	X-Temp™ Part no.	Interface	Connector ¹⁴		Part no.	X-Temp™ Part no.	Interface	Connector ¹⁵		Part no.	X-Temp™ Part no.	Interface	Connector ¹⁶		Part no.	X-Temp™ Part no.	Interface	Connector ¹⁷	
CI08-FCI02	CIH08-FCI02	2 way	10757671		CI08-90-FCI02	CIH08-90-FCI02	2 way	10757671		CI08-BC2	CIH08-BC2	2 Way	1 928 403 137		CI08-DE001	–	3 way	–	
CI08-FCI03	CIH08-FCI03	3 way	15394689		CI08-90-FCI03	CIH08-90-FCI03	3 way	15394689		CI08-BC3	CIH08-BC3	3 Way	1 928 403 110		CI08-MP2	–	2 way	12162194	
CI08-FCI04	CIH08-FCI04	4 way	15425692		CI08-90-FCI04	CIH08-90-FCI04	4 way	15425692		CI08-BC4	CIH08-BC4	4 Way	1 928 403 112		CI08-MP3	–	3 way	12129615/12110293*	
CI12-FCI02	CIH12-FCI02	2 way	10757671		CI12-90-FCI02	CIH12-90-FCI02	2 way	10757671		CI12-BC2	CIH12-BC2	2 Way	1 928 403 137		CI08-MMP2	–	2 way	12162852	
CI12-FCI03	CIH12-FCI03	3 way	15394689		CI12-90-FCI03	CIH12-90-FCI03	3 way	15394689		CI12-BC3	CIH12-BC3	3 Way	1 928 403 110		CI08-WP2	–	2 way	12052613/12065863*	
CI12-FCI04	CIH12-FCI04	4 way	15425692		CI12-90-FCI04	CIH12-90-FCI04	4 way	15425692		CI12-BC4	CIH12-BC4	4 Way	1 928 403 112		CI08-PTD2	–	2 way	15397337	
CI12-FCI14	CIH12-FCI14	14 way	10757674		CI08-90-FCI14	CIH08-90-FCI14	14 way	10757674		CI28-BC40	CIH28-BC40	40 Way	1 928 404 777		CI08-GT153	–	3 way	15336121	
CI16-FCI14	CIH16-FCI14	14 way	10757674		CI12-90-FCI14	CIH12-90-FCI14	14 way	10757674		Bosch Compact 90°					16-GT284	–	4 way	13521459	
16-FCI14	H16-FCI14	14 way	54201415		CI16-90-FCI14	CIH16-90-FCI14	14 way	10757674		CI08-90-BC2	CIH08-90-BC2	2 Way	1 928 403 137		CI08-GT150SF-2	–	2 way	13520101	
CI16-FCI06	CIH16-FCI06	6 way	15430633		CI20-90-FCI14	CIH20-90-FCI14	14 way	10757674		CI08-90-BC3	CIH08-90-BC3	3 Way	1 928 403 110		CI08-90-GT150SF-2	–	2 way	13520101	
CI17-FCI10	CIH17-FCI10	10 way	15425612							CI08-90-BC4	CIH08-90-BC4	4 Way	1 928 403 112						
CI25-FCI50	–	50 way	10867079							CI12-90-BC2	CIH12-90-BC2	2 Way	1 928 403 137						
										CI12-90-BC3	CIH12-90-BC3	3 Way	1 928 403 110						
										CI12-90-BC4	CIH12-90-BC4	4 Way	1 928 403 112						





CONNECTOR REFERENCE CHART

CONNECTOR KEY:

- | | | | | |
|---|-------------------------------------|--------------------------------------|---------------------------------------|---------------------------------|
| 1 TE Amp Superseal | 5 TE AMPSEAL 16 | 10 TE/Deutsch - DT Series | 14 FCI Automotive Apex 2.8 | 18 Aptiv Series 90° |
| 2 TE AMP Superseal 90° | 6 7 TE AMPSEAL 16 90° | 11 TE/Deutsch - DT Series 90° | 15 FCI Automotive Apex 2.8 90° | 18 Kostal |
| 3 TE AMP Junior & Mini timer | 8 TE Econoseal | 12 TE/Deutsch - DRC50 Series | 15 Bosch Compact | 19 Kostal 90° |
| 4 TE AMP Junior & Mini timer 90° | 9 TE Econoseal 90° | 13 Heavy Duty Series | 16 Bosch Compact 90° | 20 Kostal SLK Series 90° |
| | | | 17 Aptiv Series | 21 Sumitomo |

* All colour and wire variants - for full list of connector references, please visit the main part pages.



TE AMPSEAL 16

Part no.	X-Temp™ Part no.	Interface	Connector 5
CI08-AT2PL	CIH08-AT2PL	2 way	776428-3*
CI08-AT3PL	CIH08-AT3PL	3 way	776523-1*
CI08-AT4PL	CIH08-AT4PL	4 way	776487-1*
CI12-AT4PL	CIH12-AT4PL	4 way	776487-1*
CI12-AT6PL	CIH12-AT6PL	6 way	776434-3*
CI12-AT8PL	CIH12-AT8PL	8 way	776494-3*
CI12-AT12PL	CIH12-AT12PL	12 way	776437-4*
CI16-AT8PL	CIH16-AT8PL	8 way	776494-1*
CI16-AT12PL	CIH16-AT12PL	12 way	776533-1*

TE AMPSEAL 16 90°

Part no.	X-Temp™ Part no.	Interface	Connector 7
CI08-90-AT2LP	CIH08-90-AT2LP	2 way	776427-1*
CI08-90-AT2LR	CIH08-90-AT2LR	2 way	776428-1*
CI08-90-AT3LP	CIH08-90-AT3LP	3 way	776523-1*
CI08-90-AT3LR	CIH08-90-AT3LR	3 way	776430-1*
CI08-90-AT4LP	CIH08-90-AT4LP	4 way	776524-3*
CI08-90-AT4LR	CIH08-90-AT4LR	4 way	776488-1*
CI08-90-AT6LP	CIH08-90-AT6LP	6 way	776433-1*
CI08-90-AT6LR	CIH08-90-AT6LR	6 way	776434-1*
CI12-90-AT2LP	CIH12-90-AT2LP	2 way	776427-1*
CI12-90-AT2LR	–	2 way	776428-1*
CI12-90-AT3LP	CIH12-90-AT3LP	3 way	776523-1*
CI12-90-AT3LR	CIH12-90-AT3LR	3 way	776430-1*
CI12-90-AT4LP	–	4 way	776524-3*
CI12-90-AT4LR	–	4 way	776488-1*
CI12-90-AT6LP	CIH12-90-AT6LP	6 way	776433-1*
CI12-90-AT6LR	–	6 way	776434-1*
CI16-90-AT4LP	–	4 way	776524-3*
CI16-90-AT4LR	–	4 way	776488-1*
CI16-90-AT6LP	–	6 way	776433-1*
CI16-90-AT6LR	–	6 way	776434-1*



TE/Deutsch - DT Series

Part no.	X-Temp™ Part no.	Interface	Connector 10
CI08-DT2	CIH08-DT2	2 way	DT06-2S-E005
CI08-DT3	CIH08-DT3	3 way	DT06-3S-E005
CI08-DT4	CIH08-DT4	4 way	DT06-4S-E005
CI08-DT6	CIH08-DT6	6 way	DT06-6S-E005
CI12-DT2	CIH12-DT2	2 way	DT06-2S-E005
CI12-DT3	CIH12-DT3	3 way	DT06-3S-E005
CI12-DT4	CIH12-DT4	4 way	DT06-4S-E005
CI12-DT6	CIH12-DT6	6 way	DT06-6S-E005
CI12-DT8	CIH12-DT8	8 way	DT06-8SA-E005
CI16-DT12	CIH16-DT12	12 way	DT06-12SA-E005

TE/Deutsch - DT Series 90°

Part no.	X-Temp™ Part no.	Interface	Connector 11
CI08-90-DT2	CIH08-90-DT2	2 way	DT06-2S-E005
CI08-90-DT3	CIH08-90-DT3	3 way	DT06-3S-E005
CI08-90-DT4	CIH08-90-DT4	4 way	DT06-4S-E005
CI08-90-DT6	CIH08-90-DT6	6 way	DT06-6S-E005
CI12-90-DT2	CIH12-90-DT2	2 way	DT06-2S-E005
CI12-90-DT3	CIH12-90-DT3	3 way	DT06-3S-E005
CI12-90-DT4	CIH12-90-DT4	4 way	DT06-4S-E005
CI12-90-DT6	CIH12-90-DT6	6 way	DT06-6S-E005
CI12-90-DT8	CIH12-90-DT8	8 way	DT06-8SA-E005
CI12-90-DT12	CIH12-90-DT12	12 way	DT06-12SA-E005
CI16-90-DT8	CIH16-90-DT8	8 way	DT06-8SA-E005
CI16-90-DT12	CIH16-90-DT12	12 way	DT06-12SA-E005

TE/Deutsch - DRC50 Series

Part no.	X-Temp™ Part no.	Interface	Connector 12
CI122812-DRC50	–	–	DRC26-50S0*
CI201220-DRC50	–	–	DRC26-50S0*
CI202820-DRC50	–	–	DRC26-50S0*
CI251225-DRC50	–	–	DRC26-50S0*
CI252825-DRC50	–	–	DRC26-50S0*



TE/Deutsch - DTP04 Series 90°

Part no.	X-Temp™ Part no.	Interface	Connector
CI12-90-DTP04	–	–	DTP06-4S-CE02
16-90-DTP04	–	–	DTP06-4S-E004

* Both PNs fit the following connector references:
DTP06-4S, DTP06-4S-C015, DTP06-4S-CE02 and DTP06-4S-E004.

Heavy Duty Series

Part no.	Interface	Connector 13
CI08-HDSC5-B	–	1-1418469-1
CI12-HDSC5-B	–	1-1418469-1
CI20-HDSC5-E	–	1-1563759-1/1-1564337-1
CI20-F90-HDSC5-E	–	1-1563759-1/1-1564337-1



Aptiv Series 90°

Part no.	X-Temp™ Part no.	Interface	Connector 18
CI08-90-DE001	–	3 way	–
CI08-90-MP2	–	2 way	12162194
CI08-90-MP3	–	3 way	12129615/12110293*
CI08-90-MMP2	–	2 way	12162852
CI12-90-MP2	–	2 way	12162194
CI12-90-MP3	–	3 way	12129615/12110293*
CI12-90-MMP2	–	2 way	12162852
CI08-90-WP2	–	2 way	12052613/12065863*
CI12-90-WP2	–	2 way	12052613/12065863*
CI08-90-PTD2	–	2 way	15397337
CI12-90-PTD2	–	2 way	15397337
CI08-90-GT153	–	3 way	15336121
CI12-90-GT153	–	3 way	15336121
CI12-90-GT284	–	3 way	15326631
CI16-90-GT284	–	3 way	15326631

Kostal

Part no.	X-Temp™ Part no.	Interface	Connector 19
CI16-LK20	–	20 way	09432001
PG21-LK20	–	20 way	09432001
CI08-SLK28-2	–	2 way	–
CI08-SLK28-3	–	3 way	9441391
–	CIH12-MLK04	4 way	10092979
Kostal 90°			
CI08-90-K2C	–	2 way	9442291
CI08-90-K3C	–	3 way	9302231
CI12-90-K2C	–	2 way	9442291
CI12-90-K3C	–	3 way	9302231
CI12-90-K10C	–	10 way	9331031

Kostal Series 90°

Part no.	X-Temp™ Part no.	Interface	Connector 20
CI08-90-SLK28-2	–	2 way	–
CI08-90-SLK28-3	–	3 way	9441391
CI12-90-SLK28-4	–	4 way	–
–	CIH12-90-MLK04	4 way	10092979



DIN 72585

Part no.	X-Temp™ Part no.	Interface	Connector
CI08-72585	–	4 way	1-967325-1

Sumitomo

Part no.	X-Temp™ Part no.	Interface	Connector 21
CI08-SU4	–	4 way	6098-0144-B*
CI08-90-SU4	–	4 way	6098-0144-B*
CI08-X2SU4	–	4 way	6195-0030**
CI08-90-X2SU4	–	4 way	6195-0030**
CI12-SU10	–	10 way	6189-1134

* Original connector.
** New version of connector.

* Both connectors need to be fitted with TPA 1205 2845.



Harnessflex® EVO™ Connector interfaces

Quick reference chart



Type	Amphenol PL18-G2 (Straight)
Part no.	Connector
CI25-PL18-G2	PL18T-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18U-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18V-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18W-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18X-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18Y-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18T-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18U-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18V-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18W-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18X-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL18Y-300-50-2.5
CI28-PL18-G2	
CI28-PL18-G2	PL18T-301-70-2.5
CI28-PL18-G2	PL18U-301-70-2.5
CI28-PL18-G2	PL18V-301-70-2.5
CI28-PL18-G2	PL18W-301-70-2.5
CI28-PL18-G2	PL18X-301-70-2.5
CI28-PL18-G2	PL18Y-301-70-2.5
CI28-PL18-G2	PL18T-300-70-2.5
CI28-PL18-G2	PL18U-300-70-2.5
CI28-PL18-G2	PL18V-300-70-2.5
CI28-PL18-G2	PL18W-300-70-2.5
CI28-PL18-G2	PL18X-300-70-2.5
CI28-PL18-G2	PL18Y-300-70-2.5

Type	Amphenol PL28-G2 (90°)
Part no.	Connector
CI25-PL18-G2	PL28T-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28U-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28V-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28W-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28X-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28Y-301-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28T-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28U-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28V-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28W-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28X-300-50-2.5
CI28-PL18-G2	
CI25-PL18-G2	PL28Y-300-50-2.5
CI28-PL18-G2	
CI28-PL18-G2	PL28T-301-70-2.5
CI28-PL18-G2	PL28U-301-70-2.5
CI28-PL18-G2	PL28V-301-70-2.5
CI28-PL18-G2	PL28W-301-70-2.5
CI28-PL18-G2	PL28X-301-70-2.5
CI28-PL18-G2	PL28Y-301-70-2.5
CI28-PL18-G2	PL28T-300-70-2.5
CI28-PL18-G2	PL28U-300-70-2.5
CI28-PL18-G2	PL28V-300-70-2.5
CI28-PL18-G2	PL28W-300-70-2.5
CI28-PL18-G2	PL28X-300-70-2.5
CI28-PL18-G2	PL28Y-300-70-2.5

Type	Amphenol PL300 PL282
Part no.	Connector
CI25-PL282-PL300	PL282X-301-35
CI28-PL282-PL300	
CI25-PL282-PL300	PL282Y-301-35
CI28-PL282-PL300	
CI25-PL282-PL300	PL282X-301-50
CI28-PL282-PL300	
CI25-PL282-PL300	PL282Y-301-50
CI28-PL282-PL300	
CI28-PL282-PL300	PL282X-301-70
CI28-PL282-PL300	PL282Y-301-70
CI25-PL282-PL300	PL282X-300-35
CI28-PL282-PL300	
CI25-PL282-PL300	PL282Y-300-35
CI28-PL282-PL300	
CI25-PL282-PL300	PL282X-300-50
CI28-PL282-PL300	
CI25-PL282-PL300	PL282Y-300-50
CI28-PL282-PL300	
CI28-PL282-PL300	PL282X-300-70
CI28-PL282-PL300	PL282Y-300-70

Type	Amphenol PL182-G2
Part no.	Connector
CI25-PL182-G2	PL182X-301-50-2-5
CI28-PL182-G2	
CI25-PL182-G2	PL182Y-301-50-2-5
CI28-PL182-G2	
CI25-PL182-G2	PL182U-301-50-2-5
CI28-PL182-G2	
CI25-PL182-G2	PL182V-301-50-2-5
CI28-PL182-G2	
CI25-PL182-G2	PL182X-300-50-2-5
CI28-PL182-G2	
CI25-PL182-G2	PL182Y-300-50-2-5
CI28-PL182-G2	
CI25-PL182-G2	PL182U-300-50-2-5
CI28-PL182-G2	
CI25-PL182-G2	PL182V-300-50-2-5
CI28-PL182-G2	
CI28-PL182-G2	PL182X-301-70-2-5
CI28-PL182-G2	PL182Y-301-70-2-5
CI28-PL182-G2	PL182U-301-70-2-5
CI28-PL182-G2	PL182V-301-70-2-5
CI28-PL182-G2	PL182X-300-70-2-5
CI28-PL182-G2	PL182Y-300-70-2-5
CI28-PL182-G2	PL182U-300-70-2-5
CI28-PL182-G2	PL182V-300-70-2-5

CONNECTOR KEY:

- 1

Amphenol PL18-G2 (Straight)
- 2

Amphenol PL28-G2 (90°)
- 3

Amphenol PL300 PL282
- 4

Amphenol PL182-G2
- 5

Amphenol PL300 (Straight)
- 6

Amphenol PL300 (90°)
- 7

TE HVA280 3P



Type	Amphenol PL300 (Straight) Continued
Part no.	Connector
CI28-PL300	PL18X-301-50-5
CI25-PL300	
CI28-PL300	PL18Y-301-50-5
CI25-PL300	
CI28-PL300	PL18U-301-50-5
CI25-PL300	
CI28-PL300	PL18V-301-50-5
CI25-PL300	
CI28-PL300	PL18W-301-50-5
CI25-PL300	
CI28-PL300	PL18T-301-50-5
CI25-PL300	
CI28-PL300	PL18X-300-50-5
CI25-PL300	
CI28-PL300	PL18Y-300-70-5
CI28-PL300	PL18U-300-70-5
CI28-PL300	PL18V-300-70-5
CI28-PL300	PL18W-300-70-5
CI28-PL300	PL18T-300-70-5
CI28-PL300	PL18X-301-70-5
CI28-PL300	PL18Y-301-70-5
CI28-PL300	PL18U-301-70-5
CI28-PL300	PL18V-301-70-5
CI28-PL300	PL18W-301-70-5
CI28-PL300	PL18T-301-70-5

Type	Amphenol PL300 (90°)
Part no.	Connector
CI25-PL300	PL28X-300-35-5
CI28-PL300	
CI25-PL300	PL28Y-300-35-5
CI28-PL300	
CI25-PL300	PL28U-300-35-5
CI28-PL300	
CI25-PL300	PL28V-300-35-5
CI28-PL300	
CI25-PL300	PL28W-300-35-5
CI28-PL300	
CI25-PL300	PL28T-300-35-5
CI28-PL300	
CI25-PL300	PL28X-301-35-5
CI28-PL300	
CI25-PL300	PL28Y-301-35-5
CI28-PL300	
CI25-PL300	PL28U-301-35-5
CI28-PL300	
CI25-PL300	PL28V-301-35-5
CI28-PL300	
CI25-PL300	PL28W-301-35-5
CI28-PL300	
CI25-PL300	PL28T-301-35-5
CI28-PL300	
CI25-PL300	PL28X-300-50-5
CI28-PL300	
CI25-PL300	PL28Y-300-50-5
CI28-PL300	
CI25-PL300	PL28U-300-50-5
CI28-PL300	
CI25-PL300	PL28V-300-50-5
CI28-PL300	
CI25-PL300	PL28W-300-50-5
CI28-PL300	
CI25-PL300	PL28T-300-50-5
CI28-PL300	

Type	Amphenol PL300 (90°) Continued
Part no.	Connector
CI25-PL300	PL28X-301-50-5
CI28-PL300	
CI25-PL300	PL28Y-301-50-5
CI28-PL300	
CI25-PL300	PL28U-301-50-5
CI28-PL300	
CI25-PL300	PL28V-301-50-5
CI28-PL300	
CI25-PL300	PL28W-301-50-5
CI28-PL300	
CI25-PL300	PL28T-301-50-5
CI28-PL300	
CI28-PL300	PL28X-300-70-5
CI28-PL300	PL28Y-300-70-5
CI28-PL300	PL28U-300-70-5
CI28-PL300	PL28V-300-70-5
CI28-PL300	PL28W-300-70-5
CI28-PL300	PL28T-300-70-5
CI28-PL300	PL28X-301-70-5
CI28-PL300	PL28Y-301-70-5
CI28-PL300	PL28U-301-70-5
CI28-PL300	PL28V-301-70-5
CI28-PL300	PL28W-301-70-5
CI28-PL300	PL28T-301-70-5

Type	TE HVA280 3P	
Part no.	Connector	Compatible Connector Cap
CI16-HVA280-3	4-2103015-1	2103013-1
		2103013-2
		2103013-3
CI16-HVA280-3	4-2103015-2	2103013-1
		2103013-2
		2103013-3
CI16-HVA280-3	4-2103015-3	2103013-1
		2103013-2
		2103013-3
CI16-HVA280-3	4-2103015-4	2103013-1
		2103013-2
		2103013-3
CI16-HVA280-3	4-2103015-5	2103013-1
		2103013-2
		2103013-3
CI16-HVA280-3	4-2103015-6	2103013-1
		2103013-2
		2103013-3

Harnessflex® EVO™

Talking about EV connector risks

With countries across the globe looking to tackle climate change through less carbon emissions and greater sustainability, the shift towards electric modes of transport is ever-growing.



- 01 No strain relief present.
- 02 Extra engineering required.
- 03 Compromise of connector seals.
- 04 Exposed HV cable.
- 05 Debris intrusion hotspot.
- 06 Management of bulky cables.

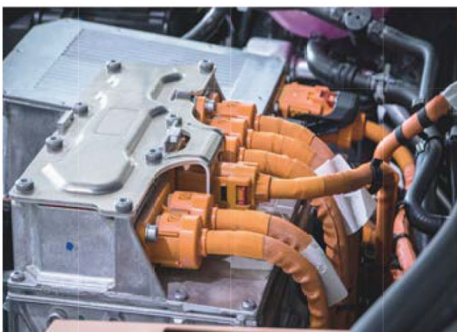
With the electric vehicle (EV) industry projected to see compounded annual growth (CAGR) of 21.1% over the next 10 years, we can soon expect to see more electric cars, buses, trucks, trams and trains in our cities.

With electric vehicles soon to become the norm, it is important that their reputation for reliability is maintained. Electric vehicles contain significant critical wiring that facilitates their operation. Therefore, the optimum level of cable protection is absolutely crucial in order to maintain the vehicle's productivity.

Without the right cable protection system in place, electric vehicles may become prone to critical electrical failure which will cause them to breakdown, resulting in timetable disruptions and repair costs.

One of the key areas at risk is the vital link between cable and connector. Without robust backshell protection, cables running into connectors are often left exposed, leaving them open to intrusion, excessive strain and impact damage - all of which can lead to electrical fault: and vehicle failure.

01



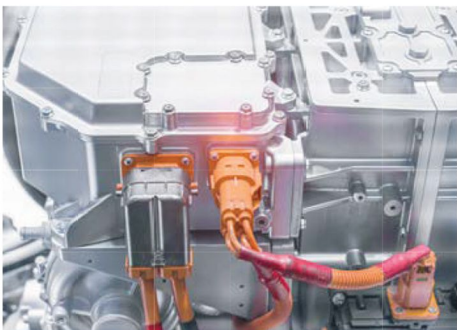
02



03



04



05



06



EVO™ High voltage connectors

HV Connector interfaces

- Features & benefits:**
- Supports connector Ingress Protection (IP) performance
 - Isolates and reduces cable movement
 - Provides cable-connector interface with high mechanical protection
 - Provides connector to cable strain relief
 - High pull-off strength - conduit corrugations sit tightly into joiner junctions
 - Enhanced abrasion and vibration protection
 - External fit for unrestricted bore and quick assembly
 - Tamperproof, integrated clip system as standard
 - Safe for use with 1000V AC and 1500V DC

- Applications:**
- For use with high voltage connectors
 - Power Distribution Units (PDU)
 - Motor Control Units (MCU)
 - Invertors
 - DC Drive Motors
 - In-wheel Motors
 - E-Axles
 - High Voltage Battery Packs
 - Hybrid Systems
 - Static Power Systems
 - Marine

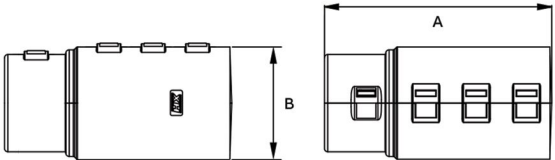
01 EVO™ High voltage connectors HV Connector interfaces.

01



EVO™ high voltage connectors for use with Amphenol Powerlok high voltage connectors

Part No.	Connector Series			Connector Series	Dimensions (mm)	
	NC	NW	US		A	B
CI25-PL300	25	22	¾	Amphenol Powerlok 300 (1 Pos)	67.7	33.8
CI28-PL300	28	23	¾	Amphenol Powerlok 300 (1 Pos)	68.5	33.8



Harnessflex®

Interconnect system

The Harnessflex Interconnect System enables easy linking between Harnessflex® fittings and connector interfaces to conduit braiding, sleeving and heat shrink.



Ty-Fast®



Harnessflex® Interconnect system

Compatible with Harnessflex Multi-Function Clips or Ty-Rap® cable ties, the **Harnessflex Interconnect System** is available for all conduit outlet sizes NC08 to NC40 (excluding NC10).

Without the right cable protection system in place, electric vehicles may become prone to critical electrical failure which will cause them to breakdown, resulting in timetable disruptions and repair costs.

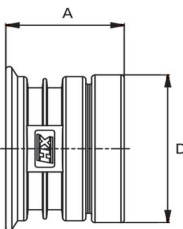
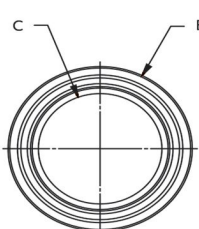
One of the **key areas at risk** is the vital link between cable and connector. Without robust backshell protection, cables running into connectors are often left exposed, leaving them open to intrusion, excessive strain and impact damage - all of which can lead to electrical faults and vehicle failure.

Materials:

- MSA parts - Nylon (PA66)
- MSAR parts - Rubber (Sarlink)

Features & benefits:

- Compatible with all Harnessflex® hinged fittings
- Compatible with all Harnessflex connector interfaces
- Can be easily secured with either Ty-Fast® cable ties or Harnessflex Multi-Function clips (see compatible parts below)
- Smooth cable entry & bore
- Easy assembly
- -40C to +120C
- CE Mark to the low voltage directive
- RoHS Compliant to 2015/863/EU
- Conforms with end of life vehicle directive (ELV) EU200/53/EC

	Part No. Nylon	Part No. Rubber	Compatible with	Nominal dimensions (mm)			For conduit
				A	B	C	(NC / NW / US)
	MSA08	MSAR08	CCSB08	17.0	13.5	5.7	08 / 7.5 / ¼
	MSA10	MSAR10	CCSB10	19.5	14.3	6.3	10 / 8.5 / ⅜
	MSA12	MSAR12	CCSB12	17.8	15.7	7.6	12 / 10 / ⅜
	MSA16	MSAR16	CCSB16	17.7	18.8	10.9	16 / 13 / ⅝
	MSA20	MSAR20	CCSB20	17.5	23.9	14.5	20 / 17 / ½
	MSA25	MSAR25	CCSB25	18.2	28.3	19.0	25 / 22 / ¾
	MSA28	MSAR28	CCSB28	18.1	30.9	21.6	28 / 23 / ¾
	MSA32	MSAR32	CCSB32	19.0	36.8	27.5	32 / 29 / 1
	MSA40	MSAR40	CCSB40	21.6	44.8	33.8	40 / 36 / 1 ¼

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