

smiths interconnect

Transformer Range

HeavyPower - TSH Series | EasyPower - TSE Series

High power modular connectors

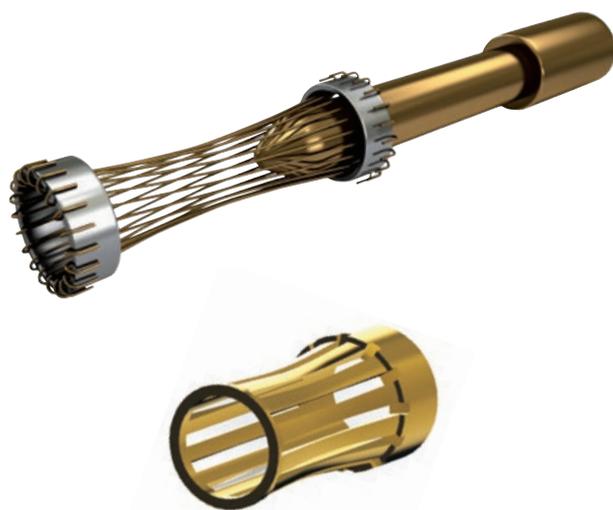


IRIS 
Certification

High Power Tortac[®] Hyperboloid Contact Technology

Smiths Interconnect offers an extensive range of superior contact technologies suitable for harsh environments and power applications. Hypertac[®] (HYPERboloid conTACT) is the original superior performing hyperboloid.

The Tortac[®] hyperboloid contact is an evolution of Hypertac maintaining the best electrical performance with excellent mechanical and environmental reliability. On balance, Tortac is the ideal compromise when mating cycle life performance and vibration resistance are important, but not to the levels requiring the original Hypertac contact.



Features

Low insertion/extraction forces

The Tortac design, inspired by the Hypertac contact, provides a low insertion force thanks to smooth contact surfaces and the shape of the spring cage.

Long contact life

The Tortac hyperboloid contact is tested to over 500 mating cycles.

Lower contact resistance

The design provides a far greater contact area than competing designs and the wiping action of the contact beams insures a clean and polished contact surface.

Immunity to shock & vibration

Tortac has been designed to resist high levels of mechanical shock and vibration. Material shapes and surfaces in the contact design provide high reliability under severe conditions.

Benefits

High density interconnect systems

Significant reductions in insertion force allow ergonomically comfortable levels of connector insertion force. No additional mating hardware is required to overcome insertion and extraction forces even for multipole connectors.

Low cost of ownership

Affordable option for applications which need ultimate dependability but without extremely high cycle life.

Low power consumption

Thanks to the low contact resistance and the smart design, the temperature rise due to current is compliant to the NF F 61-030 and EN 50467.

Reliability under harsh environments

Harsh environmental settings require connectors that will sustain their electrical integrity even under the most demanding conditions such as shock and vibration.

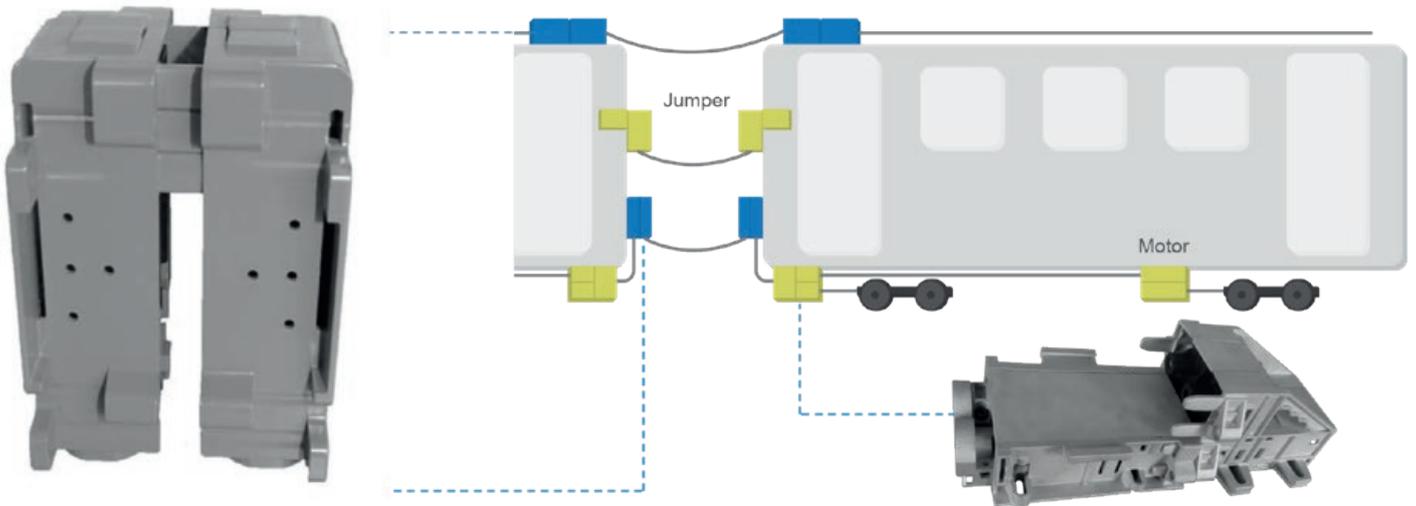
Content

High Power Tortac® Hyperboloid Contact Technology	2
Applications.....	4
HeavyPower Connectors – TSH Series	
Transformer Range	5
How to order	6
Technical characteristics	7
Dimensions.....	8
EasyPower Connectors – TSE Series	
Transformer range.....	10
How to order	11
Technical characteristics	12
Dimensions.....	13

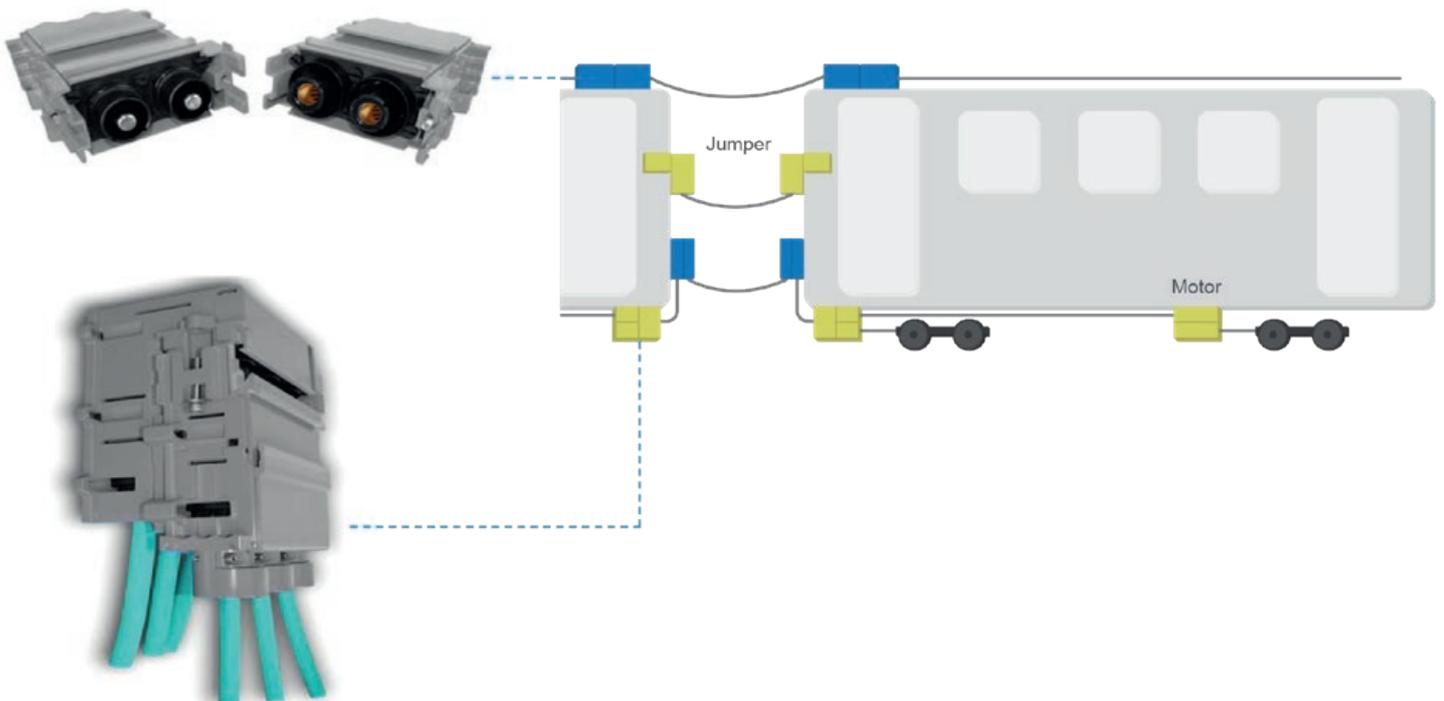
Applications

Meeting all on-board power application requirements

HeavyPower connectors - TSH Series



EasyPower connectors - TSE series



Transformer Range

HeavyPower connectors – TSH Series



The HeavyPower connectors are part of the Smiths Interconnect Transformer range, a comprehensive series of high density, modular connectors for all on-board power applications within the rail market.

The Transformer's modularity enables customers to design their own solution by supplying the elementary components of the whole connector. It employs a unique do-it-yourself system based on the building block principle. The connectors are suitable for any applications requiring the transmission of very high currents such as power distribution, intercoaches, and bogies. There is also a version available that connects the motors of the bogies.

Value Proposition

- Modularity with easy kitting devices offers a cost saving on total cost of ownership.
- Flexible solution with several crimp section of cable per contact size offering cost saving with standardization of contact size and limitation of crimping tools.
- Coding devices to allow side by side installation
- Integrating anti sway accessories to avoid extra fixing cables devices on the gangway
- Long life cycle with Tortac® power contact derived from hyperboloid technology.
- Robust and complete cable harness/jumpers shielded and non shielded solutions increasing reliability and SIL4 applications.
- Reduced maintenance costs and easy retrofit operation with removable and interchangeable modules and contacts
- The connector is equipped with a cable gland (strain relief) to protect the cable and the connectors from the mechanical and environmental hazards.
- It has been tested up to 1 million of swaying cycles to simulate the gangway environment.
- Compliant with the main rail standards (EN 45545 and NF F 61-030).

Insulator design according to EN 50124 pollution degree 4

Features and benefits

Customer configurable architecture

- Few piece parts create several type of connectors as a platform solution.
- Easy assembly with no special tooling
- Reduced stock and kitting/logistics management.
- Straight and right angle termination styles
- 4 coding keys

Rugged design

- Insulator design conforms to EN 50124 pollution degree 4 so they can be installed on the train roof or under the car, on bogies and between vehicles as jumpers.
- High protection plastic insulator ensures correct creepage distance clearance.
- Rugged, modular and safe connector solution
- Cable section size from 25 mm² to 50 mm²
- Locking by screws and coding devices according to 11.5.2.3 NF F 61-030
- IP66 and IP67 rating according to NF EN 60529
- Tortac® High Power Contact (HPT) technology
- Fire and Smoke standards according to NF F 16-101, 16-102, and EN 45545-2 (HL3 for RV22 and RV23)

Anti swaying device

- Integrated anti swaying device on the connector back end, no need for any other devices as a spacer to attach the jumper cable onto the inter-coach walls.

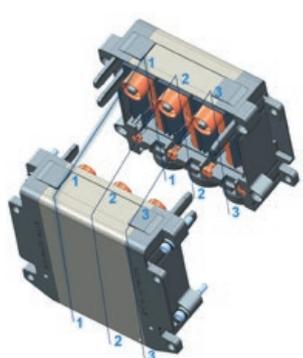
Compact size

- Space and weight saving, due to the replacement of junction box with lugs
- Simplifies installation and allows for easy maintenance.

How to order

HeavyPower Connectors – TSH Series



1	HeavyPower connector Series	Series [fixed]		
2	Connector version	S Straight	R Right angle	Y Branch
3	Connector type	M Male	F Female	
4	Contact arrangement <small>Each digit corresponds to a pole, please configure each pole according to the requested cable section.</small>	O Without any pole D 35 mm ² crimp copper K 70 mm ² crimp copper	A 25 mm ² crimp copper G 50 mm ² crimp copper	 <p>For example, the reference for the contact arrangement of a 3 pole version can be D A G O O</p> <p>This means that the 1st pole is equipped with a crimp contact for 35 mm² cable section, the 2nd one for 25 mm² and the 3rd one for 50mm². The last 00 digits indicate that no contact is required.</p>
5	Cable gland <small>Each digit corresponds to a pole, please configure each pole according to the requested cable gland.</small>	O Without any pole C Ø 13.5 to 15.0 mm	A Ø 9.5 to 10.5 mm D Ø 15.0 to 17.0 mm	B Ø 10.5 to 13.5 mm E Ø 17.0 to 19.0 mm
6	Protection	B Balast [Fixed]		
7	Swing equipment	A With (TSH./TSHY)		O Without (TSHY only)
8	Accessories	[Fixed]		

The connectors are also available as self-assembly components. Please contact Smiths Interconnect for the individual part numbers.

Technical characteristics

HeavyPower Connectors – TSH Series

Technical

Number of contacts	1 to 4 per connector TSHY 4 entries / 8 exits
Contact pin diameter	Ø10 mm

Electrical

(EN 50124 designed and tested)

Current rating	Up to 300 A
Voltage rating	3600 V (according to EN 50124-1)
Withstanding voltage rating	12 kV
Rated impulse voltage [UNi]	25 kV
Overvoltage category	OV3 PD3A (according to EN 50124-1)

Physical & Environmental

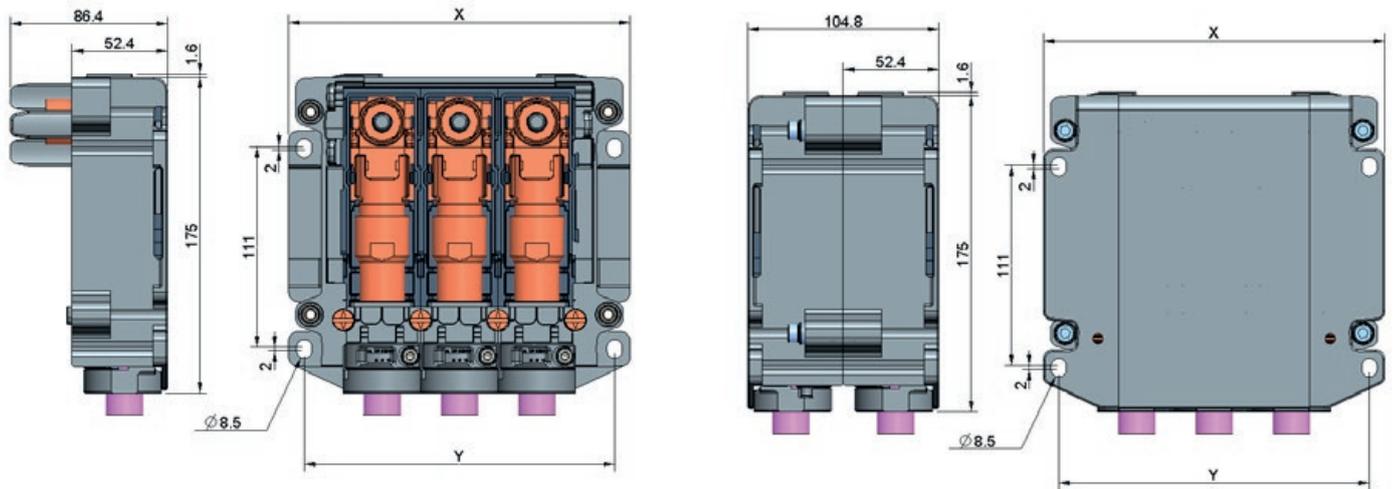
(NF F 61-030 / EN 50467 tested)

Temperature rating	-55°C to +125°C	
Contact material	Copper, nickel-plated	
Contact retention	According to 11.5.5 NF F 61-030	
Connector material	Insulator	Polyamide (CTI >600)
	Body shells	Passivated aluminium
Endurance	>500 mating cycles	
Vibration resistance	According to EN 61373 (harshest environment)	
Flammability	HL3 - R22/R23 (according to EN 45545)	
Acid resistance	According to NF F 61-030	
Fluid resistance	According to NF F 61-030	
Corrosion resistance	96 h salt spray (over 500 h mated)	
Protection level	IP66, IP67	

Dimensions

HeavyPower Connectors – TSH Series

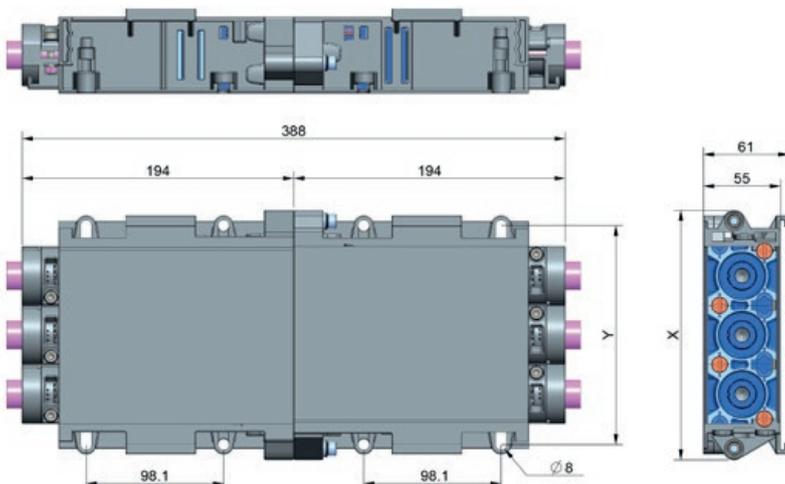
HeavyPower right angle termination



Pole number	X	Y
1	102.5	85.5
2	145.0	128.0
3	187.5	170.5
4	230.0	213.0

Dimensions are in mm

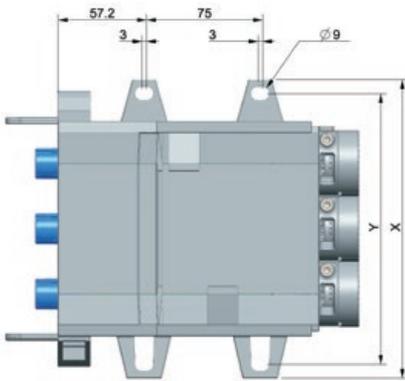
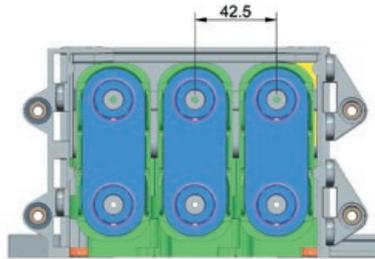
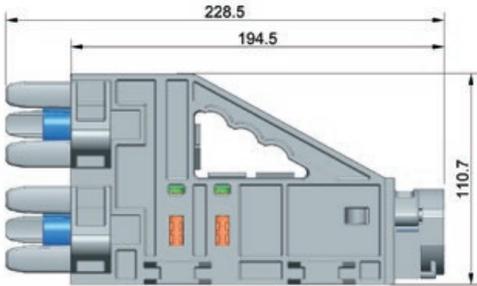
HeavyPower straight termination



Pole number	X	Y
1	94.5	72.5
2	137.0	115.0
3	179.5	157.5
4	222.0	200.0

Dimensions are in mm

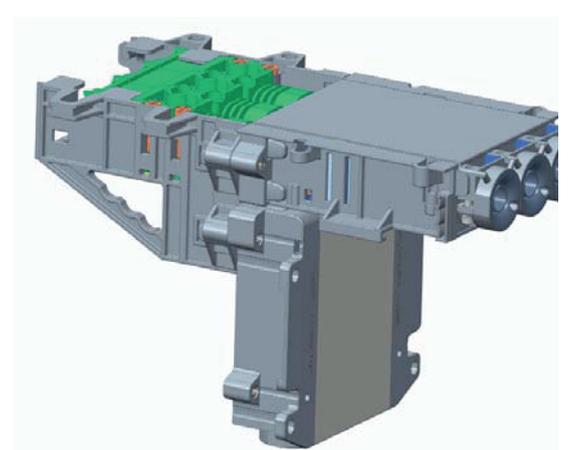
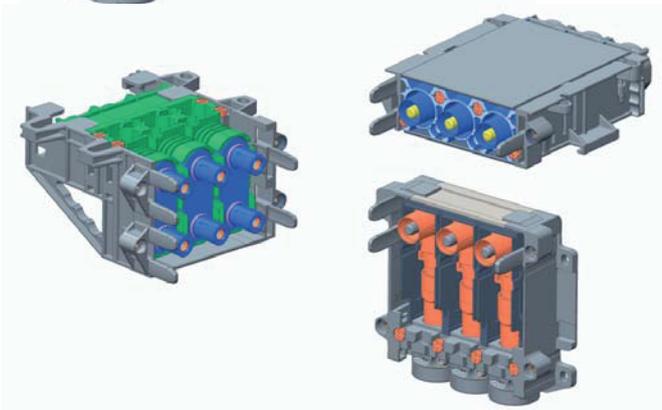
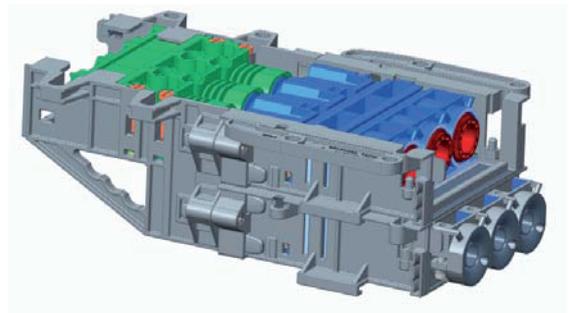
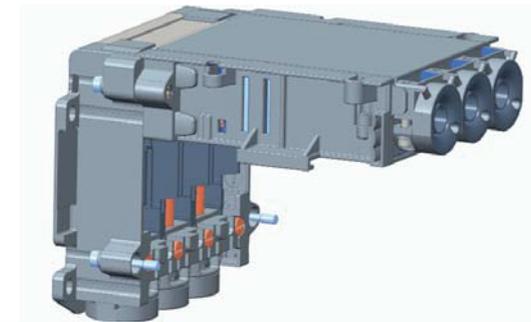
HeavyPower Y, branch connector



Pole number	X	Y
1	91.5	109.4
2	133.9	151.9
3	176.4	194.4
4	218.9	236.9

Dimensions are in mm

Example of connector configurations



Transformer range

EasyPower connectors –TSE Series



The EasyPower Connectors are part of the Smiths Interconnect Transformer range, a comprehensive series of high density, modular connectors for all on-board power applications within the rail market. The Transformer's modularity enables customers to design their own solution by supplying the elementary components of the whole connector. It employs a unique do-it-yourself system based on the building block principle. The connectors are suitable for any applications requiring the transmission of very high currents such as power distribution, intercoaches, and bogies.

Value Proposition

- Higher contacts density and management of separated modules (signal, power, high speed data) offering optimization of space on new Gangway for high speed and intercity trains.
- Long life cycle with Tortac® power contact derived of hyperboloid technology.
- Robust and complete cable harness/jumpers shielded and non shielded solution increasing reliability and SIL4 applications.
- Reduced maintenance costs and easy retrofit operation with removable and interchangeable modules and contacts
- Reduced maintenance costs and easy retrofit operation with removable and interchangeable modules and contacts
- The connector is equipped with a cable gland (strain relief) to protect the cable and the connectors from the mechanical and environmental hazards.
- It has been tested up to 1 million of swaying cycles to simulate the gangway environment.
- Compliant with the main rail standards (EN 45545 and NF F 61-030).

Modularity with easy kitting devices

Features & Benefits

Customer Configurable Architecture

- Enables the design and build of individual solutions by procuring elementary piece parts.
- Reduces stock and simplifies logistics.
- Easy assembly with no special tooling
- Straight, right angled, and shunt termination styles
- 4 coding keys

Rugged Design

- Insulator design conforms to EN 50124 pollution degree 4 ensures high electrical protection in severe environment.
- Rugged, modular, and safe connector solution
- Cable section size from 25 mm² to 240 mm²
- Locking by screws and coding devices according to 11.5.2.3 NF F 61-030
- IP66 and IP67 rating according to NF EN 60529
- Tortac® High Power Contact (HPT) technology
- Fire and Smoke standards according to NF F 16-101, 16-102 and EN 45545-2 (HL3 for RV22 and RV23)

Anti Swaying Device

- Integrated anti swaying device on the connector back end, avoiding the need for any additional cable spacer.

How to order

EasyPower connectors –TSE Series



1	EasyPower connector Series	Series [fixed]		
2	Connector version	PM Plug male	RF Receptacle female	SF Shunt female
3	Contact arrangement <small>Each digit corresponds to a pole, please configure each pole according to the requested cable section.</small>	A 25 mm ² , crimp copper K 70 mm ² , crimp copper P 150 mm ² , crimp copper ⁽¹⁾	D 35 mm ² , crimp copper ⁽¹⁾ N 95 mm ² , crimp copper ⁽¹⁾ X 185 mm ² , crimp copper	G 50 mm ² , crimp copper ⁽¹⁾ R 120 mm ² , crimp copper 1 240 mm ² , crimp copper
		For example, the reference for the contact arrangement of a 3 pole version can be 1RA00		
		This means that the 1 st pole is equipped with a crimp contact for 240mm ² cable section, the 2 nd one for 120mm ² and the 3 rd one for 25mm ² . The last 00 digits indicate that no contact is required.		
4	Cable gland <small>Each digit corresponds to a pole, please configure each pole according to the requested cable gland.</small>	A Ø 30.0 to 36.0 mm	B Ø 24.5 to 30.5 mm	C Ø 19.0 to 25.0 mm
		D Ø 16.0 to 21.0 mm	E Ø 12.5 to 16.5 mm	
5	Protection	B Balast [Fixed]		
6	Swing equipment ⁽²⁾	S With (only for TSEPM, TSERF)	O Without	
7	Accessories	[Fixed]		

Notes:

1) Cable section and contact not off the shelf

2) Swing option is not applicable for cable diameters over 29.40 mm

The connectors are also available as self-assembly components. Please contact Smiths Interconnect for the individual part numbers.

Technical characteristics

EasyPower connectors –TSE Series

Technical

Number of contacts	1 to 4 per connector
Contact pin diameter	3 sizes: Ø10 mm, Ø14 mm, Ø19 mm

Electrical

(EN 50124 designed and tested)

Current rating	Up to 700 A
Voltage rating	3600 V (according to EN 50124-1)
Withstanding voltage rating	12 kV
Rated impulse voltage [UNi]	25 kV
Overvoltage category	OV3 PD3A (according to EN 50124-1)

Physical & Environmental

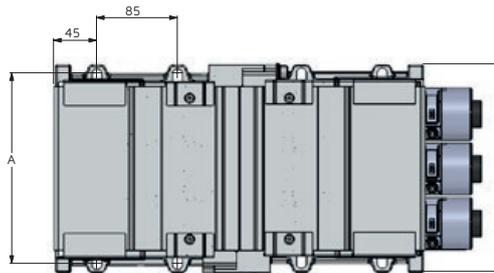
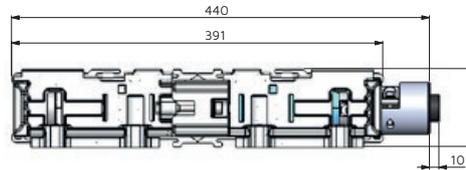
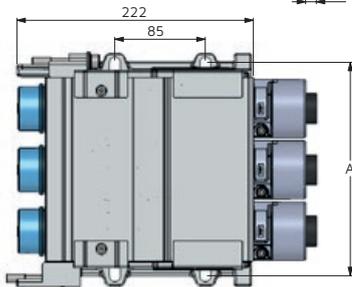
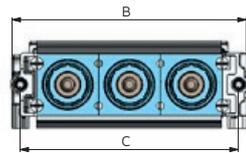
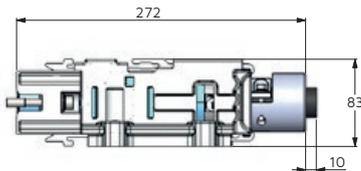
(EN 50467 / NF F 61-030 tested)

Temperature rating	-55°C to +125°C	
Contact material	Copper, nickel-plated	
Contact retention	According to 11.5.5 NF F 61-030	
Connector material	Insulator	Polyamide (CTI >600)
	Body shells	Passivated aluminium
Endurance	>500 mating cycles	
Vibration resistance	According to EN 61373 (harshest environment)	
Flammability	HL3 - R22/R23 (according to EN 45545)	
Acid resistance	According to NF F 61-030	
Fluid resistance	According to NF F 61-030	
Corrosion resistance	96 h salt spray (over 500 h mated)	
Protection level	IP66, IP67	

Dimensions

EasyPower connectors – TSE Series

EasyPower straight termination

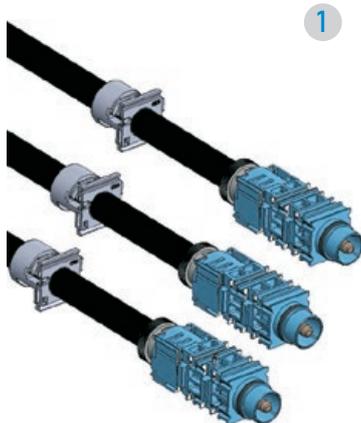


Pole number	A	B	C
1	86	106	89
2	144	164	147
3	202	222	205
4	260	280	263

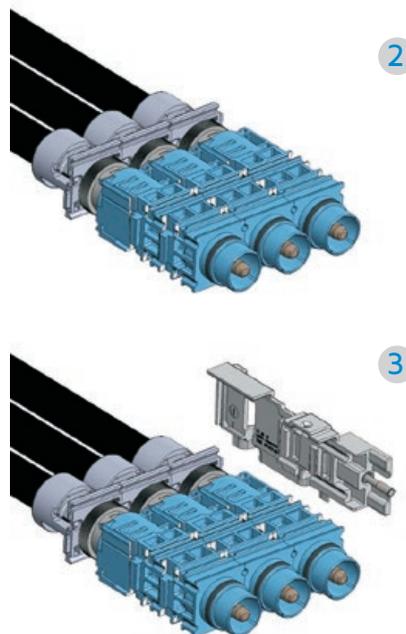
Dimensions are in mm

Connector assembly

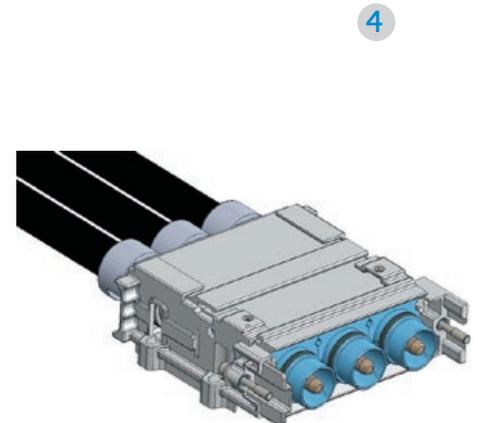
A unique do-it-yourself system based on the building block principle



Assemble the modules

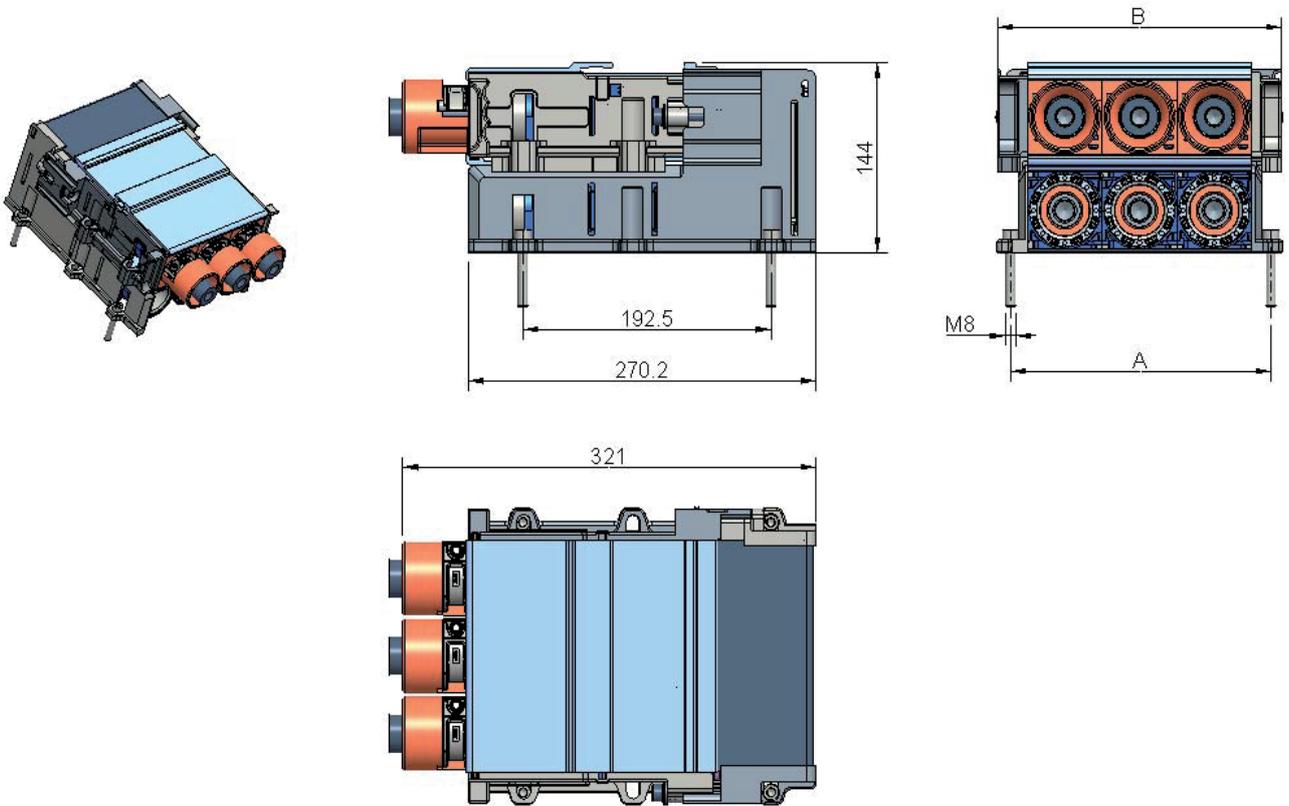


Slide the flange

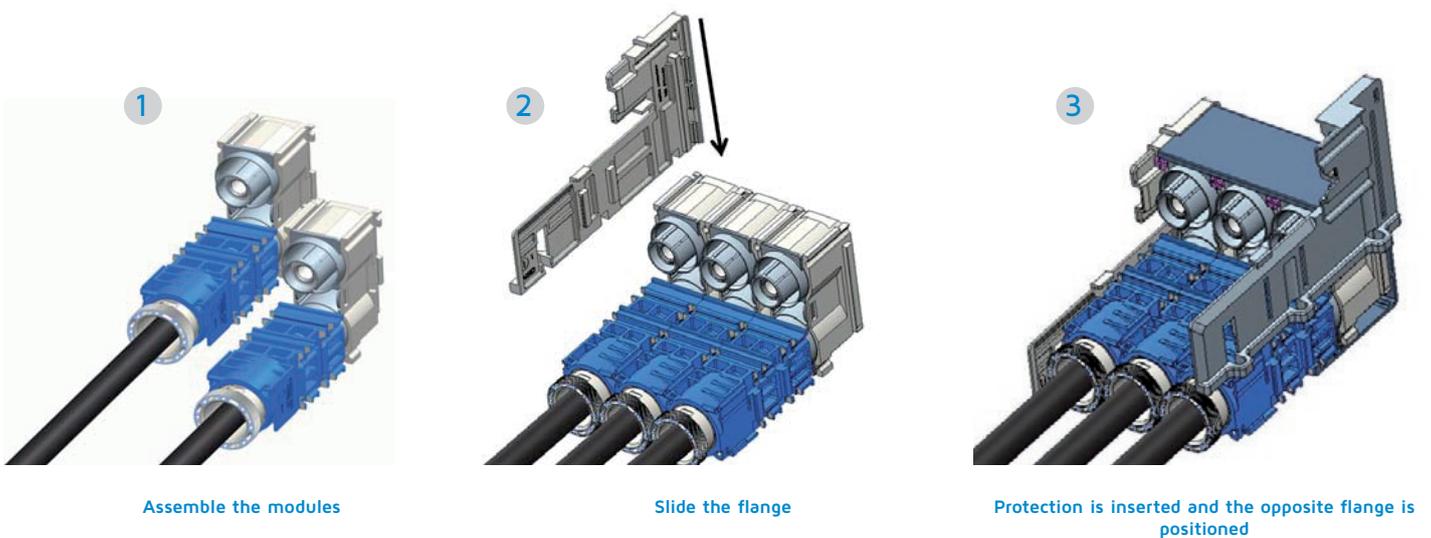


Protection and flanges are positioned

EasyPower straight termination with a shunt



Connector assembly



Disclaimer

All of the information included in this catalogue is believed to be accurate at the time of printing. It is recommended, however, that users should independently evaluate the suitability of each product for their intended application and be sure that each product is properly installed, used and maintained to achieve desired results.

Smiths Interconnect makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use.

Smiths Interconnect reserves the right to modify design and specifications, in order to improve quality, keep pace with technological development or meet specific production requirements.

No reproduction or use without express permission of editorial and pictorial content, in any manner.

Worldwide Support

Connectors

Americas

Sales

connectors.uscsr@smithsinterconnect.com

Technical Support

connectors.ustechsupport@smithsinterconnect.com

Europe

Sales

connectors.emeacsr@smithsinterconnect.com

Technical Support

connectors.emeatechsupport@smithsinterconnect.com

Asia

Sales

asiacsr@smithsinterconnect.com

Technical Support

asiatechsupport@smithsinterconnect.com

Fibre Optics & RF Components

Americas

Sales

focom.uscsr@smithsinterconnect.com

Technical Support

focom.techsupport@smithsinterconnect.com

Europe

Sales

focom.emeacsr@smithsinterconnect.com

Technical Support

focom.techsupport@smithsinterconnect.com

Asia

Sales

focom.asiacsr@smithsinterconnect.com

Technical Support

focom.techsupport@smithsinterconnect.com

Semiconductor Test

Americas

Sales

semi.uscsr@smithsinterconnect.com

Technical Support

semi.techsupport@smithsinterconnect.com

Europe

Sales

semi.emeacsr@smithsinterconnect.com

Technical Support

semi.techsupport@smithsinterconnect.com

Asia

Sales

semi.asiacsr@smithsinterconnect.com

Technical Support

semi.techsupport@smithsinterconnect.com

RF/MW Subsystems

Americas, Europe & Asia

Sales

subsystems.csr@smithsinterconnect.com

Technical Support

subsystems.techsupport@smithsinterconnect.com

Connecting Global Markets

more > [smithsinterconnect.com](https://www.smithsinterconnect.com) | [in](#) [twitter](#) [youtube](#)