Bmax

What if

your HV cable connections were no longer the weakest point?

« Discover how Magnetic Pulse Crimping delivers long-term electrical and mechanical reliability, even under the most demanding operating conditions. »



PowerTube

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Intro

To address the growing demand of electrification, Bmax has developed its Magnetic Pulse Crimping (MPC) technology, an innovative solution that leverages High Pulsed Power (HPP) to meet the most stringent technical requirements. Engineered to preserve the integrity of high-voltage cable crimp connections throughout their entire service life, MPC delivers consistently reliable electrical and mechanical performance for the most demanding high-voltage applications.

To support OEMs, as well as connector and cable manufacturers across the electrification supply chain, Bmax offers a comprehensive range of MPC-based solutions:

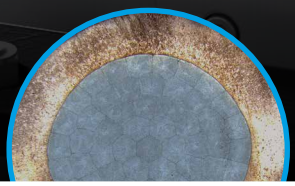


Connector **Co-Design** → HV Wire Harnesses **Production** ← Automated Manufacturing **Systems**

Magnetic Pulse Crimping (MPC)Technology: A New Approach to HV Cable Crimping

Through the ultra-fast deformation of the terminal, the connector is crimped onto the cable in less than **100 µs**. This extremely short process generates a high compaction rate while minimizing residual stresses and preventing stress relaxation over time, resulting in exceptionally **low contact resistance**.

The outcome is a highly reliable electrical connection that maintains its mechanical and electrical integrity throughout the vehicle's service life, even under repeated thermal cycling and in harsh environment.





	Magnetic Pulse **Crimping**	**Conventional Crimping**
Electrical Contact Resistance	**≤ to that of an equivalent cable length.** Consistent - Thanks to **minimal relaxation over time.**	Stress relaxation progressively raises contact resistance, creating hot spots, **reducing performance, and increasing both safety risks, down times and maintenance costs.**
Compaction Rate	Higher compression **eliminates air gaps between strands.**	Presence of **Air gaps.**
Mechanical Resistance & Durability	**Highest performance** with vibration and pull force testing.	**Limited** due to crimp relaxation over time.
Materials Combinations	**Cu/Al, Cu/Cu, Al/Al, Cu/St, CU/SS** Other Combination: On demand.	**Strong limitations.** Cu/Al crimps do not pass cycling tests.
Wire Size	Accommodates **wide range** of wire sizes, in excess of 400mm^2.	Performance **degradation** for cables over 70mm^2.
Design to Cost	Geometric design optimization reduces material usage by up to 30%, **delivering significant weight and cost savings.**	**Higher thicknesses** and longer barrels required.
System's Versatility	**One system** for multiple connector type geometries and cable diameters (35 to 400$^+$ mm^2).	**Multiple systems and tooling** to cover that range of products.

Co-Design - Connecting design to function

From concept to production, we co-develop custom connector solutions designed specifically for your application.

Power supply solution for every industry:

Industrial Vehicule · Off Road Vehicule · Automotive · Aerospace · Subsea · Data Center · BESS · Renewable Energy

Co Engineering → **Prototyping** → **Mass Production**



Combined to
Simulation skills

We provide a unique simulation and material characterization package **combining finite element analysis for high-speed dynamics with 2D/3D multiphysics modeling.**

We simulate high-speed deformation processes using **magnetohydrodynamic codes**.

We have developed a metal characterization method based on **high-velocity measurements using laser interferometry (up to 1,000 m/s),** a prerequisite to get realistic simulation results.

Automated MPC Systems for HV Wire Harness Manufacturing

Beyond in-house production, we design, manufacture, install and service industrial production systems dedicated to the mass manufacturing of HV cable assemblies.

Maximum Flexibility

1 system for contact terminal and shield sleeve, and for a wide range of cable lengths and cross-sections (typically, 35 - 150 mm^2)

≤ 10 min changeover time

High Performance & Reliability

15-20s cycle time (per crimp)

Cpk ≥ 2 – Low scrap rate

Long lifetime components

OEE ≥ 80%

Full Compliance & Traceability

Operator ID, cable ID, time stamp, process parameters, Ok/Nok and reworks

Camera vision system

Connection to customer MES

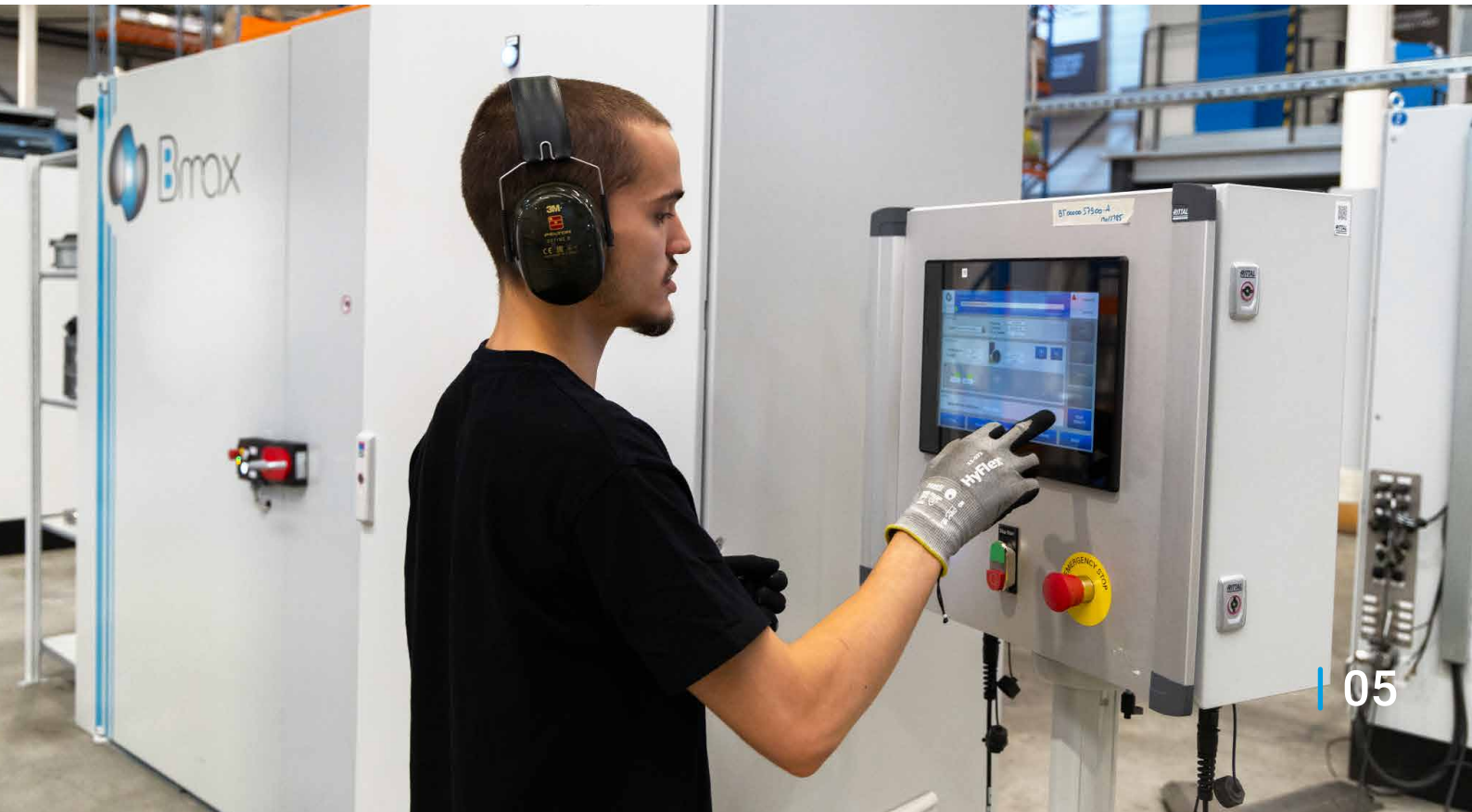
Customized Services

Best-in-class training

Full maintenance

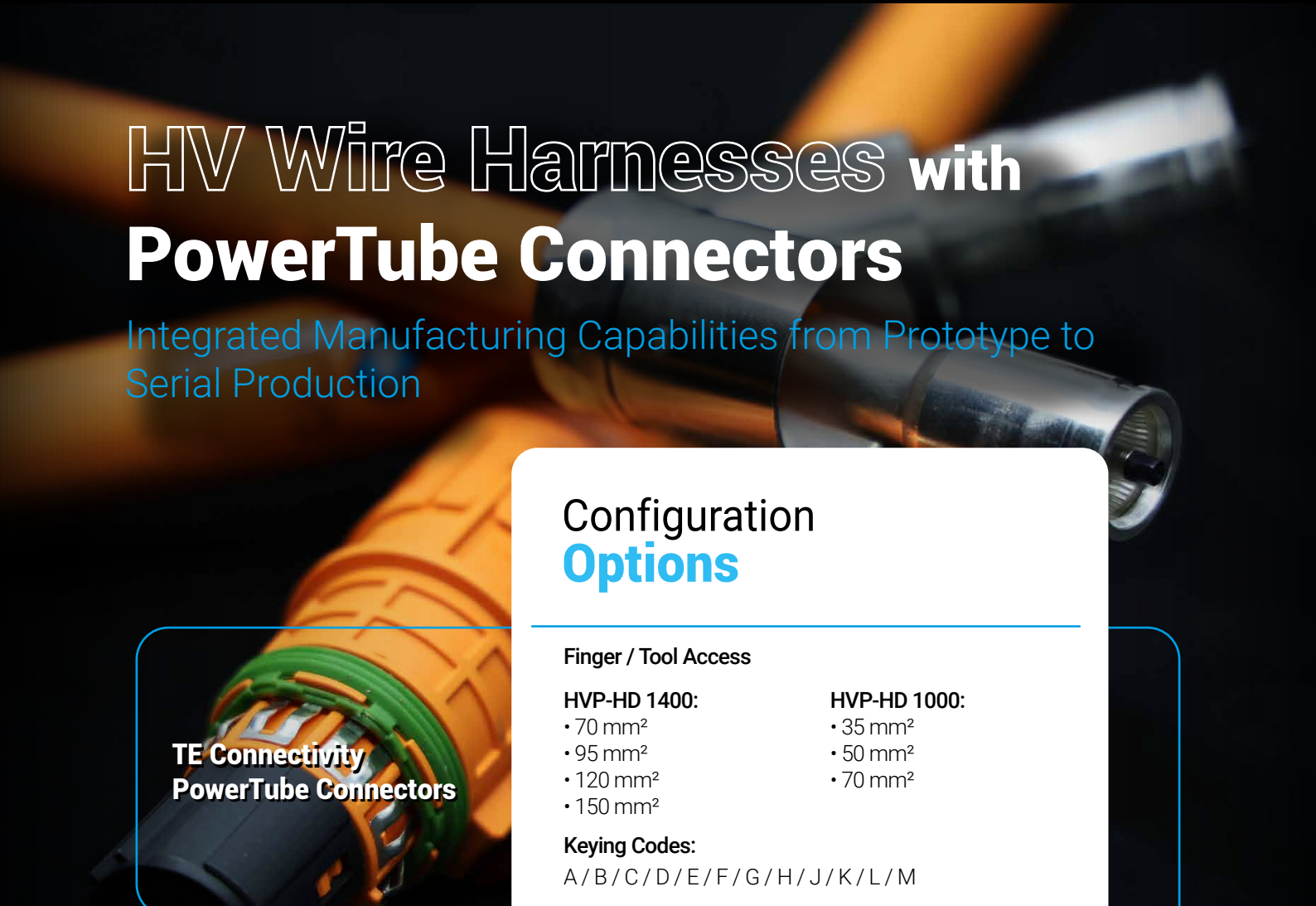
On demand supply of spare parts and consumables

Technological licensing (no CAPEX)



HV Wire Harnesses with PowerTube Connectors

Integrated Manufacturing Capabilities from Prototype to Serial Production



TE Connectivity PowerTube Connectors

Cable Suppliers

Cable Lengths

Configuration Options

Finger / Tool Access

HVP-HD 1400:
- 70 mm²
- 95 mm²
- 120 mm²
- 150 mm²

HVP-HD 1000:
- 35 mm²
- 50 mm²
- 70 mm²

Keying Codes:
A / B / C / D / E / F / G / H / J / K / L / M

Coroflex

Shielded Single Core Cable
FHLR2GCB2G 9-2617
AP Part No.:

- **35mm²:** 222874
- **50mm²:** 218170
- **70mm²:** 218171
- **95mm²:** 218172

FHL2GCB2G 9-2617
AP Part No:

- **120mm²:** 238568

Huber+Suhner

RADOX 155(S), Shielded Single Core Automotive Cable:

- 84100296 AUTO B 1X**35mm²** P 155/REMS OG
- 84096257 AUTO B 1X**50mm²** P 155/REMS OG
- 84100298 AUTO B 1X**70mm²** P 155/REMS OG
- 84100299 AUTO B 1X**95mm²** P 155/REMS OG
- 84103410 AUTO B 1X**120mm²** P 155/REMS OG
- 85010929 AUTO B 1X**120mm²** P 155/REMS FLEX OG
- 85163659 AUTO B 1X**150mm²** P155/REMS FLEX OG

On demand

Delivery Time: 1 - 2 weeks *

*Shorter lead time upon demand



System Characteristics

Technical Features

- Production
- Installation & Utilization
- Compliance & Traceability
- Maintenance
- Utilities
- Environment, Health & Safety
- Certification

Operating mode	Automatic
Annual production volume	>1,000,000 Crimps / year 15-20 sec per crimp, no cooling downtime Crimping time ≤100µs
Scrap Rate	<1%
Overall Equipment Efficiency	≥80% OEE
Repeatability/Robustness	Cpk ≥ 2
Stand-alone, easy to install, turnkey system User-friendly HMI ≤10 min tool changeover time	
Real-time data acquisition and recording with one Log file for full traceability of parts and processing parameters Connection to Customer MES	
Remote assistance, preventive and curative maintenance Diagnosis function	
Electrical power supply	3 x 400V + PEN – 50Hz
Mean power consumption	<5 kW
Compressed air	6 bars - 3.5 m^3/hour
Operating temperature	Between +10°C and +40°C
Functional safety	PL d (ISO 13849-1)
Protection rating	IP5X for the generator
Noise level	<75 dB (2003/10/EC Directive)

CE Certification

Compliance with regulations, standards and directives:
IEC EN 60204-1 / Safety of machinery – Electrical equipment of machines
EN 61010-1 / Safety of machinery – Electrical equipment of machines
Directive 2006/42/EC / Machine directive
Directive 2014/35/EU / Low voltage directive
Directive 2014/30/EU / Electromagnetic compatibility directive
ISO 13849 / Safety-related parts of control systems
Decree 2016-1074 Directive 2013/35/EU / Protection of health and safety of workers exposed to electromagnetic fields

Bmax

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