Metzner
E-Mobility

LEADING AUTOMATION FOR HIGH-VOLTAGE HARNESSES

Metzner E-Mobility

Leading the automation path for high-voltage harnesses

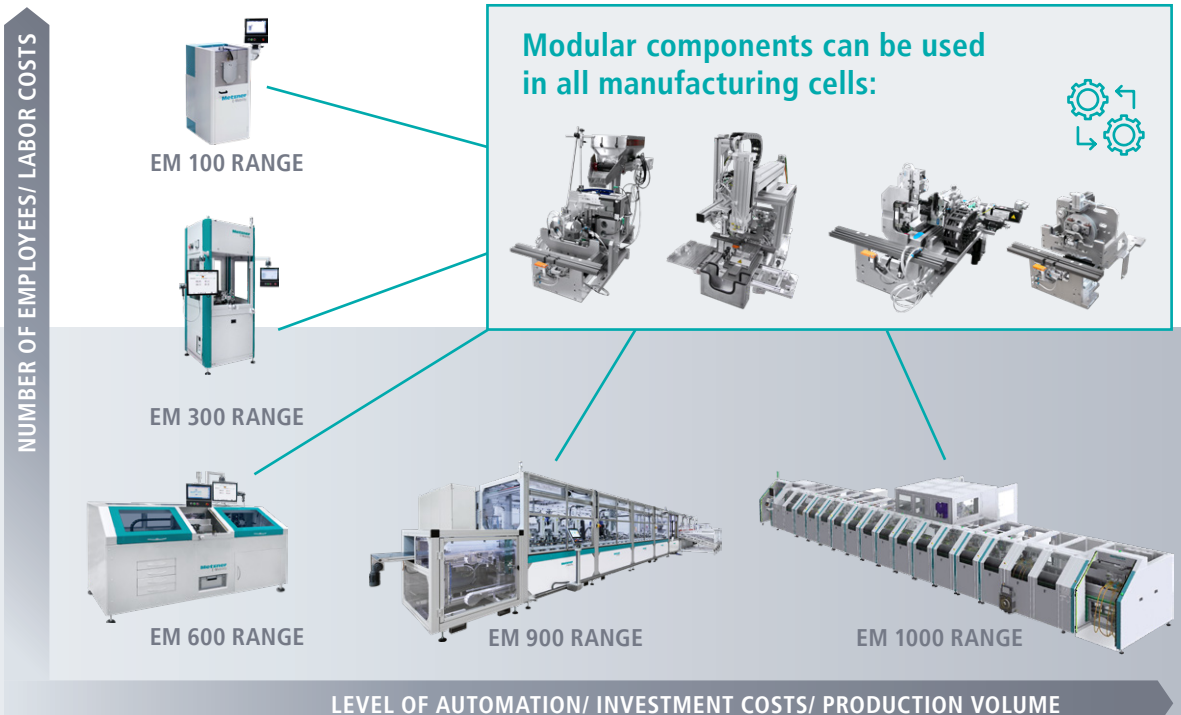
Since its founding in 2018, Metzner E-Mobility has developed into a technology leader in the processing of high-voltage cable assemblies. Metzner E-Mobility offers the greatest expertise and the largest number of automated processes for high-voltage cable assemblies.

Metzner E-Mobility is a pioneer in fully automated production solutions, from the cable drum and cable processing to the finished connector assembly, and for the first time provides automated solutions for previously unresolved processes, such as:

- Automatic and position-accurate placement into workpiece carriers
- Automatic taping with the highest technical availability
- Automatic crimping of 4-core cables
- Automatic contact carrier assembly for 4-core cables
- Reliable detection and orientation of inner conductors for automatic connector assembly

The wide range of Metzner E-Mobility process expertise can be integrated into different automation platforms depending on customer requirements, ranging from fully automated, semi-automated, to single-process stations.

Metzner E-Mobility solutions for high-voltage processing impress with their unique modularity and scalability. On-site at the customer, our systems allow flexible expansions and adaptations to new requirements and scenarios. Semi- or partially automated process automation can be upgraded and restructured into a fully automated production line.



Seamless Automation

These four pillars are essential – they form the foundation for an integrated and quality-assured process flow.

End-to-end automation for high-voltage cable assemblies requires cost-efficient and reliable solutions for all stages of cable set processing.

Metzner E-Mobility is the manufacturer that provides fully automated processes for every step—from unrolling the cable drum to the finished cable assembly—delivering convincing solutions for operator-independent production with consistent, fully traceable, and documented quality.

Cable Preparation

- Cutting
- Printing/Marking
- Placement into the workpiece carrier
- Pre-assembly of the connector components

Cable Processing

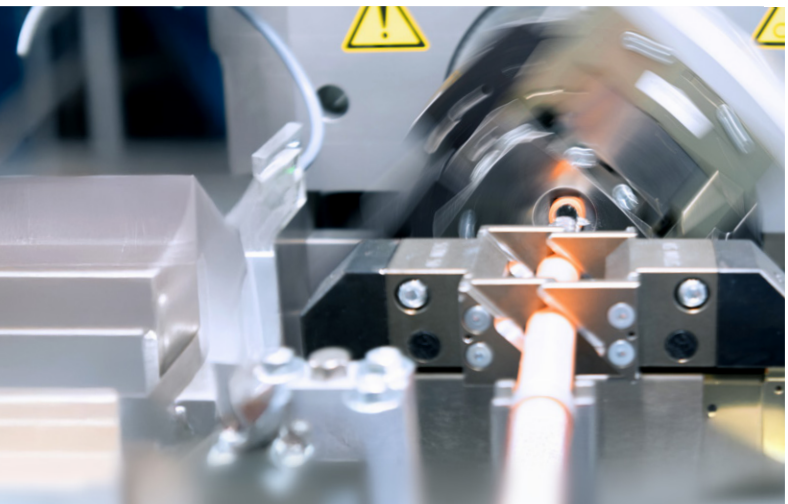
- Strip outer jacket
- Remove cable foil
- Cut cable shield
- Install & crimp ferrule
- Clean according to TSA requirements
- Fold back cable shield
- Secure shield (tape)
- Strip inner conductor

Contact and Connector Assembly

- Attach inner conductor contact (crimping, ultrasonic, EMPC)
- Mount contact carrier
- Install and crimp shield plate
- Assemble connector housing

Real-Time Quality Monitoring & Traceability

- Camera- and AI-based monitoring of quality characteristics
- Continuous determination of process capability
- Integrated quality management including maintenance forecasting
- Full MES integration with bidirectional data communication



The Widest Range

of automated processes for high-voltage cable assemblies

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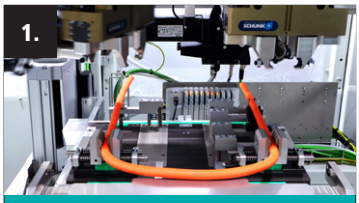


Automatic placement into workpiece carrier/ takt system

- Fully automated uncoiling, cutting, and placement into the transport system of a takt line
- End-to-end automation starting from the cable drum
- Reduction of operating personnel

2.

Cable marking/ serial number

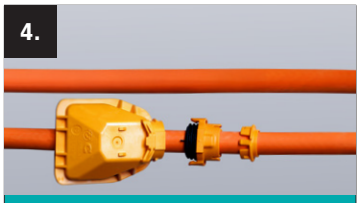
- Application of unique identification, e.g., Data Matrix code or barcode
- Traceability through unique assignment of production data and quality characteristics to the cable serial number

3.

Connector pre-assembly Example 1

- Automatic pre-assembly of connector components: end cap, seal, shield plate, connector housing
- Parts supplied from hoppers, vibratory feeders, or trays

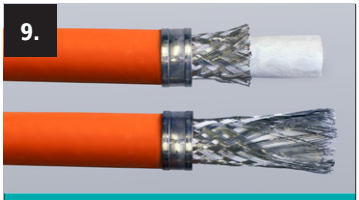
4.



Connector pre-assembly Example 2

- Automatic pre-assembly of connector components: end cap, seal, shield plate, connector housing
- Parts supplied from hoppers, vibratory feeders, or trays

9.



Cut cable shield

- Shortening of the cable shield without touching the insulation of the inner conductor
- Selectable shield opening angle
- Process time < 8 s, depending on cable properties

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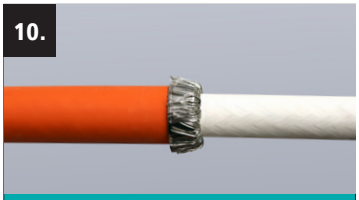
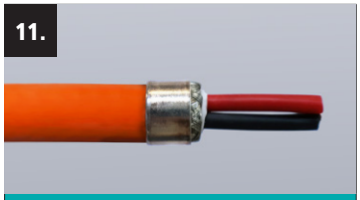


Fold back cable shield

- All braided wires are reliably captured and fully folded over the outer jacket or a ferrule

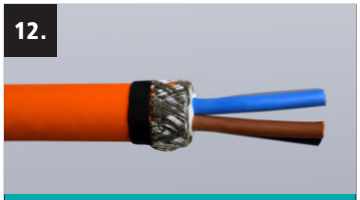
11.



Install outer ferrule

- Automatic installation of an outer ferrule over the cable shield and inner ferrule
- Parts supplied and separated from a vibratory feeder with process control

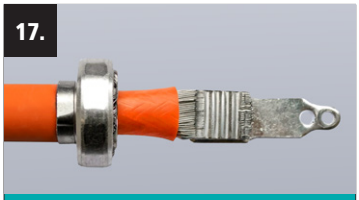
12.



Apply tape

- Some connector systems require applying tape to secure the cable shield
- Metzner has developed a patented process that ensures maximum availability
- Tape can be changed during on going production

17.



Automatic ultrasonic process

- For ultrasonic processes, Metzner offers a fully automated process flow
- The cable and contact part are automatically positioned in the ultrasonic device, and the process starts automatically
- Automatic unloading of components, optionally with 100% inspection of defined quality features

18.

Automatic EMPC process

- For certain connector systems and large cable cross-sections (up to 150 mm²), the EMPC process is specified
- Metzner provides fully automated integration of this process

19.

Automatic soldering process

- For crimp connections on aluminum cables, an additional soldering process is required for certain connector systems
- etzner has developed a fully automated soldering process for end-to-end automation, integrated into the takt line
- Optional 100% quality inspection is available

20.

Autom. contact carrier assembly with 4 inner conductors

- Metzner also offers fully automated assembly of the contact carrier for multicore cables or multiple single-core cables into one contact carrier
- Components are supplied from hoppers with camera-supported pick-and-place process
- Automatic locking of the secondary fuse

5.

Remove outer jacket

- Even with irregularly shaped cables, Metzner guarantees precise control of the cutting depth without touching subsequent cable layers
- Stripping length selectable as a recipe parameter
- Precise 360° all-around cut into the outer jacket

6.

Remove foil

- Adjusted to cable properties: contactless or mechanical removal of the cable foil
- Removal of the cable foil without excess

7.

Jacket crimp Example 1

- Automatic installation and crimping of a ferrule or jacket crimp
- End-to-end automation through seamless integration of the crimping devices

8.

Ferrule Example 2

- Automatic installation of a ferrule over or under the cable shield
- Parts supplied from a vibratory feeder with separation and process control

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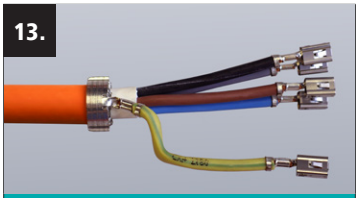
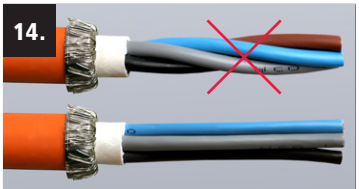


Install outer ferrule

- Process-safe assembly over the cable shield
- Separation via vibratory feeder or robot
- Camera-assisted orientation of components

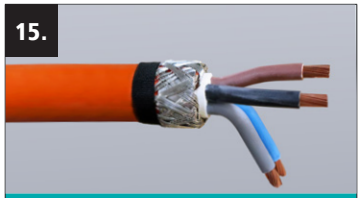
14.



Sort multiple inner conductors

- Detection of color and position of differently colored inner conductors
- Sorting of inner conductors into the desired position or sequence
- Fixation of inner conductors for subsequent processing steps

15.



Strip inner conductors

- Stripping of multiple inner conductors individually or together
- Stripping length freely selectable as a recipe parameter
- Optional integrated "zero cut" of the inner conductors

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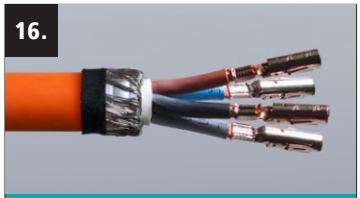
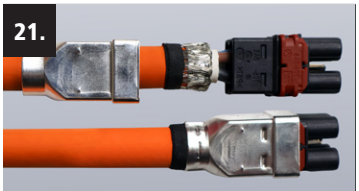


Automatic crimping of 4 inner conductors

- Automatic preparation and arrangement of inner conductors for a fully automated crimping process of multiple inner conductors
- Crimp depth control for each inner conductor

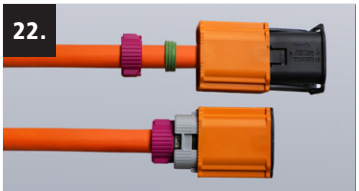
21.



Assembly and crimping of shield plate

- Certain contact systems require the assembly and crimping of a shield plate
- Metzner provides a fully automated process for assembly and crimping, integrated into a takt line

22.



Automatic connector assembly

- Connector assembly includes multiple components, e.g., housing, seal, end cap
- Metzner offers automated processes for the final assembly of connector components, integrated into a takt line

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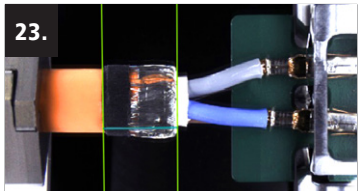


Camera inspection of attributes

- Integrated cameras fully inspect defined quality attributes from a 360° perspective
- Depending on customer requirements, image data can be automatically stored via an MES server with unique assignment to the cable identification

24.

Optical measurement of processes

- Optical measurement of quality-relevant positions or lengths
- Regular calibration routines and function checks are integrated into the workflow for optical measurement

Modular, Convertible & Expandable

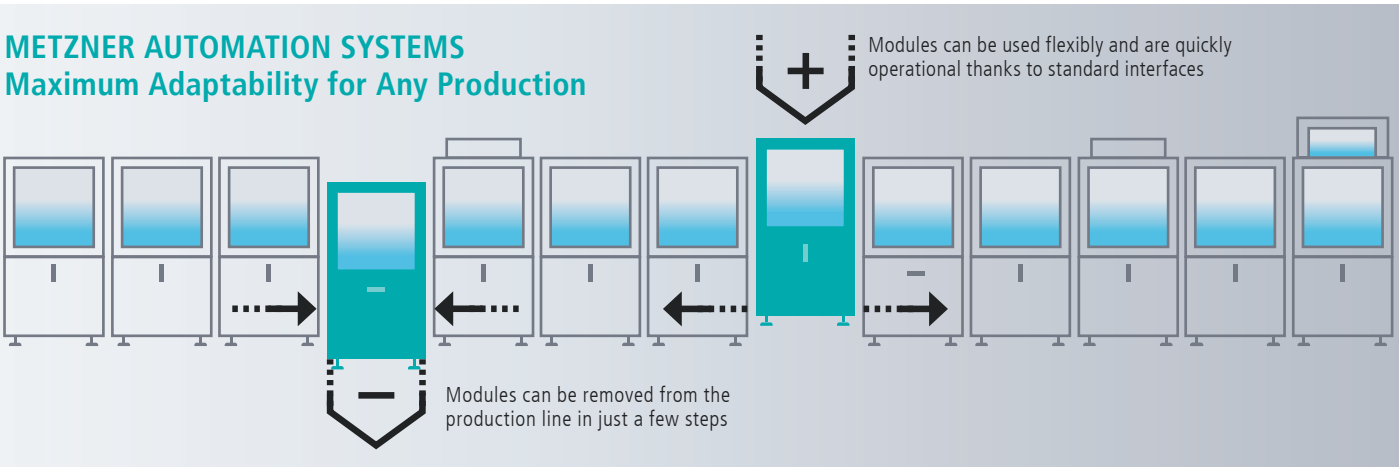
Metzner takt machines are designed for investment security and grow flexibly with your requirements

Versatile and adaptable: Quickly respond to new or changing processes

Metzner automation systems are pioneering in terms of investment security, featuring a modular and expandable concept of automation cells and quickly interchangeable process tools.

For conversion to other customer projects or connector systems, additional automation cells can be added or removed. Process stations can also be integrated into another automation cell within minutes with minimal effort. Thanks to scalability and flexibility, production planning can be efficiently organized and controlled according to changing production parameters such as batch size, system type, and quantities.

METZNER AUTOMATION SYSTEMS
Maximum Adaptability for Any Production



Metzner Automation Platforms

for high-voltage wire harnesses

METZNER EM 100

Platform for automated cable shield processing

- Cable shield processing according to the specifications of HV cable harness manufacturing
- Optionally with additional functions: folding back the cable shield and stripping the inner conductor
- Cable cross-section from 4 to 120 mm²
- Full traceability for each processed cable with optional scanner
- Tool sets for easy and quick tool changes

METZNER EM 300

Platform for the automation of individual processes

- Platform for the integration of a wide range of individual HV processing operations
- Standardized and ready for MES integration
- Automatic determination of the reference position or zero point
- Examples of processes implemented with the EM 300 platform: foil removal, cable shield processing, crimping processes, adhesive tape application, connector assembly with force monitoring, etc.

METZNER EM 600

Platform for the automation of 3 to 5 consecutive processes

- After inserting the cable with automatic referencing, an automatic sequence of 3 – 5 high-voltage processing steps begins
- Advantage: no manual handling between processing steps
- Designed for quantities of approx. 400,000 cables per year in a 2-shift operation
- Total cycle time depending on process configuration: 30 – 45 s
- Personnel requirement approx. 30%, i.e., one operator for three machines or capacity for additional tasks

METZNER EM 700

Cost-efficient platform for linking any processes with manual transport of the workpiece carriers

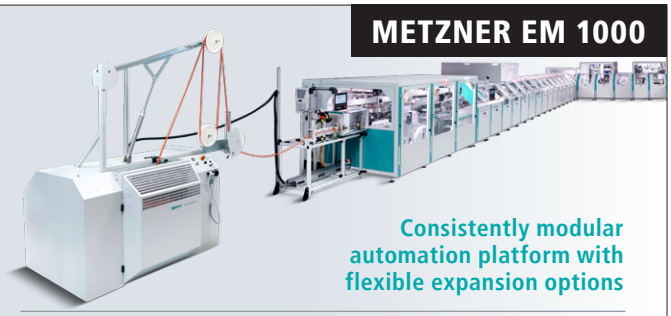
- Designed for the complete processing of an HV cable set in a workpiece carrier
- Very high precision through fixed processing positions for all steps
- Cost-effective automation through manual transport of the workpiece carriers
- Production volume flexibly adjustable according to the number of operators

METZNER EM 900

Fully automated platform for all cable processing steps and connector assembly

- Automatic transport of cable carriers with servo linear system
- Patented cable carrier system for single-core cables with pre-assembled connector components
- Designed for 10 – 25 consecutive processing and assembly steps
- Flexibly selectable processing positions
- Cycle time < 15 s for 2 cable ends

METZNER EM 1000



Consistently modular automation platform with flexible expansion options

- Designed for cable diameters < 8 mm and > 8 mm, as well as cable cross-sections up to 70 mm²
- Fully automated processing of two cable ends in a single cable carrier
- Automatic transport of cable carriers with servo linear system
- Designed for 10–25 consecutive processing and assembly steps
- Flexibly selectable processing positions
- Cycle time < 20 s for two cable ends

Metzner
E-Mobility

Quality Monitoring

Safe, monitored, verified:
real-time control for maximum production quality

Real-Time Quality Monitoring is carried out via a Metzner-developed quality dashboard, which continuously monitors, logs, and evaluates all relevant quality features both graphically and in tabular form.

Software-supported release processes of the takt system ensure transparent and secure production approval. Operation is only permitted by qualified and authorized personnel. Coded tools and consumables guarantee automatic verification of the system configuration according to the respective production order.

Weitere Features:

- Tool and consumable service life monitoring
- Automated warnings when approaching replacement intervals
- History of consumables with display of operating time & replacement status
- Preventive maintenance based on trend analyses (Predictive Maintenance)
- Organized stocking of consumables

Start more efficiently, grow smarter: with precision, innovation & true passion

Schedule your personal consultation now, digitally or directly on-site. As your high-voltage cable partner, Metzner E-Mobility will show you live how to make your cable processing more efficient, safer, and future-proof. Whether a live demo, a project discussion on equal footing, or an initial needs analysis – we focus entirely on your goals.

Technological advantage is created through dialogue.
Scan the QR code, book online, or speak directly with our Key Account Sales team.

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METZNER E-MOBILITY GMBH
Messerschmittstr. 30 | 89231 Neu-Ulm | Germany
Phone: +49 731 40199-0 | Fax: +49 731 40199-33
eMail: sales@metzner.com