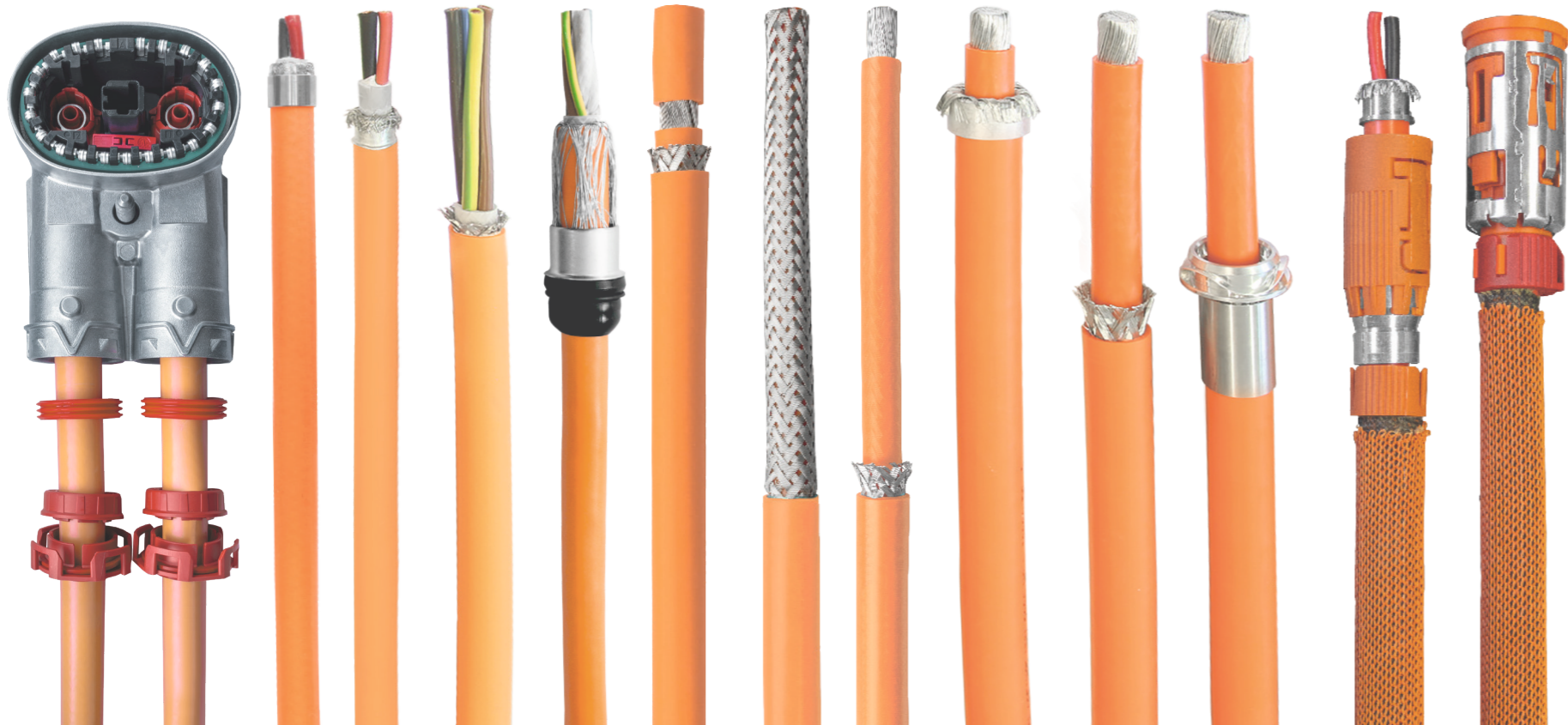




METZNER E-MOBILITY SOLUTIONS

ALL PROCESSES. ALL CONTACT SYSTEMS. FIVE AUTOMATION PLATFORMS.



WE AUTOMATE THE PROCESSING AND ASSEMBLY OF HIGH-VOLTAGE CABLES

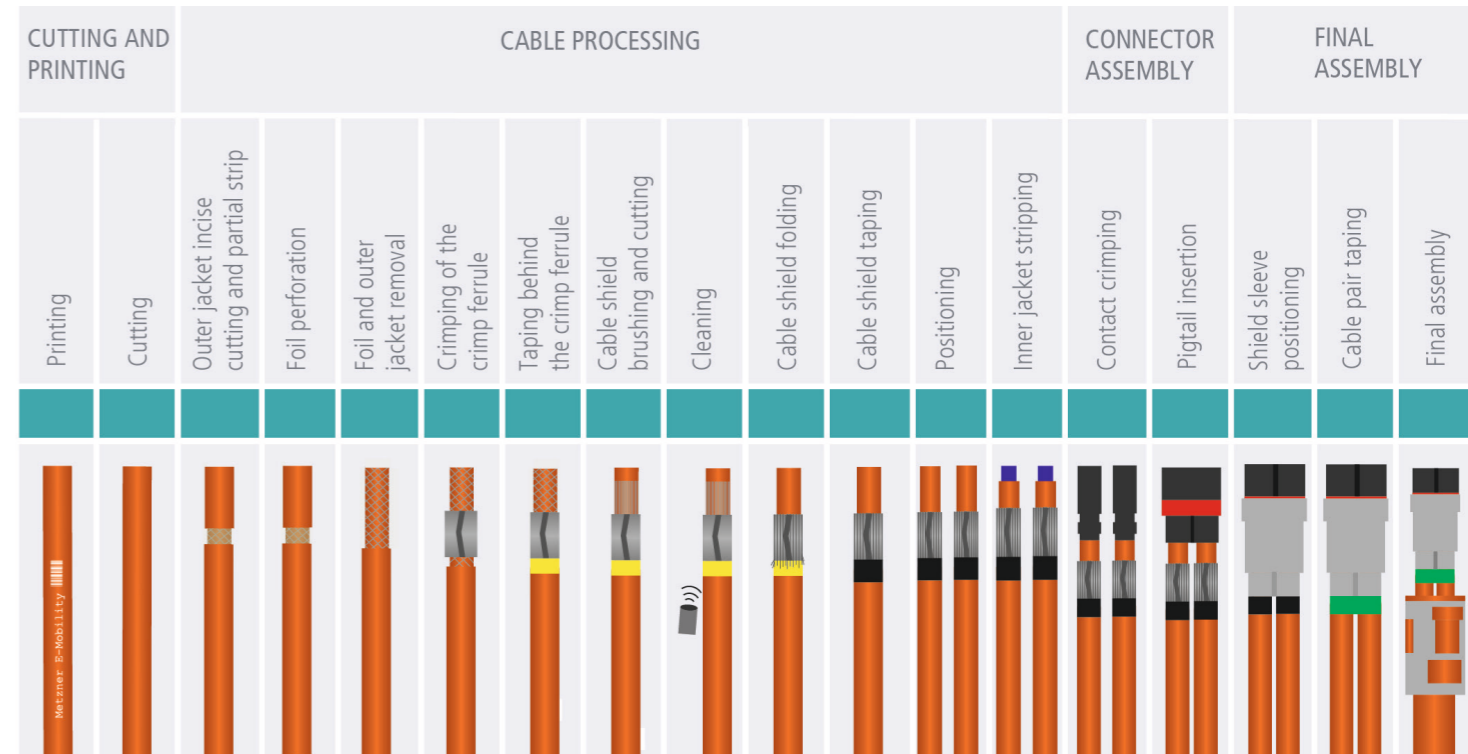
In just a few years, electric vehicles have developed from a marginal phenomenon to a key topic for the mobility of the future. Rapidly increasing production figures for electric vehicles in the next few years underline the importance of this technology for automotive engineering. Metzner transformed its experience from the processing of special cables to the requirements of high-voltage cables and high-voltage contact systems at a very early stage and today already offers widely used solutions for all processes of cable processing and the assembly of the most varied contact systems. Metzner's expertise in this area is underlined by an impressive patent portfolio specifically for the processing and assembly of high-voltage cables.

WE OFFER SOLUTIONS FOR ALL PROCESSES

Already today we offer proven solutions for the assembly of contact components in all steps of cable processing. We integrate successful 3rd party solutions for crimping and ultrasonic welding as well as the final assembly of all components of a contact system.

In addition, all Metzner solutions are consistently designed for traceability and cleanliness. The Metzner E-Mobility products offer you full traceability from cable identification to the recording and storage of all process data. For this purpose, we supply our own traceability servers or data export to customer production systems. For automated processes, smart cameras perform automated quality control.

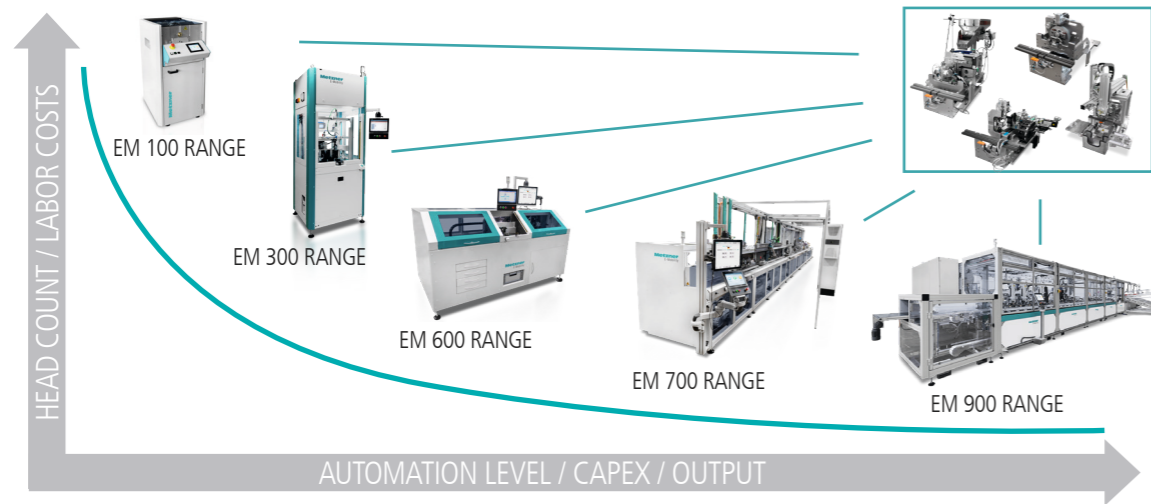
All production steps in cable processing have been developed with a special focus on technical cleanliness. In addition, highly efficient cleaning stations are available to effectively remove any remaining soiling.



MODULAR AND SCALABLE PLATFORMS

PROCESS TOOLS COMBINED WITH VARIOUS AUTOMATION LEVELS

The platforms differ in the degree of automation and personnel requirements. The common feature of each platform is its modular structure, which enables flexible and scalable expansion of production at any time. **Flexible and modular** in this case means that our process tools can be retrofitted from one platform to another within a very short time, or can be changed within the same platform to produce other cables or contact systems.



MODULAR PROCESSING PLATFORMS FOR HV CABLES

OVERVIEW OF OUR DIFFERENT EM SOLUTIONS



EM 100 RANGE

- Manual loading
- High flexibility
- Approx. 30 - 40 s cycle time

EM 300 RANGE

- 1 - 2 process stations
- Manual loading
- High flexibility
- 20 - 30 s cycle time

EM 600 RANGE

- 3 - 5 process stations
- 25 - 30 s cycle time
- 3 - 5 processes
- Cable in fixed position, tools move

EM 700 RANGE

- No maximum number of process stations
- Automatic transfer of the cables
- 1- or 2-sided processing

EM 900 RANGE

- Fully automatic HV harness processing
- No limited number of process stations
- Cycle time < 15 sec.

METZNER EM 100 RANGE

PATENTED PROCESS FOR THE AUTOMATIC PROCESSING OF CABLE SHIELDS

For entry into high-voltage cable processing, Metzner offers inexpensive individual stations in the e-mobility sector. For the first time, the EM 101 module offers a solution for removing the cable foil without affecting the cable shield. The automatic processing of high-voltage cables also requires the connection of various components of the connector system. The Metzner EM 102 is responsible for this. The EM 103 allows the cable shield to be opened and cut using a patented process that ensures there is absolutely no contact with the internal insulation. The EM 103S offers the functionality of the proven EM 103 for the requirements of smaller cables up to 8 mm in diameter. These low-cost models cannot be integrated into an automation line and are only equipped with limited traceability functions.



EM 101



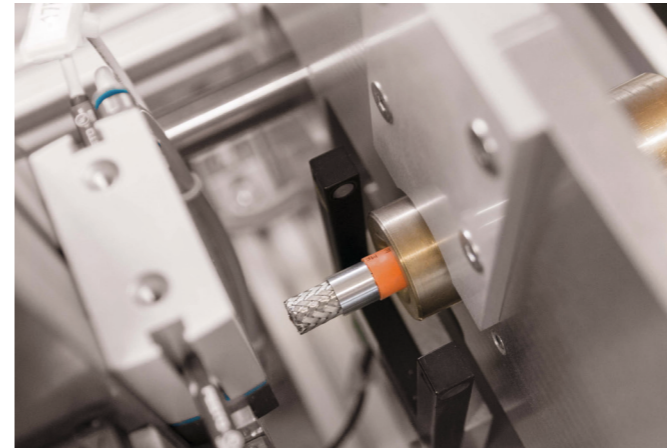
EM 102



EM 103



EM 103S



EM 300 PLATFORM

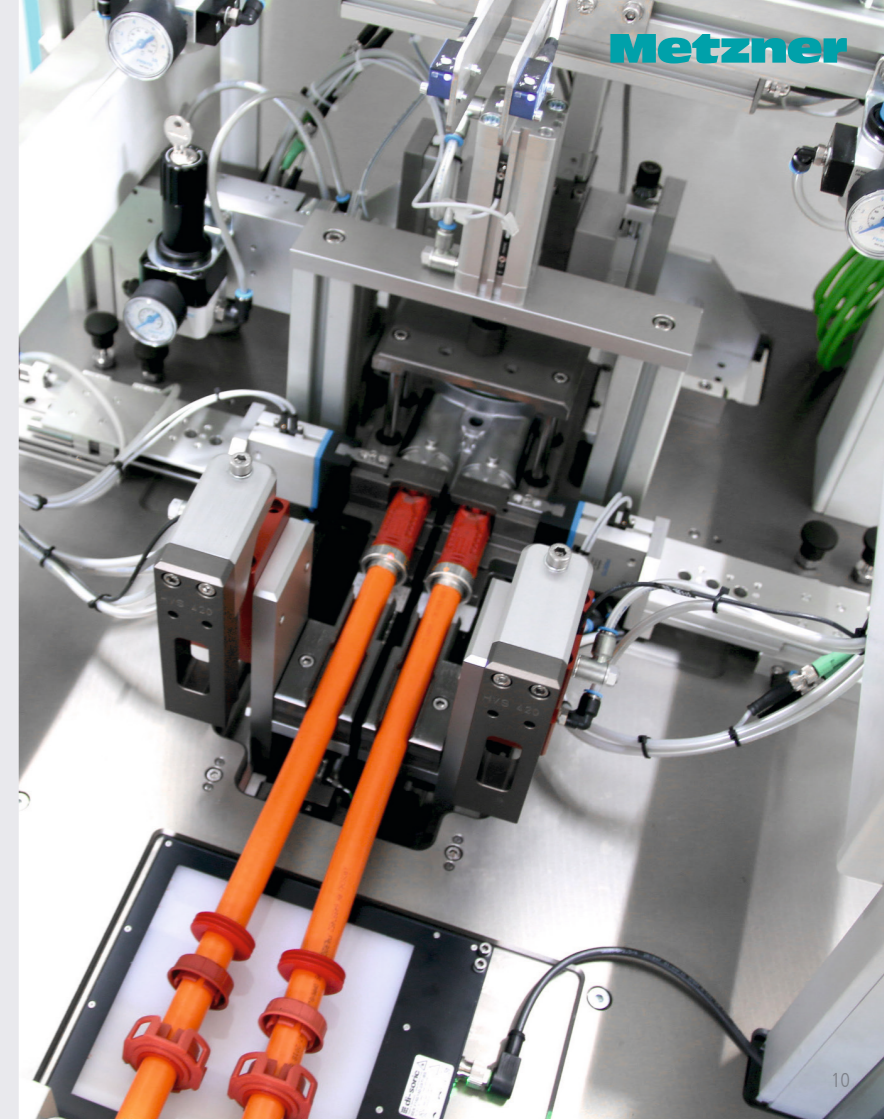
QUICK CHANGEOVER AND FAST CYCLE TIMES



The Metzner EM 300 platform offers further convenience in high-voltage cable processing through a quick change of process tools and faster cycle times. Depending on the requirements, the HV cable processing machine can thus be equipped with different tools for cable processing. This means that the EM 300 can be used for several processing steps and is prepared for a wide range of processes. In addition, with the EM 300 we protect your investment by offering improved expandability that enables „plug-and-play“ integration of future new applications.

FEATURES

- Metzner EM 300 stands for a versatile and modular automation platform
- Prepared for full traceability and Industry 4.0
- Designed for quick and easy change of process tools
- Base station designed for all high voltage cable and assembly processes
- Ready to grow as your needs grow - the EM 300 is designed to be daisy-chained with several other stations with a higher level of automation (see EM 900 as a fully automated processing line)
- EM 300 protects your investment by offering tool change and upgrade options



METZNER EM 600 PLATFORM

ONE STATION - UP TO SIX MACHINING TOOLS



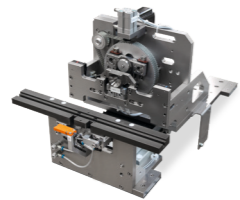
The EM 600 is able to combine up to 6 consecutive process tools in one station. After insertion, the cable remains in a fixed position while the tools move to the cable for optimal protection of the HV cables. The total cycle time of an EM 600 station is approx. 30 s for all processes of this station, with a total capacity of approx. 400,000 cable ends per year.

FEATURES

- Modular automation platform to accommodate the complete process portfolio of HV harnesses.
- The platform is alternatively designed for loading by one operator
- Easy expansion of the platform with additional processes and an upgrade to a higher level of automation
- Cycle time less than 30 seconds
- One person can easily run 2- 3 EM 600 stations in parallel
- Cost-effective automation
- Designed for quick and easy change of process tools

VARIABLY APPLICABLE TOOLS

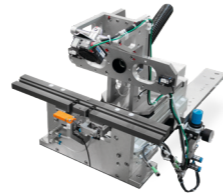
Configuration example for the Metzner EM 600. The machine can be combined with any process module and adapted to your individual requirements for processing your high-voltage cables.



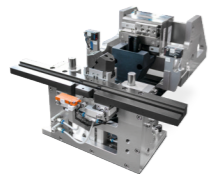
CUTTING IN THE EXTERNAL INSULATION



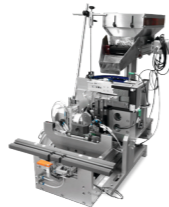
BRUSHING THE CABLE SHIELD



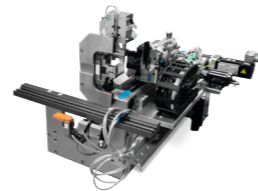
CLEANING STATION



STRIPPING THE INNER CONDUCTOR



PUSHING ON THE FERRULE



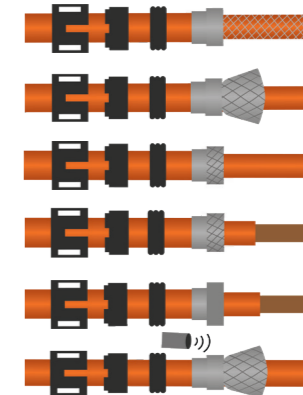
ASSEMBLY OF THE CONTACT PART CARRIER

THE EM 600 CS++ REPRESENTS THE POWER OF THE EM 600 PLATFORM:

METZNER EM 600 CS++

The EM 600 CS ++ covers the following machining steps with four tools:

1. Mounting the support sleeve
2. Cutting the cable shield
3. Folding the cable shield
4. Mounting the crimp sleeve
5. Stripping the inner sheath
6. Cleaning



METZNER EM 700

SEVERAL PROCESS STATIONS COMBINED



SEVERAL PROCESS STATIONS COMBINED - COMPLETE WIRE HARNESS PROCESSING - COST-EFFECTIVE AUTOMATION

Several EM 600 stations in combination with a cost-effective transfer system offer you the additional advantages of the EM 700 series: In wire processing, you achieve a higher degree of automation and have no limit to the number of stations. In addition, the system for cable processing for HV connectors is modularly expandable. Any high-voltage cable and any high-voltage connector can be processed by the EM 700. One-sided or two-sided cable processing of HV connectors is possible.

FEATURES

- Interlinking with automatic cable transfer
- Processing of specific connector systems possible
- Only one operator per line required for loading the parts
- Automatic unloading
- Processing of all cable lengths

STATION 1
CABLE PREPARATION

STATION 3
CABLE PROCESSING

- Rotary cut
- Foil processing
- Foil removal
- Cable shield processing
- Cleaning

STATION 5
CRIMPING & ULTRASONIC WELDING

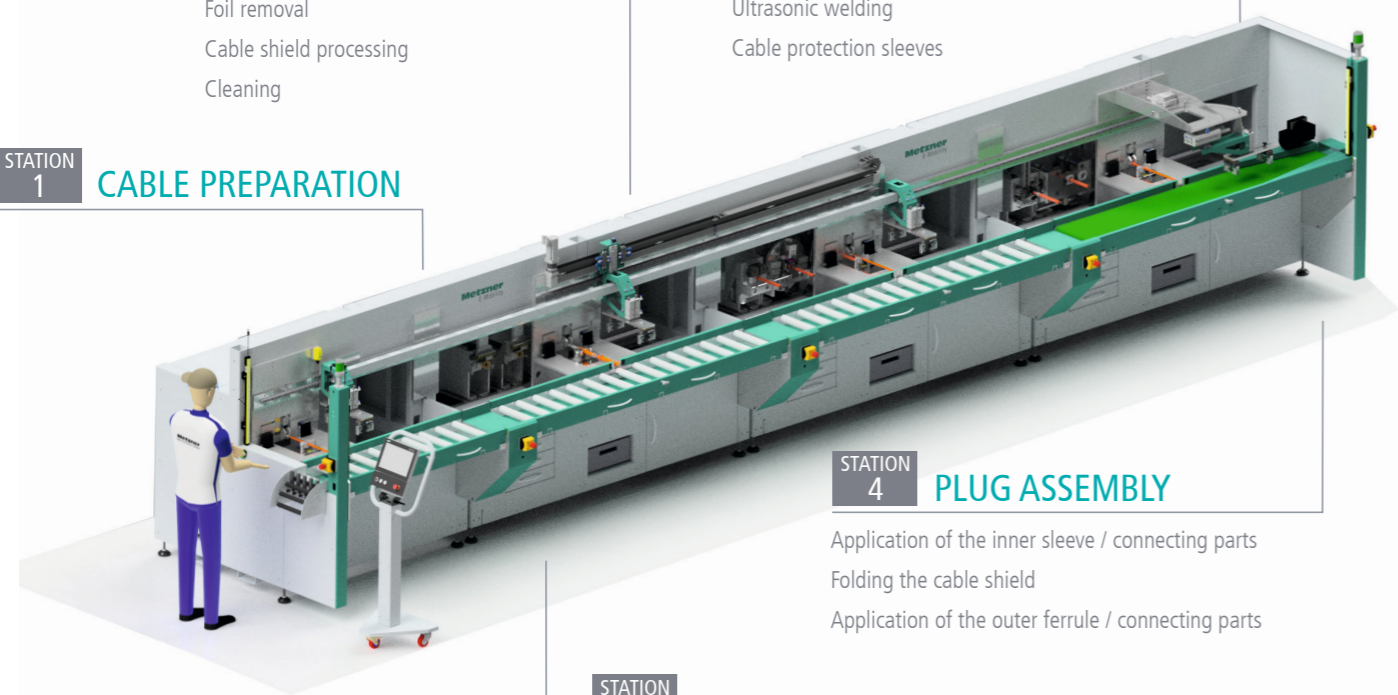
- Crimping
- Ultrasonic welding
- Cable protection sleeves

STATION 4
PLUG ASSEMBLY

- Application of the inner sleeve / connecting parts
- Folding the cable shield
- Application of the outer ferrule / connecting parts

STATION 2
PRE-ASSEMBLY

Assembly of the connecting parts

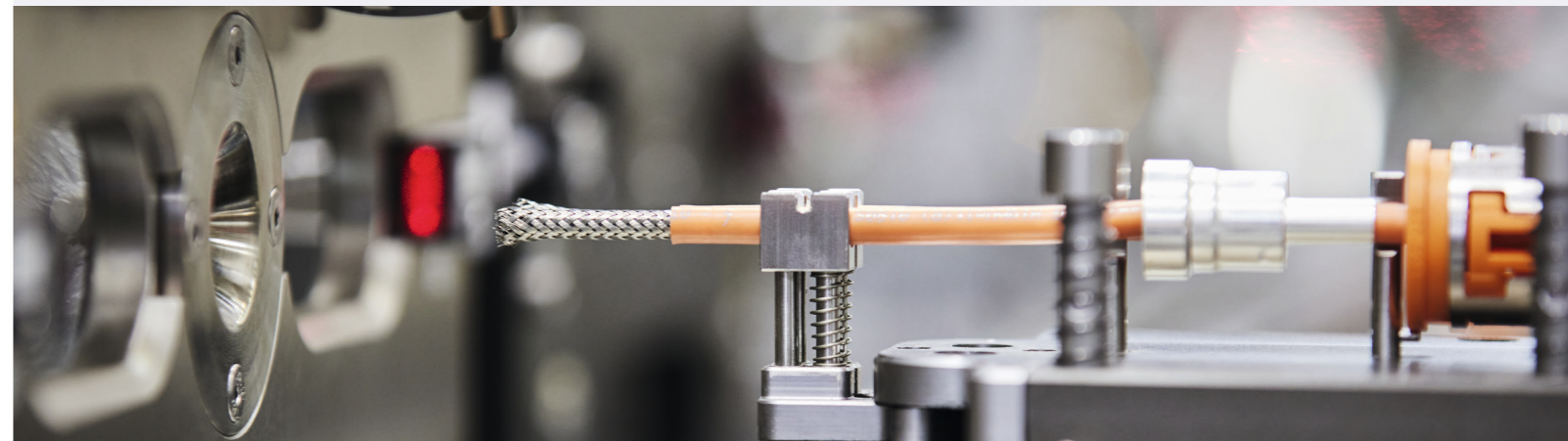


METZNER EM 900

FULLY AUTOMATIC WITH TRANSFER SYSTEM

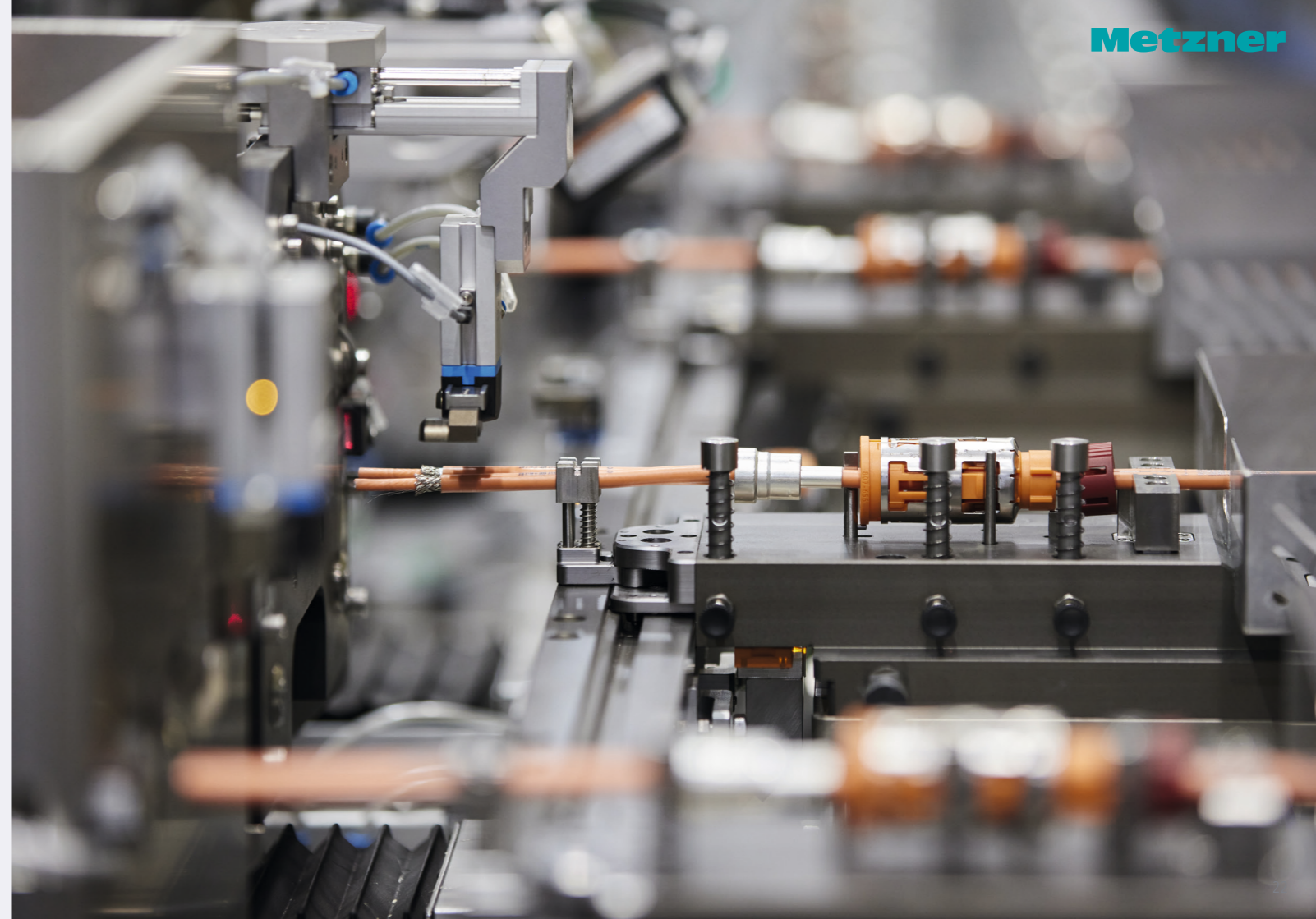


Metzner understands the future and converts existing processes into fully automated system solutions. We have combined previously separately operated workstations for cable assembly into fully automatic production lines. The starting point of an automatic cable processing machine is the cable wound onto a drum. By stringing together tools for HV cable processing, we have automated every previously manual work step in high-voltage cable assembly. The end result is a finished cable with a fully assembled HV connector system.



FEATURES

- Cable carrier
- For cables in straight or coiled condition
- Cycle times ≤ 15 s
- Very flexible design for quick and easy check-in and inspection of stations
- No operator required
- Automatic, camera-based quality control integrated
- Full traceability
- Industry 4.0 as standard equipment





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