

Riveting Machines Assembly Systems



Friedrich

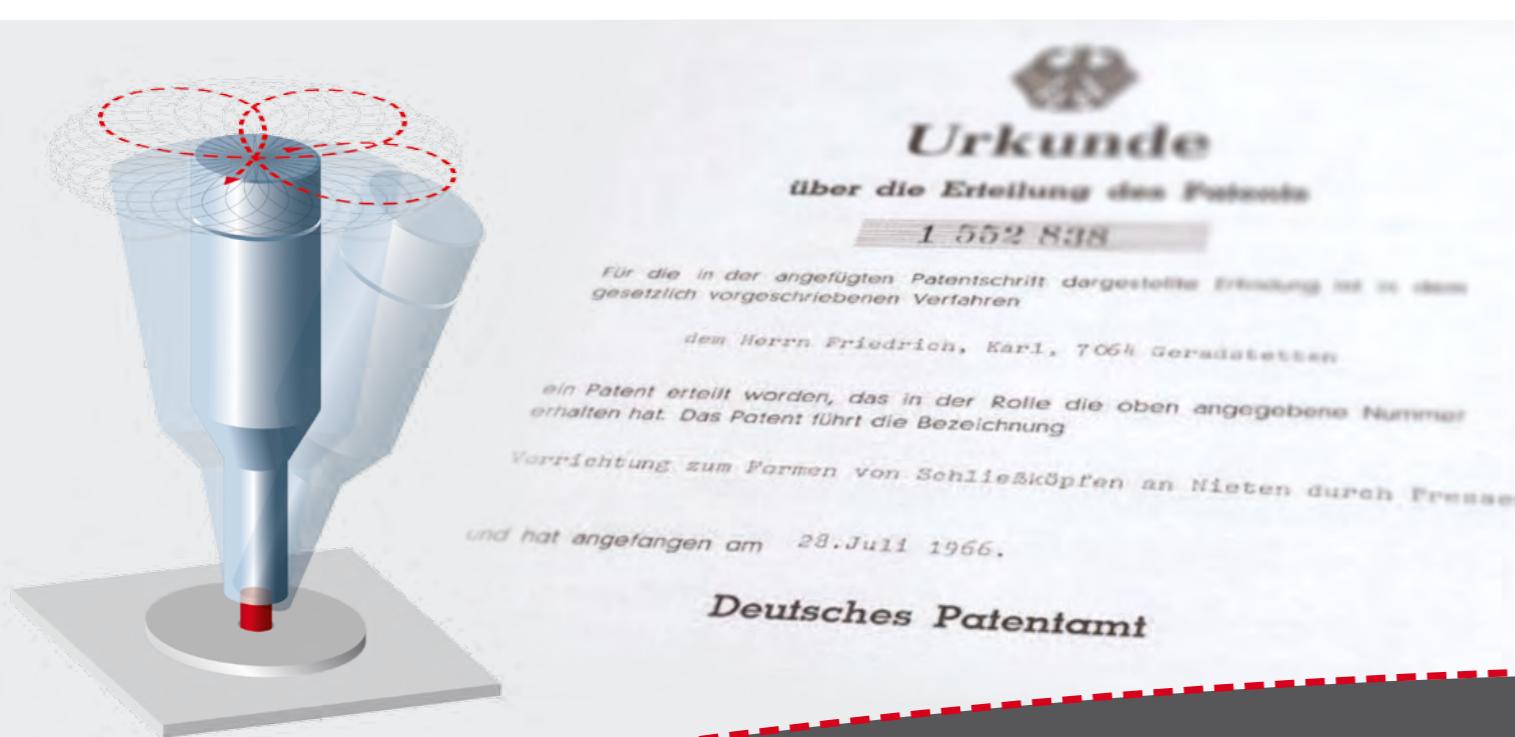


Riveting Technology Pioneers

From the pioneer of modern riveting technology ...

Riveting machines

Pedestal-type and column-type riveting machines, bushing and roll-forming machines as well as CNC riveting machines – FMW Friedrich's extensive product range comprises more than 200 variants that cover all areas in industrial riveting technology. Meeting the highest quality.



Invention and patenting of the radial point riveting technology

Established in 1948, in Remshalden, FMW Friedrich laid the foundation for a riveting process in 1966 that is the most effective and most economical until today.

The radial point riveting technology was patented for FMW Friedrich in 1966.

Continuous technological further development

Tradition and innovation guarantee the success of our family-run company until today. This is underscored by further patents and product firsts, such as the CNC riveting machine, the integrated measurement device, the safety riveting machine, the servo roll-forming machine, etc.

Our highly qualified engineers, software developers, mechanics and electricians continuously work on cutting-edge solutions in a modern environment – **Made in Germany**

... to the experts in smart solutions for industrial riveting



Assembly systems

With our extensive know-how as well as in-house development and production, we realize individual solutions and sophisticated assembly systems from a single source. From technical advice and project planning through to commissioning and beyond – we are competently at your side.

This brochure includes:

*Column-type and pedestal-type riveting machines · from p. 16 · Riveting units p. 22 · Nietcontrol p. 26
CNC riveting machines from p. 28 · Assembly systems from p. 36 · After-sales service p. 42*

Customer focus is no coincidence for us ...

... but the basis for success

FMW Friedrich is a specialist in riveting technology and much more than that: a contact for customer requirements and a forward-thinking partner that has an profound knowledge of customers' needs.

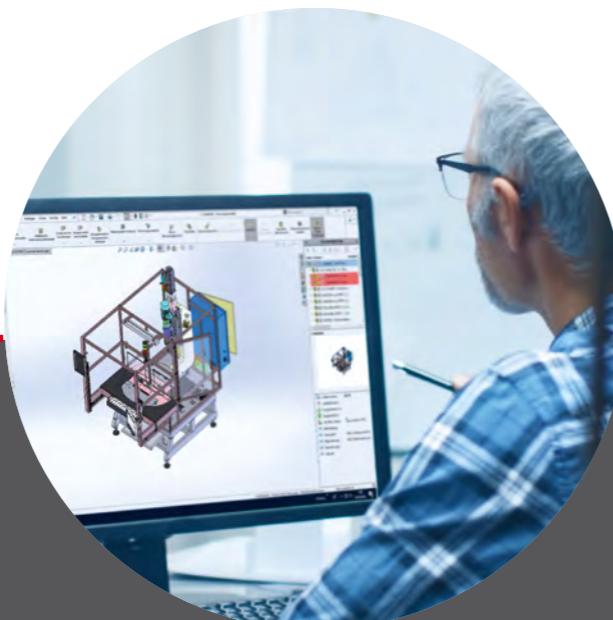
Customer-specific criteria

Based on our specific experiences, our aim is to clarify all the relevant facts already in the consultation and offer phase – turning a tailored offer into a **tailored solution**.



Consultation Analysis

- Recording and analysis of **customer requirements** by competent technical sales staff
- Structural **feasibility tests**
- Support in the **optimization of production processes**
- Requirements matching with **FMW standard**
- Comparison with realized, proven and trusted solutions



Development Design

- **Individual approach** to finding solutions based on the defined conditions in terms of technology and mode of operation
- **Sample riveting** in the test laboratory
- Extensive **quote preparation**
- **Revision** by/with customers
- Variants and modifications
- Adaptation or expansion of standard solutions

Our aim is to convince you in the long term through effectiveness and reliability. We therefore rely on the principle of quality instead of quantity. Our tailored solutions guarantee highest productivity, significant cost savings, and long-term customer satisfaction.



Production Assembly

- Quality management system in accordance with **DIN ISO 9001:2015**
- **High level of vertical integration** of our products
- Production and assembly **from a single source**
- FMW Friedrich **controller software** flexibly adaptable as per customer request
- If applicable, **short-term** riveting machine and riveting unit assembly from the warehouse

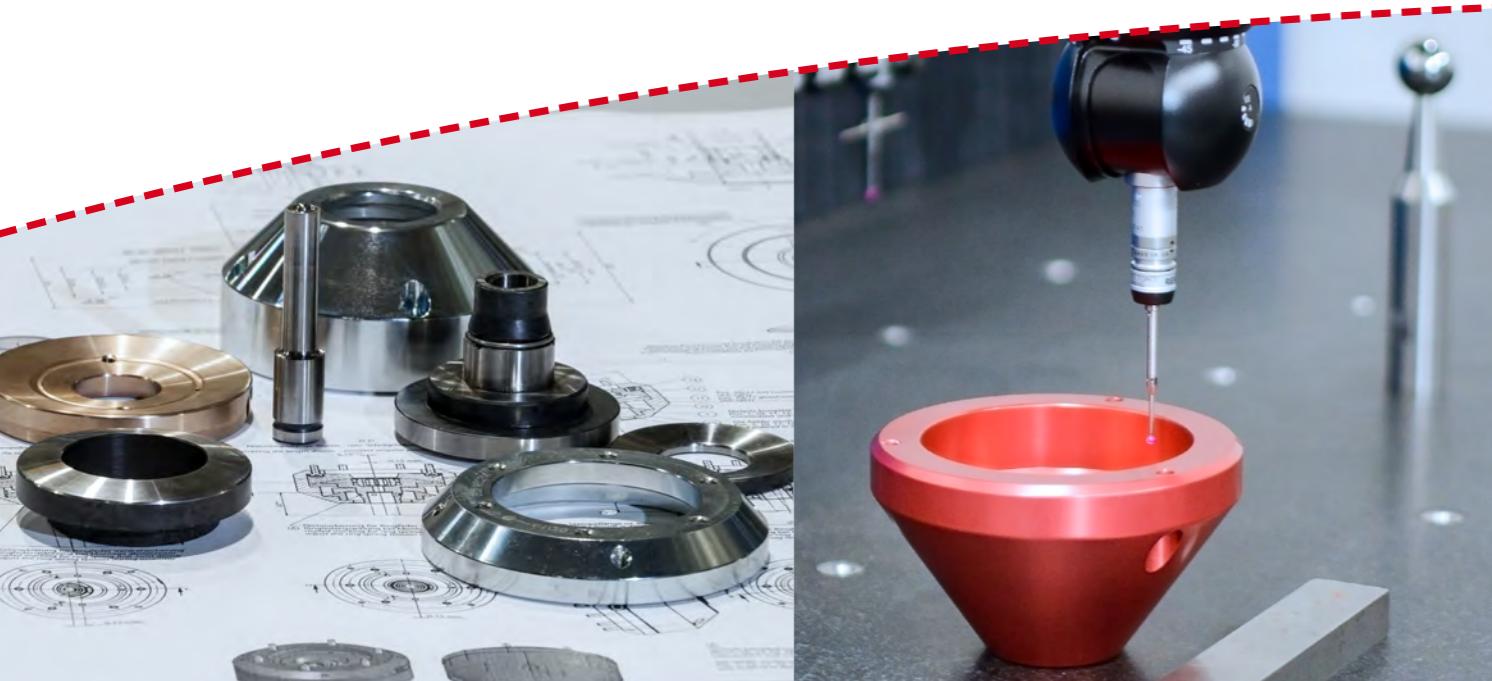


Commissioning service After-sales service

- **Commissioning of machines and systems** by trained and experienced service technicians and programmers
- Inclusion of our sales and service partners at **start of production**
- Our well-stocked parts warehouse guarantees high availability and **fast spare parts shipment – worldwide**
- **After-sales service** such as training, familiarization, free telephonic support and remote support

Highest quality and safety is a given for us ...

We only deliver the best quality thanks to the use of high-quality components and the high level of vertical integration in our versatile mechanical production processes. This is demonstrated by the exceptional durability of our products and our long-standing customer relationships.



Our production is certified in accordance with ISO 9001: 2015. In-house component production and the latest

testing systems enable us to carry out modifications and improvements.



A safety concept is developed for each system and realized with individually selected components.

Each riveting machine undergoes an extensive endurance test run before it is delivered to the customer.

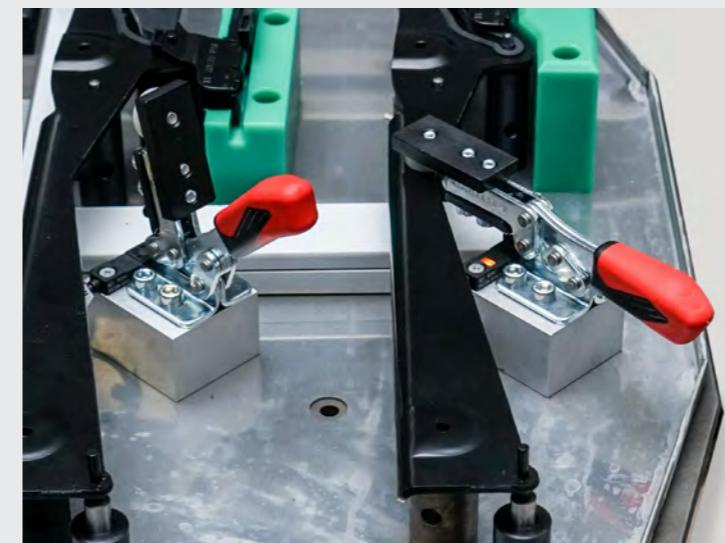
... this applies to our products as well as those of our customers.

Through process-oriented in-house developments, such as measuring systems, we ensure that you have complete control of the riveting process. Incorrect placement, components outside the tolerances and fluctuations in the strength of the riveting material are reliably detected.

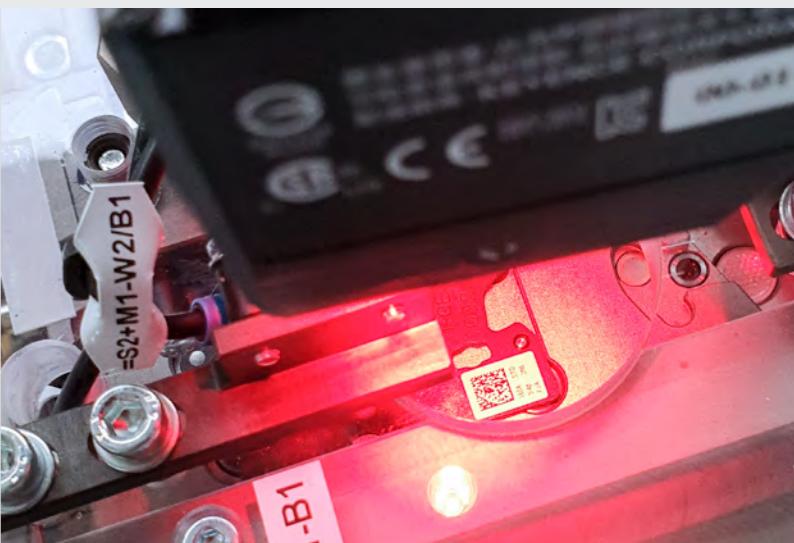


The components of the FMW Nietcontrol, which are also developed and produced in-house, are each subjected

to extensive testing. This allows us to guarantee the high product quality of our controller electronics.

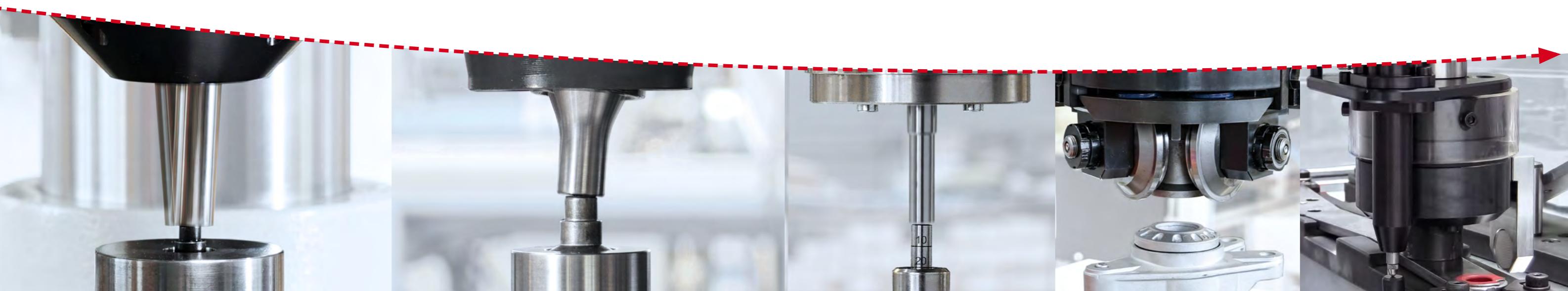


Sensor and camera queries prevent assembly and placement errors for our customers' valuable parts.



An integrated barcode scanner ensures a verifiable production process.

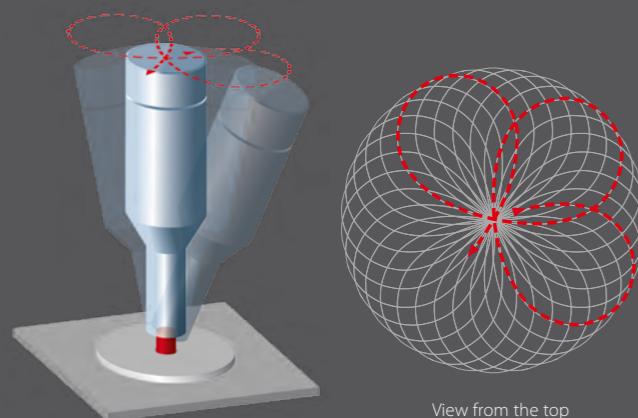
Joints with method and expertise ...



Radial point riveting

The riveting die depicts a hypocycloid movement. It permanently alternates between vertical position and maximum deflection angle. The resulting point contact compresses the riveting material in its depth and forms it into a stable snap head from the inside out.

Applications: Solid rivets, non-round rivets, small peeled rivets.



Change in material structure in different riveting processes



Radial point riveting

Orbital riveting (GBA)

Compressed rivets

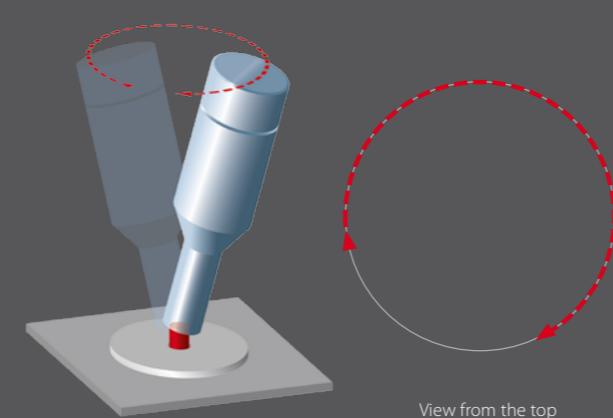
When comparing micrographs it can be seen that the joint structure of the material remains largely intact in the radial point riveting process.

Due to the lower force requirement compared to orbital riveting or compression riveting, the material is gently deformed and produces a reliably strong joint.

Orbital riveting (GBA)

The riveting die is driven by a circular movement and thus rotates with a constant setting angle. The churned material deformation caused by this process requires excellent parts fixing.

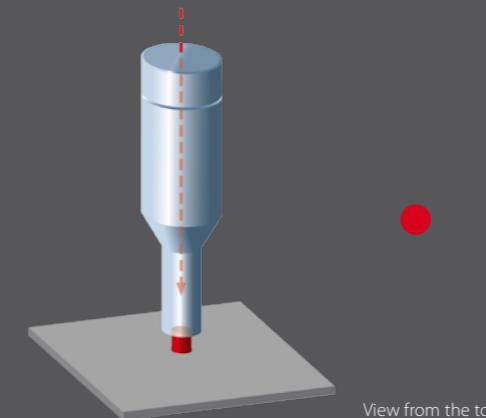
Applications: Hollow rivets, flares and large peeled rivets.



Compressed rivets

The deformation does not entail a rotational movement. Due to a high axial force, the part hole is well filled and a large bearing pressure is generated also at depth.

Applications: Riveting with solid rivets and high shear stress.



Joining

Axial force is also used to precisely insert two components into each other. This ensures that both the bearing pressure and a plastic deformation of the material is achieved. Applications: Bearings in bearing seats, dowel pins, clinch nuts or clinch studs.

Roll-forming

Roll-forming heads are used to roll bearings into housings and meet special requirements in terms of strength, tightness and freedom from chips.

The material is deformed by several roll-overs. Depending on the application, axial and/or radial deformation processes are combined carefully without chips.

Applications: Fixing of bearings/fixtures in housings, constriction of pipes.

Bushings

In this process, plain bearing bushes are inserted and flanged by axial force. The bushings can be flanged in one or several passes, depending on the characteristics and requirements.

In order to achieve high, consistent quality and uniform torque progression of the finished bearings, the bushing is finally calibrated in diameter and height.

... for the automotive industry



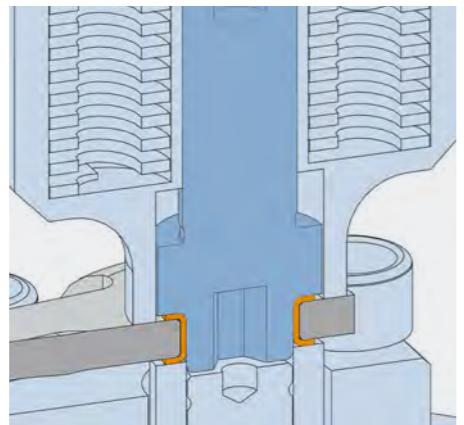
FMW Friedrich provides individual solutions for various industries and a variety of applications and requirements.

Hood/door hinges

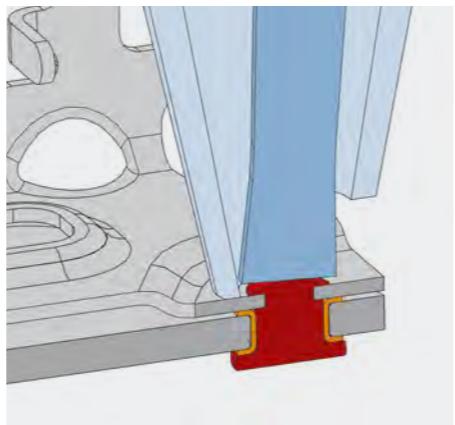
Articulated joints for hood or door hinges are made using plain bearing bushes and step rivets.



Bushings



Radial point rivets



Seat bases

To maintain the required stability, the side parts are connected by large-diameter tubes and reliably flared with GBA technology.



Flaring / orbital riveting (GBA)

Door locks

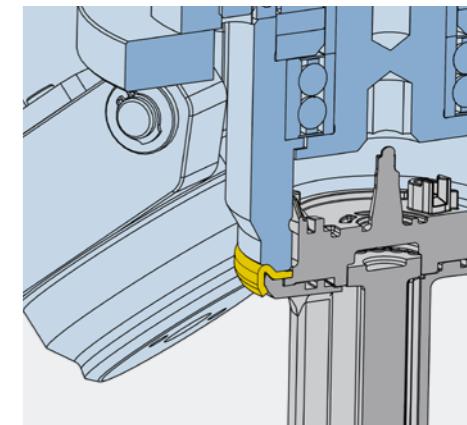
A car door lock involves many different riveting tasks, which are perfectly solved with FMW's radial point riveting technology.



Radial point riveting



Roll-forming



Other applications

Brake pad retaining clips • Drive kinematics for throttle valve • Seat belt

buckles • Windscreen wipers • Clutches
• Ball bearings • Steering column

• Handbrake • Spoiler kinematics
• Gearbox components • Sunroof

guidance • Joints for folding tops of convertibles • Battery housing

- Workpiece
- FMW tool
- Rivet
- Bushing
- Deformation zone

... for toolmaking and mechanical engineering, for medical instruments

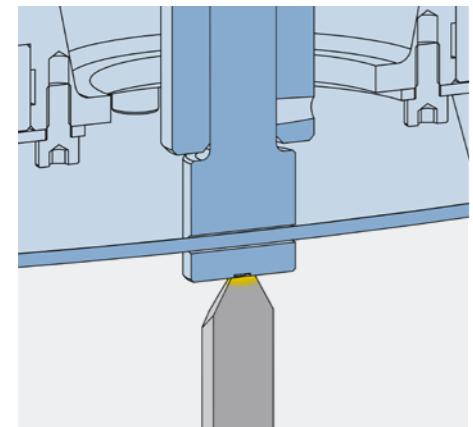


Number punches

With FMW's radial riveting point technology, specialized riveting dies make it possible to emboss letters, numbers and logos.



Embossing with radial point

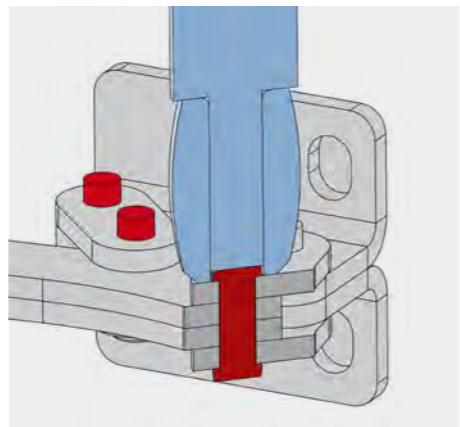


Toggle clamps

In a multi-articulated joint, the precision of the riveted joint is extremely important to achieve a firm yet flexible result.



Radial point riveting

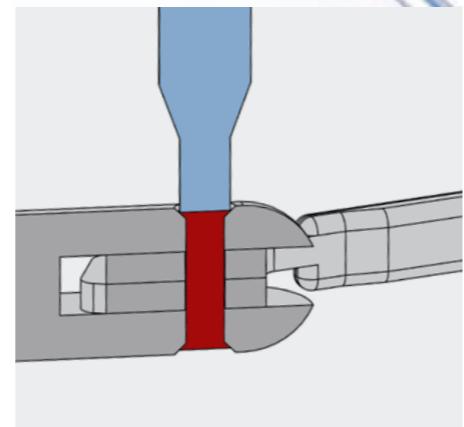


Surgical instruments

With FMW riveting machines, rivets in the micrometer range for medical applications are a cinch.



Radial point riveting

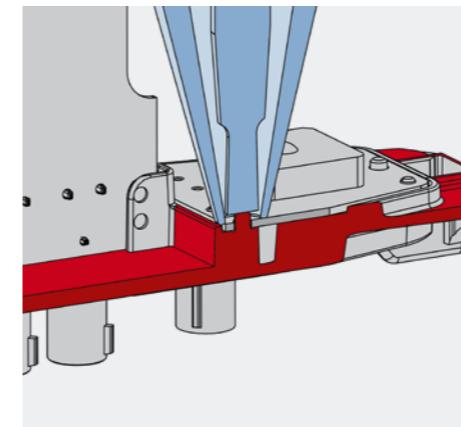


Roof antenna

FMW machines combine a variety of materials, e.g. circuit boards and cast housings, without damaging sensitive printed circuit boards.



Radial point riveting

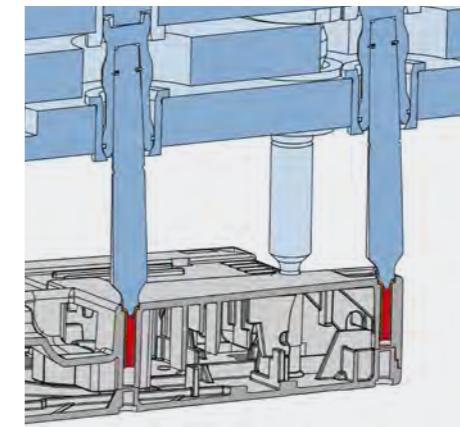


Automatic switches

With our individually developed multi-spindle rivet heads, multiple rivet points can be riveted at the same time.



GBA with multiple spindle head

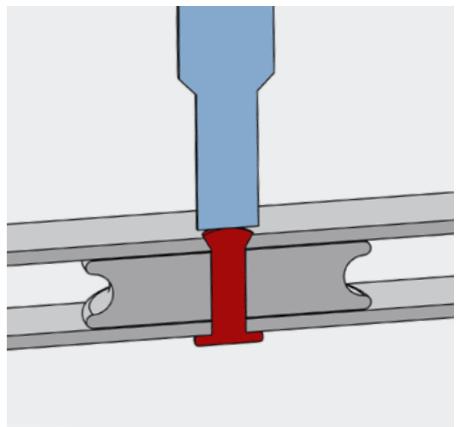


Guide carriages

Despite heavy-duty joints, FMW's radial point riveting technology ensures smooth movement for opening, closing, tilting or sliding.



Radial point riveting



Other applications:

Tongs • Chainsaw chains • Heavy duty castors • Ball bearings

Pump flanges • Valves • Piston

Sterile storage containers • rods
Endoscopes • Biopsy forceps

Threaded nuts for circuit board screw joints • Sockets • Plugs

Coils • Radar sensors • Circuit breakers

Door locks • Door and window fittings • Hinges • Locking systems

Riveting machines



Column-type riveting machines



- Modular, compact and robust
- Height-adjustable machine body
- Mechanically adjustable riveting spindle stroke
- Machining table with center hole and T-slot
- Two-hand actuation at the machining table

Area of application: Manual workstation for small-scale to mass production of high-quality products with low automation requirements. In laboratories/development centers for tests, process optimization and pre-production.

Technical specifications	N000	N100*	N200*
Riveting diameter (mm) (Rm=370 N/mm ²)	1 - 3	1 - 4 (2 - 6)	3 - 10
Maximum riveting force (kN)	1,8	3 (6)	12
Spindle stroke (mm)	5 - 30	5 - 30	5 - 30
Working pressure (bar)	1 - 6 pn.	1 - 6 pn.	1 - 6 pn.
Riveting motor 230/400 V, 50 Hz (kW)	0.25	0.74	0.74
Maximum double stroke volume (l)	0.25	0,35 (0,7)	1,45
Approx. weight (kg)	50	170	170
Working area (mm)	2.5 - 103	19.5 - 229.5 (2.5 - 212.5)	2.5 - 212.5 (19.5 - 229.5)
Projection (mm)	128	170	170
Clamping area (mm)	220 x 175	320 x 290	320 x 290
Riveting die diam. (mm)	8	10 (14)	14 (10)
Riveting die length (mm)	40 - 80	40 - 120 (40 - 170)	40 - 170 (40 - 120)

Design

- Radial point riveting machine
- Radial point riveting machine with compression and joining function
- Orbital riveting machine (GBA)
- Riveting machine with multiple spindle head
- With or without measuring system

* Optional variants in brackets

Controller

- Riveting machine controller pressure/time
- FMW Nietcontrol with one or two measuring systems

Accessories

- Automatic riveting head lubrication
- Slider mechanism
- Riveting die length up to 220 mm

More accessories available on request

Safety riveting machine



- GS-tested and BG-certified
- Patented accident prevention system
- Modular, compact and robust
- Height-adjustable machine body
- Mechanically adjustable riveting spindle stroke
- Machining table with center hole and T-slot

Area of application: Preferably used as a manual workstation for riveting manually fixed parts.

Technical specifications	N100	N200
Riveting diameter (mm) (Rm=370 N/mm ²)	2 - 6	3 - 10
Maximum riveting force (kN)	6	12
Spindle stroke (mm)	6 - 30	6 - 30
Usable working stroke (mm)	24	24
Working pressure (bar)	1 - 6 pn.	1 - 6 pn.
Riveting motor 230/400 V, 50 Hz (kW)	0.74	0.74
Max. double stroke volume (l)	0.7	1.45
Approx. weight (kg)	170	170
Working area (mm)	1 - 181.5	1 - 181.5
Projection (depth in mm)	170	170
Clamping area (table in mm)	320 x 290	320 x 290
Length of riveting die (mm)	65 - 120	65 - 120

Design

- Radial point riveting machine
- Radial point riveting machine with compression and joining

Controller

- Riveting machine controller pressure/time
- BG-certified safety controller

Accessories

- LED lighting in the working area
- Workpiece and carrier

More accessories available on request

Pedestal-type riveting machines



- Modular, compact and robust
- Height-adjustable machine body
- Mechanically adjustable riveting spindle stroke
- Machining table with center hole and T-slot
- Two-hand actuation at the machine table

Area of application: Manual workstation for small-scale to mass production of high-quality products with low automation requirements. In laboratories/development centers for tests, process optimization and pre-production.

Technical specifications	R100*	N300	N400	N430	N510*
Riveting diameter (mm) (Rm=370 N/mm ²)	2 - 6 (2 - 7)	3 - 11	4 - 13	4 - 16	4 - 18
Maximum riveting force (kN)	6.5 (8,2)	16	25	30	40
Spindle stroke (mm)	5 - 30	5 - 40	5 - 40	5 - 40	5 - 50 (5 - 72)
Working pressure (bar)	1 - 6 pn.	1 - 6 pn.	1 - 6 pn.	1 - 8 pn.	10 - 70 hy.
Riveting motor 230/400 V, 50 Hz (kW)	0.37	0.74	0.74	1.9	1.9
Maximum double stroke volume (l)	0.58 (0.78)	1.86	2.08	2.08	0.45 (0.65)
Approx. weight (kg)	110	320	325	335	420
Working area (mm)	30 - 180 (13 - 163)	1 - 252	1 - 247	1 - 247	20 - 348 (1-348)
Projection (mm)	159	200	200	200	200
Clamping area (mm)	240 x 247	360 x 335	360 x 335	360 x 335	360 x 335
Riveting die diam. (mm)	10 (14)	14	14	30	30
Riveting die length (mm)	40 - 120 (40 - 170)	70 - 170	70 - 170	75 - 200	75 - 200

Design

- Radial point riveting machine
- Radial point riveting machine with compression and joining function
- Orbital riveting machine (GBA)
- Roll-forming machine
- With or without measuring system
- Column can be extended by up to 250 mm

Controller

- Riveting machine controller pressure/time
- FMW Nietcontrol with one or two measuring systems

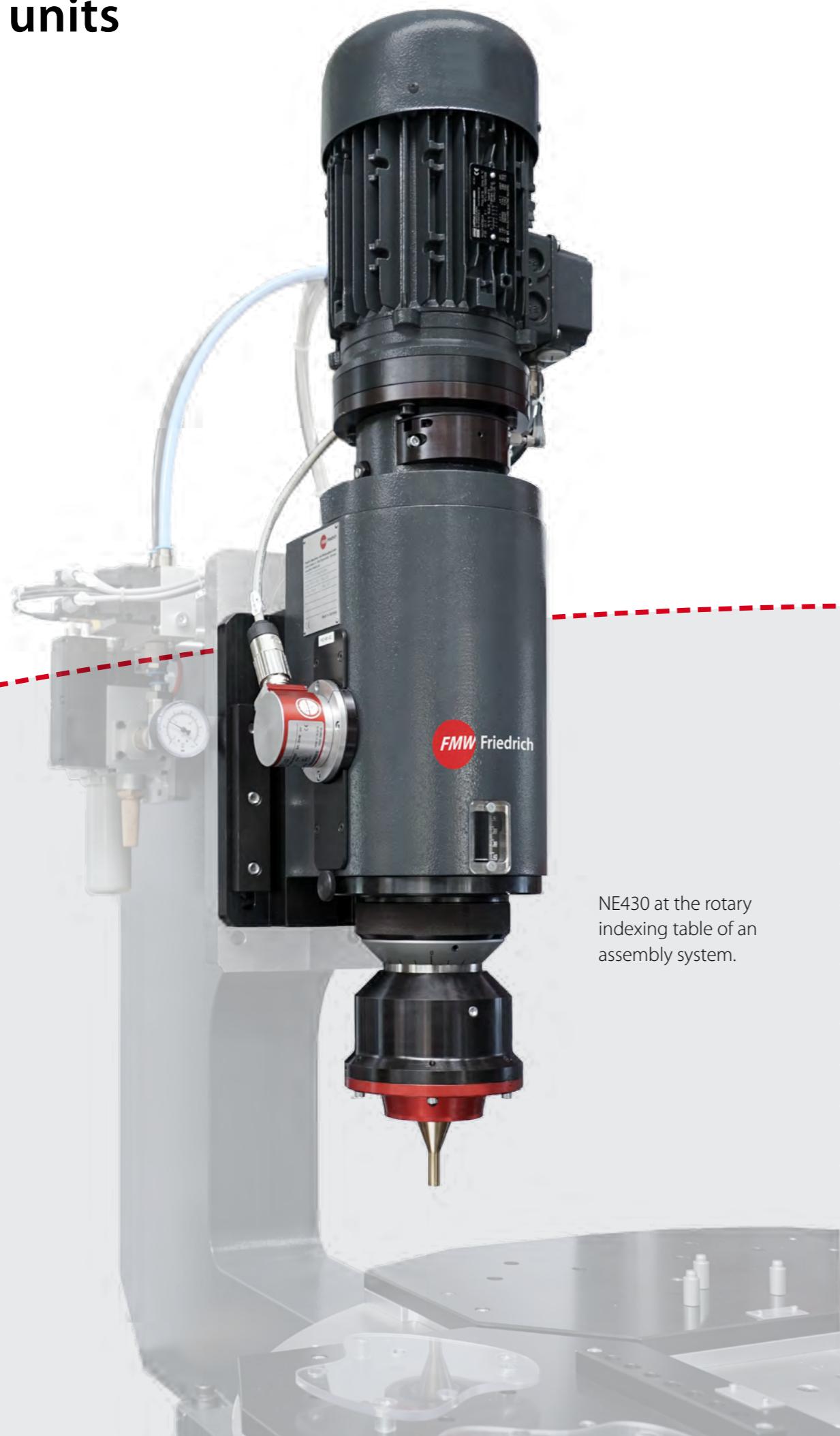
Accessories

- Automatic riveting head lubrication
- Slider mechanism
- Riveting die length up to 220 mm

More accessories available on request

* Optional variants in brackets

Riveting units



- Modular structure in a compact design
- Various installation positions possible due to variable lubrication
- Portable drive motor for confined adaptations
- Mechanically adjustable riveting spindle stroke
- Also available as a complete workstation with C-shaped frame

Area of application: Integration in conveyor and rotary indexing systems. Proven use in assembly lines and complete systems.

Technical specifications	RE100*	NE100*	NE200*	NE210*	NE300	NE400	NE430	NE510*
Riveting diameter (mm) (Rm=370 N/mm ²)	2 - 6 (2 - 7)	1 - 4 (2 - 6)	3 - 10	3 - 10	3 - 11	4 - 13	4 - 16	4 - 18
Maximum riveting force (kN)	6.5 (8.2)	3 (6)	12	12	16	25	30	40
Spindle stroke (mm)	5 - 30	5 - 30	5 - 30	5-50 (5-80)	5 - 40	5 - 40	5 - 40	5-50 (5-72)
Working pressure (bar)	1 - 6 pn.	1 - 6 pn.	1 - 6 pn.	10 - 70 hy.	1 - 6 pn.	1 - 6 pn.	1 - 8 pn.	10 - 70 hy.
Riveting motor 230/400V, 50 Hz (kW)	0.37	0.74	0.74	0.74	0.74	0.74	1.9	1.9
Maximum double stroke volume (l)	0.58 (0.78)	0.35 (0.7)	1.45	0.2 (0.3)	1.86	2.08	2.08	0.45 (0.65)
Approx. weight (kg)	35	55	55	55	85	90	95	70
Riveting die diam. (mm)	10 (14)	10 (14)	14 (10)	14	14	14	30	30
Riveting die length (mm)	40-120 (40-170)	40-120 (40-170)	40-170 (40-120)	40-170	70-170	70-170	75-200	75-200

Design

- Radial point riveting unit
- Radial point riveting machine with compression and joining function
- Roll-forming unit
- With optional electric controller

Controller

- Riveting machine controller pressure/time
- FMW Nietcontrol with one or two measuring systems

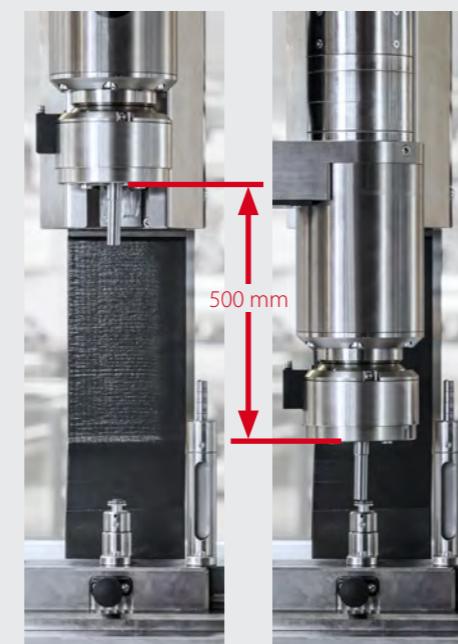
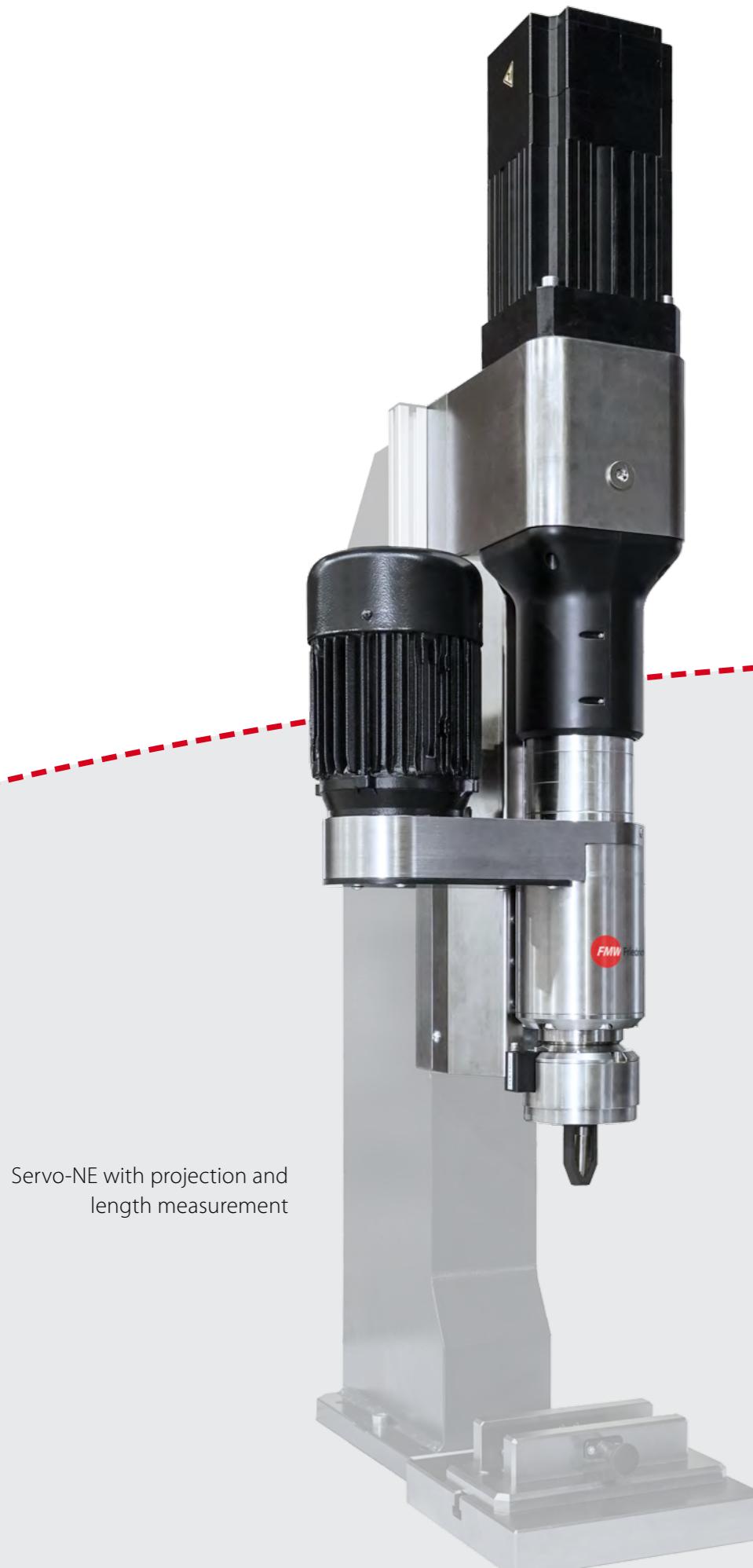
Accessories

- Mechanical downholder for pretensioning multilayer assemblies
- Automatic riveting head lubrication

More accessories available on request

* Optional variants in brackets

Electric riveting units



A maximum riveting force of 18 kN, a **unique spindle stroke of up to 500 mm** and an **idle stroke speed of up to 250 mm/s** are the core features of this highly versatile riveting unit.

- Integrated speed control and torque limitation
- Extensive criteria for switch-off of the riveting process
- Integrated length measurement including center position check
- Enhanced Nietcontrol functions thanks to the latest servo technology
- No emissions, suitable for clean room applications

Area of application: As a riveting machine: comfortable and variable manual workstation. As a riveting unit: for integration into conveyor systems, assembly lines and automated production facilities.

Technical specifications	Servo-NE	Servo-NE
Riveting diameter (mm) (Rm=370 N/mm ²)	1-7	2-11
Maximum riveting force (kN)	7	18
Spindle stroke (mm)	5-300 expandable to 500	5-300 expandable to 500
Force generation	elektric servo	elektric servo
Riveting motor 230/400 V, 50 Hz (kW)	0.74	0.74
Servo motor (kW)	2.07	4.62
Approx. weight (kg)	140	150
Riveting die diam. (mm)	14	14
Length of riveting die (mm)	40 - 170	40 - 170

Design

- Radial point riveting unit
- Radial point riveting machine with compression and joining function
- Riveting unit with joining function
- Roll-forming unit

Control

- FMW Nietcontrol based on Codesys V3 Basis
- Operation via 10" touch panel
- Interfaces: CanOpen, Ethernet and EtherCat

Servo drive

- Electric drive
- Without hydraulics or pneumatics
- Clean and energy-efficient work process
- Stroke up to 500 mm:
Reduces setup and cycle times
High flexibility of application

Accessories

Wide range of accessories available on request

FMW-Nietcontrol 3

The 3rd generation of the FMW Nietcontrol controller software developed by our specialists meets all the requirements for parameterizability and modern operating concepts. The traditional functionality, featuring an informative and clearly arranged user interface, perfectly rounds off our riveting technology product line.

Features

- High-resolution, robust multi-touch display for industrial applications
- Intuitive menu guidance and program functions
- Help function directly in the user menu
- USB interface to load the riveting program as well as controller upgrades and updates
- TCP socket connection for QS data transfer
- German/English language options.
- More languages available on request
- **Retrofit: Backward compatibility** for older Nietcontrol machines

Functions

- Riveting process switch-off with 7 different parameters
- Visual identification of process errors in the riveting program
- At least 63 different riveting points can be parameterized, optionally expandable to 255
- Simultaneous display of target and actual process values
- All the parameters of the riveted joint can be adjusted in a window
- Categorization for complex tolerance combinations (10 categories with 30 riveting points each)
- Riveting tool positioning
- Control of manual or automatic slider mechanisms, index cylinders and lifting stations

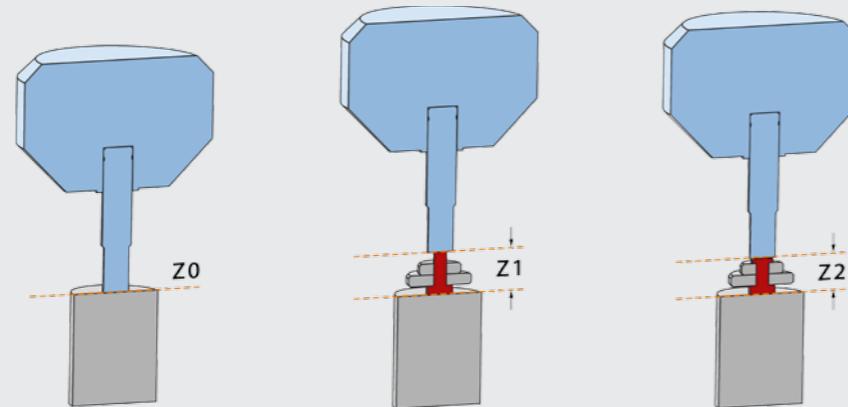


Process monitoring

Measurement of Z-axis:

Length measurement of the overall dimensions (length) of the rivet bolt.

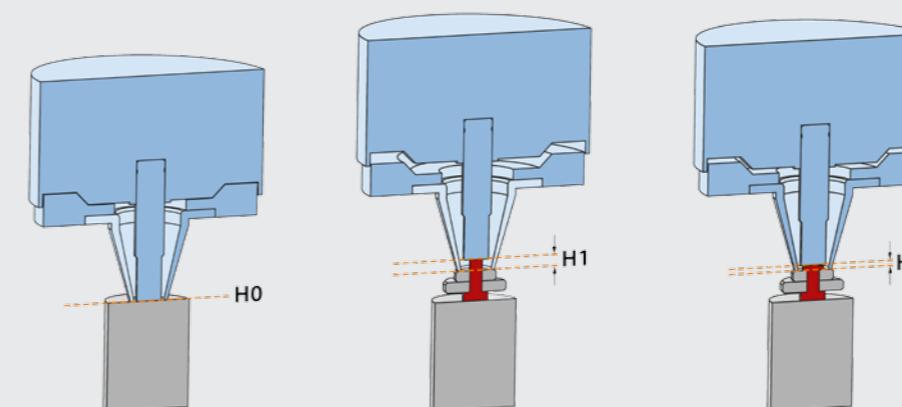
Initial length **Z1** and finished length **Z2**, their tolerances and riveting pressure are decisive parameters for exactly reproducible and economical rivets.



Options:

Alternatively, the riveting process can also be carried out with a delta measurement.

In this process, a defined delta value from the initial length Z1/H1 is used for the rivet.



Measurement of H-axis:

Projection measurement of riveting bolt to the component: Starting with value **H1**, the riveting process is completed when end value **H2** is reached.

A significant advantage of this measurement for riveted multilayer joints is that incorrect or faulty components as well as critical tolerance combinations can be identified.

Combining both measuring systems enables extended monitoring of riveting process parameters.

CNC riveting machines modular system



Thanks to the modular structure of our CNC riveting machines, we offer effective production processes with a range of features in our standard program. These can be put together according to customers' requests and individually expanded.

Working concepts

- ① Rotary table (450 - 1200 mm)
- ② Conveyor transfer system
- ③ Lifter

Workstation structure

- ① Grab containers
- ② Material provision
- ③ Lighting

Holding device

- ① Workpiece carrier

Occupational safety

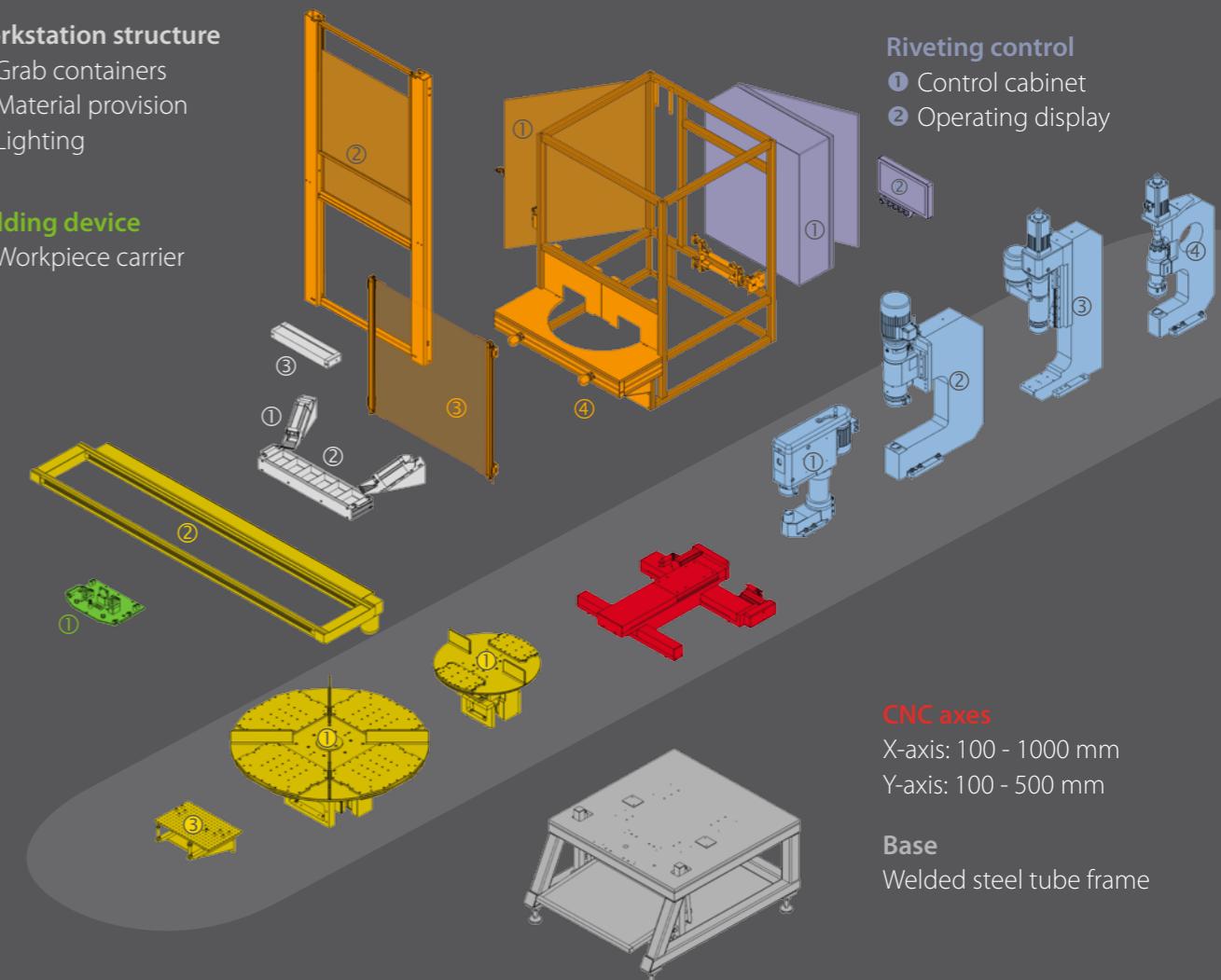
- ① Safety enclosure
- ② Safety door
- ③ Light curtain
- ④ Two-hand start

Riveting processes

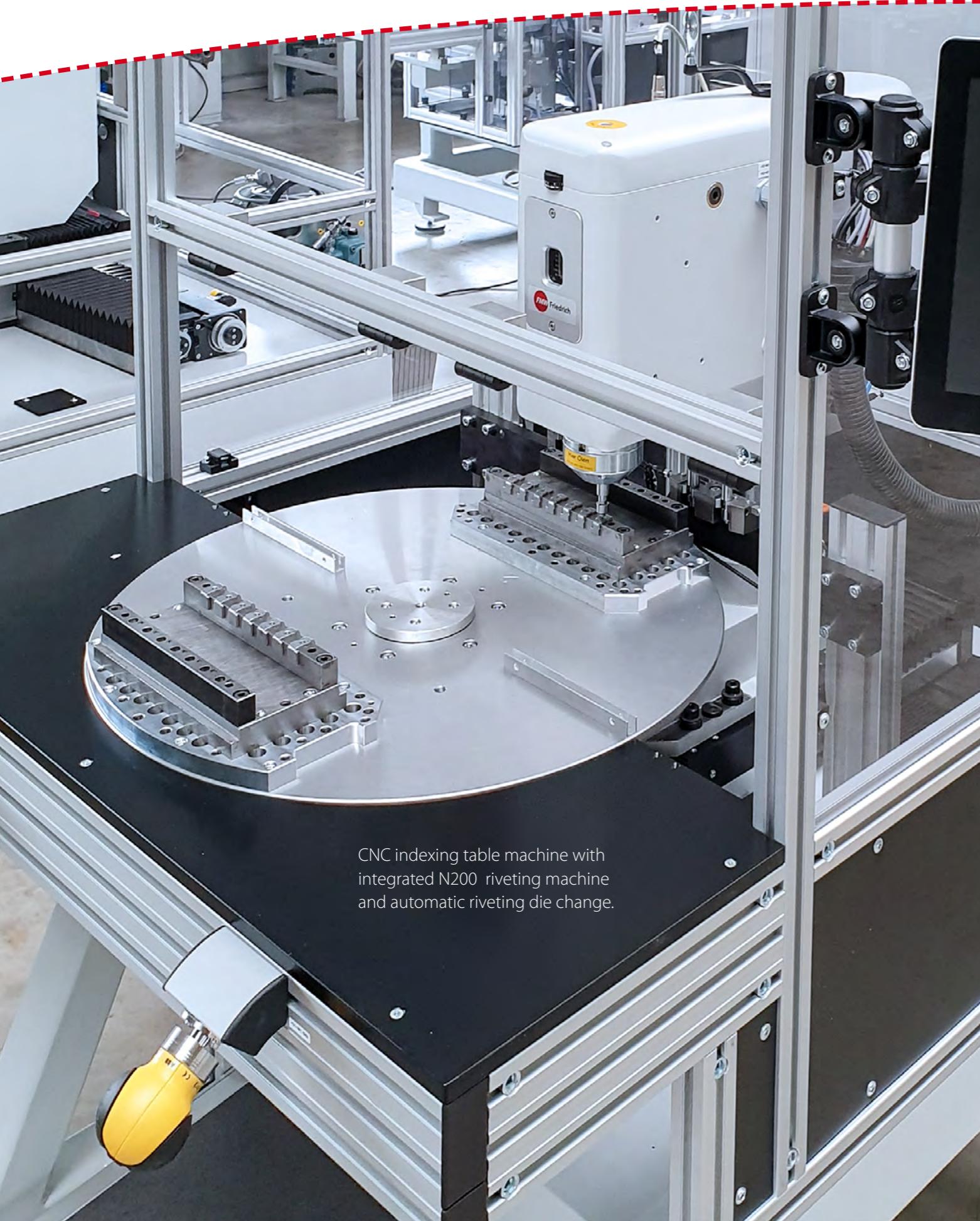
- ① Pneumatic riveting machine
- ② Hydraulic riveting unit on C-shaped frame
- ③ Electrical riveting unit on C-shaped frame
- ④ Electrical joining unit on C-shaped frame

Riveting control

- ① Control cabinet
- ② Operating display



CNC riveting machines modular system



CNC indexing table machine

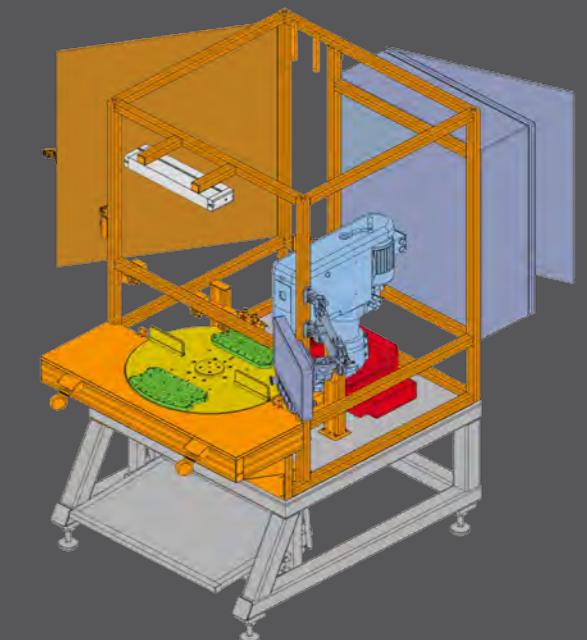
- Effective production process due to simultaneous loading and riveting
- This feature is available with every FMW riveting unit
- The movement range can be enlarged with wide-range axes
- Expandable, for example with thread forming, joining, ejection or control station

Technical specifications

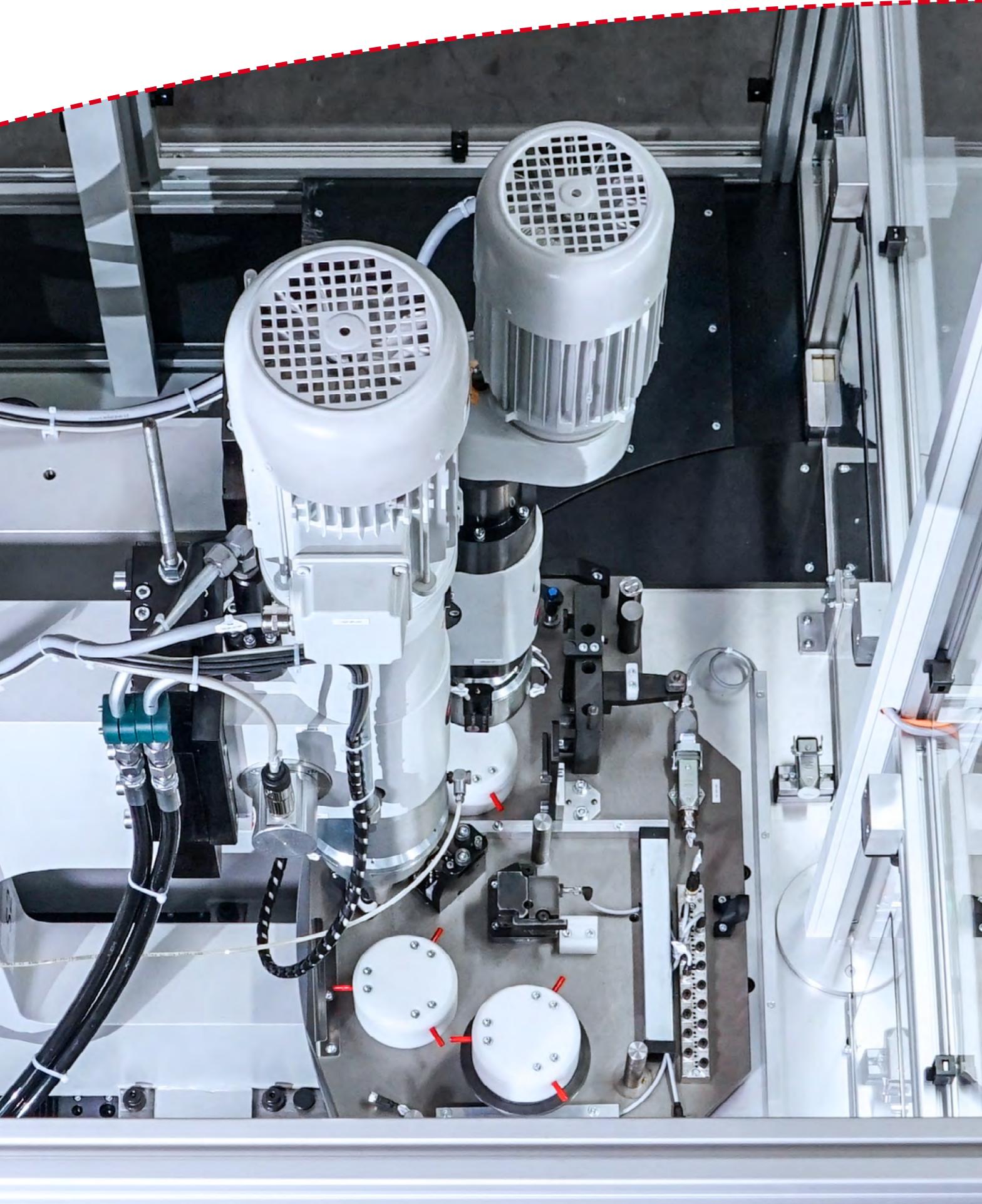
Rotary/indexing table diameter (mm)	650	900	1200
X-axis travel distance (mm)	280	400	500
Y-axis travel distance (mm)	180	300	350
Division	2 or 4	2 or 4	2 or 4
Riveting area (mm)	280 x 160	400 x 280	500 x 350
Travel speed (mm/s)	up to 500	up to 350	up to 200
Depth (mm)	1640	2000	2320
Width (mm)	1070	1200	1500
Height (mm)	2200	2200	2200

Accessories

- Lifting function
- Riveting head lubrication
- Workstation structure
- Wide-range axes
- Automatic riveting die change (see fig. below)



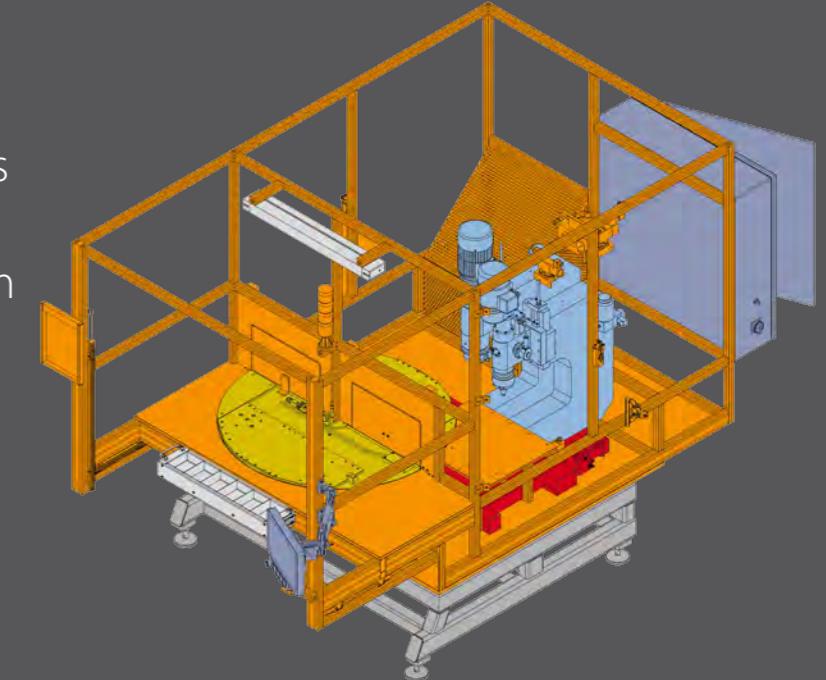
CNC-riviting machines modular system



Project examples:

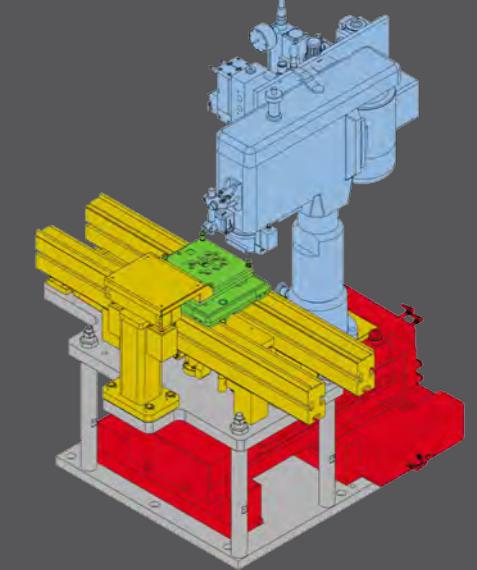
Coordinate riveting system with two hydraulic riveting units

- Two measuring systems each
NE510 40 kN max. force
NE210 12 kN max. force
- Rotary table dia. 1,2 m, 2 stations
- Wide-range axis
- Movement range 800 x 350 mm
- Light curtain for operator area
- Workpiece carrier coding
- Measurement sensors
- Assembly administration
- Wireless coupler for sensors at workpiece carrier (iO-link)
- Integration of label printer



CNC riveting module with pneumatic riveting machine

- With projection measuring system in ESD design
- N000 1.8 kN max. force
- Integrated belt conveyor with lifting and positioning unit
- Setup mode while safety door is open with reduced travel speed of axes
- Tool coding



FMW CNC machine controller

Our CNC machine control system stands out due to its versatile application options both in FMW Friedrich CNC riveting machines as well as in assembly systems. A state-of-the-art operating concept, highly flexible programming and continuous further development make it a core element of production systems.

Features

- High-resolution, robust 18.5" multitouch display for industrial applications (NC 5")
- Intuitive menu guidance and program functions
- Programming based on CODESYS V3, Linux- or Windows-based
- USB interface for loading riveting programs or connection to external input devices and storage media to back up process data
- Operating elements directly on the display
- Internal EtherCat communication

Functions

- Setup and management of riveting points
- Control of additional processing stations
- Positioning and control of CNC axes
- Communication with higher-level PLC as well as TCP socket connection possible
- Graphical real-time display of the machining cycle
- Help function directly in the user menu
- English/German language options. Other languages available on request

Industry 4.0 Functions and solutions

e.g. remote service - BDE interfaces - machine and system networking - data logging - support of open source platforms etc.



FMW Pick-by-Vision

The optional FMW Pick-by-Vision system adds another modern and useful element to the functions of the FMW-CNC machine control.

In the event of a placement or riveting error, the operator is shown the exact areas on the machine display, visually highlighted, where action needs to be taken.

This allows loading and rework times to be reduced to a minimum and costs to be saved.

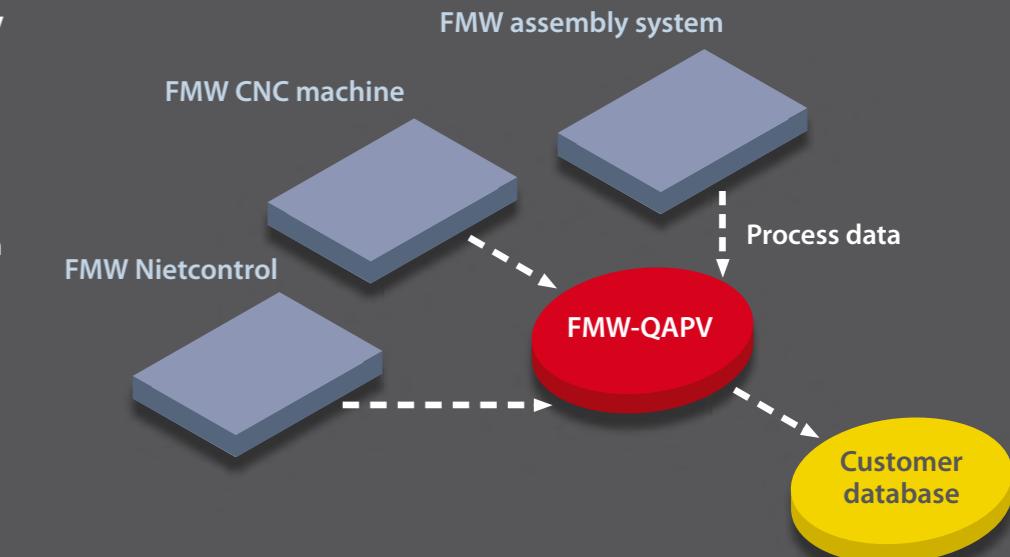


Example (see photo): A base size error of a component to be riveted is shown in red.

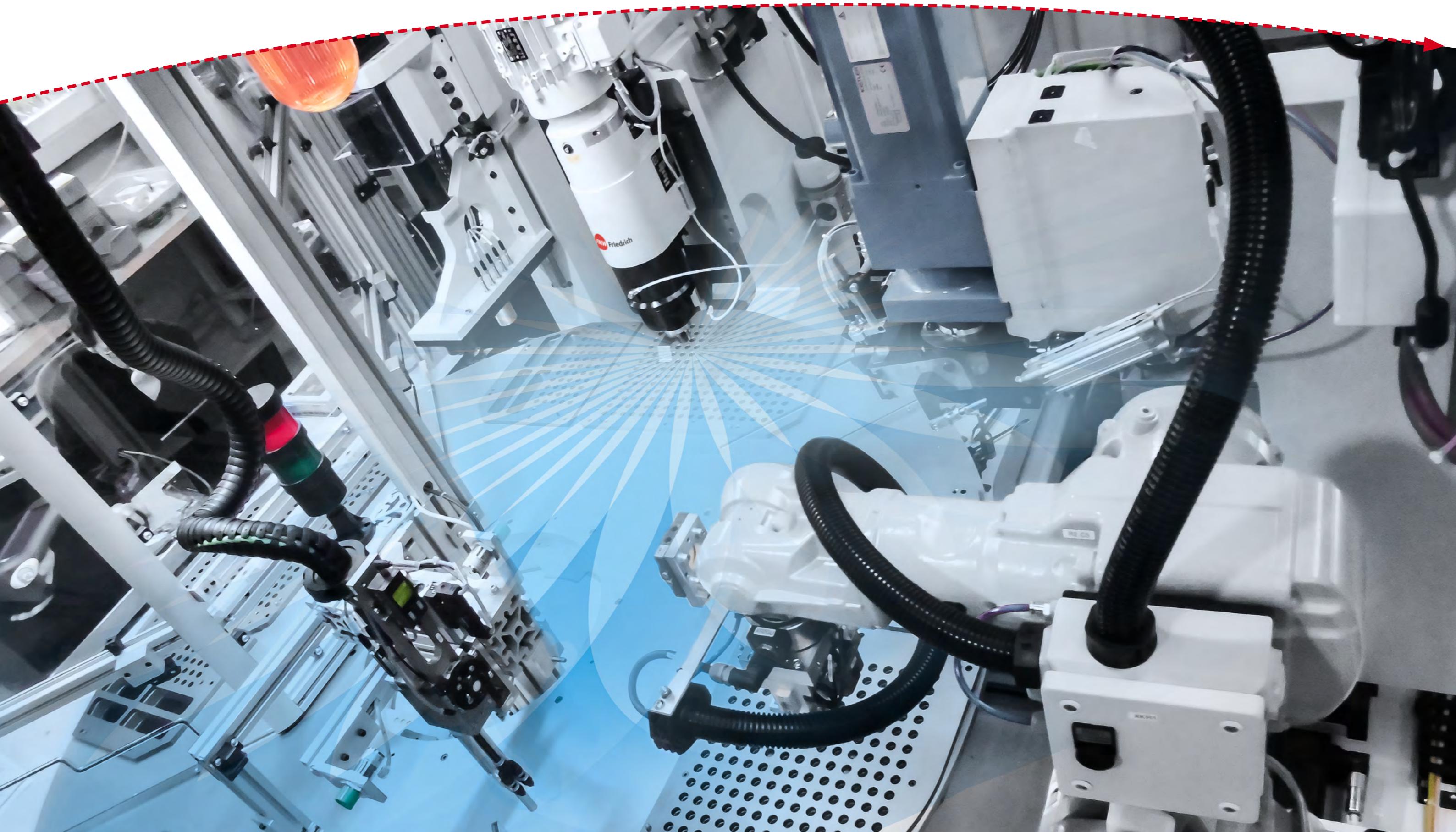
FMW Friedrich QAPV

The FMW Friedrich QAPV software (**Quality Assurance and Process Visualization**) for the transfer, archiving, and visualization of process data was developed in collaboration with our customers.

Important key figures such as CPK, CMK, etc. are graphically prepared and made available externally via an interface, if required. Archived data can be reimported at a later date.



Assembly systems



Tailored solutions through consultation

Each FMW assembly system is designed and produced in close collaboration with the customer for their respective operating conditions. Customers benefit from our full-service principle, starting with consultation through design and production to commissioning.

FMW's full-service principle

We support our customers well before the realization of a solution by providing comprehensive specific expertise on the riveting and assembly process.

We develop production concepts for customers, taking into account all the relevant parameters and linking the riveting process with other production processes.

The consistent digitization of FMW riveting machines allows for the integration of processes and production across technologies in an **"intelligent factory"**. Clearly defined interfaces to customer-specific systems enable efficient personnel and resource planning.



Partnership-based project planning and process consulting with expertise



Versatile machinery for in-house production



FMW riveting machine assembly in a CNC indexing table machine



Video acceptance in the factory at FMW before delivery to the customer

Working in partnership simplifies the entire project process and results in efficient operations with the best possible outcome: Customers receive a turnkey system with high-quality components, flexible and revisable with a long service life.

Processes that can be integrated

Cryogenics **Labeling** **Blind riveting**
Automatic parts removal **Lubrication**
Orbital riveting (GBA) **Embossing**
Handling systems **Compressed rivets**
Flaring **Torque testing**
Ionization **Radial point riveting**
Robotic systems **Screwing** **Thread cutting**
Joining **Automatic parts feeding**
Ultrasonic welding **Camera checks**
Greasing **Bushings** **Roll-forming**
etc.



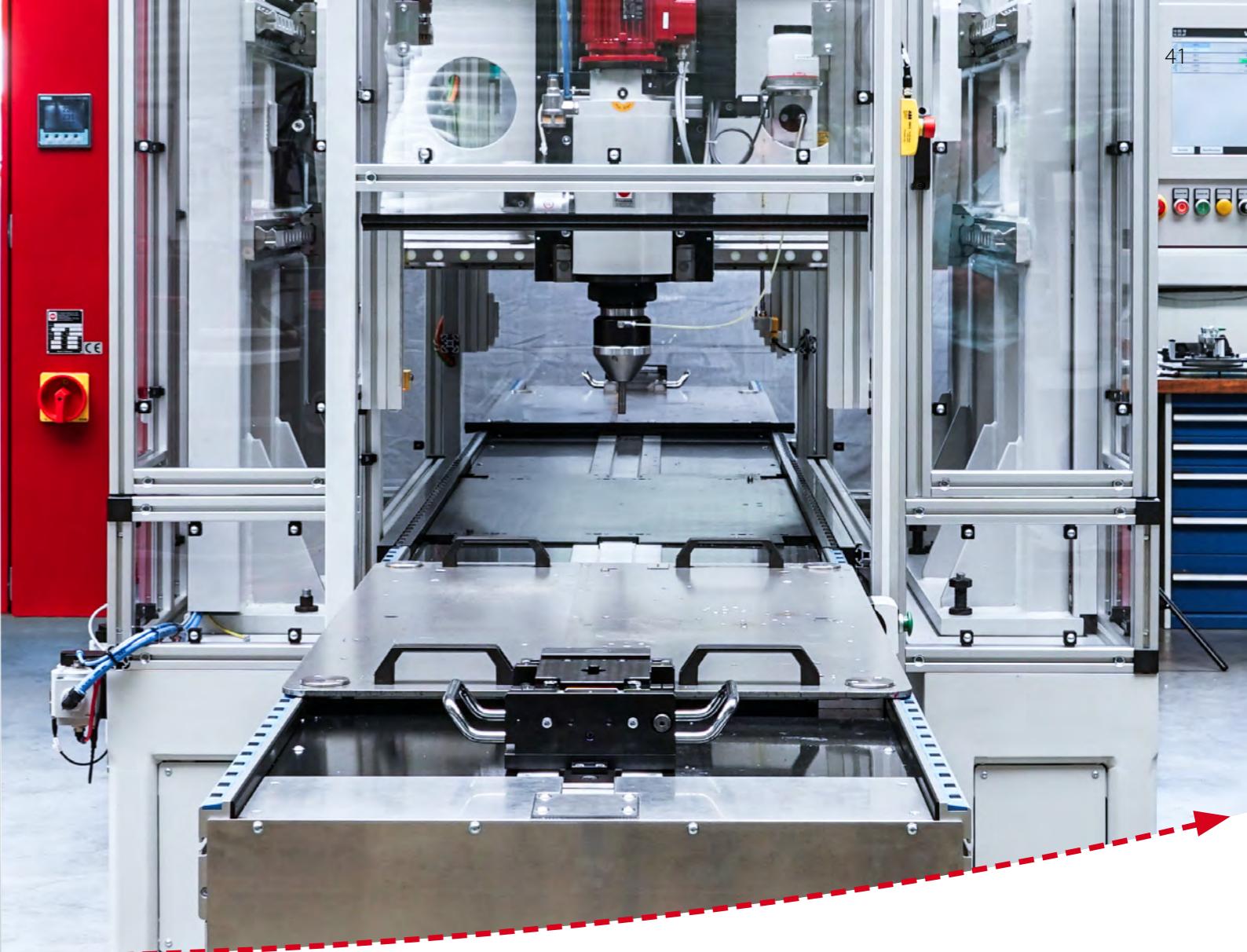
e.g.: Feed systems for correctly positioned component provisioning



... Tensioning, gripping and clamping units support the assembly processes



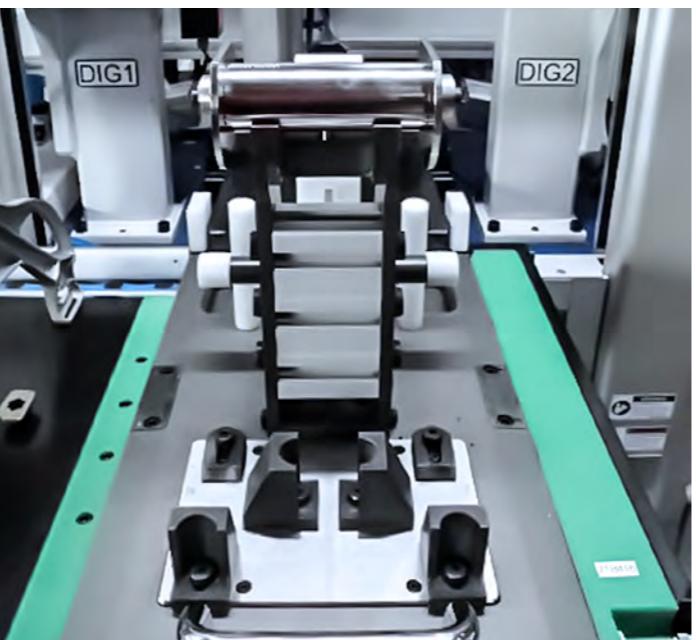
... Bolting station with depth limitation and network interface



Project examples:

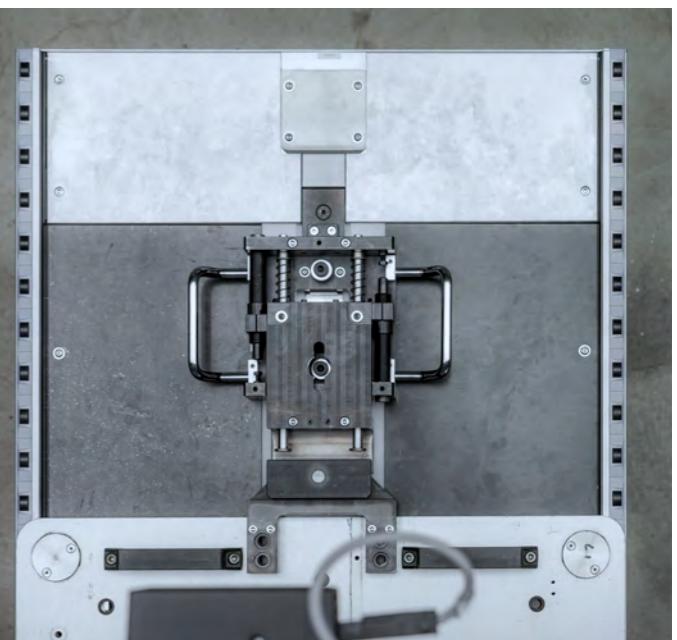
Assembly system with 2 horizontally working riveting units with measuring system, manual transfer system and testing station

- 2 x NE513 40kN max. force
- Riveting and test station, each with safety guard and 1-hand start
- Checking of all components for presence and correct position
- Manual cross transport section between test and riveting station
- Testing and joining station with force measuring device
- Alternating horizontal riveting of 2 riveting points. **With tolerance class categorization**



Portal riveting machine with pneumatic riveting unit and measuring system

- NE400 25 kN max. force
- Riveting area 800 x 500 mm
- W-axis for overall lift of riveting unit of 270 mm
- Servo conveyor belt section with indexation and locking of workpiece carrier in position
- Workpiece carrier coding
- Belt drive with protective function
- Riveting volume area > 1 m³
- Active workpiece acceptance system
- Pick-by-Light and Place-to-Light via Bluetooth data transfer



We provide long-term support to our customers with an extensive range of services

FMW Friedrich stands for modern and reliable technical solutions – as well as for trusting and long-term customer relationships. We also fulfill this commitment with excellent service in order to reduce downtimes or product discontinuations in your production to a minimum.



Riveting laboratory service

- Flexibly equipped test laboratory for a wide range of **riveting tests and sample riveting**
- **Practical support and advice** on the process from experienced technicians and engineers
- Speedy production of application-related **devices and tools** for test purposes and for sample series
- **Optimization and cost reduction** of your planning phase through early validation of the riveted joint

Spare parts service

- **Permanent availability** of all common parts for riveting machines in stock
- **In-house spare parts production** allows for prioritization of time-critical spare parts
- High delivery capacity as well as **express shipping**
- **Pre-assembly** of assemblies and project-related configuration
- **Complete sets** for overhaul of assemblies
- Installation support via **remote support**
- **Worldwide partner network** for optimal spare parts supply on site



Your direct line to our specialists:

Service hotline: **+49 7151 9790549**
or E-Mail: **service@fmw-friedrich.de**

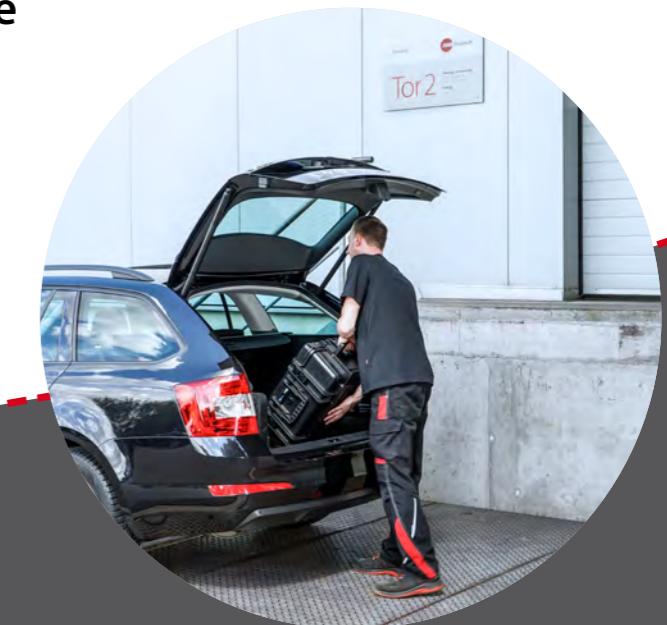


Repair service

In our factory in Remshalden, we provide individual service solutions for almost any machine ever manufactured by FMW Friedrich. These solutions include:

- Inspection and maintenance
- Repair
- General overhaul
- Express repair
- Modernization
- Conversion

Replacement or loan machines are available.



Field service

On-site service by FMW Friedrich service technicians and programmers – worldwide

- Failure and root-cause analysis
- Fault remedy
- Technical advice and setting assistance
- Staff training for your employees
- Calibration and testing service
- Commissioning of our products
- Deliverables from our repair service

The centralized structure of FMW Friedrich's service management means that you will always have the same contact person, making it easier for organization on your side.

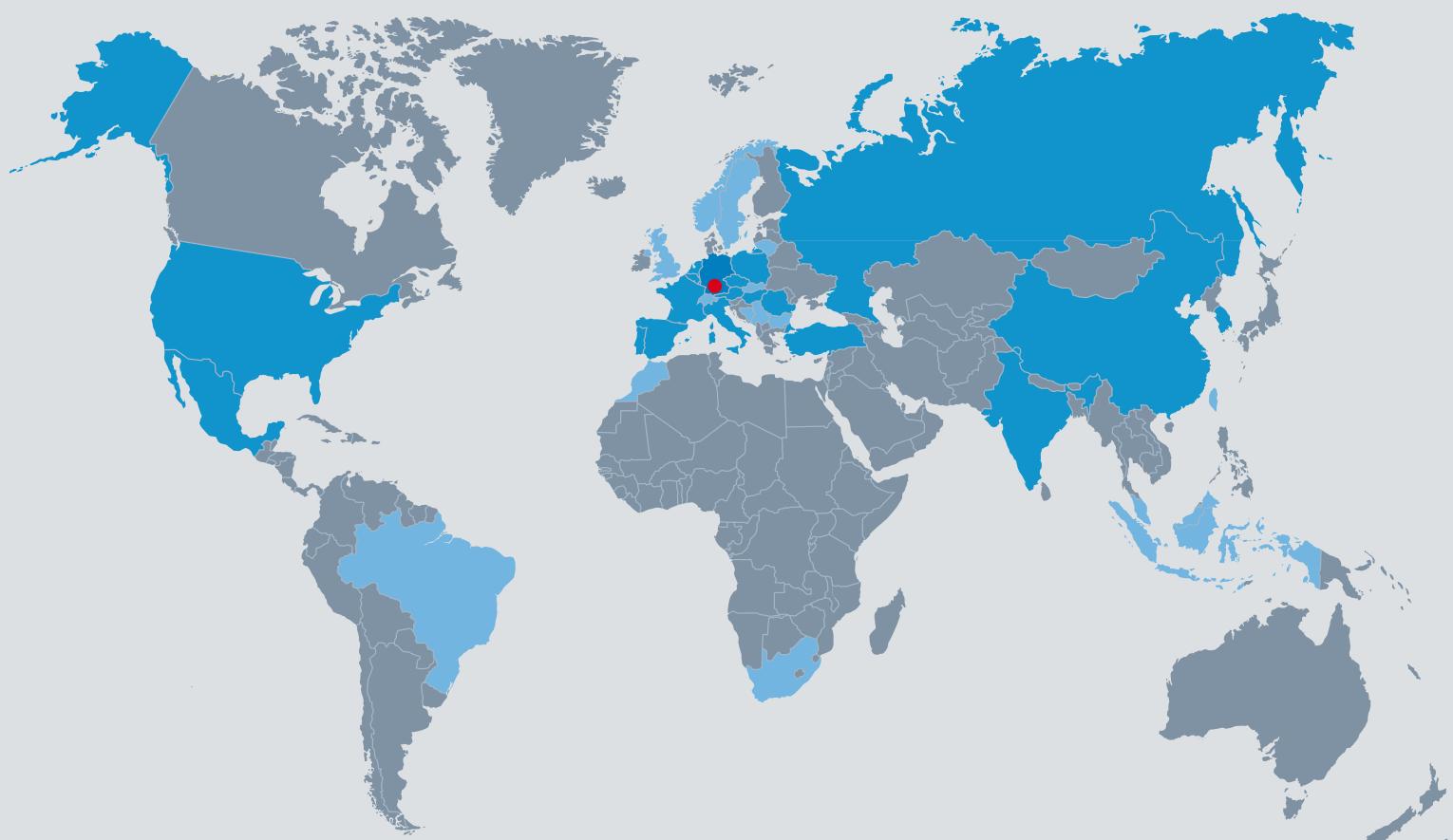
FMW Friedrich – worldwide

Advice or technical support – our sales and service partners are generally traditional mechanical engineers and are available to support you with qualified staff. If required, FMW service technicians will assist you.

- Countries with regional FMW sales partners
- Countries with existing supply relationships

Please see our website for the contact details of our international partners

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