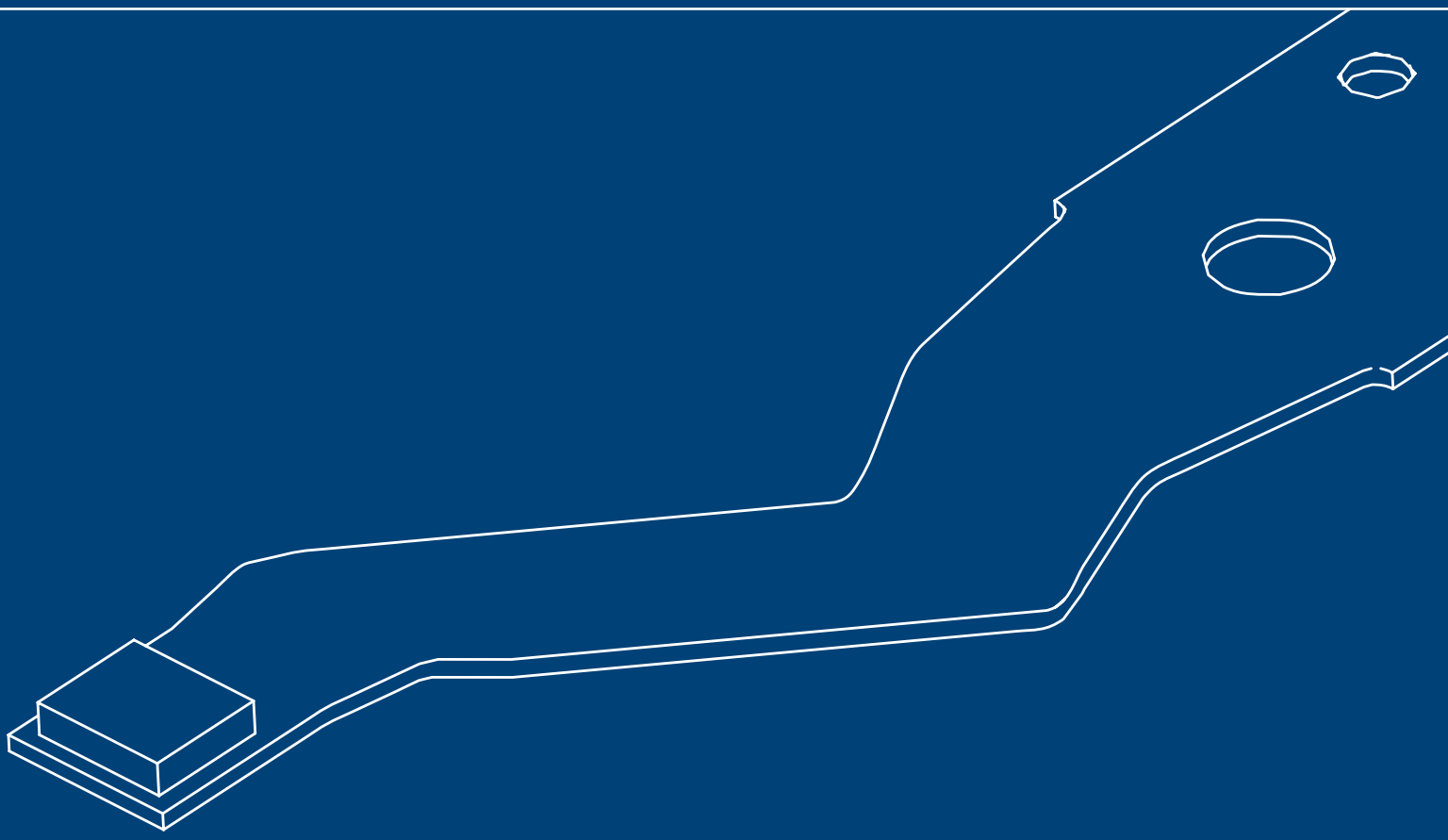
# BIMERIC BW 4500

High-end production system for the manufacture
of contact parts for industrial circuitry



BIHLER

# BW 4500

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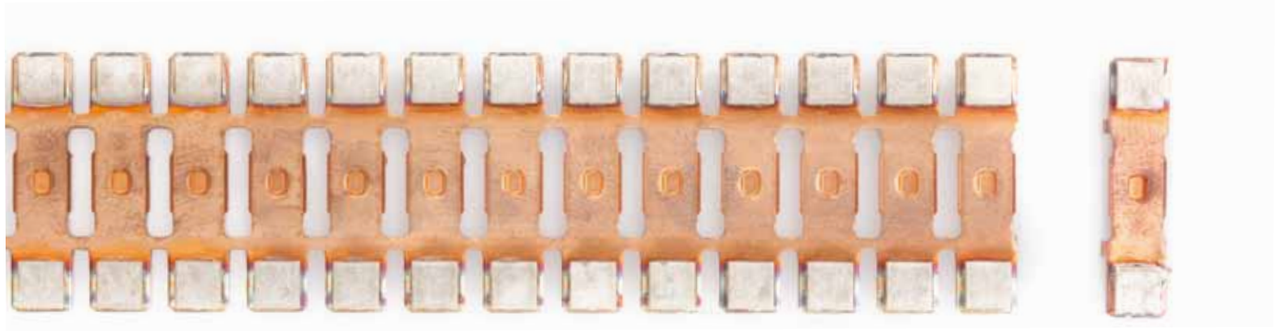
## Ultimate productivity and extremely short set-up times

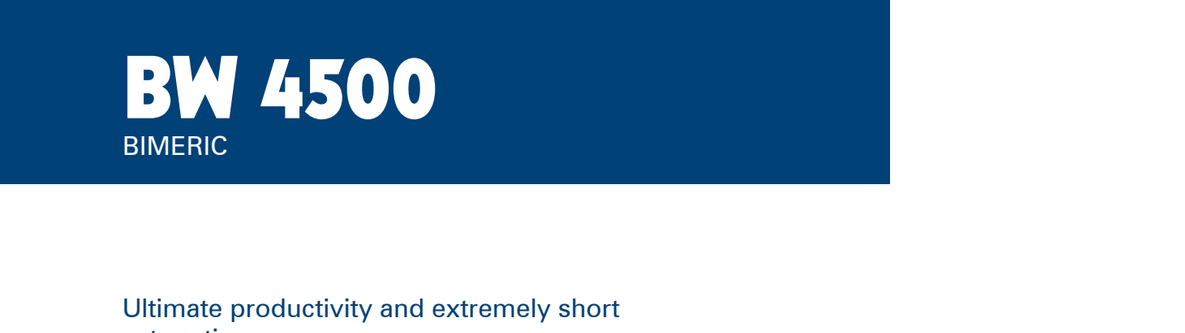
With its high-end production system BIMERIC BW 4500 Bihler can now offer users a complete system for highly efficient production of electrical contact parts. The fully automatic NC production system offers output rates up to three times as high and set-up times up to four times as fast compared with existing systems of other manufacturers.

The modular design of the machine means that existing progressive dies can be fully integrated. Continuous process and quality control and the central machine and welding control system VC 1 are further components of the system.

Example of a double-trap single contact



Example of a solder contact



Example of a dual contact

Example of a single contact

## A wide range of applications

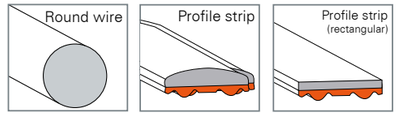
The BIMERIC BW 4500 is designed for the production of different types of electrical contact parts for industrial circuitry: from components for the IT industry, to process measurement and control technology, low-voltage systems as well as medium and high-voltage systems.

**Range of use**

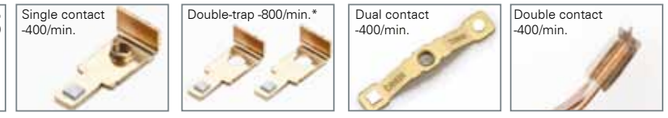
| IT technology | Process measurement and control technology | Low-voltage systems | Medium and high-voltage systems |
|---|---|---|---|

0,4x0,2x1,0 / Ø 0,2x0,5 — Contact size — 8,5x3,5x8,5 / Ø 3,0x5,5

**Semi-finished products**




**Fields of application**




* without thread forming

# BW 4500

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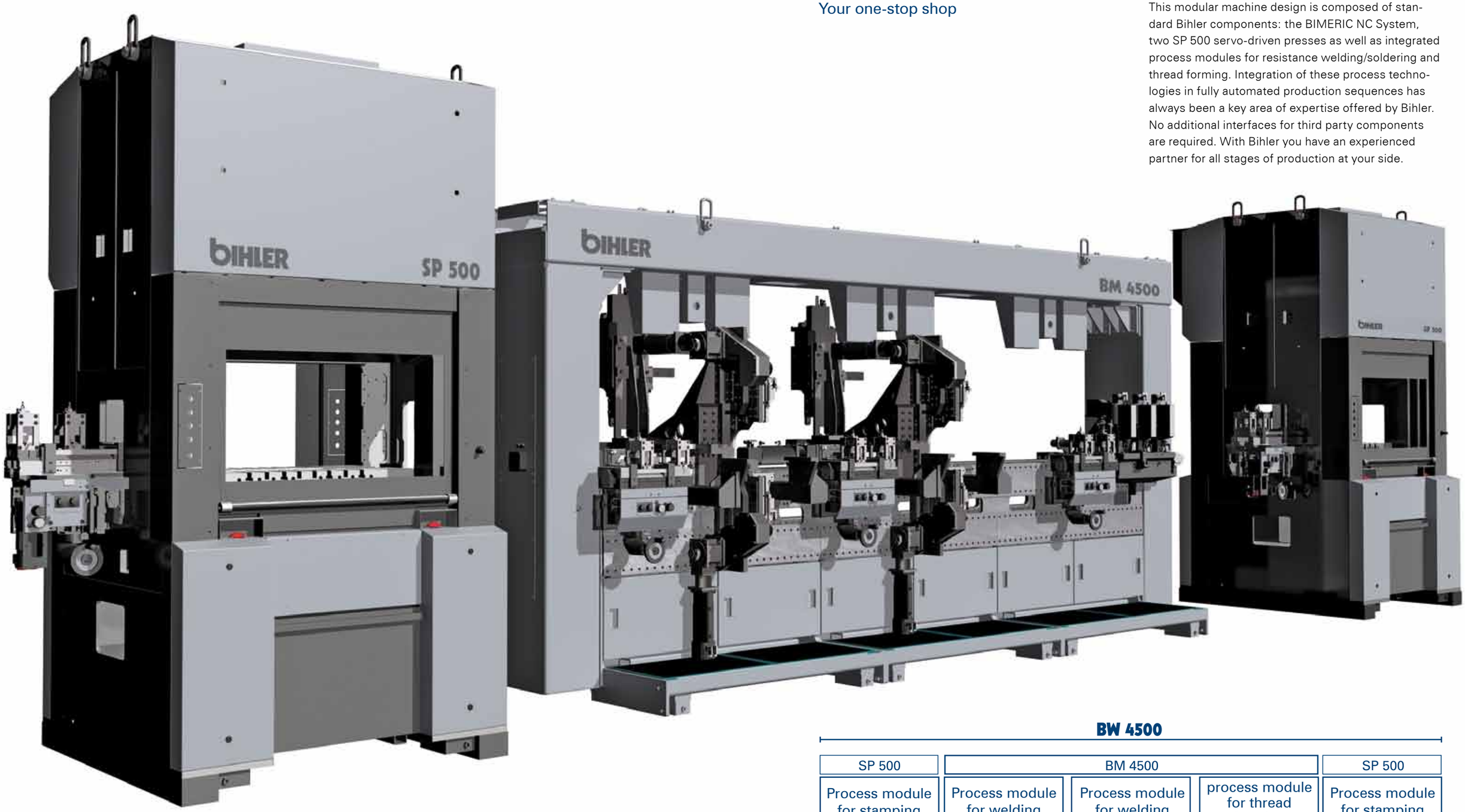


Modular design comprising standard machine models with integrated process modules

## Your one-stop shop

This modular machine design is composed of standard Bihler components: the BIMERIC NC System, two SP 500 servo-driven presses as well as integrated process modules for resistance welding/soldering and thread forming. Integration of these process technologies in fully automated production sequences has always been a key area of expertise offered by Bihler. No additional interfaces for third party components are required. With Bihler you have an experienced partner for all stages of production at your side.

**BW 4500**

| SP 500 | BM 4500 | | | SP 500 |
|---|---|---|---|---|
| Process module for stamping | Process module for welding | Process module for welding | process module for thread forming | Process module for stamping |

# BW 4500
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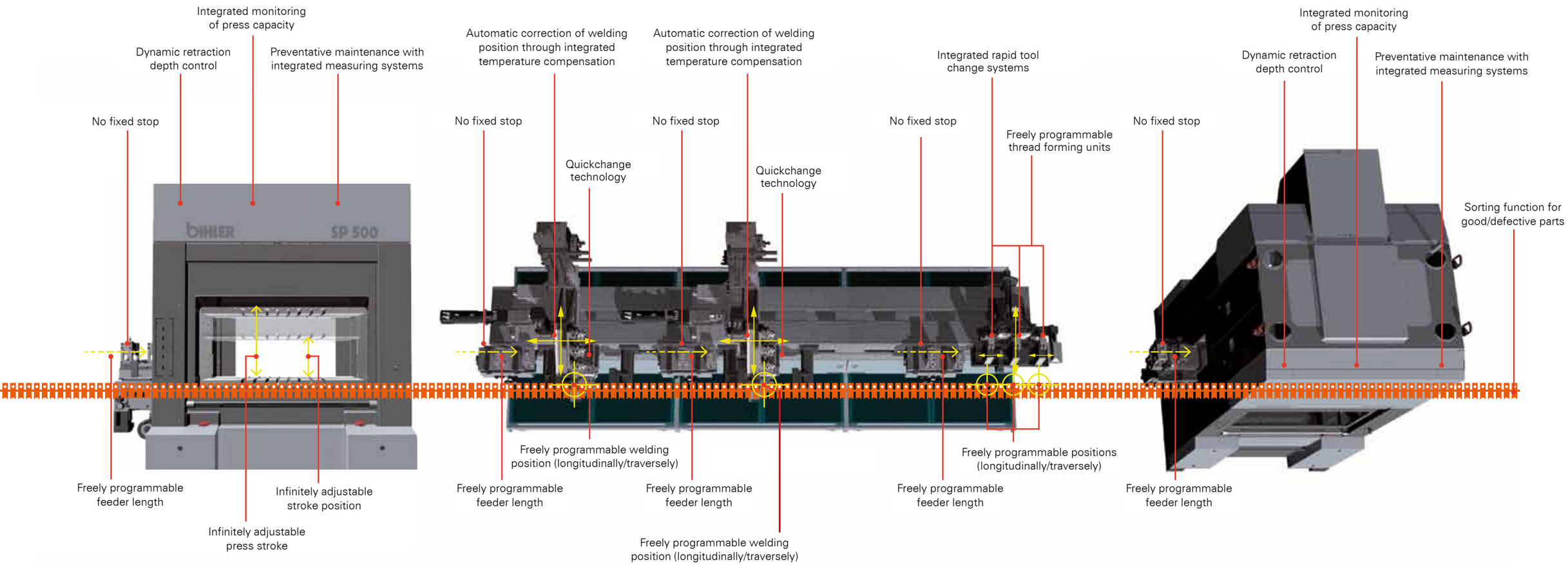
## Minimum retooling time

All NC process modules can be programmed freely. Settings can be stored in and retrieved from the super-ordinate machine and process control system.

All process modules are positioned fully automatically. All components that need replacing (e.g. strip guides, welding electrodes, etc.) are designed for process and user-oriented handling. Any items that need replacing are available as modular sets. All integrated process modules are fitted with rapid clamping and changeo-ver systems.

All positions, parameters and adjustment values are stored in the tool program.




Schematic diagram of the whole facility showing technical product features

# BW 4500

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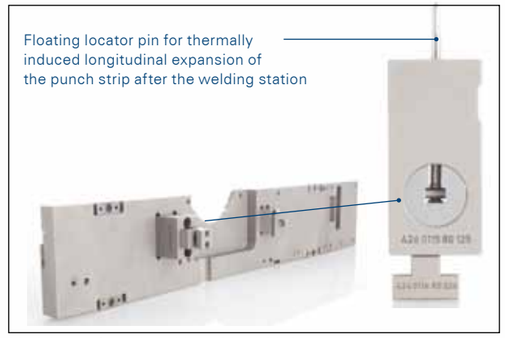
## Decoupled processes

Each production stage consists of a stand-alone system with NC material feed. This division avoids the problem of faults caused by upstream processes (e.g. expansion of the strip at high temperatures and oscillations) and means different production speeds can be implemented (cycle-based production e.g. thread forming).

## Main product features

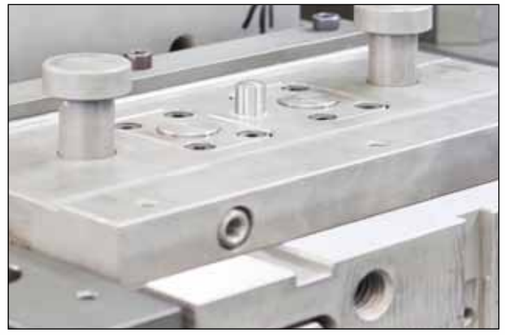
- Highly flexible stand-alone system for the production of electrical contact parts for industrial circuitry
- Full integration of existing progressive dies
- Continuous process and quality control with sorting function
- Fully NC controlled, fully automated production system
- Your one-stop shop for a stand-alone system; your contact partner for all processes and components

Decoupled process module




Modular set for strip guides with rapid changeover system

Free positioning of all processing positions on two levels



Rapid locking system for all replaceable components

Applications: Bihler manufacturing systems with integrated welding technology

# BW 4500

Control system

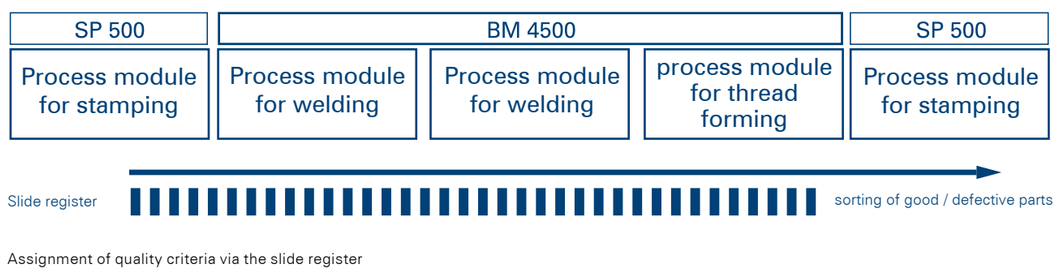
## Central control system

The stand-alone system and all process modules are controlled via a central machine and process control unit VariControl VC 1. The control system performs all necessary tasks and functions such as:

- machine control
- tool control
- axis control
- monitoring functions, e.g. measuring systems, production data acquisition
- diagnostics and help system
- all parameters are assigned to the tool program

## Continuous process and quality control

All integrated process modules are fitted with the appropriate measuring systems. Values with freely definable measuring points as well as warning or deactivation limits can be monitored and output to a visual device. This offers the possibility of displaying trends for each measuring channel. The sorting function is integrated at the end of the line and sorts defective parts from good parts.



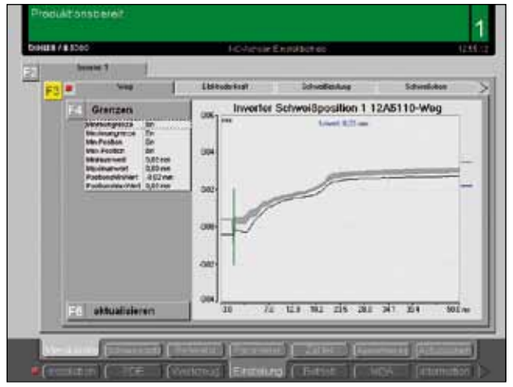

Assignment of quality criteria via the slide register

## Welding control B 5000

The welding process is controlled by the B 5000 welding control system. When entering settings for the process it is possible to select variable welding frequencies between 1000 Hz and 5000 Hz in steps of 500 Hz, for optimum adaptation of welding times (min. 0.2 ms) to the welding process. The welding profile can be defined freely in up to eight legs, allowing for flexible applications.

Integrated measuring technology such as current or voltage metering, set-back path measurement and electrode force measurement with evaluation of all measured values, intelligent linking of measuring sequences and welding time control as well as envelope functions ensure that all options for process control are available.

Online measurement capture with tracking at component level, fault monitoring and free configuration of outputs for identifying faults for the slide register of the VC 1 machine control system guarantee ultimate process reliability.




First contact welding unit

## More than 40 years of process expertise in welding applications

For more than forty years the integration of key technologies in fully automated processes has been one of the key areas of expertise at Bihler. Our comprehensive process know-how, particularly in the field of resistance welding, is a decisive factor in the success of Bihler production systems worldwide. From the development of our first welding unit in 1970 to the latest high-tech B 5000 welding system, Bihler has always set milestones in resistance welding technology.

# BW 4500

„Stamping“ process module / servo-driven press SP 500

## Flexible integration of progressive dies

The servo-driven press SP 500 was developed in close collaboration with Minster. It has freely programmable stroke and stroke position adjustment. This means that progressive dies can be integrated flexibly into the servo-driven presses. Only two values are needed for programming: stroke length and opening value at bottom dead centre. These values are stored in the tool program and are set automatically when changing tools.

A dynamic retraction depth control is integrated to ensure a safe punching process. This adjusts the position of BDC during operation throughout the whole speed range. The direct drive via a highly dynamic torque motor is ideally designed for high performance and flexibility of the forming process. There is also the option of programming slide stroke movements individually. Tool change systems guarantee very short changeover times.


Easy integration of existing progressive dies


Reduction of rigging and set-up times

## Preventative maintenance with integrated measuring systems

Various sensor systems have been integrated for maximum operating safety. Continuous measurement of values such as temperature, force, path and vibration and their comparison with stored thresholds and limiting curves prevent damage to press and tools. If these thresholds are exceeded or are not reached, the machine is stopped automatically so any necessary maintenance work can be carried out.

## Technical data*

| | |
|---|---|
| Speed: | 400 1/min |
| Nominal power: | 500 kN |
| Stroke range: | 15 mm - 63 mm |
| Stroke position range: | 0 - 60 mm |
| Tool mounting plate (LxW): | 1000 x 560 mm |

* For further values see technical data for the whole system

Pre-clamped roller guide systems and recirculating roller guides

# BW 4500

„Welding“ process module

## High performance and high flexibility with servo drives

Two process modules for resistance welding, each with one contact welding device, are integrated in the BW 4500. The modules are powered by servo drives. The combination of the cam plate and NC technology makes overlapping time/movement profiles (e.g. resistance soldering and welding using one curve) possible for the welding gun.

## Integrated temperature compensation

The welding module is fitted with integrated temperature compensation. This guarantees automatic correction of the welding position in the direction of the feed. Hence the correct position of the welding point can be determined independent of belt expansion caused by high temperatures. A downstream optical measuring system has been integrated as an additional check of the position of contact parts.

Parts subject to high temperatures are fitted with integrated cooling elements to dissipate heat. The electrode force measurements and set-back path measurements deliver the required process data. The welding module can be set up for a welding position above and below. All Bihler contact welding units D1Q – D3Q can be integrated.

Welding process module without contact welding unit and kits for strip guidance


Welding process module with integrated welding tool and guide set

## Contact welding devices with the new „Quickchange“ system

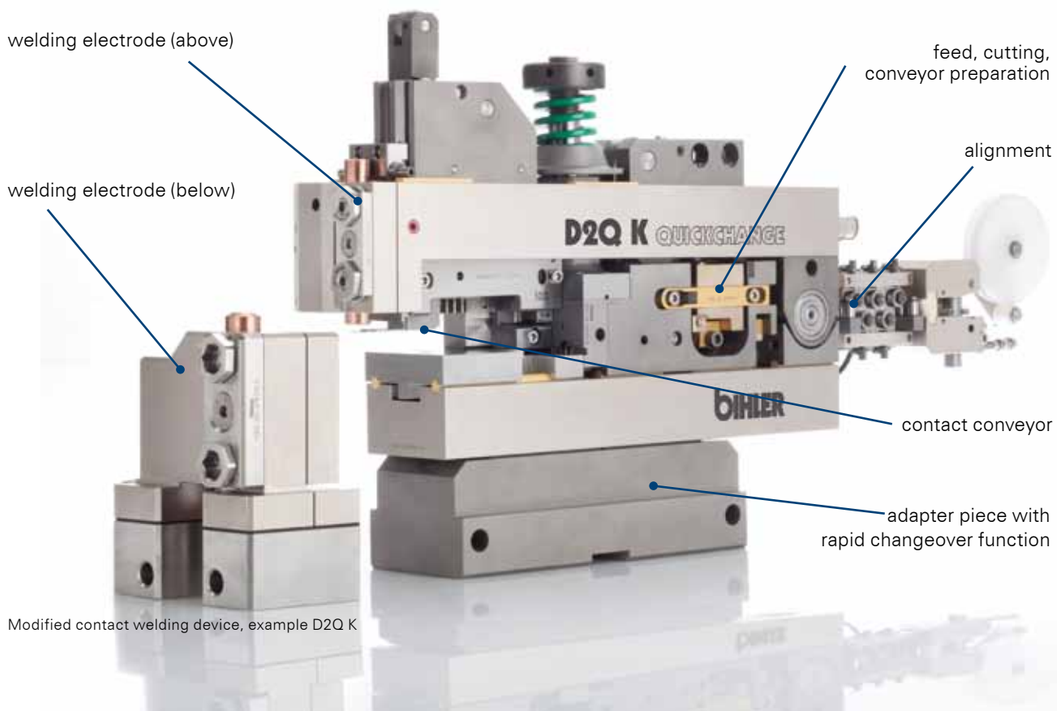
Bihler contact welders are stand-alone systems with a modular design. They carry out all production stages, from feeding in the contact material through conveying, cutting and positioning, through to the fully welded contact piece.

In addition, the integrated „Quickchange“ technology offers numerous options for flexible applications and fast changeovers, such as:

- processing different contact profile shapes with one gripper system
- feeder length can be adjusted freely
- infinitely adjustable welding force
- electrodes can be replaced without dismantling the unit
- replacement sets ready for use

Replacement sets integrated in the contact welding device

Rapid clamping system prevents distortion of the welding electrode




Modified contact welding device, example D2Q K

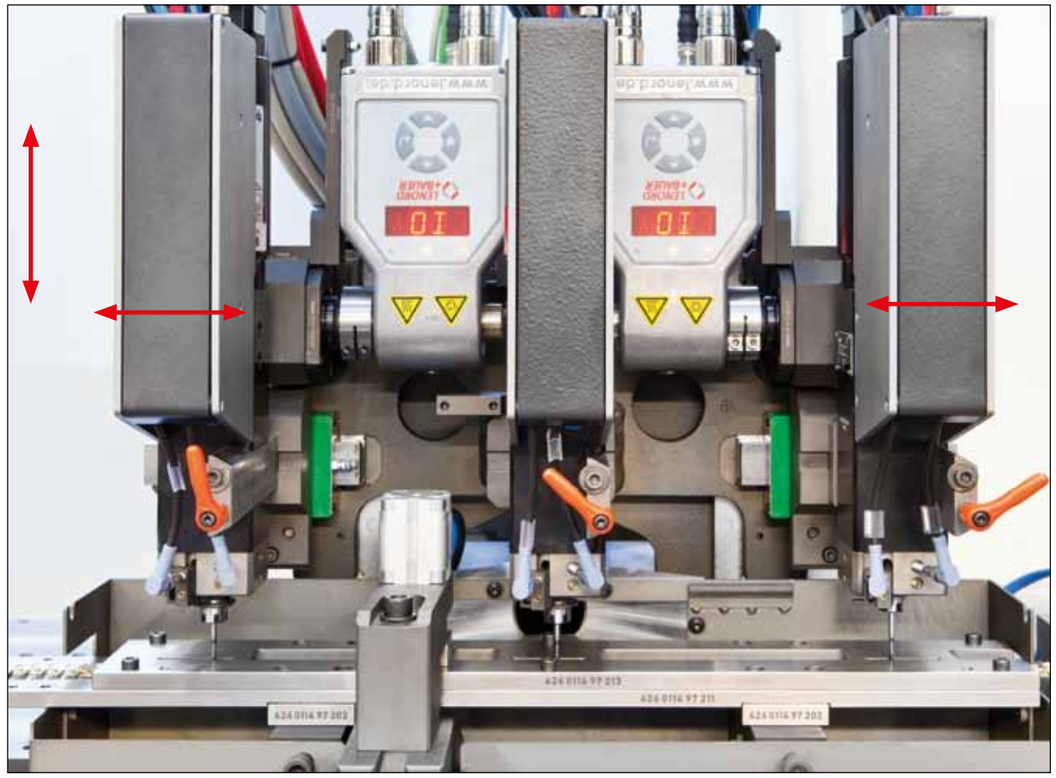
# BW 4500

„Thread forming“ process module

## High-speed thread forming

The process module is composed of three high-speed GSE KS thread forming units. Their position in relation to the component can be set individually. The GSE KS units can be programmed freely in relation to process parameters (e.g. thread size, stroke, cutting speed). This makes different pre-strokes and return stroke speeds possible, for example.

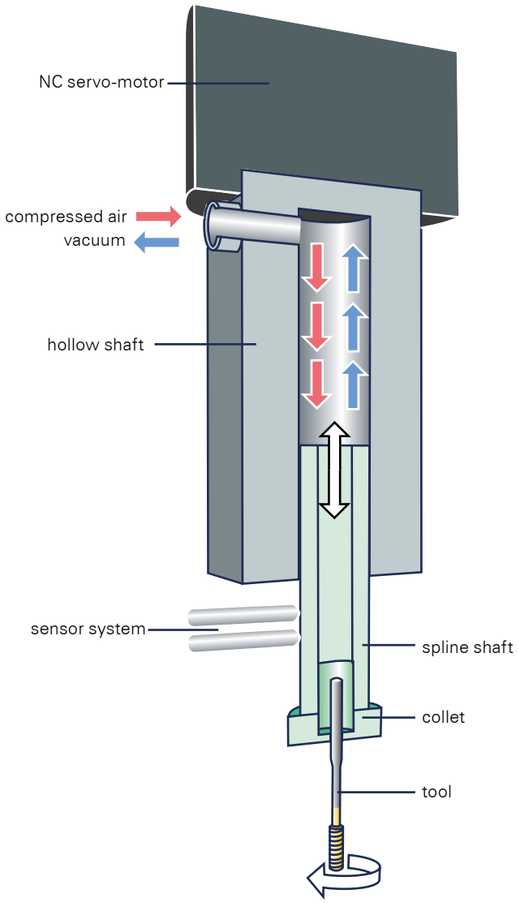
Freely programmable processing positions of the GSK KS units



Overview of the thread forming process module

## Operating principle

The working stroke is created by the spline shaft sliding inside the hollow shaft of the servo-motor. During the feed the sleeve is pressurised with compressed air. The pressure can be adjusted freely. The return stroke is created by a vacuum. The spline shaft is fitted with a collet and union nut for changing the thread former. A second spline shaft can be mounted optionally for even faster tool changes.




Operating principle GSE KS units

## Extremely low wear and short set-up times

The patented process modules have exceptionally low wear and extremely short set-up times. They do not need a mechanical pitch leader. This innovative principle reduces mechanical wear on tools significantly.

Free feed movement means programming is totally flexible. There is no longer any need to change mechanical components in the unit.

The GSE KS units are fitted with a rapid tool change system which can be pre-adjusted with the assembly jig and guarantees set-up times of seconds only.

Thread former in quickchange system

## Rapid changeover system

- Spindles with thread former can be changed in seconds
- The thread forming size can be changed in seconds

# BW 4500
Technical data

| Component | Type | Value (min.) | exactly | max | Phys. size |
|---|---|---|---|---|---|
| | Drive type | | Direct torque motor | | |
| BW 4500 | Overall dimension (w x h x d)[1] | | 10,3 x 2,9 x 4,1 | | m |
| BW 4500 | Conatct type | Single contact, dual contact and double contact | | | |
| BW 4500 | Carrier belt (w x s) | 20 x 0,5 | bis | 100 x 2 | mm |
| SP 500 | Feed length | 2,5 | bis | 80 | mm |
| SP 500 | Integrated tool size available | | | 500 x 350 x 1000 | mm |
| SP 500 | Max. cycle rate for press[2] | | | 400 | 1/min |
| SP 500 | Nominal power[3] | | | 500 | kN |
| SP 500 | Mounting plate (l x w) of tool | | | 1000 x 560 | mm |
| SP 500 | Tool installation height[4] in TDC / in BDC | 266 / 227 | | 350 / 311 | mm |
| SP 500 | Floor to upper edge of mounting plate | | ca. 1150 | | mm |
| SP 500 | Opening in pedestal, lateral | | | 254 | mm |
| SP 500 | Slide surface | | | 1000 x 500 | mm |
| SP 500 | Infinitely adjustable stroke position | 0 | | 60 | mm |
| SP 500 | Infinitely adjustable stroke | 15 | | 63 | mm |
| Process module “Welding” | Contact geometry[5] | Square, profile, round wire | | | |
| Process module “Welding” | Contact size – round[5] | Ø 0,2 x 0,5 | | Ø 5,0 x 5,5 | mm |
| Process module “Welding” | contact geometry - profile and square[5] | 0,4 x 0,2 x 1,0 | | 8,5 x 3,5 x 8,5 | mm |
| Process module “Thread forming” | Thread sizes GSE KS1[6] | M2 | | M6 | mm |

1) without winder with control cabinet
2) with 30 mm stroke
3) with crank angle of 30° before BDC and stroke = 30 mm
4) dependent on stroke position and stroke
5) see technical data for Bihler contact welding units
6) for further sizes see Process Modules GSE KS2 – KS3 / Technical Data

# BW 4500
Support

## Technical support

Bihler machines are noted for their proverbial reliability. However, if a problem should occur, our team in our Technical Support department will be happy to help you.

- Hotline
- Remote control
- Field maintenance technician

### Remote control

Remote maintenance saves time and money. On receiving your approval, a Bihler specialist will connect to your machine, detect any faults in the control system and will resolve operating faults and input errors immediately.

### Experience service technicians

If on-site maintenance is necessary, we will send an experienced service technician to you at once. He will ensure that you can start up production again as quickly as possible.

When prompted, activate the secure link by pressing this button on the operating console on the control unit.

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