SCAN ME

LINGL SCHWEISSTECHNIK ResistanceWelding

Product information and technical specifications

Pneumatic welding pincers
Pneumatic welding heads
Motorized welding heads and welding pincers
Welding controls and transformers
Secondary switch
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Manual workstations
Component sets
Automated system solutions - customized special machine construction
Compacting
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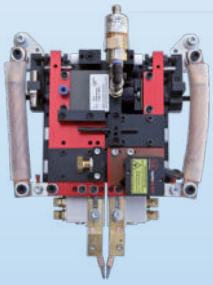
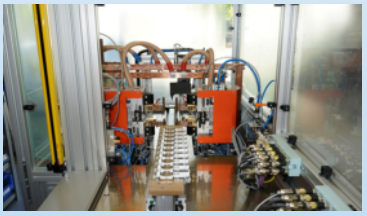
Process monitoring
Measuring techniques





Quality management
ISO 9001:2015
certified

Environmental management
ISO 14001
certified

TISAX Scope ID: STH57C – Assessment-ID: ACT9T6-2 / TISAX and TISAX results are not intended for the general public / The results are available via the ENX portal at: https://portal.enx.com/en-US/TISAX/tisaxassessmentresults

LINGL Schweißtechnik GmbH
Otto-Hahn-Straße 9 - D-82216 Maisach - Phone: +49/ 8141/ 10 39 50
info@lingl-schweisstechnik.de - www.lingl-schweisstechnik.de

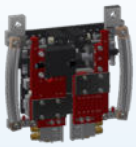
Pneumatic welding pincers

The welding pincers in the PZ series are activated via a pneumatic cylinder and the force is set reproducibly via a proportional valve. The re-setting behaviour is ensured by an integrated spring system or friction-optimized cylinders. Guidance is provided by pre-tensioned ball bushes or guide rails.
The closing movement depends on the accessibility of the welding point and the force that the component can absorb. There is a floating version in which the pincer is supported by a force on the component. If this is not possible, the pincer can be designed to close centrally, which requires precise positioning of the component. In addition, the contact electrode can be adjusted to a fixed position using a lateral feed cylinder.
Force and displacement measurement can be integrated into all pincers. The compact design enables integration into your production units. Naturally, each product is adapted to the customer's specific requirements.

PZ-1

Force range:	10 N - 223 N
Stroke:	30 mm
Dimensions (WxHxD):	289 mm x 191,5 mm x 107,5 mm
Weight (approx.):	10 kg

PZ-2



Force range:	10 N - 1080 N
Stroke:	30 mm
Dimensions (WxHxD):	285 mm x 280 mm x 88,5 mm
Weight (approx.):	10 kg

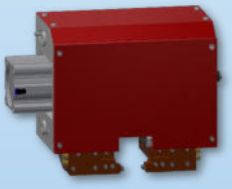
PZ-3

Force range:	30 N - 890 N
Stroke:	30 mm
Dimensions (WxHxD):	245 mm x 216,3 mm x 136 mm
Weight (approx.):	12 kg

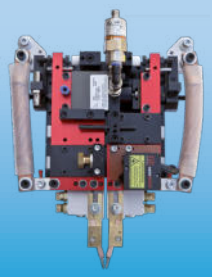
PZ-4

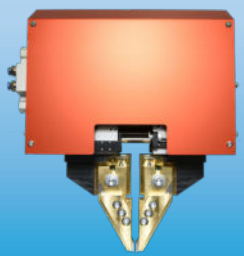
Force range:	300 N - 3.857 N
Stroke:	40 mm
Dimensions (WxHxD):	350 mm x 341 mm x 195 mm
Weight (approx.):	41 kg

PZ-5



Force range:	1.000 - 7.700 N
Stroke:	60 mm
Dimensions (WxHxD):	480 mm x 356 mm x 290 mm
Weight (approx.):	80 kg





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info@lingl-schweisstechnik.de - www.lingl-schweisstechnik.de

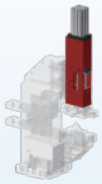
Pneumatic welding heads

The welding heads in the PSK series are activated via a pneumatic cylinder and the force is set reproducibly via a proportional valve. The integrated spring system guarantees optimum resetting behavior. Guidance is via preloaded ball bushes, the anti-rotation lock is easily accessible from the outside.
Depending on the application, the design of the welding heads ranges from single guide heads to double heads and versions with a lower lifting cylinder. The smaller heads are ideal for thermocompression applications due to the low contact forces. All heads are prepared for the integration of force and displacement measurement.
The compact design enables integration into your production units. Naturally, each product is adapted to the customer's specific requirements.

PSK-0

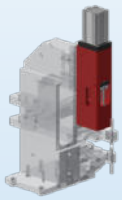
Force range:	1 N - 35 N
Stroke:	15 mm
Dimensions (WxDxH):	90 mm x 63 mm x 284 mm
Weight (approx.):	5 kg

PSK-2



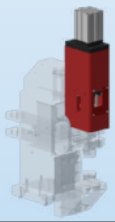
Force range:	10 N - 265 N
Stroke:	30 mm
Dimensions (WxDxH):	38 mm x 71 mm x 190 mm
Weight (approx.):	1,2 kg

PSK-3



Force range:	20 N - 1.060 N
Stroke:	30 mm
Dimensions (WxDxH):	60 mm x 81 mm x 225 mm
Weight (approx.):	3,1 kg

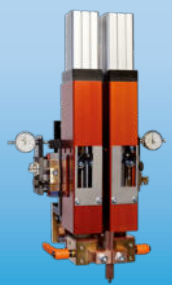
PSK-4



Force range:	30 N - 4.239 N
Stroke:	40 mm
Dimensions (WxDxH):	98 mm x 140 mm x 310 mm
Weight (approx.):	13,6 kg

PSK-5

Force range:	120 - 16.965 N
Stroke:	50 mm
Dimensions (WxDxH):	198 mm x 198 mm x 350 mm
Weight (approx.):	59 kg



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Motorized welding heads and welding pincers

The motorized welding heads and welding pincers with electromagnetic linear drive have been specially developed for welding tasks in micro-assembly. The welding heads can be used individually as a welding head or combined as a gap welding system or as „electric floating“ pincers.
A high-precision electromagnetic linear drive is used here and the welding times can be set in 0.1 ms increments.
The welding advantages of the motorized welding heads and welding pincers result from the principle of the electromagnetic linear drive. The perfect repositioning behavior of the electrode (comparable to that of an ideal mechanical spring) ensures a further improvement in welding quality. The friction-induced self-locking known from spindle drives is avoided. In addition, the linear drives do not require any lubricants. Despite the high electrode forces available, the linear heads are only serviced with non-hazardous 24 V motor voltage.

LSK80

Force range:	2 N - 50 N
Stroke:	25 mm
Dimensions (WxDxH):	23 mm x 92 mm x 216 mm
Weight (approx.):	1,5 kg

LSK200

Force range:	5 N - 200 N
Stroke:	25 mm
Dimensions (WxDxH):	40 mm x 135 mm x 228 mm
Weight (approx.):	3,6 kg

LSK300

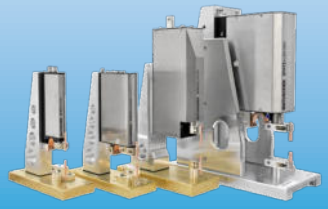
Force range:	20 N - 300 N
Stroke:	50 mm
Dimensions (WxDxH):	72 mm x 148 mm x 319 mm
Weight (approx.):	10 kg

LSK750

Force range:	40 N - 750 N
Stroke:	25 mm
Dimensions (WxDxH):	66 mm x 233 mm x 314 mm
Weight (approx.):	13 kg

LSK1000

Force range:	50 - 1.000 N
Stroke:	25 mm
Dimensions (WxDxH):	111 mm x 208 mm x 319 mm
Weight (approx.):	22 kg



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Innovation

Motorized servo welding pincer MZ-4

The motorized servo welding pincer is ideal for brazing tasks, which are increasingly being used on electric motors.
It is equipped with a high-precision servo drive, resulting in a cycle time saving of approx. 25%. The perfect repositioning behavior of the electrode is comparable to that of a mechanical spring and ensures a further improvement in welding quality and brazing quality. For optimum quality, there are additional evaluations via force measurement curves. The spindle of the MZ-4 is available in different gradations, so the MZ-4 can always work in the ideal force range and achieves optimum resetting behavior.

MZ-4

Force range:	100 N - 5.000 N
Stroke:	50 mm
Dimensions (WxDxH):	567,3 mm x 329,5 mm x 382 mm
Weight (approx.):	52 kg

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Welding controllers and transformers

The welding controllers in the SPATZ+ series are based on the principle of inverter technology. With the fastest reaction speed, the SPATZ welds just as precisely as it does powerfully and persistently. Each weld is controlled during the welding process. Constant current control (KSR), constant power control (KLR) and constant voltage control (KUR) can be used as control methods.
can be used. At the end of each weld, the SPATZ+ checks the current welding parameters to ensure that they comply with the specified limit values.

The welding control units of the SPATZ+ offer you the following advantages:
» Profibus, ProfiNet or EtherCAT capable
» Welding program can be changed via fieldbus
» Data can be read out via fieldbus without long waiting times (for MES)
The M300, M400, M600 and M900 models are also available as AC versions

Transformers: In conjunction with matched external transformers, the welding inverters can be used efficiently and optimally adapted to your application thanks to different current ranges.

P500, H9000, H12

Cycle:	20.000 Hz
Welding current range:	up to 12 kA
Rated power:	33 kVA at 50% ED
Transformer:	internal
Dimensions (WxHxD):	380 mm x 460 mm x 210 mm
Weight (approx.):	22 kg - 30 kg

H300, M300

Cycle:	20.000 Hz (H300) 1.000 Hz (M300)
Welding current range:	up to 9 kA
Rated power:	up to 90 kVA at 50% ED
Transformer:	externsl
Dimensions (WxHxD):	380 mm x 460 mm x 210 mm
Weight (approx.):	25 kg

M400, M600, M900

Cycle:	1.000 Hz
Welding current range:	up to 30 kA
Rated power:	90 kVA at 50% ED
Transformer:	external
Dimensions (WxHxD):	200 mm x 425 mm x 260 mm
Weight (approx.):	15 kg - 17 kg

Dragspatz

Cycle:	20.000 Hz
Welding current range:	up to 65 kA
Rated power:	300 kVA at 50% ED
Transformer:	external
Dimensions (WxHxD):	600 mm x 600 mm x 600 mm

Transformatoren:

Cycle:	1.000 Hz or 20.000 Hz
Welding current range:	up to 65 kA
Rated power:	up to 270 kVA

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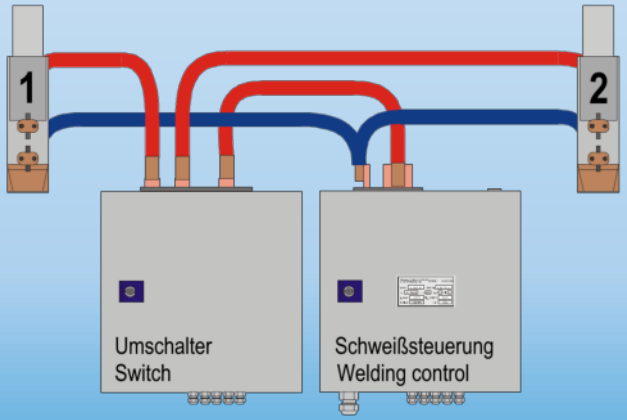
Secondary changeover switch

A secondary changeover switch is used to switch secondary circuits in resistance welding systems. The function of the secondary changeover switch is to switch the welding pulse (welding current) from one welding point to the next as quickly as possible (approx. 20 ms).
This enables the service of several welding heads/welding pincers on one welding power source. The welding heads/welding pincers can be fed or closed simultaneously to save time and carry out the weld one after the other.
This enables all-pole electrical isolation of the secondary circuits within a resistance welding system to prevent unwanted current flows (shunts) in electrically connected workpieces or system parts. The secondary changeover switches are designed for a maximum of 6 kA with a corresponding duty cycle.

Secondary changeover switch plus-minus (SPM)	For the service of a welding head/welding pincer on a welding power source. Both poles of the power source are permanently connected to the welding head/welding pincer, the polarity (+/-) is changed after each welding spot.
Secondary changeover switch 2-fold (S2F)	For the service of 2 welding heads/welding pincers on one welding power source. The negative pole of the power source is permanently connected to all welding heads/welding pincers, the positive pole is switched either to welding head/welding pincer 1 or welding head/welding pincer 2.
Secondary changeover switch 3-fold (S3F)	For the service of several welding heads/welding pincers on one welding power source with electrical separation of both poles of the secondary circuit. The positive and negative poles of the power source are only connected to the welding head/welding pincer for the welding process; this requires 1 changeover switch per welding head/welding pincer.
Mechanical secondary changeover switch plus-minus (P-SPM)	For the service of one welding head/welding pincer on one welding power source. Both poles of the power source are permanently connected to the welding head/welding pincer, the polarity (+/-) is changed after each welding spot. The switching time for a mechanical secondary changeover switch is approx. 200ms.
Mechanical secondary changeover switch 2, 3 or 4-fold (PSxF)	For the service of 1-4 welding heads/welding pincers on one welding power source with electrical separation of both poles of the secondary circuit. The positive and negative poles of the power source are only connected to the welding head/ welding pincer for the welding process. Plus/minus polarity reversal: for the service of a welding head/ welding pincer on a welding power source with the option of swapping the positive and negative poles at the welding point. The changeover time with a mechanical secondary changeover switch is approx. 200ms.



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Otto-Hahn-Straße 9 - D-82216 Maisach - Phone: +49/ 8141/ 10 39 50
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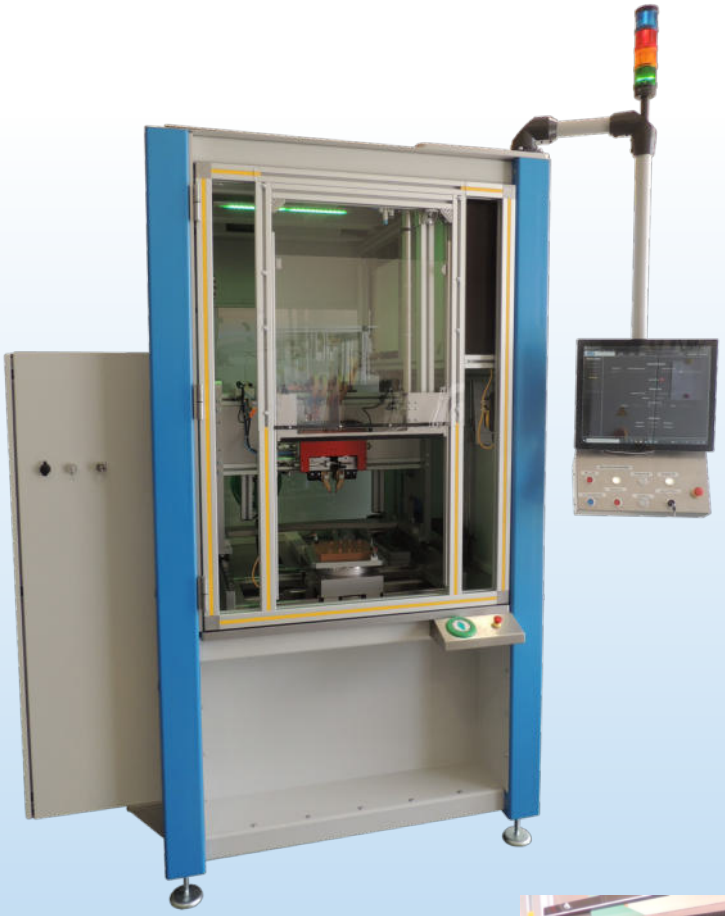
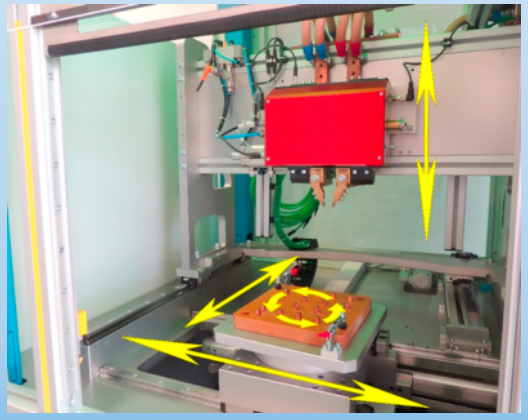
4-axis welding cell

The solution for flexible welding applications in the laboratory or small series production. The simple programming enables complex components with up to 50 welding points to be produced. The automatic process is triggered by a start button. An automatic bulkhead ensures the safety of the user. The welding result is automatically evaluated and NOK parts are displayed.

The LINGL 4-axis welding cell is simple and intuitive to operate thanks to its state-of-the-art control system. Thanks to the flexibility and simplicity of programming and all work steps, the LINGL 4-axis welding cell offers you considerable savings potential, from planning to monitoring your application. You have the option of creating a highly flexible program archive and thus save a lot of programming work.



Technical data	
Dimensions	1,650 x 1,250 x 2,320mm (W X D x H) Approx. 970 kg
Movement areas	X-axis: 400 mm Y-axis: 350 mm Z-axis: 200 mm Rotary indexing table: 360
	Moving speed 250mm/s
Clamping surface	Ø200 mm grooved table on turntable
Welding pincers: Welding heads: (also as double head)	PZ-1, PZ-2, PZ-3 PSK-0, PSK-2, PSK-3 LSK80, LSK200, LSK300 Force ranges from 1 - 1,080 N possible or mounting your own tools on the Z-axis up to 30 kg
Welding control Welding current	SPATZ+ P500 up to 500 A SPATZ+ H9000 up to 9,000 A SPATZ+ H12 up to 12,000 A
Connection	3x400V, 32A CE-compliant



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Manual workstations

Flexibility in terms of quantities and product variants is often an important factor when defining the production concept. This can often only be ensured through the use of manual workstations. We manufacture complete manual workstations for flexible applications with various tasks for laboratories, sample welding and production. If there are only a few welding points on pre-assembled parts, sliding devices with pneumatic support can reduce the cycle time and significantly increase reproducibility compared to simple manual workstations by fixing the parts in fixtures. Operator safety is ensured with protective screens, light grids, two-hand release, etc.

» Simple manual workstations

» Semi-automated manual workstations with pneumatic or manual sliding devices

» Semi-automated manual workstations with pneumatic turning devices

» ESD-compliant manual workstations

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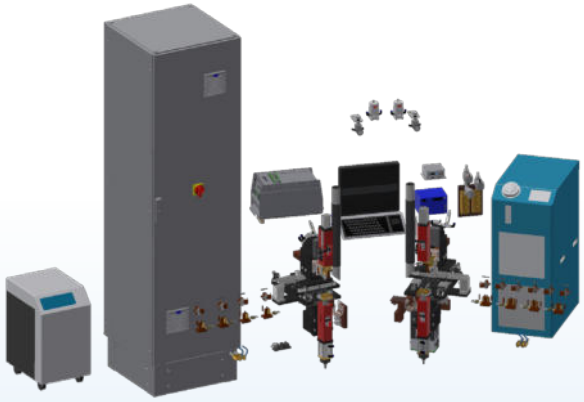
Component sets

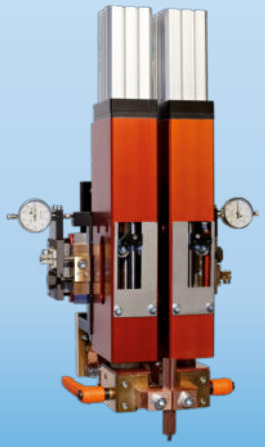
We offer you component sets consisting of the ideal equipment for your welding task. As the seamless integration of our products is paramount, we support you right through to installation and process start-up.

Optimize your machines or systems with our precision-manufactured components for the best welded joint.

Our component sets contain everything you need for your welding task, e.g:

- Welding head and/or welding pincer
- Electrode holder and electrodes
- Welding control unit
- Transformer
- Pneumatic components
- Cooling unit
- Welding fume extraction system
- Electrical connection box
- Displacement measurement
- Changeover switch
- PC and UPS
- Operating devices
- and much more





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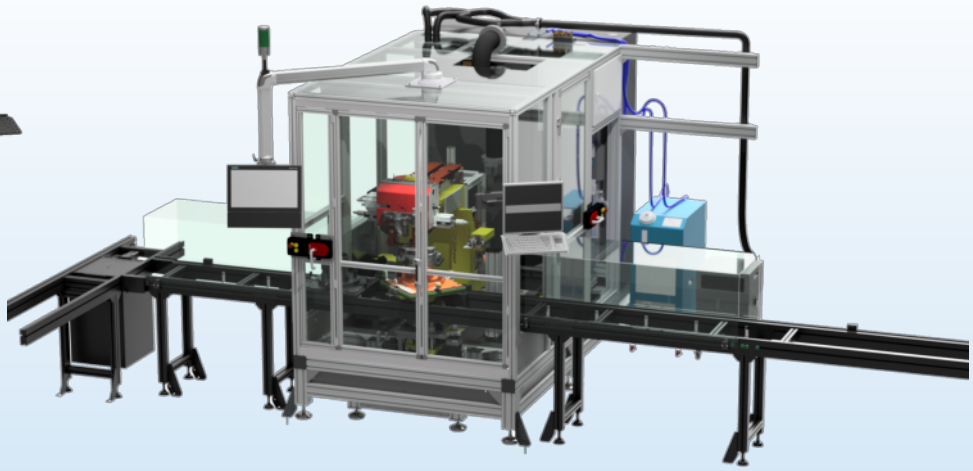
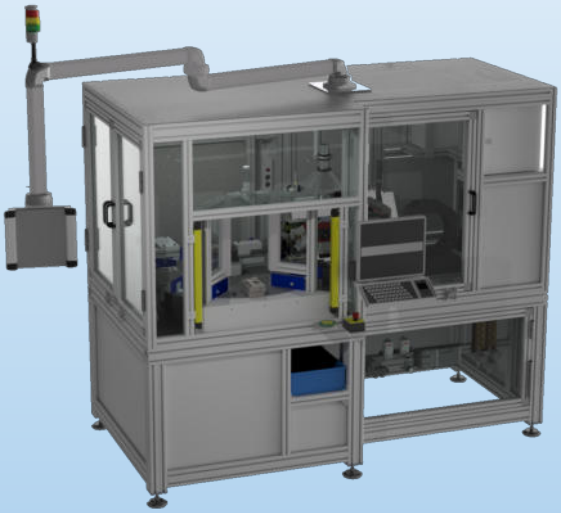
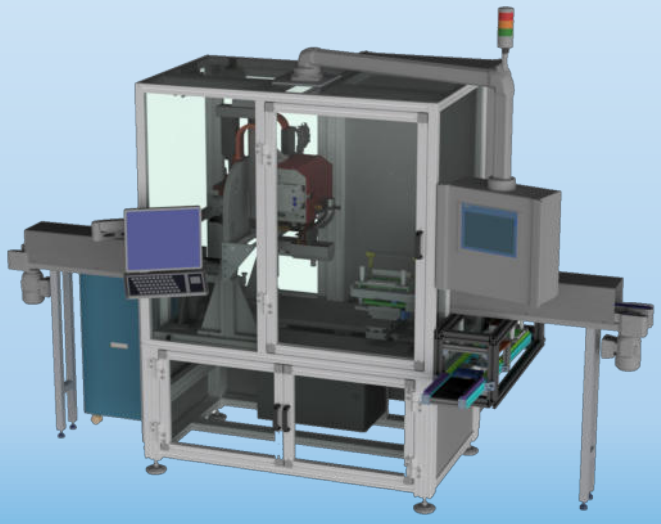
Automated system solutions - customized special machine construction

We manufacture precision-engineered semi-automatic or fully automatic systems according to your specifications, as well as modules that can be integrated into production lines.
Our focus is on resistance welding technology and individual adaptation to your product. Efficiency, safety and seamless integration are at the forefront here, thereby improving your production processes. Optimize your processes with our precision-manufactured special machines for the best welded joint.







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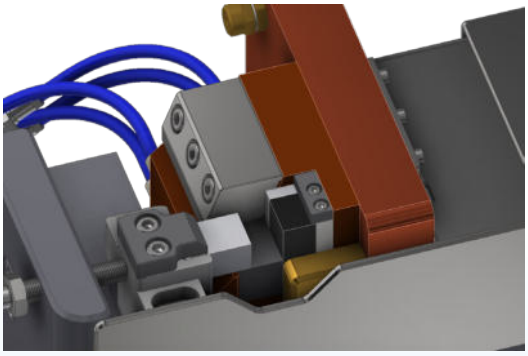
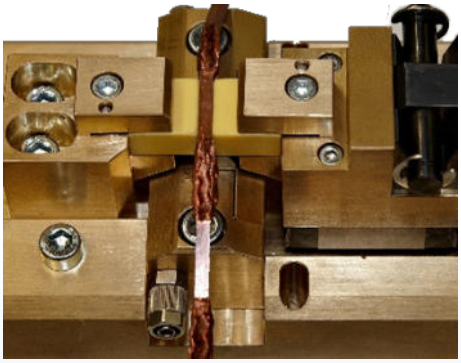
Compacting

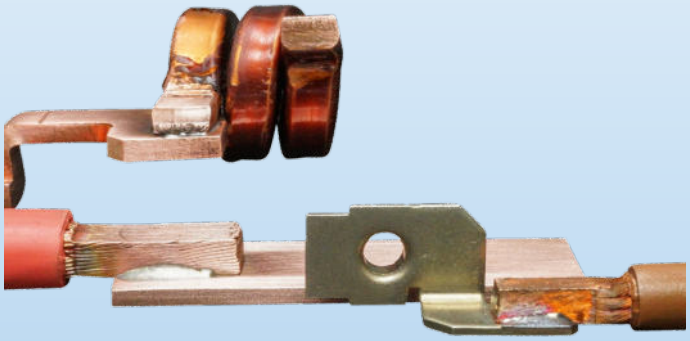
With force and heat to the final thickness.
The compacting method makes it possible to bind individual strands of wire. The strand is clamped laterally in ceramic jaws and the current is fed through the electrodes from above and below. The component is pressed to its final thickness using force and heat. Typical applications are stranded wires and enameled wires with a cross-section of 0.5 mm² - 95 mm²; a sleeve or cable lug is required for enameled wires.





Resistance brazing

Ideal for joining parts with very different masses and very bulky components that can no longer be joined by resistance welding. The great advantage of resistance brazing is that the joint only needs to be heated to the working temperature of the brazing alloy, which is usually well below the melting point of the parts to be joined. This makes it easy to produce large joint cross-sections. At the same time, the risk of damage to surrounding components is reduced to a minimum and the structural change in the base material of the joining partners is very small. Depending on the brazing alloy used and the components to be joined, a flux may be necessary.



Other welding processes (more information can be found on our homepage)

- Enameled wire welding
- Thermocompression welding
- Gap welding
- Step welding
- Sealing technology

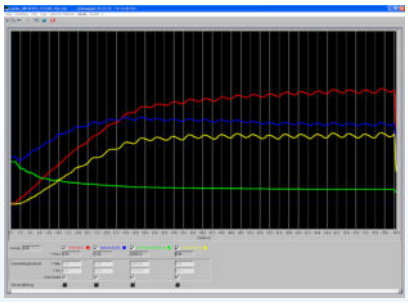
SCAN ME

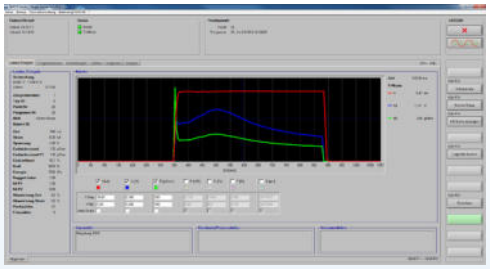
LINGL Schweißtechnik GmbH
Otto-Hahn-Straße 9 - D-82216 Maisach - Phone: +49/ 8141/ 10 39 50
info@lingl-schweisstechnik.de - www.lingl-schweisstechnik.de

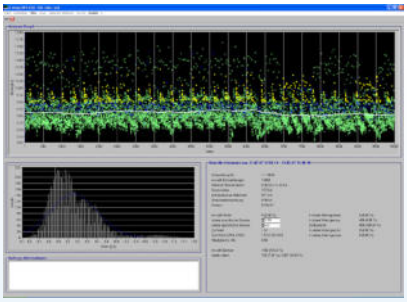
Process monitoring

Automatically control quality
In process monitoring, a distinction is made between live recording and offline evaluation.
Recording is used for monitoring and quality control. Live measured value trends can be used to intervene in the process at an early stage before poor welds occur. The software is password-protected to prevent unauthorized changes (welding program/limits) and every login is logged. Limit monitoring of the welding program is possible at any value.
Two curves can be monitored with tolerance band monitoring. Traceability of all data via date/time and/or component ID, 100k data in the controller, theoretically infinite data recording on PC/server is possible. Data transmission is possible (numerical values + welding curves) via MQTT, e.g. to „feed“ an AI

Important quality characteristics such as mean value, scatter and process capability values can be calculated in the offline evaluation.







Measuring techniques

Measurement and test data for quality assurance
In order to achieve a consistent quality of the welded joint, the process parameters must be kept constant and monitored. Our welding controllers, welding heads and pincers are prepared for the connection of measuring sensors.
We offer pressure transducers or piezo sensors for monitoring the welding force. We use digital probes and analog sensors (laser, eddy current, inductive probes) to monitor the penetration path.
Our range also includes external measuring devices for checking systems without monitoring or for calibrating permanently installed systems.

We offer the following measuring systems, among others:

Mobile measuring device Muti04
Force and displacement measuring systems.

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