

DALEX Automation & Welding

„FAST AND EFFICIENT“

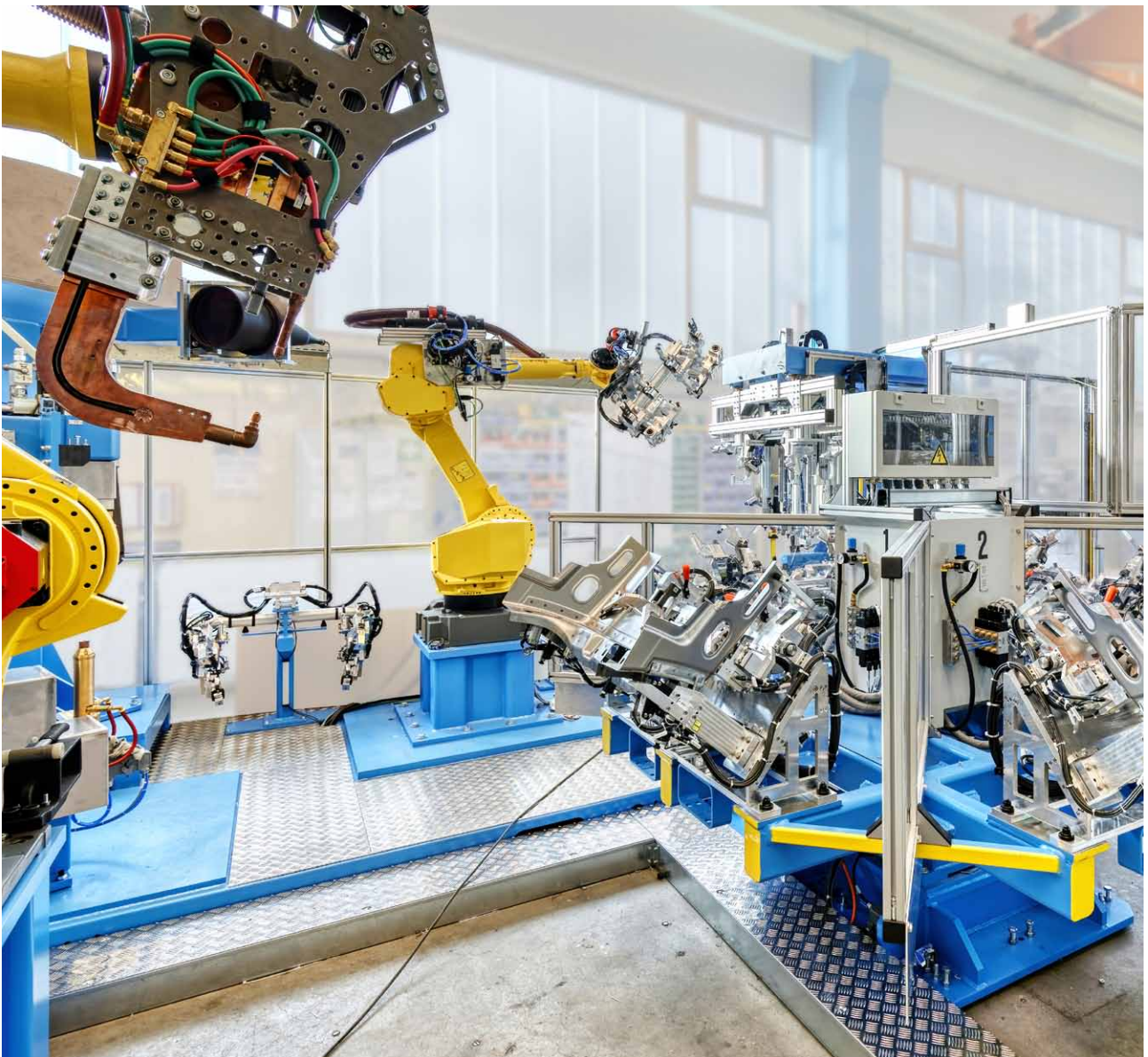
Plant solutions for
cable packaging
and electrical industry



www.dalex.de

DALEX

Automation & Welding



More than just welding - complex system solutions from a single source

ABOUT US

DALEX is not only synonymous with authoritative products in the field of resistance welding, but more importantly a reliable partner for automation.

Founded in 1911, the company began producing welding transformers 85 years ago and has since earned an outstanding reputation in welding technology, not least due to the highest quality standards. Today, our customers appreciate not only the leading products in the field of resistance welding, but also and especially the solution competence from a single source for the integration of a wide variety of joining and handling systems in complex special plants.

More than 150 experienced and specialized employees work together with customers from a wide range of industries to develop the right solution for almost any automation task - from manual welding guns to robot cells, linear transfer systems, rotary transfer systems, gantry systems and coordinate machines for resistance welding, laser welding, arc welding, soldering, gluing, press-fitting, flanging, riveting, clinching and many other technologies.

In order to expand its range of services, DALEX has taken over the business operations of Augenstein Maschinenbau GmbH from Günzburg and Oettersdorf with additional 50 employees. Focusing on conveying and feeding systems for a wide range of industries, Augenstein has also been known for very high quality products for over 40 years. The portfolio additionally includes packing, palletizing and labeling systems. Thus, DALEX can offer a wide range of products and ensure seamless integration from a single source.

*Challenge us and let us convince you
our solutions!*



Plant solutions for electrical engineering

Cable assembly, current straps and copper strands

Assembled cables are used in a wide range of areas of application. The best-known areas of application include consumer electronics and white goods. One of the most important is the automotive industry, which uses e.g. single strands and single or multi-core sheathed cables. The products are also used in system, automation and drive technology as well as battery technology, photovoltaics, wind turbines and more.

In order to guarantee the high quality of the products, DALEX has already developed and supplied many systems for well-known manufacturers of current strips, copper strands and cable assembly.

These also include fully automated systems that take over the cutting the cables to length, feeding the strands, welding the connections, signing and discharging the finished parts. Precise and fast.

Are you looking for a reliable partner for the production and planning of plants for the assembly of cables and cable sets, current springs and copper strands entirely according to your wishes and needs?

From the modified machine to the DALEX finds the solution tailored to your solution tailored to your application.

We are looking forward to your request!



Satisfaction is our goal

Well-known customers from the electrical engineering have been relying on DALEX system solutions for years



Fully automated turntable system for cable assembly

In order to optimize the production of stranded cables and to combine several work steps, the customer was looking for a system solution that would handle all tasks from cable feeding to measuring, cutting and stripping processes, feeding of the wire end contacts to welding of the contacts on both sides and ejection of the finished products - all fully automatically.



Fully automatic 16-station turntable system for cable assembly

The challenge - high diversity of variants

Welding tube connectors with cross-sections of 16, 25, 35, 50, 70 and 95 mm² and lengths of 75 to 300 mm were to be manufactured reliably, precisely and productively in the shortest possible time and in large quantities with a grid spacing of 1 mm.

The solution

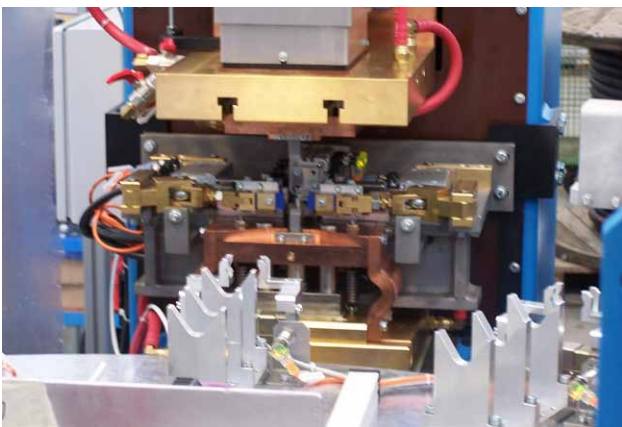
A 16-station rotary assembly machine tailored precisely to the requirements.

Fully automatic production of contacted stranded cables

By means of dancer control, the stranded cable is fed to the line from the coil/coiler unit. For the production of the various diameters and lengths, the cable is measured, stripped and cut to length.

The conveyor then transports the relevant cable section to the removal station at the turntable. A sensor automatically detects the cable. The cable is then removed from the conveyor and placed on the turntable.

Special plant solutions for special challenges

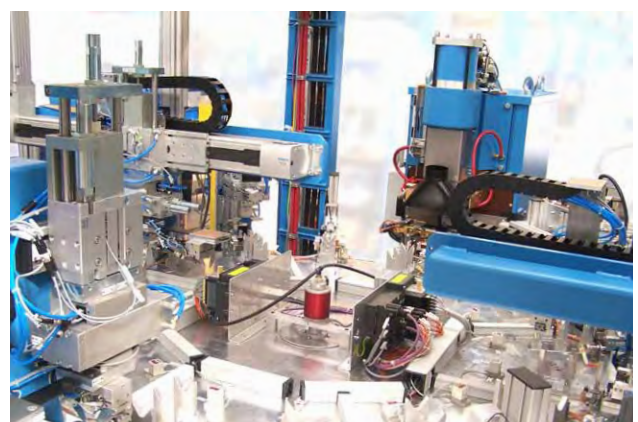


Double welding reduces times

The line is equipped with two welding stations, each of them welding one end of the cable to the end contacts. Thus, there are always two cables in the line and the quantities can be fulfilled much faster.

A spring-loaded handling unit inspects the cable, equalizes the lengths and brushes the copper wires to remove oxidation residues for optimum welding. It is then inserted into the welding station. The copper end contact lugs also enter the station automatically. During the projection welding process, the system monitors the welding current, voltage and welding path to achieve a perfect result.

Between the two welding stations, a servo-motor handling unit removes the cable, turns it, moves it into position and inserts it into the component fixture of the welding machine.



Automatic end control

After welding, the system automatically inspects the welded cables. If the parts are in order, a needle embosser marks the contacts. Then they are discharged from the system by means of a conveyor belt. If the parts are defective, they are automatically separated before marking. In the final station, a light barrier checks whether the component holder is empty after removal.

ADVANTAGES AT A GLANCE

- **Efficient and productive manufacturing** by combination of the separate work steps
- **Economically and profitably** through a single plant that covers all the different variants
- **Significant shortening of production times** due to the parallel welds

DALEX 3-PHASE DIRECT CURRENT SERIES

Robust and powerful

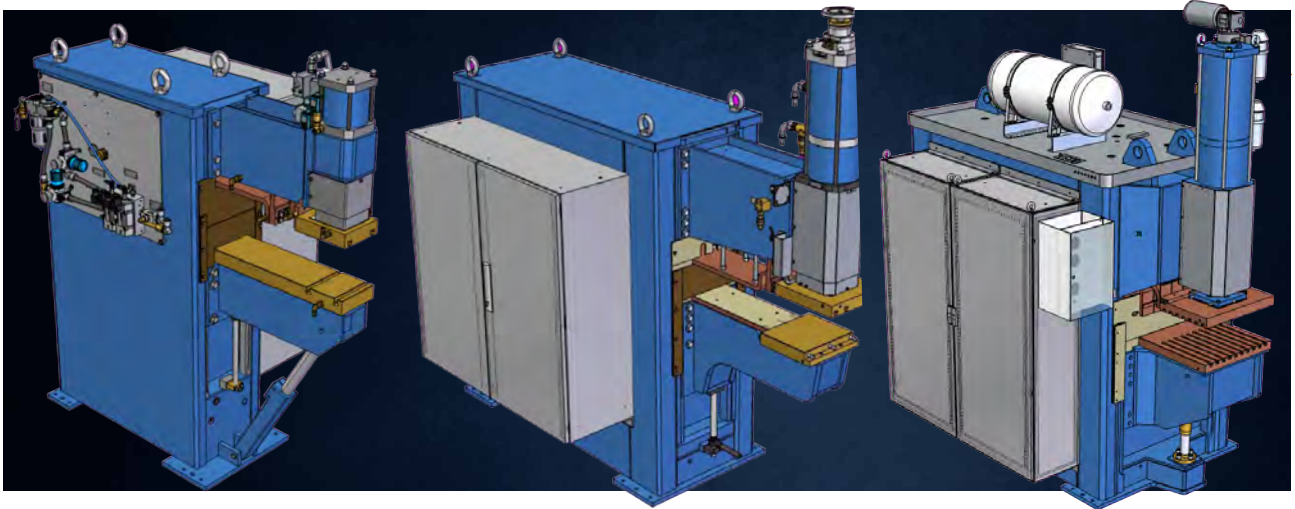
The machines from the DALEX DC series have proven their worth for the production of from the DALEX DC series have proven themselves.

DALEX - Direct Current Series

The DALEX DC current range embodies a machine concept whereby, in addition to special economic productivity and dependable continuous operation, each machine is easy to maintain and reliability of all components is a true reality. Every diode can be tested individually and exchanged if by chance the need arises. Further advantages include close-coupling and minimised losses.

Transformers are cast in a vacuum and fitted with a temperature sensor to avoid the dangers of overloading. Diodes are thermally monitored to ensure reliable duty cycles. If a certain threshold temperature is exceeded, then the machine will be switched off automatically.

All machine frames are designed & built with distortion-resistant, generously dimensioned sectional frame welded construction, and yet still enabling free access to all components.



Power sizes

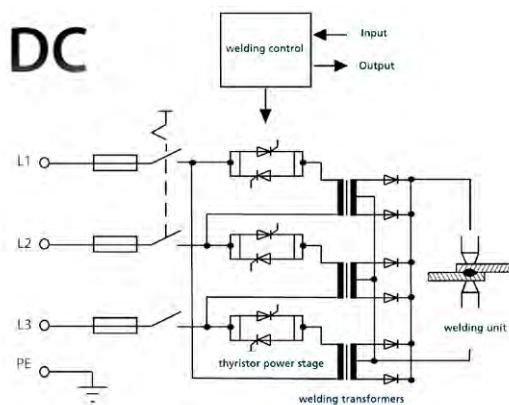
Nominal power	Electrode force	Maximum welding current
Rectifier sets from 60 up to 1200 kVA	from 0,2 up to 150 kN (20 - 15000 daN)	up to 300 kA

3-PHASE DIRECT CURRENT TECHNOLOGY

Efficient and energy-saving

Three-phase direct current technology

For welding with a 3-phase DC machine, three transformers are used, with rectifier packs mounted on the secondary side of each transformer, which generate a DC current when connected in parallel (6-pulse midpoint circuit). In principle, the currents and voltages behave in a similar way to the AC machine.



Scheme 3-phase direct current



DALEX three-phase direct current projection welding machine type PMS 38-6 G3 for projection welding of Cu strips

ADVANTAGES AT A GLANCE

- LOW TEND-TO-ALLOY OF THE ELECTRODES
- SHORT WELDING DURATION WITH REDUCED HEAT AFFECTED ZONE
- GOOD CONDITIONS FOR MAIN CONNECTION
- UNIFORM CURRENT DISTRIBUTION IN ELECTRODES AND WORKPIECES
- BIG POWER FACTOR - SMALL LOSSES
- LOW ENERGY CONSUMPTION

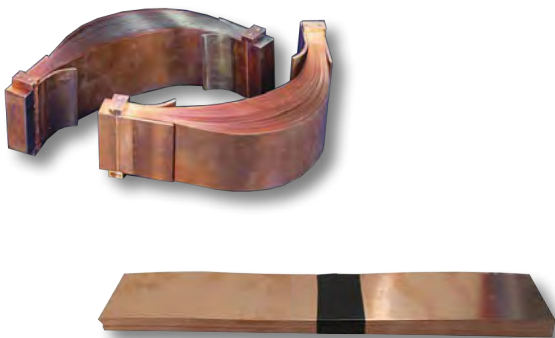
With the DALEX DC series to the perfect welding result



DALEX three-phase direct current projection welding machine type PMS 38-6 G3 with 1200 (6 x 200) kVA

Welding process:
Compacting and compressing Cu strand, current strip.

Design of the system with enlarged clamping plate 400 x 400 mm, level adjustment of the clamping plate at the top via 4 hand ratchets, double stroke cylinder DHZ max. 7650 daN, electric motor-driven pre-stroke adjustment



DALEX three-phase gleichstrom projection welding machine type PMS 38-6 G3 with 1200 (6 x 200) kVA

Welding process:
Press projection welding of Cu lamella strips

Design of the system with double cylinder and double cylinder in twin design, each with switchable force range, clamping plates at the top in special design, the level adjustment of the clamping plates is carried out in each case via 2 pcs. electromotive adjustment devices



With the DALEX DC series to the perfect welding result

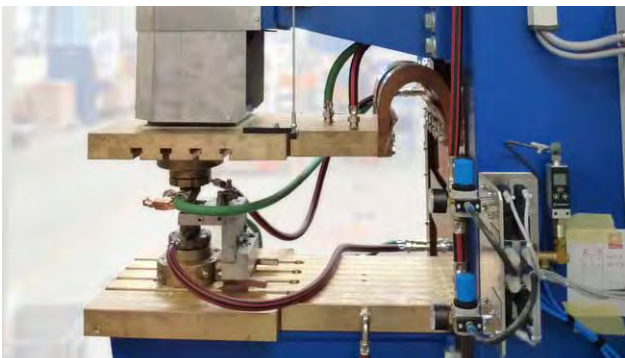


DALEX three-phase direct current projection welding machine type PMS 38-6 G3 with 600 (3 x 200 kVA)

Welding processes:

Silver contact to switch finger / Copper strands to switch finger / Switch finger to holder

Design of the system with special clamping plates and pre-mounted brass plates to accommodate special electrode holders

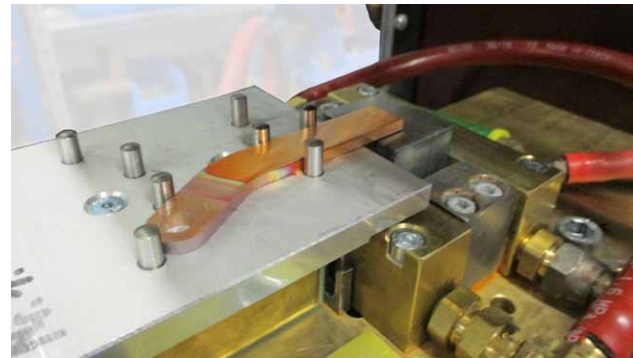


DALEX three-phase direct current projection welding machine type PMS 36-6 G3 with 600 (3 x 200 kVA)

Welding process:

Compacting Copper foil on current spring

The plant is executed on site with special tools for compacting the Copper-foil on current spring



DALEX MEDIUM-FREQUENCY TECHNOLOGY

Energy efficient and economical

The machines are predestined for welding of cable lugs and Copper-flat-stranded wires in medium-frequency technology.

DALEX - Medium frequency transformers

Particularly compact, weight-saving, free from thermal problems, our DALEX transformers from our own production are successfully used from manual welding guns to industrial robots and high-performance stand welding machines - as well as recognized products by plant manufacturers and integrators.

In a special inverter control, the three-phase mains voltage is rectified and converted to a 1000 Hz AC voltage. This voltage is fed to a compact, closely coupled transformer and rectified again on the secondary side by water-cooled diode packages. This produces a direct current for welding that can be regulated quickly and precisely.



Power sizes	Typ MF 80/90	Typ MF 160/180	Typ MF 250/300	Typ MF 500	Typ MF 160/180
Nennleistung bei 20 % ED:	80 - 90 kVA	130 - 180 kVA	250 - 300 kVA	500 kVA	700 - 1000 kVA
Open circuit DC voltage	6,3 - 8.3 V	7.0 - 10.2 V	10.2 - 16.0 V	11.8 V	8.4 - 15.9 V
Weight	17 kg	26,5 kg	33 kg	54,5 kg	167 kg
Quantity/Diodes	2 piece	4 / 6 piece	4 / 6 piece	6 piece	10 piece

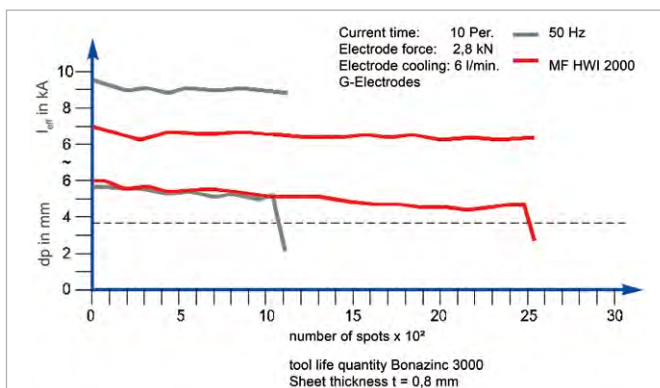
Transformers in special design, e.g. 2-stage transformer on request

DALEX-MEDIUM-FREQUENCY TECHNOLOGY

Presize and fast

APPLICATIONS

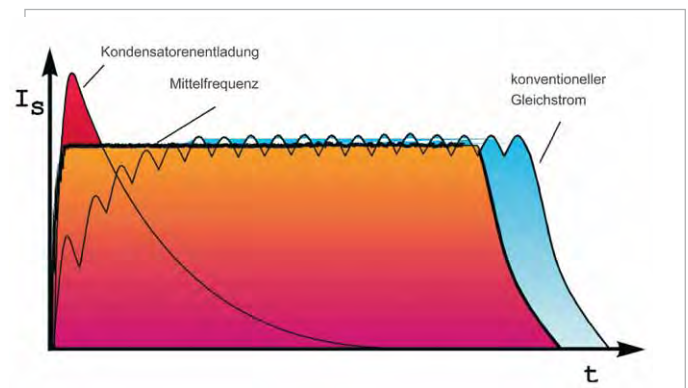
- Short time welding (e.g. ring projection), partly as a replacement of capacitor discharge welding machines
- Welding of galvanized sheets
- Joining of different materials as well as non-ferrous metal
- Welding of coated materials



ELECTRODE LIFE MF DIRECT CURRENT/ALTERNATING CURRENT

FEATURES

- Low self-impedance
- series connection of all cooling circuits
- from size MF 180 secondary protective circuitry
- diodes max. braced in pairs
- high performance with small size

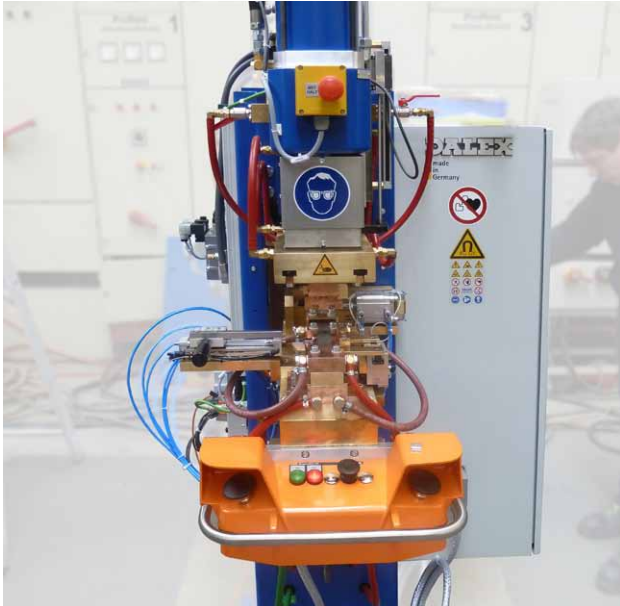


WELDING CURRENT CHARACTERISTICS IN COMPARISON

ADVANTAGES AT A GLANCE

- HIGH QUALITY DIRECT CURRENT
- LOW INDUCTIVE LOSSES
- ENERGY SAVING
- REGULATION AND TIME ADJUSTMENT IN ms
- FAST CURRENT RISE
- HIGH ELECTRODE LIFE
- COMPACT, LIGHTWEIGHT TRANSFORMERS
- HIGH WELDING POINT QUALITY
- LARGE WELDING RANGE
- SYMMETRICAL MAINS LOAD
- LOW SPATTER TENDENCY

With DALEX medium-frequency technology to the perfect welding result



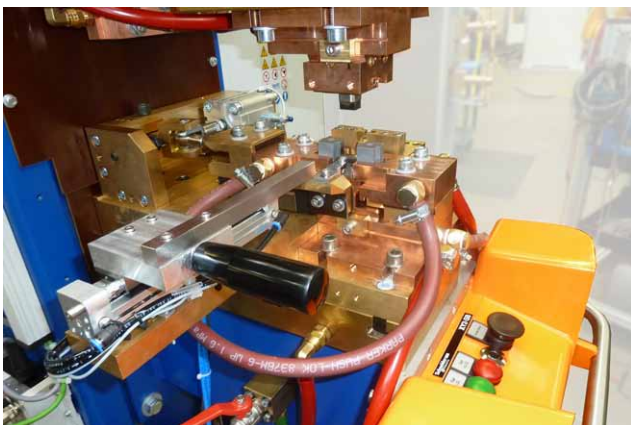
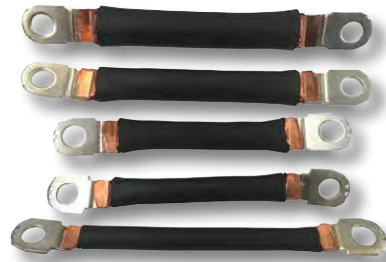
DALEX medium frequency projection welding machine
type PMS 32-6 MF with 2 x 180 kVA



DALEX projection welding machine type PMS 36-6 MF
in medium frequency technology 2 x 180 kVA

Welding process:
Cu strand to cable lug

The systems are executed on site with
Special tools for pressure welding of
stranded copper wire to cable lug



With DALEX medium-frequency technology to the perfect welding result



DALEX projection welding machine type PMS 38-6 MF in medium frequency technology with 4 x 180 kVA



DALEX projection welding machine type PMS 36-6 MF in medium frequency technology with 700 kVA

Welding process:
Compacting of copper stranded wires

The equipment is made on site
with special devices for pressure welding
of the Cu-stranded ropes and Cu-flat strip strands



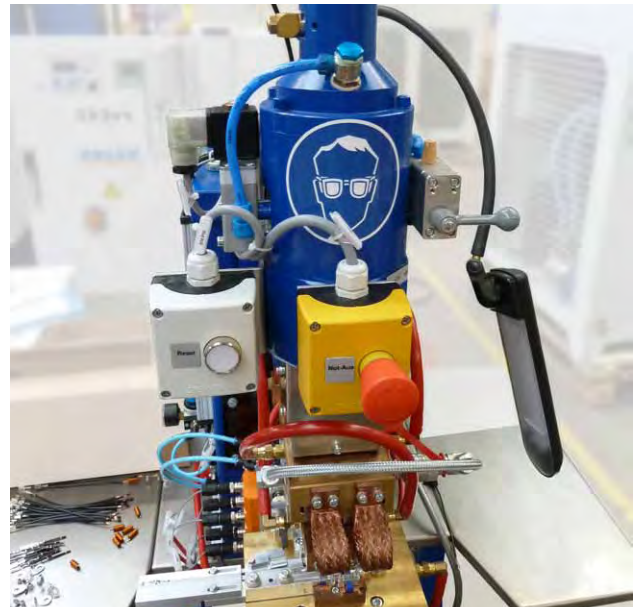
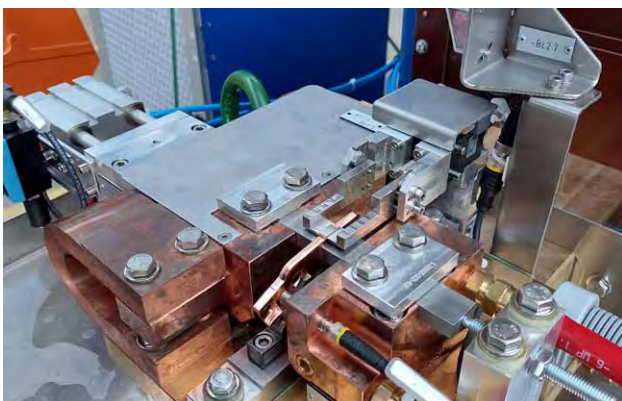
With DALEX medium-frequency technology to the perfect welding result



DALEX medium frequency projection welding machine
type PMS 14-6 MF with 2 x 250 kVA

Welding process:
Soldering/welding of silver contact to switch finger.

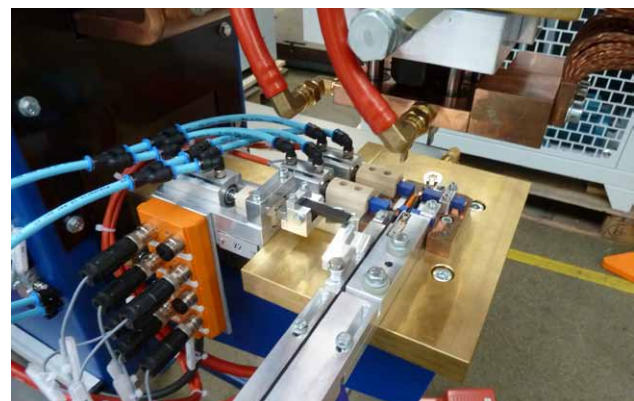
Execution of the system with special welding tool
consisting of upper tool adapted to the silver contact
and lower tool with mandrel for the copper plate



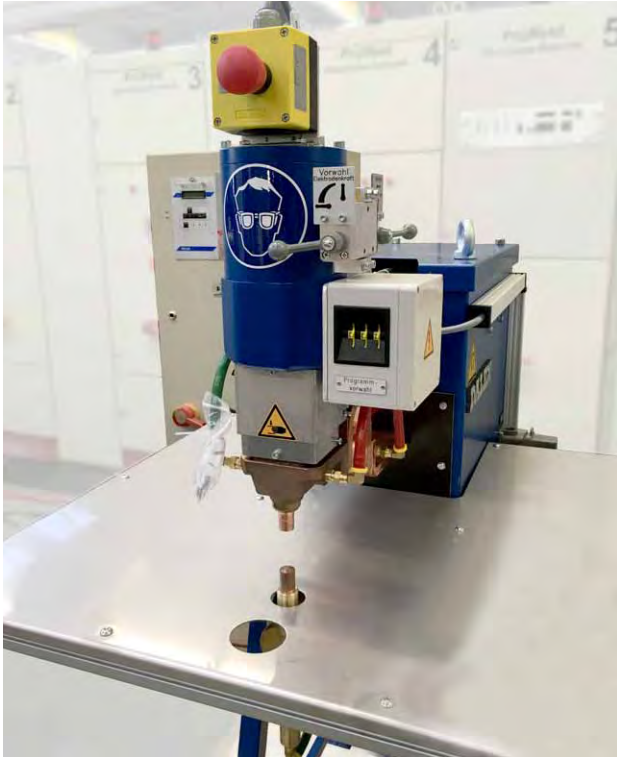
DALEX medium frequency table spot welding machine
type PMS 10-6 MF with 90 kVA

Welding process:
Spot welding of Cu stranded wire with Cu coil wire
and capacitor simultaneously in one stroke.

Execution of the system with special tools and com-
pensating element on top with electrode holder and
electrodes on top for better repositioning



With DALEX medium-frequency technology to the perfect welding result



DALEX medium frequency table spot welding machine
Type PMS 10-6 MF with 90 kVA

Execution of the system with machine table in special design extendable to the front, electrode holder at the top and bottom to accommodate special electrodes provided by the customer, adapted to the components



Welding processes:

Projection welding of 2 pc Cu foil on Cu bridge with 2 round projections.



Projection welding of Cu bridge with 2 round projections on VA rail



Projection welding of brass foil package on VA rail and 2 pcs. va foils



With the DALEX - AC series to the perfect welding result

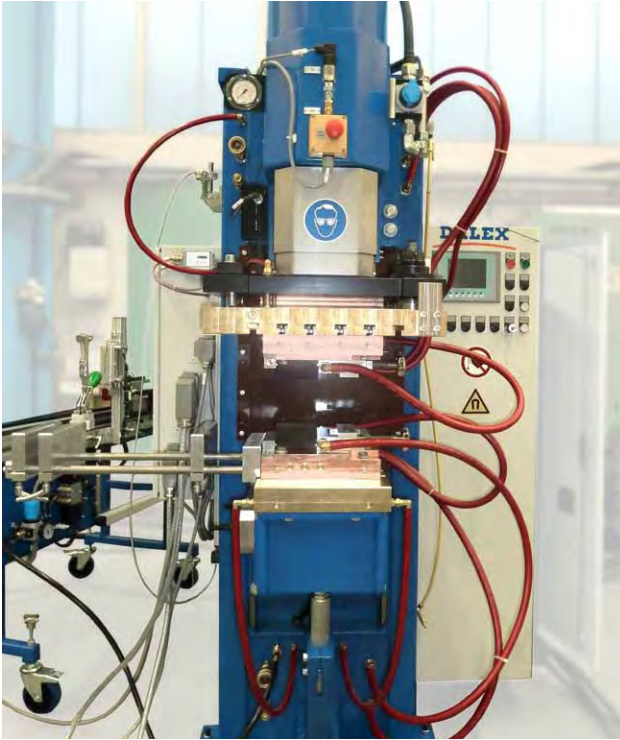


DALEX projection welding machines type PMS 37-6
with widened clamping plates to accommodate
of special tools

Welding process:
Pressure welding of Cu lamellas (current strips)

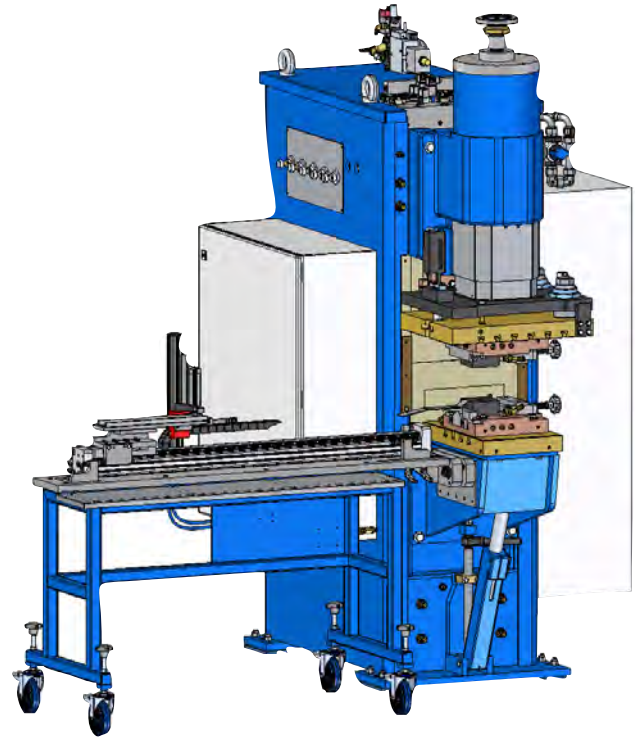


With the DALEX - AC series to the perfect welding result



DALEX projection welding machine type PMS 37-6
with special tool and automatic feed unit

Welding process:
Pressure welding of Cu lamellas (current strips)



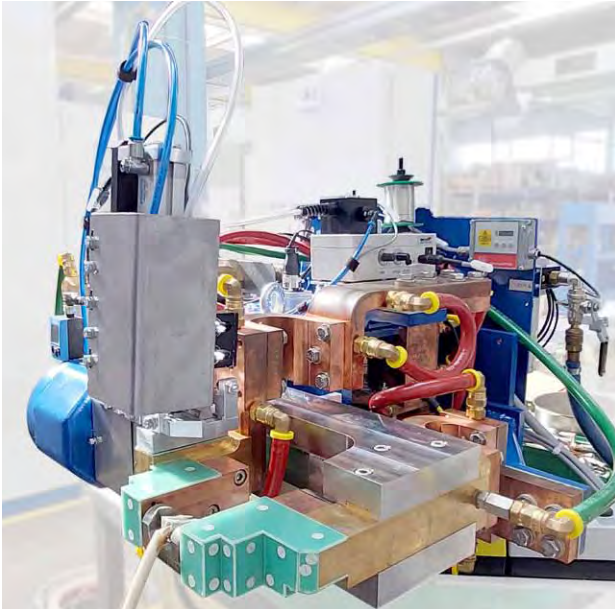
The unit is equipped with a special die with clamping cooling jaw for clamping and cooling the inserted copper lamellae and a graphite carbon electrode for transferring the current to the lamellae.

A clamping and feeding unit for fixing long lamellae is attached to the lower tool if required.

In addition, an automatic feed unit is available, which can be flanged to the lower delivery. This unit generates the feed motion, sets the pressure welding length and aligns and fixes the copper laminations.



Special plant solutions for special challenges



Compensating pliers in special design
horizontally arranged for soldering

Welding process:
Soldering of cable lug to cable strand

System horizontally arranged with special electrodes, solder wire cylinder and solder wire feeder

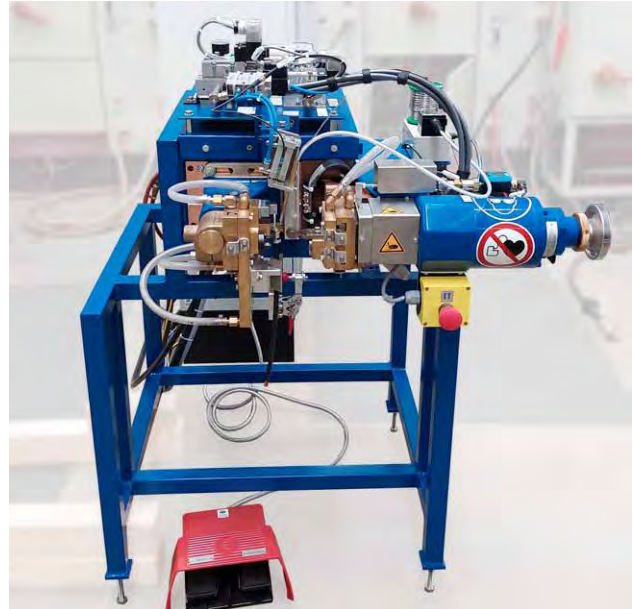
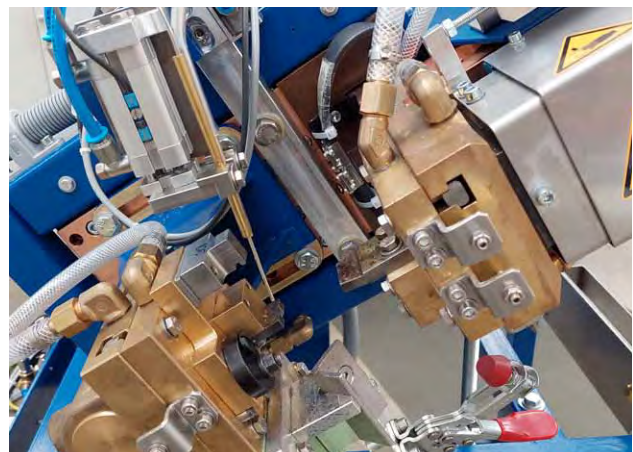
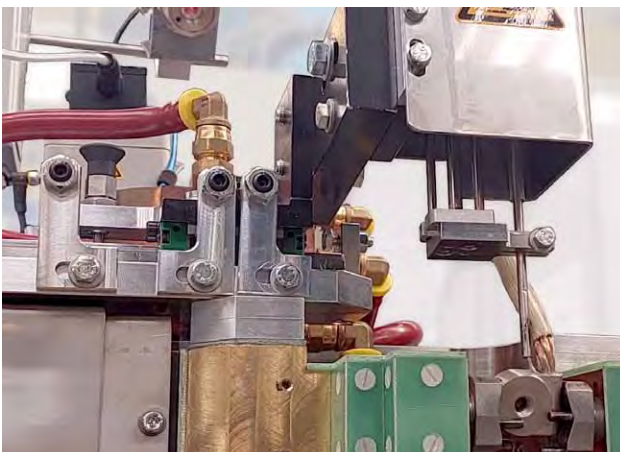


Table projection welding machine in special design
for soldering

Welding process:
Soldering of cable lug to cable strand

Plant in inclined position with special electrodes for soldering and solder wire feed



Special plant solutions for special challenges



Table spot welding machine in special design with special fittings

Welding process:
Spot welding of Cu stranded wire on mains terminal block

Unit equipped with height-adjustable table with suction device as well as special spot welding tool and linear guide with guide carriage

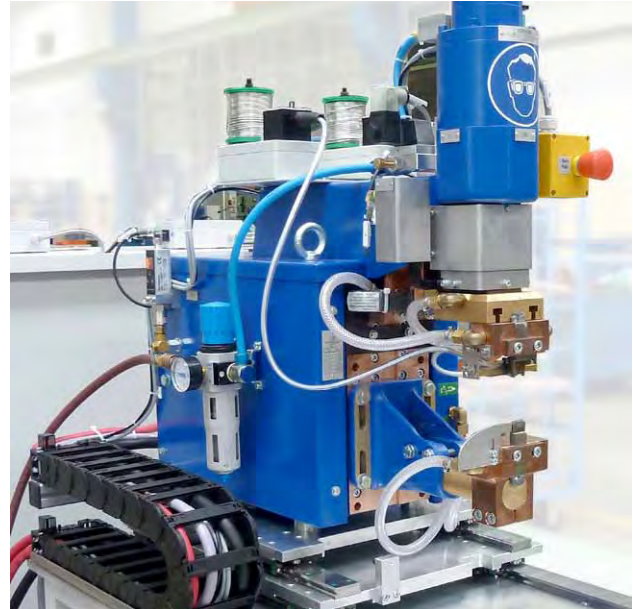
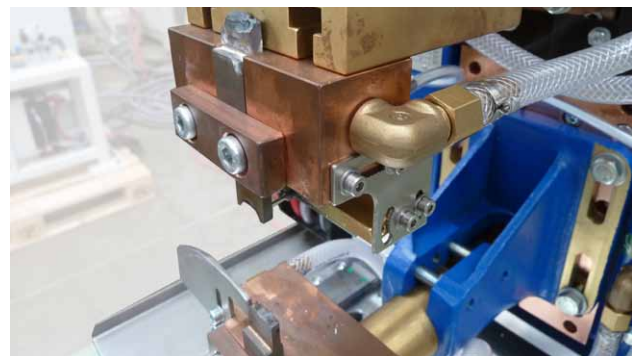


Table projection welding machine in special design with linear slide for soldering

Welding process:
Brazing of connecting studs to Cu-rail

Machine equipped with linear slide for moving the machine in longitudinal direction, equipped with special electrode holder and 2 pcs. automatic solder wire feeding device



Special plant solutions for special challenges

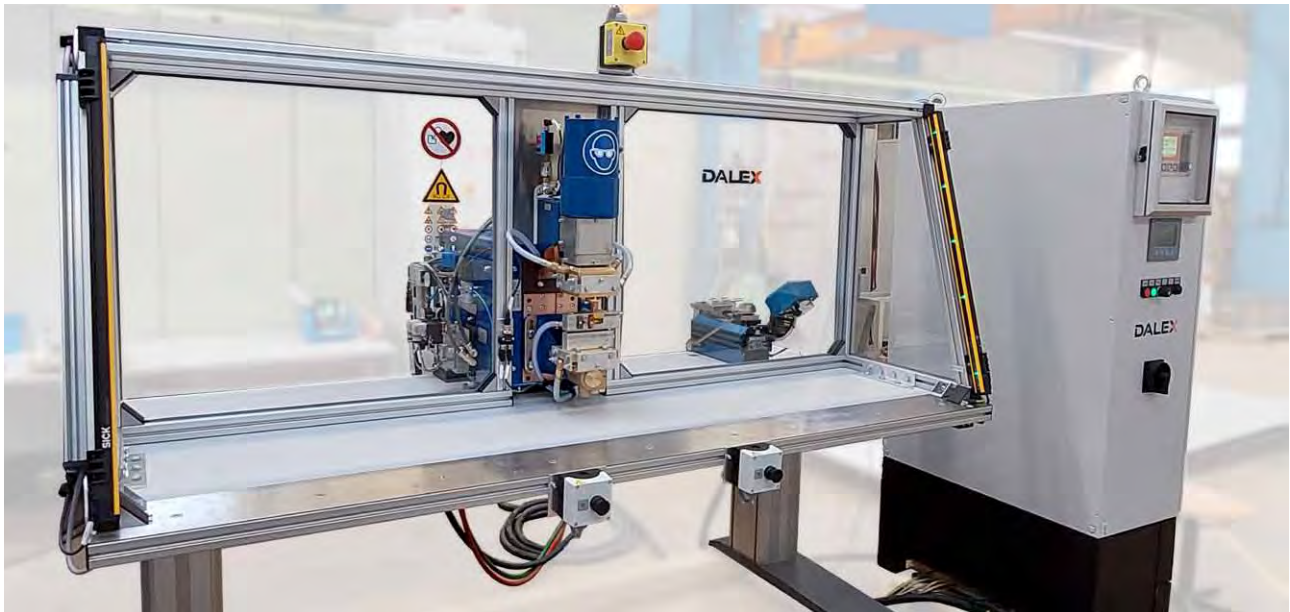
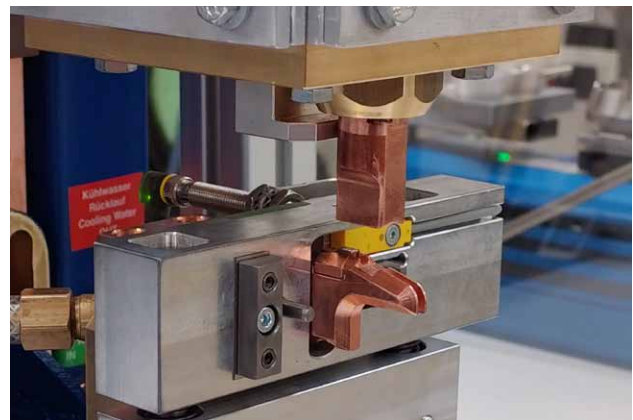


Table spot welding machine type PMS 10-6 T
in special design

Welding process:
Welding of the assembled cables to the component

System designed with special machine table with
protective housing and welding tool at the top
with special electrodes adapted to the component
geometry as well as electrode holder below with
electrode for positioning the assembled cable



Plant solutions for electrical engineering

Cable assembly, Current straps and Copper strands



The applications are versatile -
our systems tailored to your task for precise and economical production.

We would be pleased to convince you of our expertise. The DALEX Technology Center is part of the welding technology consulting support. With ready-to-operate spot, projection and roller seam welding machines in AC, three-phase DC, medium-frequency and KE technology, we have the possibility to carry out test welds and demonstrate to you the best welding processes and the welding samples for your application.



Interested?

We will gladly advise you!

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Stand 05/2022

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