DALEX

EPS-DRIVE SYSTEMS

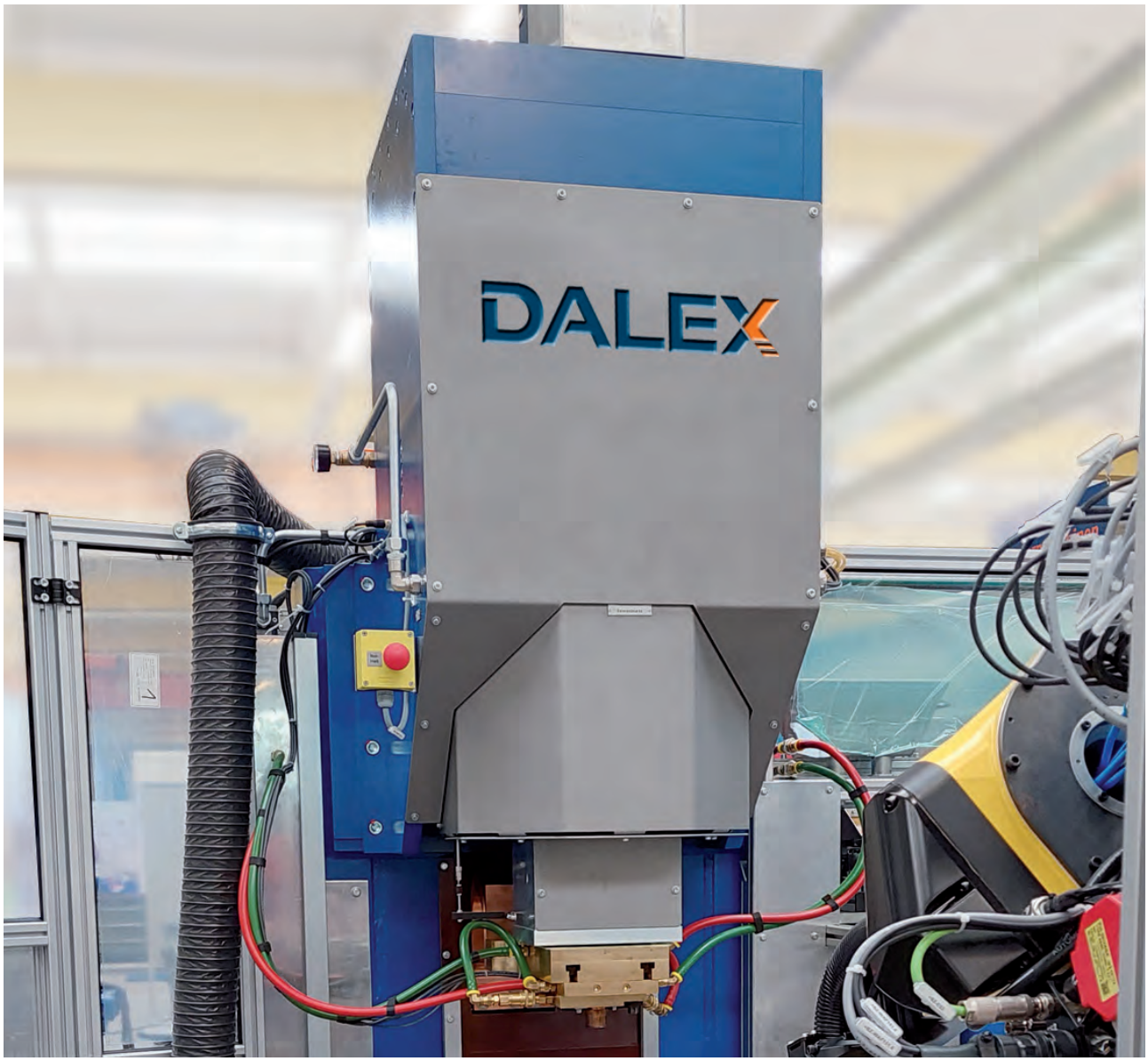
„FAST and DYNAMIC“

to the perfect welding result

www.dalex.de

DALEX EPS DRIVE TECHNOLOGY

Electro Pneumatic Welding Drives



FAST AND DYNAMIC

to the perfect welding result

DALEX - EPS drive technology for all projection and spot welding machines

In addition to the component-specific characteristics, the welding quality in resistance welding depends essentially on the welding current, the welding current time and the welding force. The optimum interaction of welding current and welding force over time is of particular importance.

When the welding current starts, heating takes place in the contact zone between the components to be joined. This heating leads to melting of the materials of the components to be joined at these points. The molten area reduces the force acting against the electrodes, which in turn reduces the contact force in the weld. Here it is now important that the welding force does not break off and is kept at the same level as far as possible, and that the electrodes are tracked (readjusted) in the direction of the joint. If the welding force is not readjusted quickly enough, weld spatter and welding defects may occur.

To make this simple and energy efficient, DALEX has developed a new electro-pneumatic welding actuator for resistance welding systems. It ensures an almost constant and effective welding force over the entire weld.

Electro-pneumatic welding drive (EPS)

EXCELLENT REPOSITIONING BEHAVIOR AND SHORT CYCLE TIMES

The **EPS electro-pneumatic welding drive** developed by DALEX consists of a servo-motor linear unit designed as a spindle drive and a follow-up unit attached to it, in which a preloaded spring filled with compressed air transmits the welding force to the welding spot.

The masses to be accelerated during welding are very low, which ensures **excellent resetting behavior.**

With the servo motor drive stroke, the welding electrodes can be adjusted precisely, quickly and continuously in relation to each other according to the required welding task and component geometry. A speed of up to 200 mm/s can be set. Perfect for achieving a clean weld even with **short cycle times.**

COMFORTABLE

to the perfect welding result

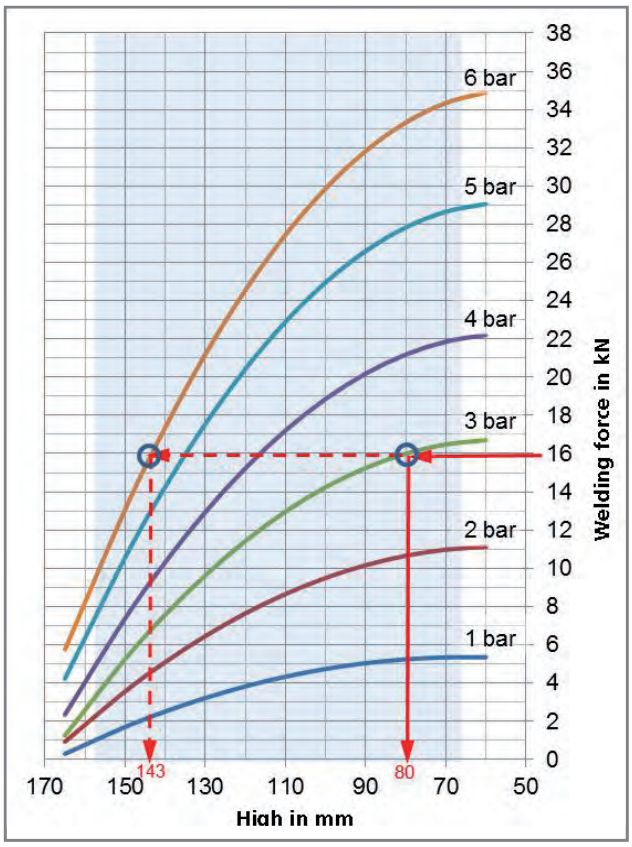


Fig. Pressure-dependent characteristic curves of the electro-pneumatic welding drive (schematic).

COMFORTABLE OPERATION

The user simply adjusts the welding force to the respective task by entering the required values via the user interface. After setting the parameters, the machine control system then automatically determines the spring or welding pressure based on stored sets of characteristic curves and determines the required spring compression.

When the welding electrode is fed to the welding point with the linear unit, the „pneumatic spring“ is only subjected to a fraction of the welding pressure, which is defined and set beforehand. This ensures that the electrode is placed on the workpiece gently and without impact. When the electrode is in contact, a sensor in the tracking unit gives the signal to adjust the spring travel until the defined spring compression is reached. Thanks to the pre-control of the pressure, the welding force is already at the required level and the welding process can begin without delay

User-friendly operation: After the welding force has been set, the machine control system automatically determines the welding pressure on the basis of stored characteristic curve sets and determines the required spring compression.

DYNAMIC

to the perfect welding result

HIGH DYNAMICS IN THE WELDING PROCESS

If the welding projection starts to melt due to the welding current supplied, the tracking device immediately follows, expanding the spring and the welding force acts almost constantly on the welding point. This is achieved by the fact that during the actual welding process only the components directly connected to the tracking unit - i.e. only a very small mass due to the pneumatic spring - need to be accelerated.

A direct comparison of the EPS with a linear drive with additional pressure compensation via elastomer springs clearly shows the superiority of the DALEX system. Both drives were used on a capacitor discharge machine (KE) for welding a ring projection.

When the welding force collapses due to melting of the annular projection, the linear actuator only reaches the original force level when the welding current has already fallen to about 20 percent of the maximum (see Figure 2). This means that the welding process is practically completed electrically before the full welding force is available again.

The EPS operates much more efficiently. If the welding force reaches its initial value again, the welding current has just exceeded its maximum value and is still around 80 percent (see Figure 3). The welding force is therefore at a uniform level almost over the entire weld

SCHEMATIC DIAGRAM IN COMPARISON

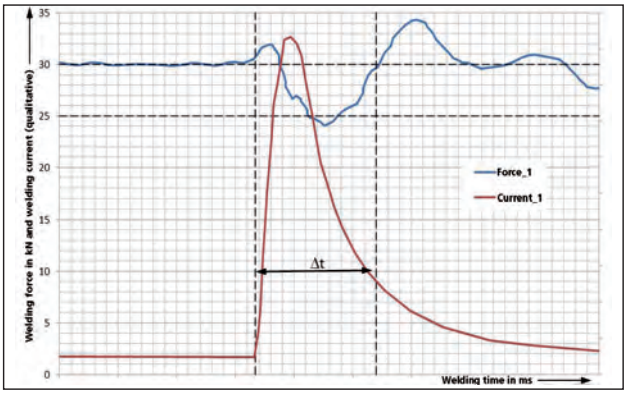


Fig. 1:
When welding a ring projection on a KE machine, the linear drive with additional pressure compensation via elastomer springs does not reach the original force level after the welding force collapses until the welding current has already dropped to about 20 percent of the maximum.

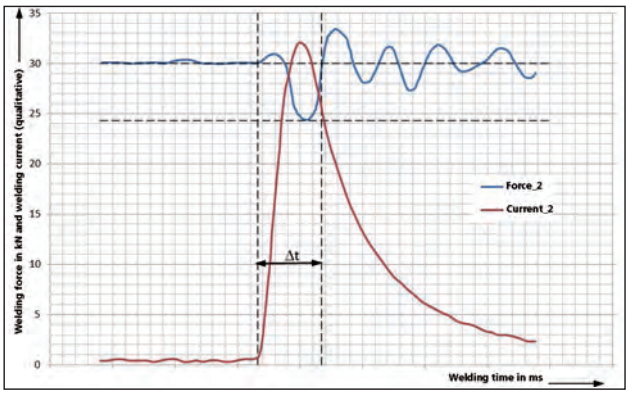


Fig. 2:
The EPS from DALEX, in contrast, keeps the welding force at a constant level almost throughout the entire weld. When the welding force reaches its initial value again, the welding current is still at around 80 percent.

ECONOMICAL

to the perfect welding result

LOW ENERGY COMSUMPTION AND WEAR

Not only is the quality of the weld right with the new EPS from DALEX, the system also offers advantages in terms of operating costs: The pneumatic drive only requires compressed air when adjusting the electrode force, and only in very small quantities to regulate the pressure of the pneumatic spring. This minimizes compressed air consumption and **saves energy**. Also, only a small amount of air flows out, so that **noise development is greatly reduced** In addition, the welding force and current can be kept as low as possible by adjusting the parameters in a targeted way.

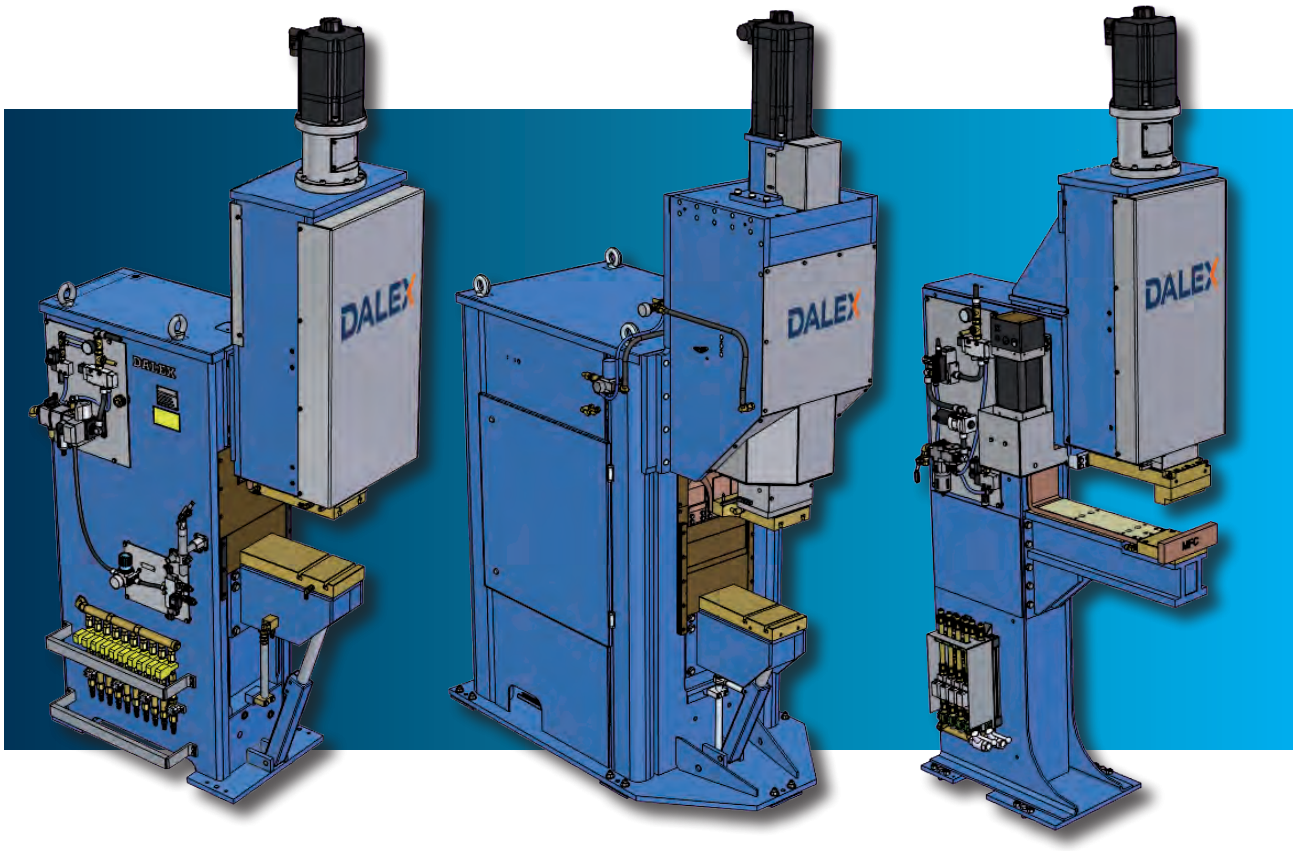
Because the drive concept does not use sliding seals, but instead works with guides mounted on roller bearings, the effects of friction are almost completely eliminated. This supports the high dynamics of the drive and **significantly reduces wear.**

ADVANTAGES AT A GLANCE

- *FREELY SELECTABLE WORKING STROKE*
- *SHORT CYCLE TIMES*
- *IMPACT-FREE TOUCHDOWN*
- *LOW MOVING MASS*
- *HIGH DYNAMIC REPOSITIONING*
- *LOW FRICTION AND LOW WEAR*
- *MINIMAL COMPRESSED AIR CONSUMPTION*
- *COMFORTABLE OPERATION*

EPS-DRIVE SYSTEMS

Types / Technical data



Model overview / Technical data					
Series size	EPS-640	EPS-1350	EPS-1750	EPS-3350	EPS-4200
Welding force (at 0,5- 6 bar)	70 - 640 daN	100 - 1350 daN	170 - 1750 daN	300 - 3350 daN	420 - 4200 daN
Drive stroke bellows	25 mm	60 mm	60 mm	70 mm	35 mm
Adjustment stroke series	150 mm	150 mm	150 mm	200 mm	200 mm

With the DALEX - EPS DRIVE SYSTEM

to the perfect welding result

DALEX projection welding machine type PMS 37-6 MF in medium frequency technology, equipped with an EPS drive 4200 daN

Welding process:
Projection welding of impact plate to cylinder tube

Design of the plant for automatic loading with parts via handling robots, feeding of components via feeding systems and automatic unloading

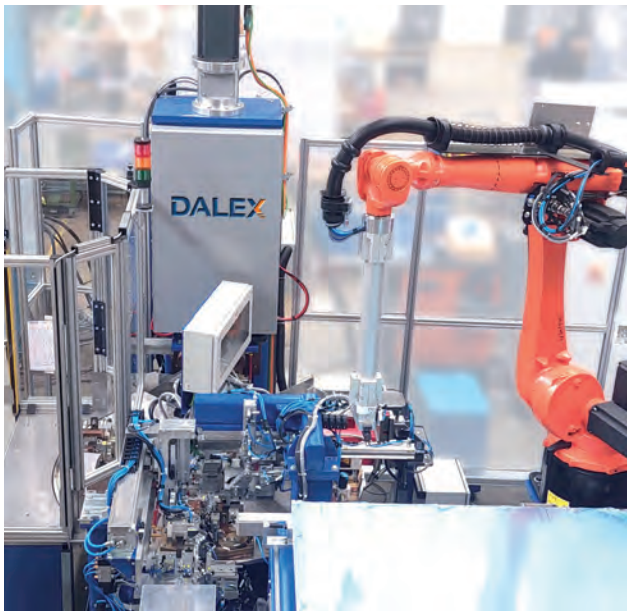
DALEX spot welding machine type PMS 12-6 MF in medium frequency technology, equipped with an EPS drive 2000 daN

Welding process:
Spot welding of wire crossings

Execution of the plant as CNC coordinate welding with 2 side-by-side machining stations, which are approached by the electrodes of the welding machine horizontally in X- and Y-direction as well as vertically.

With the DALEX - EPS DRIVE SYSTEM

to the perfect welding result



DALEX projection welding machine type PMS 37-6 MF in medium frequency technology, equipped with EPS drive 4000 daN

Welding process:
Projection welding of angle to end plate

Design of the plant as a turntable plant with 4 stations for insertion, welding, demagnetization, and removal of the assembly. This is followed by transfer by means of pick-and-place handling to a testing and marking station and storage in a wire mesh box.

DALEX-C modules with projection welding armature in medium frequency technology, equipped with EPS drive 2700 daN

Welding process:
Projection welding wire mesh

Design of the system as space-saving C-modules which are integrated into an automated production line by the customer.

With the DALEX - EPS DRIVE SYSTEM

to the perfect welding result

DALEX-C module as projection welding machine in medium frequency technology, equipped with an EPS drive 1750 daN

Welding process:
Projection welding of handles on push-pull props

Plant equipped with special tools designed as a sliding tool for welding the handles in two positions and subsequent excavation of the welded assembly.

DALEX projection welding machine type PMS 37-6 MF in medium frequency technology, equipped with an EPS drive 4200 daN

Welding process:
Projection welding of threaded socket to cylinder barrel

Plant for manual operation with extensive control system for documentation and component archiving

With the DALEX - EPS DRIVE SYSTEM

to the perfect welding result

DALEX projection welding machine type PMS 36-6 MF in medium frequency technology, equipped with EPS drive 3000 daN

Welding process:
Projection welding of nozzle to cylinder barrel

Plant for manual operation and very simple handling

Interested?

We will gladly advise you!

Please contact with us:

Phone: +49 2742 77-0
E-Mail: info@dalex.de
Web: www.dalex.de

Stand 03/2022

DALEX

DALEX GmbH
Koblenzer Straße 43
D - 57537 Wissen

Phone: +49 2742 77-0
E-Mail: info@dalex.de
Web: **www.dalex.de**