

KISTLER

measure. analyze. innovate.

Electro- mechanical NC Joining Systems

**Compact Servomotor
Actuator with
Piezoelectric
Force Monitoring**



New Generation of Electromechanical NC Joining Systems – Now with Piezoelectric Force Monitoring

Electromechanical NC joining systems are increasingly supplanting the familiar hydraulic presses and joining modules in electromechanical joining applications. In addition to better environmental compatibility, a more favorable energy balance, compact design, minimal installation effort and very low-maintenance operation, it is primarily production aspects (flexibility, exact positioning, extremely high reproducibility and accurately defined joining forces) that make an electromechanical system a more obvious choice for the system designer.

With the new generation of its electromechanical NC joining systems NCFH, Kistler offers a particularly compact and precise system solution for a wide variety of force displacement monitored press-fitting and joining tasks.

The new integral piezoelectric force measurement technology allows just two sizes of spindle to cover the wide measuring range between 1 kN and 60 kN – a small one for up to 10 kN and a large one for up to 60 kN. Provided the machine design remains unchanged, this ensures spindle

Electromechanical NC Joining System: Compact Unit Consisting of Joining and Measuring System

Hollow-shaft servomotor is assembled directly around the threaded spindle drive.

The elimination of gearing ensures highly responsive operation.

A piezoelectric force sensor is integrated directly into the electromechanical NC joining module.

	Size 1	Size 2
Measuring range (kN)	1 / 2 / 5 / 10	15 / 30 / 60
Overall length (mm)	approx. 475	approx. 795
Stroke (mm)	200	400
Speed (mm/s)	300	300
Measurement direction	compression/tension	compression/tension

interchangeability under different conditions.

Their **unrivalled shortness and compactness** also make the electromechanical NC joining systems NCFH suitable for under bench mounting. With an overall length of approx. 475 or 795 mm they offer a stroke of 200 or 400 mm, which allows them to reach extended end points, such as bearings in transmission half shells.

At a Glance

Electromechanical NC joining systems NCFH are synonymous with

- low space requirements,
- installation with little effort and
- very low-maintenance operation,

offer

- a high degree of flexibility,
- exact positioning,
- extremely high reproducibility levels and
- accurately defined press-fitting forces,

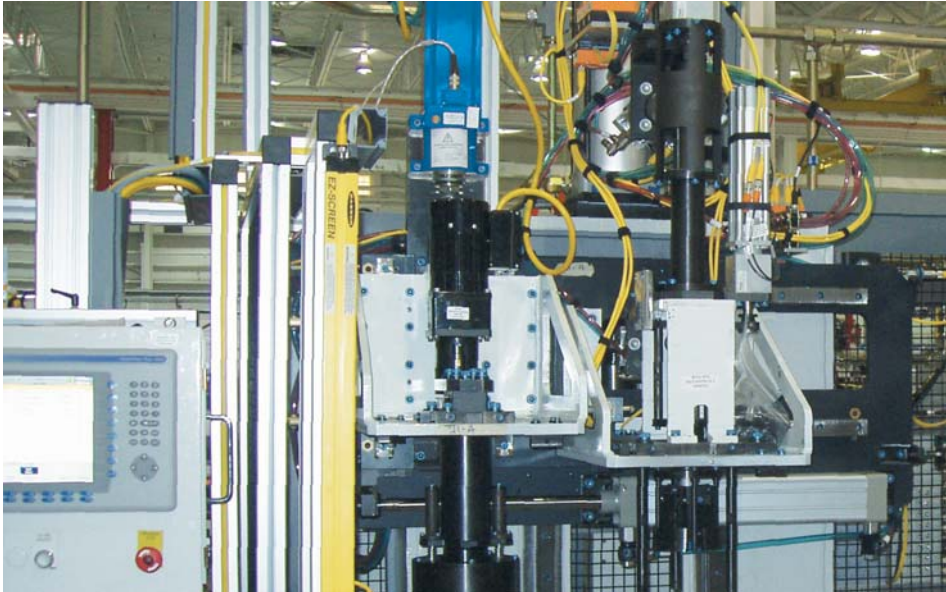
and bring the user

- considerable energy savings,
- higher process reliability,
- improved product quality and
- more cost-effective production

The small electromechanical NC joining system NCFH Type 2151B... for measuring range of up to 10 kN and stroke of 200 mm Hub



The large electromechanical NC joining system NCFH Type 2151B... for measuring range of up to 60 kN and stroke of 400 mm



Mounting station in factory of German automotive supplier with electromechanical NC joining system, NCFH

Plus Points of Electromechanical NC Joining Systems, NCFH

- + Gearing eliminated by hollow-shaft motor design
- + Long spindle stroke yet compact dimensions
- + High speed up to 300 mm/s
- + Active compression compensation system
- + Force control system
- + Standard holding brake
- + Dynamic operation
- + Ideal for under-bench mounting
- + Integral force-displacement monitoring

Despite long feed travels, the **high speed** of up to 300 mm/s offers a **quick return stroke** and therefore enables a **short machine cycle**. The fact that **tension and compression forces** are always available as standard leaves considerable machine design freedom.

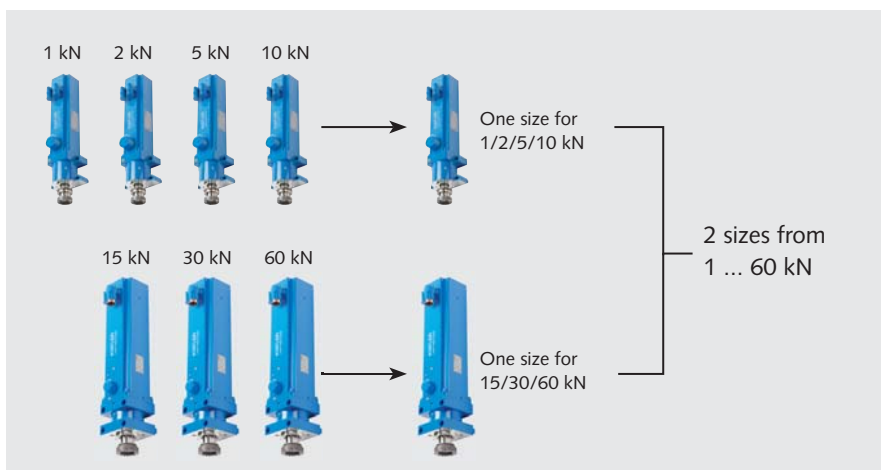
The force signal employed by the force-displacement monitoring system is used to **control movement** for highly specialized joining tasks. The **force control system** increases the application versatility of this electromechanical NC joining system. Thus spring elements, for example, can be loaded

to specific values or compensation applied with constant force in case of displacement of parts. Two central lubrication points for guide and bearing ensure **very low-maintenance operation**. The threaded spindle drive is permanently lubricated.

As the **active compression compensation system** eliminates the effect of the bending of the spindle and customer's assembly, the positional accuracy is no longer influenced by the force. The **standard holding brake** permits the use of particularly heavy tools as it prevents the ram from dropping when the module is switched off.

Advantages of Piezoelectric Force Measurement

- Single electromechanical NC joining module covers large number of measuring ranges
- Preset of the "correct" measuring range unnecessary
- Low sensitivity to disturbance variables
- Wide variety of parts on a station, makes mixed production feasible on single machine
- Factor of safety against overload of up to 15
- Cuts spare parts inventory and design costs
- Highly dynamic response because of high level of rigidity



For specifications see data sheet 2151B_000-690e.

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