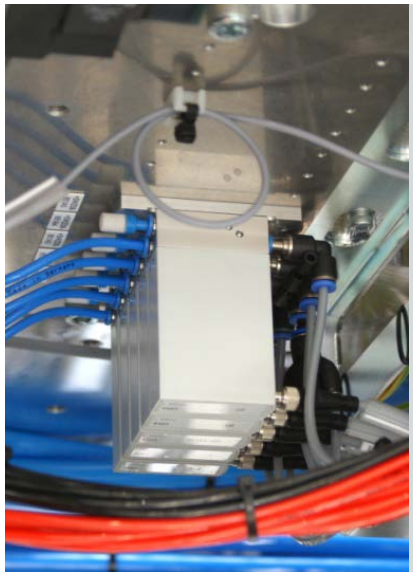
Welding system for joining automotive door panels and interior parts



Highlights

- Use of innovative piezo valves
- Low energy consumption and long service life
- Permanent process data monitoring
- Full flexibility in adjusting the welding pressure
- Fast switching times in the sub-microsecond range

Customer

The special machine builder 3CON GmbH (Austria) specialises in manufacturing innovative tool and system technology for the production of automotive interiors. The scope of services ranges from conceptualisation and manufacturing to commissioning systems on site.

Project

Development of a welding system for joining several individual components into four complete car doors within 30 seconds.

Requirements

- Low cycle times and maximum precision
- Maximum flexibility: the welding system must be convertible fully automatically within ten minutes, depending on the car type.
- Total process reliability: each door must be welded precisely down to the last millimetre.
- Processing of a total of 148 welding points in 30 seconds

Solution

- ADNGF guided drive with SDAT position sensors ensure the exact feeding of ultrasonic welding sonotrodes
- The cylinders in the welding tool are controlled by piezoelectric pressure regulators of the type VEAB – first for position and later, during the welding process, for pressure
- DZF flat cylinders clamp the retainer frame to fix the doors in the system during transport
- During the welding process, the process valves of the type MN1H supply cooling air
- A service unit MSB6 ensures optimal process air in the machine

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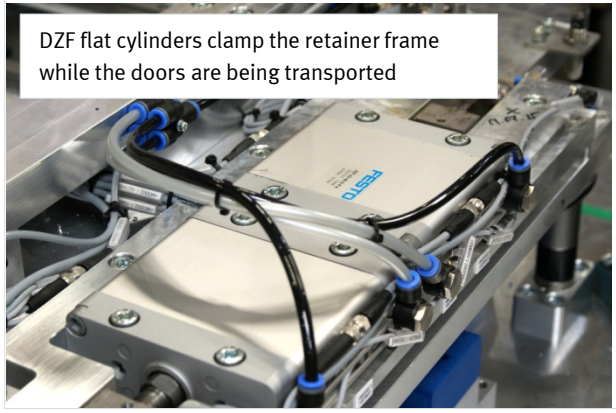
Piezoelectric pressure regulators VEAB control the cylinders in welding tool

ADNGF guided drive with SDAT position sensors ensure exact feeding of the ultrasonic welding sonotrodes



DZF flat cylinders clamp the retainer frame while the doors are being transported

Process valves MN1H supply cooling air in the welding units

Service unit MSB6 ensures optimal process air in the machine

Optimising welding systems: products and solutions

Piezoelectric pressure regulator VEAB

- Short response times of ‹ 10 ms
- Voltage setpoint value: 0 ... 5 V or 0 ... 10 V
- Current setpoint value: 4 ... 20 mA
- Very long service life
- Low power consumption
- Piezoelectric valve system
- Noiseless operation
- High control precision and dynamic control behaviour

Compact cylinder ADNGF

- Diameter: 12-100 mm
- Stroke length: 1 ... 400 mm
- Force: 68 ... 4712N
- Position sensing
- Fixed/self-adjusting cushioning
- Mounting hole pattern to ISO 21287
- Piston rod secured against rotation by means of guide rod and yoke plate
- Plain-bearing guide
- For position sensing
- Available with through piston rod

Position transmitter SDAT

- Analogue output: 4-20mA
- IO-Link
- Switching output: NO or NC
- Position measuring range: 50, 80, 100, 125, 160 mm
- Cable length: 0.3 m
- Electrical connection, 4-pin, M8x1 plug
- Design for T-slot
- Reliably and accurately senses positions for standard strokes
- High repetition accuracy
- Coordinated with and tested for Festo's cylinders
- Plain bearing

Process valve MN1H-MS

- Connection: G1/4 ... G1 ½
- Flow rate: 2000 ... 30500 l/min
- Voltage: 24 V DC, 110 ... 230 V AC
- Pilot operated diaphragm valve
- Adjustable closing cushioning, in-line mounting or through-hole
- Electrically actuated, piloted, pneumatic spring return
- Connection via plug/socket
- Brass design
- Adjustable closing cushioning, in-line mounting or through-hole
- Can only be used for gaseous media