

# Drive & Control profile

## Tube and Profile Bending Machines Incorporate Intelligent Safety System from Bosch Rexroth



Rexroth IndraDrive with Safe Motion™ technology.

Tube and Profile Bending Machines Incorporate Intelligent Safety System from Bosch Rexroth. More and more tubes and profiles are being used in automotive production. They offer advantages in terms of weight, rigidity,

processing outlay and costs. The more efficiently the parts are machined prior to being fitted, the greater the cost benefits. Likewise, customer demands are showing a corresponding increase when it comes to production systems,

### Challenge

Use drive-based motion control to improve safe operation of newest generation of metal tube bending machines

### Bosch Rexroth Solution

IndraDrive with Safe Motion™ technology

### Benefits

- Drive-based safe motion control
- Certified redundant safe monitoring
- Dual channel safe stop or safe operating stop selected directly on drive
- Safe start lock, safe direction of rotation and safe shutdown monitoring
- Enables very short re-tooling times without compromising safety
- Improve productivity and machine/line flexibility

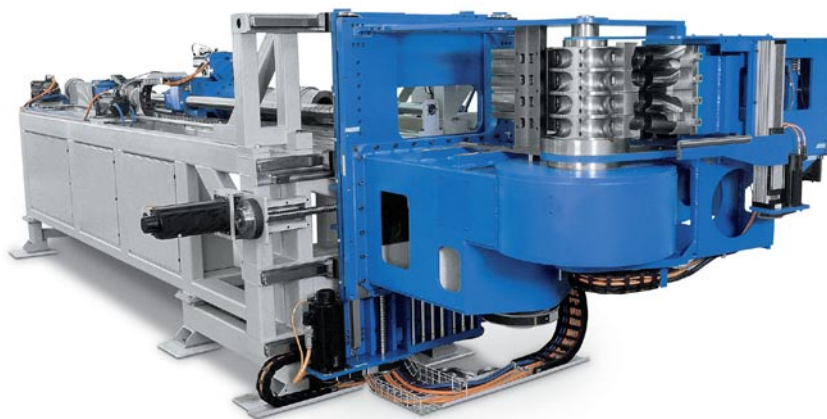
peripherals and accessories. With its Megalus and Gigalus range of modular bending machines, Mewag Maschinenfabrik AG of Wasen in Switzerland, which supplies two thirds of its machines to the automotive industry, has geared its range of machinery to meeting these demands. The machines have one or two free-standing bending heads which bend to the left and/or to the right. They will operate with up to 15 axes. During operation any number of bending tools with different radii can be used and, depending on the machine model, tubes of up to 60 mm diameter (Megalus) and up to 150 mm diameter (Gigalus) can be machined.

#### Short re-tooling times

Even parts with short clamping sections featuring complex left and right bending geometries as well as free form radii can be fabricated in a single mounting operation with the new generation of Megalus/Gigalus machines. Workpieces with machined ends, with flanges, ring assemblies and nuts can be bent without any problems. All main axes are fitted with monitored safety couplings. Very short re-tooling times are possible because all the tool default settings and clamping pressures are under fully automatic control. The electromechanical movement of the clamping fixture and the slide rail support is effected by means of spherical spindles. Hardened roller rail guides as well as low-maintenance servo drives make for wear-free operation, a maintenance friendly system and long life. The

feed and bending movements are highly precise and highly dynamic thanks to the use of digital intelligent drives with the SERCOS interface. This internationally standardized interface between drives and the control system guarantees interference-free communication based on fiber optics and micro-second accuracy as regards the synchronization of all drives.

safety functions decentrally – without additional hardware or alternative routing via the control. “The absence of external monitoring devices and measuring systems means that we need less wiring and also save on control cabinet space,” says Technical Manager Samuel Gerber. “This in turn means that throughput time is considerably reduced”. For this reason, the new generation of



Electric tube bending machines from the Megalus and Gigalus series, equipped with intelligent servo-drives from Rexroth.

#### Intelligent safety system

Easy access to the tool head and its horizontal arrangement enable rapid tool changes to be carried out, something which also calls for an intelligent safe motion system. For this reason Mewag decided on certified redundant safety monitoring directly within the Rexroth IndraDrive servos. This feature implements all important

Rexroth IndraDrive servos was specified as standard for Megalus and Gigalus machine series.

When the operating mode is switched over from normal to special operation – on the safe motion-equipped drives in the security zone – dual channel safe stop or safe operating stop is selected directly on the drive,

bypassing the PLC and other time-delaying devices. As soon as all the drives have automatically moved into the safe state the machine operator can enter the security zone without risk to carry out tests or checks. A laser scanner is used for monitoring the security area around the bending head.

In comparison with conventional safety concepts, the Mewag machine factory avoids having to use power relays in main power or engine supply lines, which means less wiring in the control cabinet.

With the redundant connection of permissive signals to the drives, it is possible in special operation to travel at a number of safely reduced speeds or using safely reduced rhythms. Monitoring the limits set by a password is achieved with redundant soft and hardware modules in the drive. No secondary encoder system is required for this. Safe start lock, safe direction of rotation and safe shutdown monitoring are additional functions incorporated by Mewag directly within the drive.

**Rexroth**  
Bosch Group