

FORMING THE FUTURE



HYDRAULIC PRESS LINES

HYDRAULIC PRESS LINES. FROM THE BLANK TO THE FINISHED PART.



Hydraulic press line with Schuler blankloader and robot automation. Total press force: 89.000 kN (five presses).

Hydraulic press lines permit the efficient and versatile series production of medium-sized and large parts. The press lines comprise four to six automated stand-alone presses depending on the required forming operations. Automation systems for blank loading, press interlinkage and finished part handling and stacking, designed specifically for the respective line, ensure reliable and economical series production.

HYDRAULIC PRESSES FOR PRESS LINES

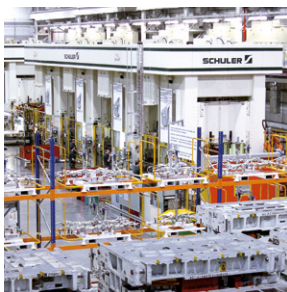
	Lead press	Secondary presses
Press force [kN]	From 10,000 – 35,000	From 6,300 – 20,000
Bed length [mm]	3,300 – 5,000	3,300 – 5,000

Other sizes available on request.



Focus on best part quality.

FROM THE BLANK TO THE FINISHED PART



Versatile hydraulic press line for manufacturing aluminum components.



Flexible robot automation.



End-of-line system.



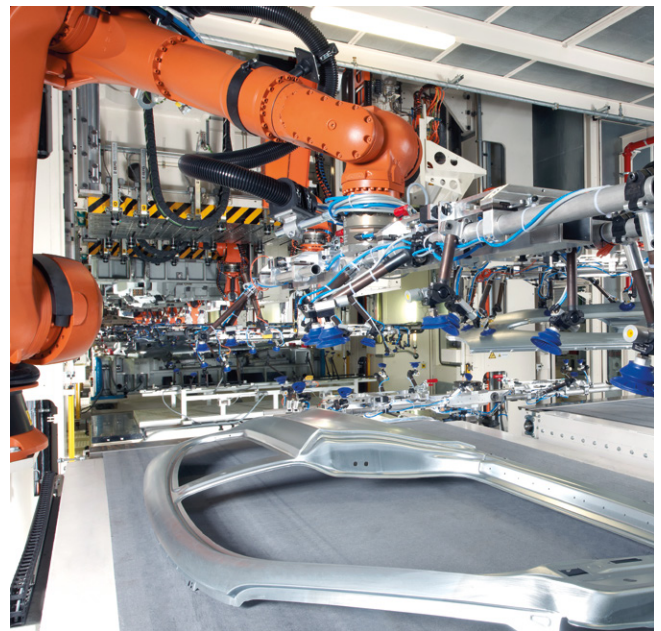
Line host controller.

TECHNICAL EQUIPMENT.

Hydraulic press lines facilitate comprehensive automation of the production process from the blank to the finished part: with Schuler blank loading, press automation and finished part stacking systems.



Fully automatic die change system.

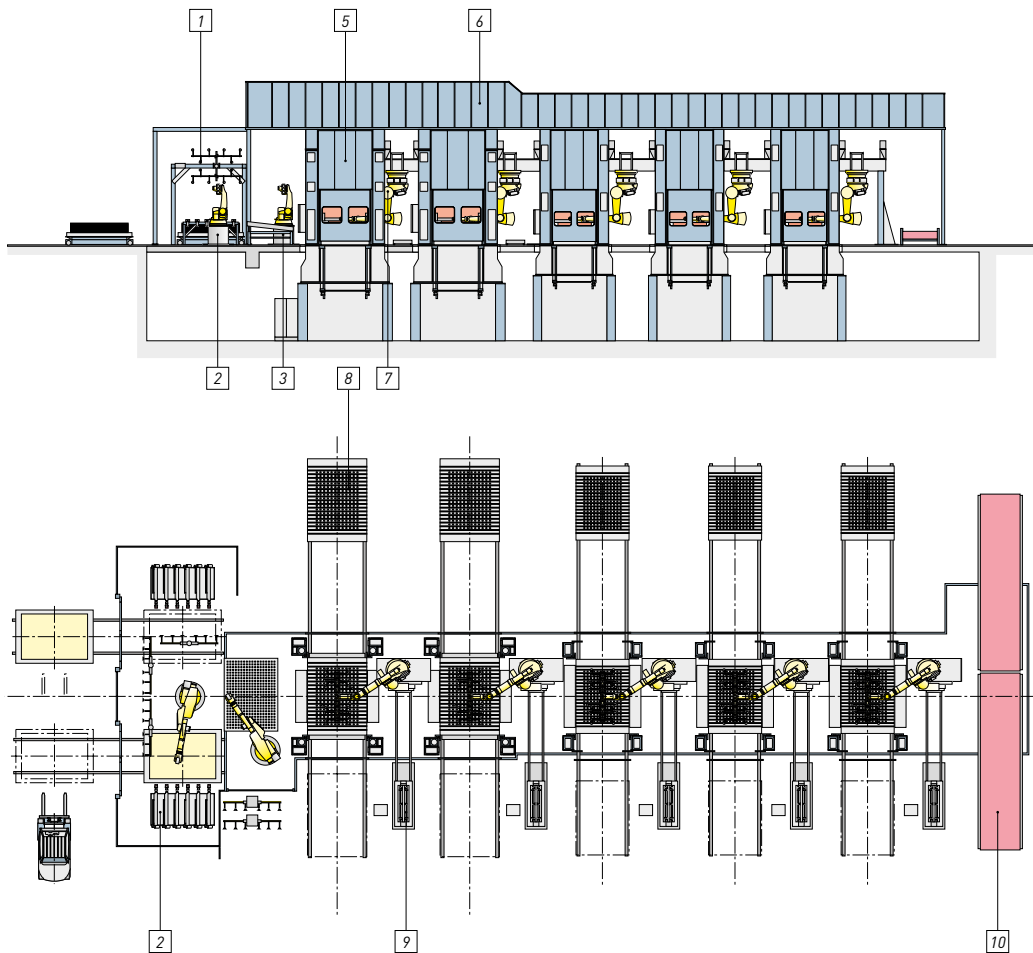


End-of-line system.

Versatile and economical. Hydraulic press lines are primarily used for manufacturing a wide range of parts in small to medium batches. The lines comprise four to six stand-alone presses depending on the required forming operations. Normally, the production process is fully automated – from the blank to the finished part. Depending on the application, this is realized by conventional robots or the Crossbar Robot developed by Schuler.

Hydraulic press line control and visualization systems facilitate straightforward, uniform operation, efficient diagnosis and management of all process and die data for all presses and the automation systems.

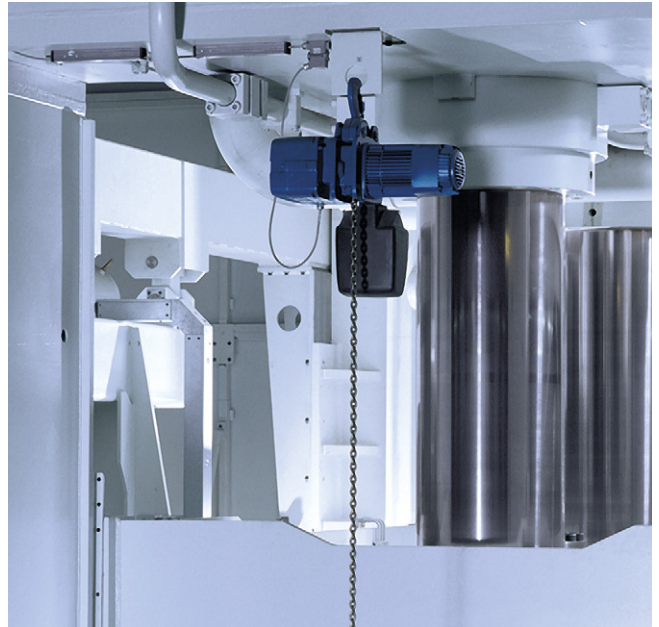
HYDRAULIC PRESS LINE WITH BLANKLOADER AND CROSSBAR ROBOT AUTOMATION



- | | | | | | | | |
|---|------------------|---|------------------|---|--------------------------|----|-----------------------------|
| 1 | Blankloader | 4 | Destacking point | 7 | Crossbar Robot | 10 | Finished part conveyor belt |
| 2 | Destacking robot | 5 | Lead press | 8 | Moving bolsters | | |
| 3 | Loading robot | 6 | Hydraulics | 9 | Automatic tooling change | | |



Hydraulic press lines permit the efficient and versatile series production of medium-sized and large parts.



Innovative hydraulic solutions make it possible to manufacture components economically to the highest standards of quality.

The advantages:

Modular line concept:

- Process-oriented line configuration based on standard components
- Defined interfaces to other components

Consistent control architecture and visualization:

- Reduced training outlay for operators and line maintenance personnel
- Integrative documentation
- Online diagnostic capability for the entire line

Dynamic force control:

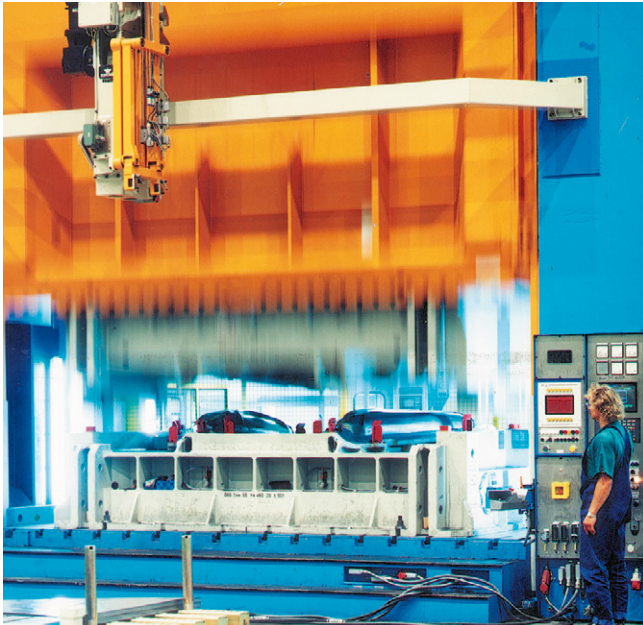
- Increased productivity and output, reduced unit costs

Precise slide guidance and rigid press frame to automobile industry standards:

- High part quality even when manufacturing multiple parts
- Simple and fast adaptation of automobile industry dies
- Short start-up times
- Faster production of GO parts

Efficient use of energy:

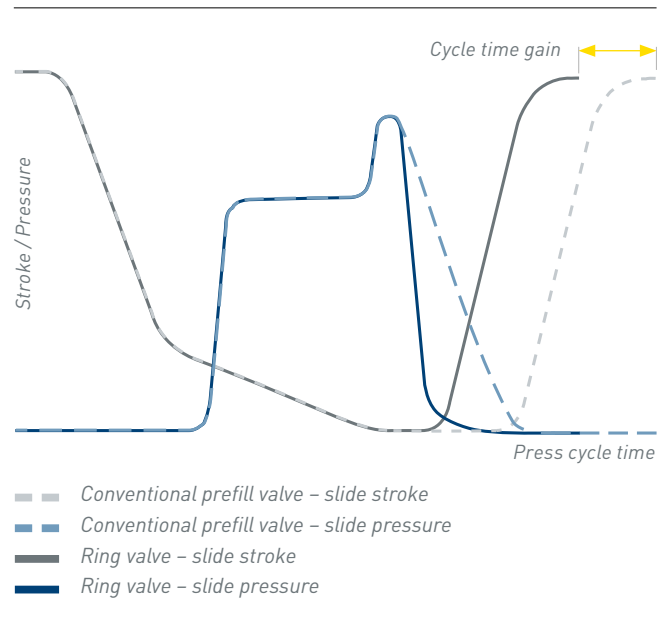
- Efficiency-optimized main drives
- Flow-optimized control blocks
- Low-friction seals/guides
- Slide counterbalancing
- Low-consumption high and low pressure circuits
- Energy Analysis in the Press Shop
- Use of Energy-Efficient Components
- Innovative System Solutions
- Intelligent Control Solutions



“Speed” function extends application areas.

RING VALVE TECHNOLOGY.

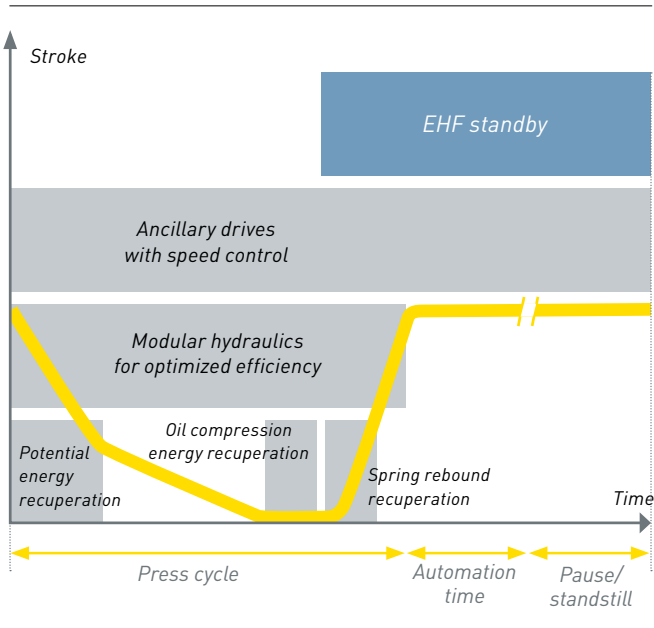
The cycle times of hydraulic presses can be significantly reduced by means of ring valve technology. Used in prefill valves it provides fast filling of the cylinders during rapid closing. After the working stroke, the pressure in the cylinder has to be released quickly so that the slide can complete its return stroke. Unlike conventional prefill valves, the ring valve can be opened by the control system upon reaching the BDC position of the slide under maximum system pressure. This means that the pressure release phase can be significantly shortened.



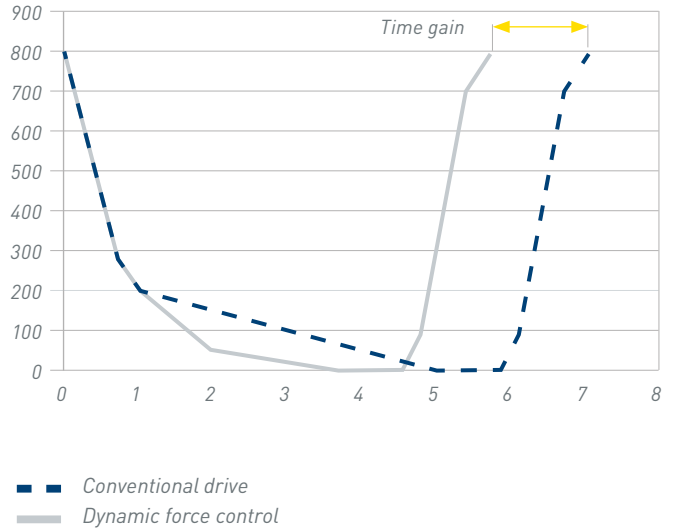
The cycle times can be significantly reduced by means of ring valve technology.

Benefits at a glance:

- Short switching and pressure release times
- Flow-optimized design
- High closing and return stroke speeds
- Targeted pressure release, especially for springloaded dies
- Compact, straightforward design, long service life and reliability



EHF Efficient Hydraulic Forming saves energy costs.



A cycle time gain can be achieved by means of dynamic force control. In this example it amounts to 1,4 seconds.

IMPACT SHOCK DAMPENING.

The optional hydraulic impact shock dampening system can significantly extend the service life of blanking dies while also greatly reducing noise emission and wear on the press. An additional increase of the dampening effect can be achieved by recording the point of impact of previous strokes and optimizing timing automatically in self-teaching mode.

ENERGY EFFICIENT DRIVE TECHNOLOGY

Innovative drive system to increase the energy efficiency of hydraulic presses achieved by:

- EHF standby
- Ancillary energy generated on demand
- Modular hydraulics for optimized efficiency
- Energy recuperation

Energy savings resulting there of 20-60%

DYNAMIC FORCE CONTROL.

To increase productivity, production presses can be equipped with dynamic force control. The press has three working cylinders. Part yield is increased by means of the automated adaptation to the required forming force and, therefore, to an increase in slide speed. During phase one of the operation, only the center cylinder provides the necessary force, tripling the working speed. In phase two, if the full nominal force is required, the press automatically cuts in the other slide cylinders.



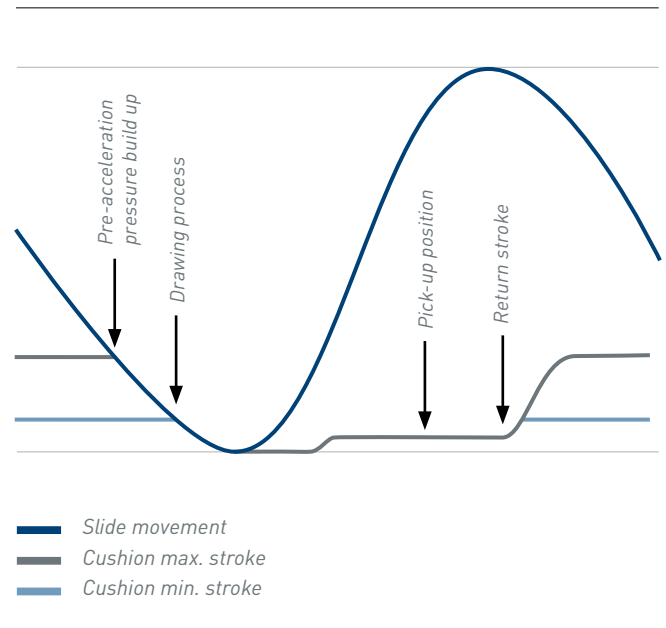
The hydraulics are easily accessible.

BLOCK HYDRAULICS.

The oil tank incorporating the capacity-controlled axial piston pumps is located on the crown of the hydraulic presses. A direct drive supplies all consumers with hydraulic oil pumped directly without a pressure accumulator. The system pressure therefore correlates directly to the pressure requirement of the die.

Benefits at a glance:

- All valves of a particular function are combined in one control block
- Direct connection between pump, block, and cylinder
- Simplified trouble-shooting/fault finding by means of function and testing ports
- Enclosed valves can be suitably combined with space-saving externally-mounted valves
- The valves, mounted on to the surface of the block, are easily accessible



Hydraulic bed cushions help to ensure consistent part quality.

HYDRAULIC BED CUSHIONS.

All-hydraulic bed cushions are standard on the lead presses. The use of a controlled hydraulic bed cushion in the lead press is recommended for the manufacture of outer-skin panels.

This helps to ensure consistent part quality by means of exactly reproducible production parameters. Multi-point cushion control is available as an option. This enables the force of each individual displacement cylinder to be programmed independently over the drawing stroke. This offers a number of advantages especially when manufacturing complex drawn parts and multiple parts.

DIE CHANGE.
DIES ARE CHANGED FULLY AUTOMATICALLY ON
MOVING BOLSTERS.



Hydraulic press line with Crossbar Robot automation. Total capacity: 66.000 kN (6 presses).



Crossbar Robot 4.0. The latest generation of press line automation.

The significance of efficient die changing becomes increasingly apparent in the face of ever decreasing batch sizes. Even our basic models feature automatic PLC-controlled adjustment of the stroke and pressure axes in accordance with the selected die data record. Moving bolsters facilitate the die changing process which can be partially or fully automated. Automation tooling can also be changed automatically, especially when industrial robots are deployed.

DIGITAL SUITE – DIGITALIZATION IN THE PRESS SHOP

With its Digital Suite, Schuler offers you new opportunities to boost the productivity of your press shop. From the networking of your systems and die protection to component tracking and production monitoring.



Significant reduction of die change times.

Fully automated die change.

- Significant reduction of die change times
- Fully-automated die clamps on the slide
- Automated scrap chute covers
- Connections for die automation on the moving bolsters
- Complete set-up and preparation of dies and tooling possible outside the line during production
- Connection to automation panels via special couplings
- Automatic tooling change for robots

Embark on the path to digitalization with Schuler. Reliable, uncomplicated, and customized to your individual needs.

digital@schulergroup.com



<https://digitalsuite.schulergroup.com/en/>

STANDARD EQUIPMENT FOR HYDRAULIC PRESS LINES

MECHANICAL EQUIPMENT

- Single action presses
- FEM-calculated press frame of welded steel construction, thermo-stress relieved
- Press slide constructed as welded pressure element, thermo-stress relieved
- Slide parallelism monitoring
- 8-way guiding of the slide with bronze plates and tempered wear strips
- Oil recirculation lubrication
- Hydraulic bed cushion for lead press with 1 pressure axis
- Bed cushion functions: displacement, pad, ejector
- Bed cushion pressure element with 8-way flat guiding
- Supporting bars for foundation covers on the press bed (covers are customer's supply)
- Walkable press crown and oil tank
- Semi-automatic changeover with 2 moving bolsters for each press moving out to the side
- Electromotive safety guards for lateral windows in the uprights
- Slide locking in top dead center (TDC)
- Press and safety equipment according to Schuler standard and EN/DIN
- Illumination of die space
- Power supply to the moving bolster by means of cables running in an open channel level with the floor
- Presses fixed on grouted foundation

SERVICES

- Operating instructions and controls in the language of the country of use
- Introductory operator training included

HYDRAULIC EQUIPMENT

- Capacity-controlled axial piston pumps with delivery rate control for main drive
- All power units located on the press crown
- Modular design as hydraulic valve block
- Countercurrent oil-water heat exchanger, thermostatically controlled, located on the press crown
- Oil filtration in a separate circuit
- Springloaded die control (Nitrodyne control)
- Connections for auxiliary die functions on the press upright:
1×continuous air ½"/2×supply + 2×return air with 5/3-way pneumatic valve/1×coupling/receptacle outlet HAN 24 (16 inputs/4 outputs)
- Leak oil drainage in separate tank with level switch

ELECTRICAL EQUIPMENT, CONTROL

- Schuler control system for open and closed loop control as per IEC 61131-3, PC control
- LCD touchscreen, flat color monitor (19")
- Ethernet for network connection
- EtherCAT as bus system for the quick control of axes
- Profinet as bus system
- 200 storable die data records
- Schuler safety control system for the safety functions
- Operating modes: setup, single stroke, automatic mode
- Pendant panel with integrated touchscreen and hardware pushbuttons
- Connecting cable control cabinet/press for up to 10 m of installation length outside the press
- Control cabinet with air conditioner

Subject to change in the interests of technical progress.

OPTIONAL EQUIPMENT FOR HYDRAULIC PRESS LINES

MECHANICAL EQUIPMENT

- Double-action lead press
- Hydraulic slide weight counterbalance dependent on capacity required (fixed setting)
- Multi-point cushion control for bed cushion of the lead-off press (4, 6 or 8-point control)
- Hydraulic bed cushion for secondary press
- Covers for pressure pin holes
- Hydraulic slide cushion
- Mechanical stroke limitation with cutting impact dampers
- Adaptive control of cutting impact dampers
- Moving bolsters running on T-track arrangement
- Fully automated die change
- Mechanical moving bolster lock
- Die clamps on the slide
- Die space protected by presence-sensing safety device
- Infinitely variable slide lock
- Press installation on vibration damping elements
- Scrap flaps, segmented, manually operated
- Scrap flaps, one piece, automatically operated
- Scrap chutes below floor
- Sound enclosure
- Deflection of press bed/slide designed for 0.125 mm/m

SERVICES

- Training for operating and maintenance personnel
- Supervised startup
- Maintenance contracts
- Turn-key delivery of the complete line

HYDRAULIC EQUIPMENT

- Dynamic force control
- Ring valve technology
- Double switch-over filter for cooling and filtration circuit
- Oil and nitrogen filling

ELECTRICAL EQUIPMENT, CONTROL

- Superordinate master control
- Remote diagnostics

ENERGIEEFFIZIENZ

- Energieeffizienz Module 1 – 4

Subject to change in the interests of technical progress.

SCHULER SERVICE.

STATE-OF-THE-ART SERVICE FOR
MORE PERFORMANCE.

Schuler Service offers a tailored portfolio of services covering the entire life cycle of your equipment.



Schuler Service – Customer-oriented & efficient, worldwide.

Over 800 service employees worldwide provide expert support 24/7 in close cooperation with you – our partners. Our main priority is always to ensure the maximum productivity and safety of your production equipment in order to secure your company's continued success.

With over 180 years of experience and expertise, we can guarantee the best possible support for the operation of your machines – and not only those supplied by Schuler, but by all other manufacturers. Whatever the situation, Schuler Service has the right solution for your specific needs.

OUR SERVICES FOR YOU.

Technical Customer Support:

- Machine inspections
- Safety inspections
- Preventive maintenance
- Repair
- Repair welding
- Production support

Components and Accessories:

- Spare parts and spare part packages
- Maintenance kits
- Repair parts
- Replacement parts

Project Business:

- Modernization
- Retrofits
- Refurbishment
- Machine relocations

Special Services:

- Service contracts
- Hotline and remote service
- Training
- Tailored customer training
- Optimizing plant & processes
- Consulting

Used Machinery:

- Purchase and sale
- Evaluation



[www.schulergroup.com/
service_en](http://www.schulergroup.com/service_en)

ABOUT THE SCHULER GROUP – WWW.SCHULERGROUP.COM

Schuler offers customized cutting-edge technology in all areas of forming – from the networked press to press shop planning. In addition to presses, our products include automation, dies, process know-how and service for the entire metalworking industry. Schuler’s Digital Suite brings together solutions for networking forming technology and is continuously being developed to further improve line productivity and availability. Our customers include automotive manufacturers and suppliers, as well as companies in the forging, household appliance and electrical industries. Presses from the Schuler Group mint coins for more than 180 countries. Founded in 1839 at our headquarters in Göppingen, Germany, Schuler has approx. 5,000 employees at production sites in Europe, China and the Americas, as well as service companies in more than 40 countries. The company is part of the international technology group ANDRITZ.

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