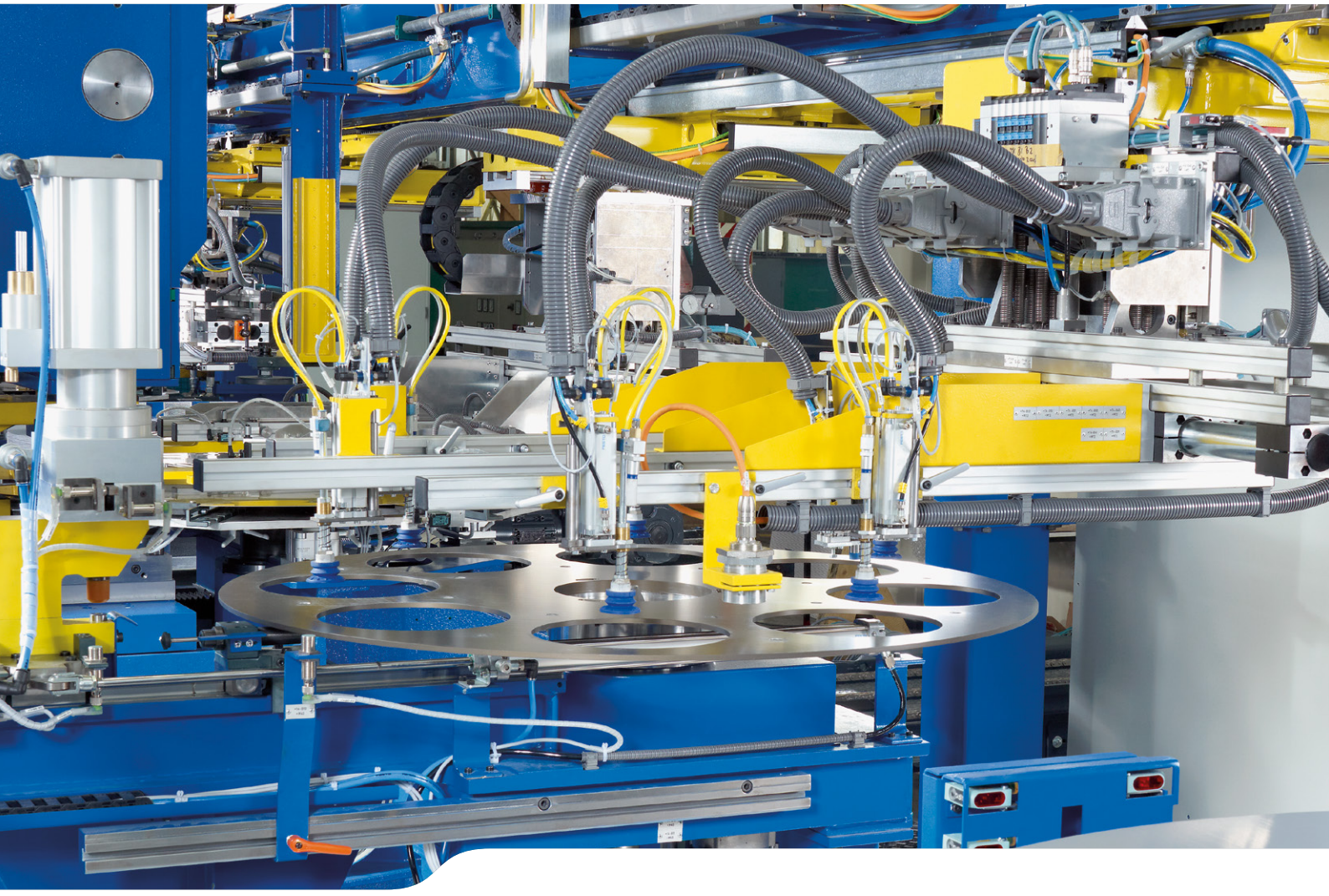
FORMING THE FUTURE

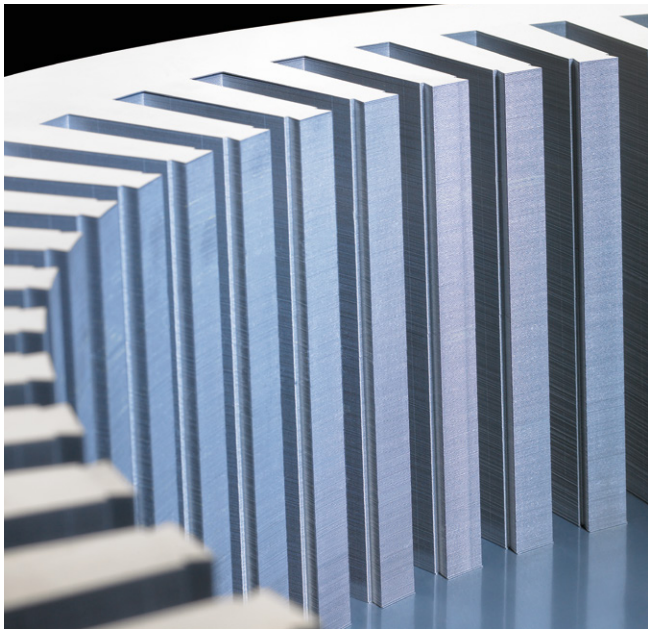


ELECTRIC MOTOR LAMINATION SYSTEMS SOLUTIONS – NOTCHING

SCHULER

Member of the ANDRITZ GROUP

NOTCHING EQUIPMENT.
COST-EFFECTIVE MANUFACTURING TECHNOLOGY FOR ELECTRIC MOTOR LAMINATIONS IN SMALL AND MEDIUM LOT SIZES.



Utmost part quality with notching equipment from Schuler.

Modular product lines for a variety of process requirements. Schuler's modular program of manually operated machines and automated lines can be configured for a variety of manufacturing requirements. The foundation is provided by specific high-precision, high-performance press ranges for producing round blanks and/or segments. They can be operated as single presses with manual feeding, as well as in various degrees of automation.

MANUALLY-OPERATED NOTCHERS

Schuler offers manually-operated notchers for the cost-effective manufacture of rotor and stator laminations for electric motors and generators.

Special features:
- Operator friendly
- High levels of flexibility
- High levels of precision

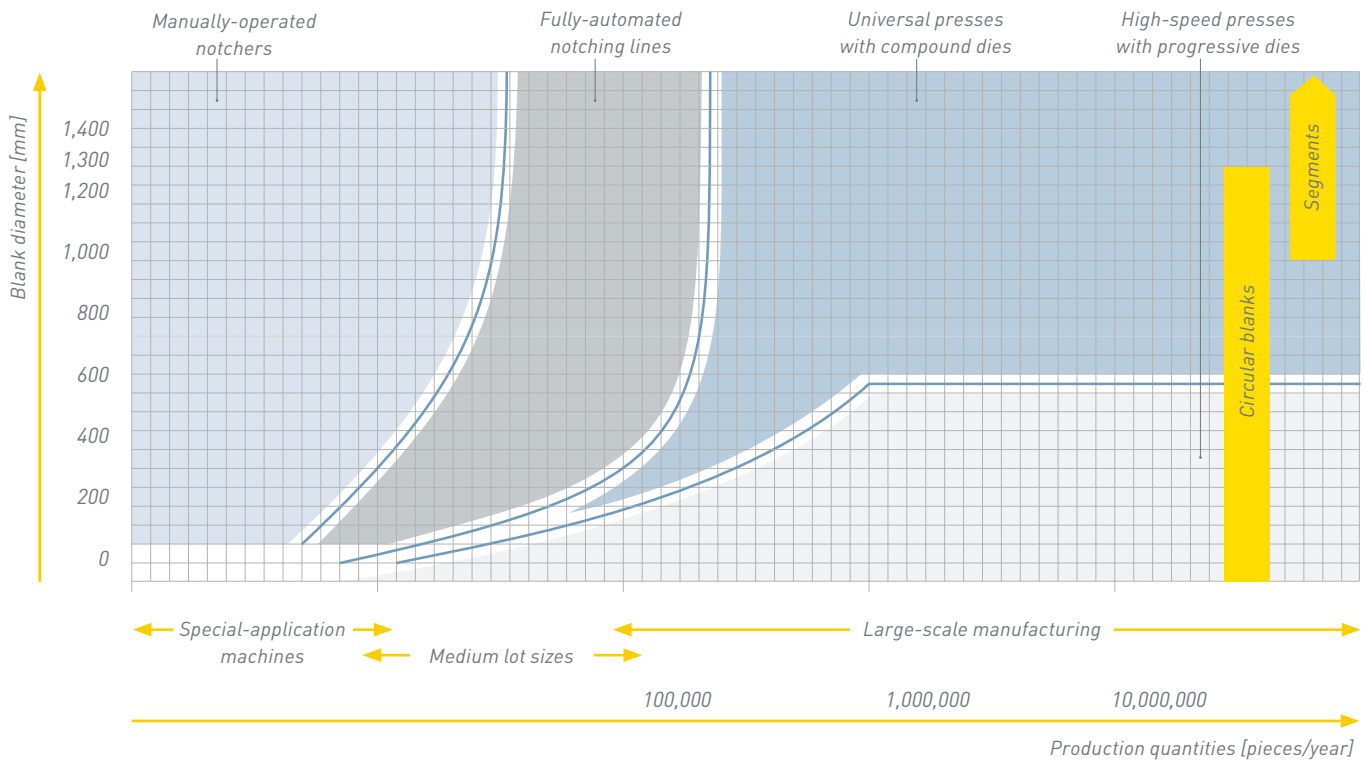
FULLY-AUTOMATED NOTCHING LINES

For high production volume, Schuler offers fully-automated high speed notching lines with high process reliability. The combination of one or two notchers with a linear or rotary automation system produces a line that is both cost-effective and flexible.

Special features:
- High production rates
- High levels of uptime
- Short changeover times

EXTENSIVE ACCESSORIES AND SPECIAL APPLICATION EQUIPMENT

A wide selection of accessories is available for special tasks. The extreme versatility in the number of possible combinations ensures optimal configurations for customer-specific requirements.



AREAS OF APPLICATION FOR EQUIPMENT USED TO MANUFACTURE ELECTRIC MOTOR LAMINATIONS

The cost-effective manufacturing of electric motor laminations requires widely different die and machine technologies, depending on part shape and production lot sizes. The figure seen here offers a schematic representation of the appropriate areas of application for single notch, compound or progressive dies.
The single notch is the most versatile and flexible manufacturing method. In contrast to large scale production runs requiring compound or progressive dies, this method can be used not only for medium to small production lot sizes but also for cost-effective one-out production for special-application motors and generators.

USER-FRIENDLY.
MANUALLY-OPERATED NOTCHERS FOR CIRCULAR BLANKS AND SEGMENTS.

Precise manufacturing and simple handling with a manually-operated notcher.

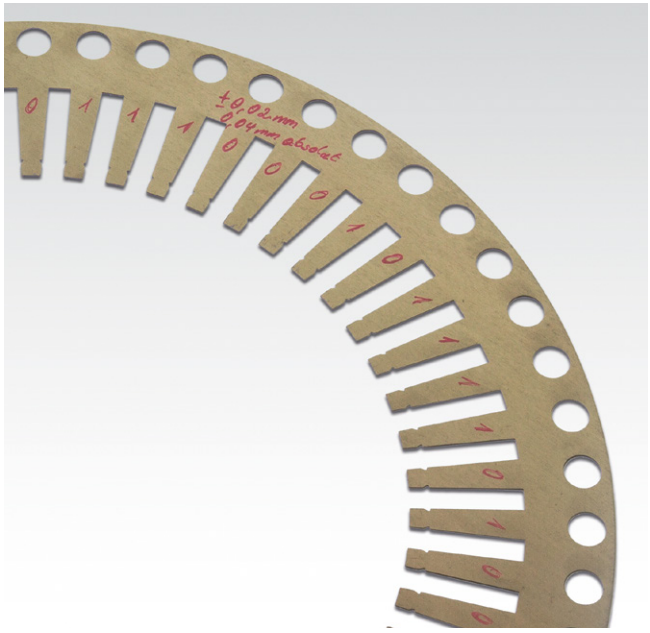
SCHULER NOTCHING EQUIPMENT

Schuler notchers are constructed with cast press frames. They are notable for their favorable resilience and vibration characteristics. In order to maintain the desired notch indexing, the CNC indexing drive is provided by a position-controlled servo motor. In this way, these presses ensure a high degree of flexibility, short changeover time as well as the ability to achieve the widest possible variety of notch patterns.

The design of the y-axis (pitch) diameter adjustment includes a CNC-axis. This allows punching of multiple pitch diameters in one setup by use of controllable dies.

The benefits:

- Low investment costs
- High stroke rate
- Low costs for dies
- Production precision
- Simple operation
- High degree of flexibility



Utmost precision with almost zero tolerance at extremely high stroke rates.

PerFormer S – manually operated notcher.

Wide variety of parts manufactured on Schuler notching equipment.

MANUALLY-OPERATED NOTCHERS

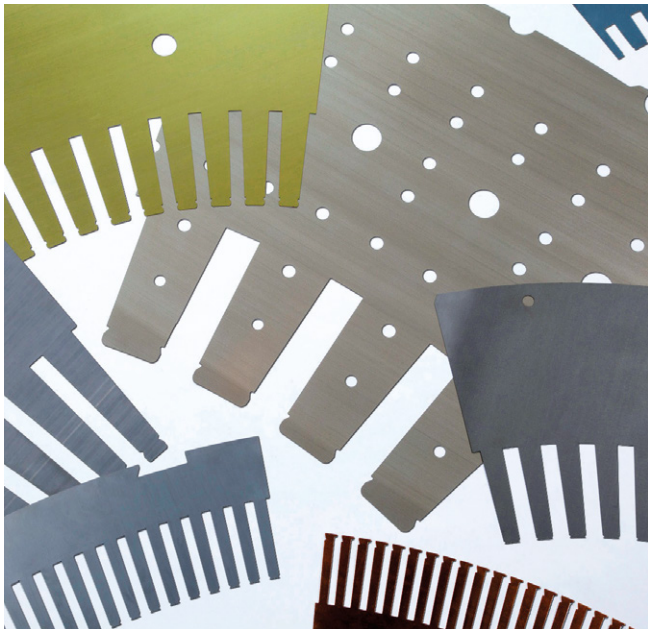
When operating a notcher as a stand-alone press, the loading of blanks and unloading of notched laminations is performed manually. The manually-operated notchers work with precision and efficiency at high stroke rates as well as at the highest level of indexing accuracy to ensure part quality.

For the notching of circular blanks, Schuler offers a numeric notching press with an extensive range of accessories. Schuler offers 1-axis or 3-axis notching presses for the notching of segments.

- Application: circular blanks
- Press capacity: 80/200 kN
- Blank outer diameter up to max: 1,100 / 1,800 mm

The equipment is versatile in its range of applications and can be supplied with numerous accessories to suit customer-specific requirements.

3-axis segment notching press.



SEGMENT NOTCHING PRESS

Programmable segment notching presses offer nearly unlimited possibilities for the design of large motors and generators. Either 1-axis or 3-axis models can be used, depending on the blank dimensions and desired programmable complexity. The 1-axis lines are best suited to the manufacturing of pole laminations and smaller segment laminations. The 3-axis lines are provided with a blank support plate with 3-axis CNC motion capabilities. Circular blanks can also be notched.

Available in 1-axis and 3-axis design:

- Application: segments and circular blanks
- Press capacity: 250 / 320 kN

1-axis:

- Circular blank outside diameter up to max: 1,800 mm
- Segment blank outside diameter up to max: 2,500 mm

3-axis:

- Circular blank outside diameter up to max: 1,800 mm
- Segment blank outside diameter up to max: unlimited

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.

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

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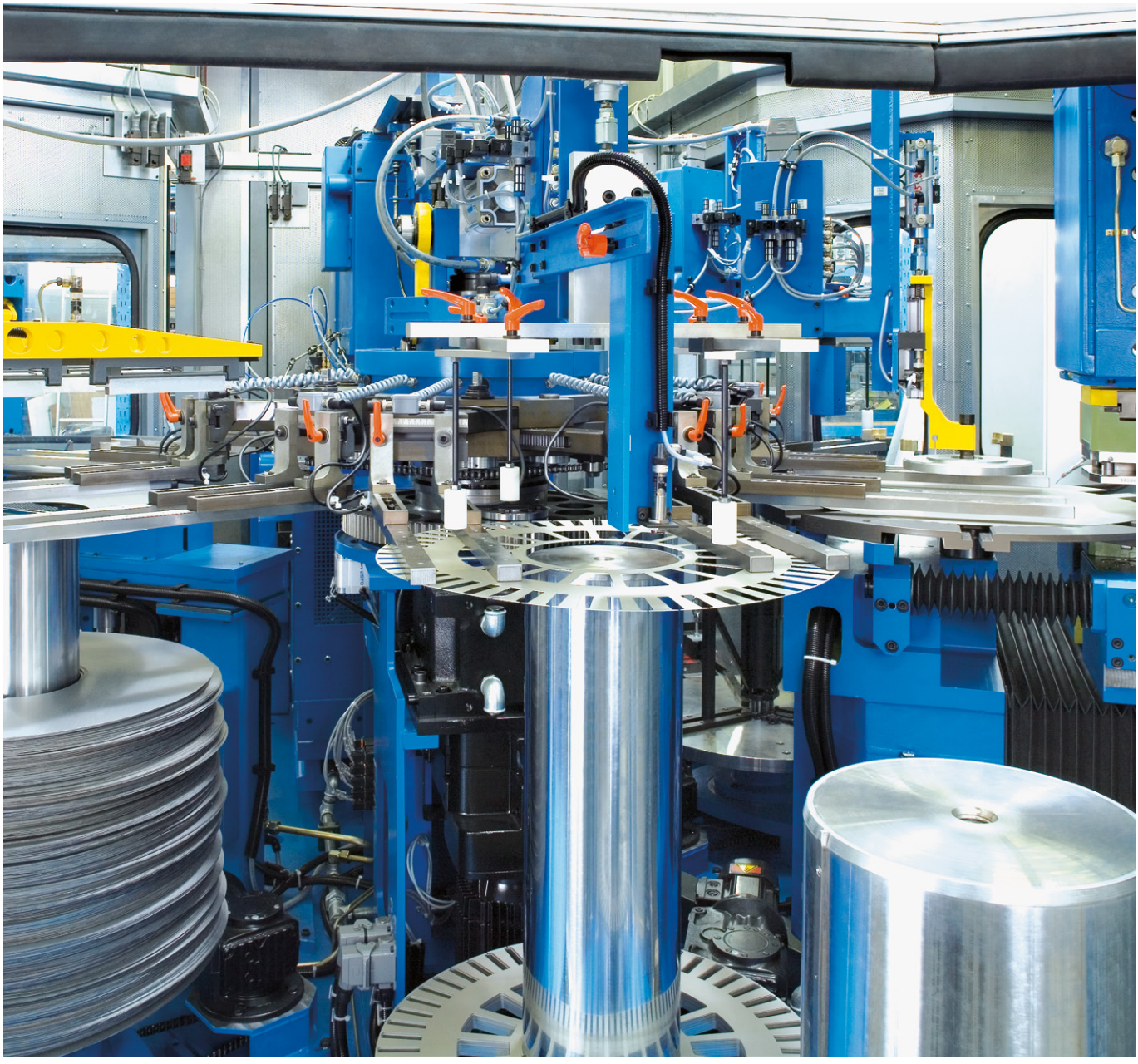
MORE INFORMATION

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

PROCESS RELIABILITY FOR HIGH PRODUCTION VOLUME.

FULLY-AUTOMATED NOTCHING LINES.

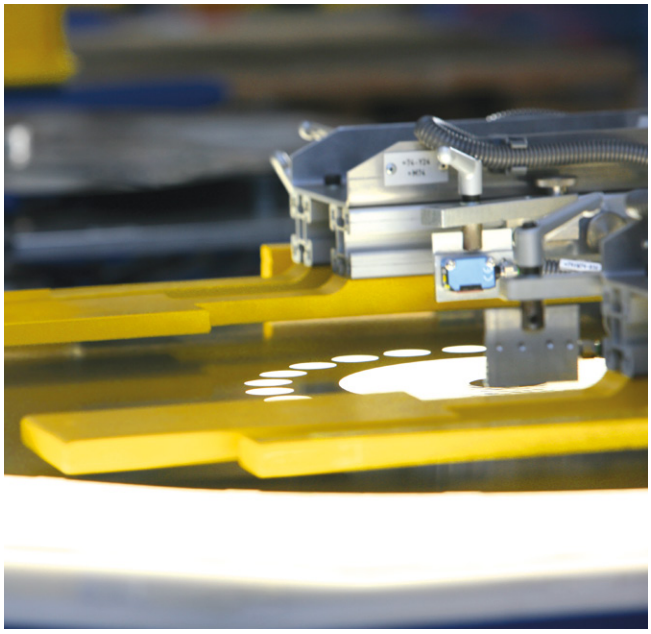


Fully-automated notching line with circular transfer (spider) automation.

Schuler offers automated lines for notching electric motor laminations at high production rates and with a high level of process reliability. The combination of one or two notching presses with a linear or rotary automation system provides a solution that is both cost-effective and extremely flexible. The systems are not only flexible but can be expanded to include fully automated pallet/stacking mandrel change-overs as well as integrated shaft hole punching.

The benefits:

- Short cycle times
- Short changeover times
- High levels of uptime
- Fast stack changes
- Cost-effectiveness
- Safe, reliable handling of laminations on stacking mandrel or pallet



Optical orienting station.

FULLY-AUTOMATED NOTCHING LINE WITH CIRCULAR TRANSFER (SPIDER) AUTOMATION

For the notching of blanks with smaller diameters, Schuler offers its compact and efficient system of circular transfer (spider) automation. Drive for the circular transfer (spider) by servo motor. The pneumatically-operated raise/lower motion ensures the precise transfer of blanks to individual stations. The rotors and stators are stacked onto mandrels. Two mandrels are mounted on each turntable. This ensures fast stack changes, whether performed manually or automatically.

- Application: circular blanks
- Model variants: single / tandem
- Press capacity: 80 / 200 kN
- Circular blank outside diameter max.: 400 / 630 / 800 / 1,000 mm
- Stacking /unloading: via stacking mandrel

FULLY-AUTOMATED NOTCHING LINES WITH LINEAR AUTOMATION, SINGLE/TANDEM

The automated feeding and unloading of larger lamination blanks and segments is performed by a linear overhead transfer system. This achieves maximum flexibility together with a very high degree of automation. The drive for the independent feeding and unloading grippers is provided by servo or linear motors. The gripper arms can be individually adjusted to suit the entire spectrum of possible requirements. Features such as double blank monitors or fanning magnets guarantee the highest level of process reliability. Pallets are used for pick up and depositing the blanks. Automatically cycled lift platforms permit a high degree of stacking accuracy.

Different design variations are possible depending on requirements:

- Single notchers with five or more stations
- Tandem notchers with six or more stations
- Notchers for segments with four stations

All notching equipment can be expanded to suit customer requirements, for example, with the integration of shaft hole punching.

- Application: circular blanks
- Model variants: single/tandem
- Press capacity: 80/200 kN
- Segment blank outside diameter max: 1,000 mm
- Circular blank outside diameter max: 1,300 mm
- Stacking/unloading: via pallet system

Fully-automated notching line with linear automation.

Linear design for segments:

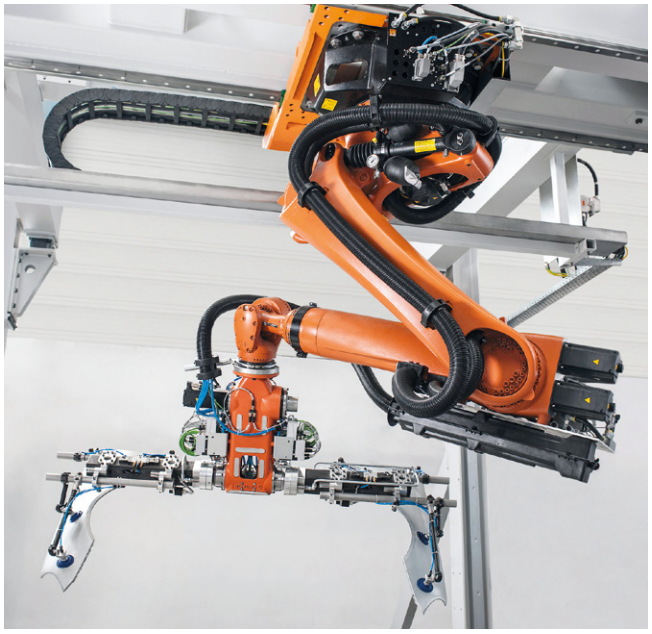
- Application: segments
- Press capacity: 250/320 kN
- Segment size max: 1,100 × 600 mm
- Stacking/unloading: via pallet system

Option: optical orienting station. The position of the blanks is detected in the orienting (centering) station by optical overhead camera system. Position correction takes place in the linear transport. The notcher corrects the offset angle.

CONTROL

The notching equipment controls are specifically designed to meet the requirements of the production process. Special attention was paid to user-friendliness. The use of Siemens components ensures fast availability worldwide. The intuitive and self-explanatory visualization/graphic display with touchscreen makes for easy operation of the lines. Numerous functions ensure complete transparency of the production process.

MAXIMUM PRECISION.
ROBOT AUTOMATION.



AUTOMATED NOTCHING LINES WITH LINEAR AUTOMATION, SINGLE/TANDEM

The automated feeding and unloading of lamination blanks and segments can also be performed by an industrial robot. This allows a variable degree of automation. With the aid of a centering and orienting station, the lines can be individually adjusted to suit the whole spectrum of possible requirements. Pallets are used for pickup and depositing the blanks.

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. Over 900 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.

MORE INFORMATION

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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