

VERTICAL TURNING



YOUR ENTRY INTO THE FUTURE CLASS

THE SCHUSTER NXT.

Vertical lathe for chucked parts
up to 200 mm in diameter.



MOVE THE STANDARD



The trend is shifting from large series to small, bespoke series. Sustainability is the new driving force behind economic efficiency. And individual production steps such as workpiece machining are becoming part of an integrated automated overall process. In short, the transformation to the Smart Factory is changing the demands on metal processing.

That's why we offer you more than just standardised lathes. We work closely with our customers from the metal processing industries to create pioneering solutions that really put them at the forefront. We never stop questioning the status quo. We're constantly working towards the next enhancement. We keep on pushing the boundaries of what's possible and feasible for you.

Together, we're inventing the future of metal processing.



YOUR ENTRY INTO THE FUTURE CLASS. THE SCHUSTER NXT.

Metal processing is undergoing a transformation. Which means we must now reconsider – from development right through to service – what has until recently been the standard for decades.

Our Schuster nxt is one solution which will open up a whole new world of automated vertical turning applications for your bespoke series production, enabling you to benefit from all the advantages of a pick-up lathe: a compact, user-friendly design, a wealth of customisation options, energy and cost savings, and high production capacity in a small space – all this, plus the quality, process and service expertise you have come to expect from Schuster. To put it another way: the Schuster nxt is nothing less than your entry into the future of metal processing.

THERE'S A STANDARD FOR ALMOST ANYTHING. BUT IT CAN DIFFER EACH TIME.

Each turned part requires an individual machining process. That's why we always consider your upstream and downstream technologies and machining steps in the overall process.

requirements. This also applies to the spatial conditions, and parameters such as material supply, quantities and production operating times, as well as to geometries or surface properties essential for proper set-up and process.

Based on our comprehensive process expertise, the Schuster nxt also features a modular machine design that means the entire machining process can be automated and ideally tailored to suit your

THE SCHUSTER WAY - OR, AS WE PUT IT: MACHINERY CONSTRUCTION YOU CAN TRUST.

UPSTREAM PROCESSES

Processes for optimum material supply.

CORE PROCESS

Turning
+ drilling
+ milling
+ grinding

DOWNSTREAM PROCESSES

Processes for measurement and ideal parts removal.



HOW DO WE FIND THE RIGHT SOLUTION?

1. By examining and analysing where you are and where you want to be:

We analyse the challenges standing between you and your goals. They can be anything from the spatial conditions to batch sizes, geometries or precision.

2. By checking the feasibility of solutions and finding the right one:

Once we've analysed your objectives and challenges, we advise you on assessing potential approaches and help you evaluate the most suitable and feasible set-up.

3. By developing the initial project plan and estimating costs:

After working with you to agree the ideal set-up, we plan the project, set objectives and define the ideal parameters for accepting the process.

4. By safeguarding your investment:

Our process expertise safeguards your investment as well. During the planning phase, with highly detailed advice and constant discussion. During acceptance of the overall process whilst taking your targets into account. During operation through the use of robust, proven and available components. And even after this phase with a service strategy tailored to suit your needs.

EVERYTHING REVOLVES AROUND YOUR WORKPIECE - VERTICALLY.

Minor changes can have major effects. This is particularly true when we reconsider the working axis of a lathe – and reorientate it from the conventional horizontal position to a vertical arrangement.

The main spindle plays the central role here. On vertical pick-up lathes like the Schuster nxt, it's responsible not just for machining the workpiece (turning, drilling, milling) but also for the entire

automation. The advantages are obvious: all of a sudden, it's possible to combine several different machining steps in a single process – ultimately saving a lot of time. What's more, the vertical working axis permits a much more compact design and so a much smaller machine footprint.

Boost your savings: minimise resources and costs with maximum production capacity in the smallest of production areas.

Whether for automotive or drive engineering applications, for soft or hard machining – the Schuster nxt provides users with a fully automated pick-up solution for manufacturing high-volume metal workpieces in compliance with exacting quality requirements. And at maximum efficiency.

SCHUSTER NXT - technical specifications

Control system	FANUC 0i-TFP		
Max. chuck diameter	mm	260	
X travel	mm	800	
Z travel	mm	390	
Main spindle: power, 40/100% duty cycle	kW	26.8/20.9	
Main spindle: torque, 40/100% duty cycle	Nm	256/205	
Main spindle: max. speed	rpm	5,200	
Tool turret		12-fold	
Tool holder		VDI 40	
Tool drive speed	rpm	4000	
Torque	Nm	63	
Power	kW	10	

WHY VERTICAL?

- + Significant time savings
- + Compact design with a small footprint
- + Simple handling and set-up
- + Good ergonomic characteristics and accessibility
- + Simple automation
- + Consistent dynamic properties
- + Downward chip disposal for continuous operation

SCHUSTER NXT READY TO TURN

Even with just the basic equipment options, the Schuster nxt offers unique quality features. They include the machine column made of 100% cast Mineralit, the guide systems (45 mm guide track in X and Z directions), as well as the high-precision spindle with extra-large bearings (120 mm) and an A6 spindle nose.

The highlight is the high-quality, user-friendly Fanuc control system. You decide whether the machine is implemented as a left-hand or right-hand version depending on your local situation.

SCHUSTER NXT MILLING VIA TURRET

Cross-drilling, slot milling and milling spanner flats on the circumference or the face side are all machining operations which can be performed professionally, economically and quickly using our driven tool turret. With its high torque of 63 Nm and a power output up to 10 kW at 4,000 rpm, the tool turret is ideal for implementing a complete machining process.

SCHUSTER NXT PRECISION BORE MACHINING

To ensure maximum precision for centric or non-centric bores (bore position does not coincide with the centre of rotation), Schuster offers the nxt with an HSK63 drilling, milling or reaming spindle as well. When combined with Schuster's patented spindle clamp, this machine variant is what enables precision bore machining in series production in the first place.

The hydraulically actuated spindle clamp for fixing the X-axis (main spindle) generates clamping forces of up to 300 Nm. Direct positioning via the spindle nose effectively suppresses even micro-vibrations and meets the demand for precision tolerances of up to 15 µm.

SCHUSTER NXT HIGH-PERFORMANCE DRILLING

Bores measuring up to 65 mm in diameter (depending on the workpiece material) are no problem with our High-Performance Drilling package. The larger volume of chips produced is removed using a generously sized cooling lubricant pump with a capacity of 60 l/min. Milled from solid material and mounted directly on the machine column, the drill bracket with standardised VDI tool interface meets the additional requirements of affecting the forces and accommodating the tools for rapid set-up, for example.



THE FUTURE STARTS HERE.

When equipped with various optional machining units and different spindle variants and loading systems, the Schuster nxt is a pick-up solution offering a wealth of advantages not only in workpiece machining but also throughout the entire process.

Highly compact design: Energy and cost savings through high production capacity in a very small space.

Ergonomics: The ergonomic design provides good accessibility to the working space and tool turret, so setting up the vertical lathe is straightforward and fast. Particularly after planned or unplanned maintenance work, this rapidly restores the machine to production readiness.

Attractive price/performance ratio: No compromises when it comes to availability or precision.

Fully integrated automation: Via the pick-up spindle including NC cycle belt.

Quality made by FANUC: Reliable, low-maintenance and lasting quality you have come to expect from FANUC.

Maximum machine availability: Supported by the ergonomic design, this ensures that the machine is soon ready to resume production – particularly after planned or unplanned maintenance tasks.

Machine column made of 100% cast Mineralit: A cast Mineralit machine column is lighter than its grey cast iron counterpart, features lower thermal conductivity and better damping properties, and increases tool life by up to 30%.

High thermal stability: The symmetrical and massive basic structure ensures optimal heat distribution. No external thermal compensation is needed.

Other advantages: Lower sound emission, 50% less energy consumed during casting, rust-proof and resistant to media.

100% Made in Germany: Trademark high Schuster quality from Bavaria.

Adapted range of options: For a custom design of the machine structure and a freely selectable production solution. See next page.

Warranty: A warranty period up to 24 months gives you the certainty you expect when investing in a future-proof machine design.

NC consulting: We can program an ideal production process for your component.

Service: Our closely knit network of service locations is at your disposal to ensure maximum availability and to extend the economic service life of your machinery. Your qualified personal contact can assist you via remote servicing or directly on site at your premises for troubleshooting and fault correction.

40 years of experience: Steadily increasing process and solution expertise in machinery construction.

THERE'S THE NXT. AND THEN THERE'S YOUR NXT.

To tailor the Schuster nxt to your exact requirements, we offer the machine with numerous optional equipment features in addition to the four standardised packages.

Chip conveyor with tank

You decide whether chips are removed to the left or right based on your local situation. Our Schuster nxt is therefore available in both variants.

Cooling-lubricant cleaning

Coolant cleaning systems with paper belt filters and separate tank for high-performance drilling.

Z-axis extension with absolute lengths

Additional measuring system (glass scale) made by HEIDENHAIN. Positive air pressure protection.

Remote diagnostics system: VPN adapter for remote machine maintenance

Made by HELMHOLZ.

The customer provides the network connection and cabling, as well as the remote WAN IP address. Connections are made in the control cabinet.

Spindle clamp

The spindle clamp securely and rigidly clamps your workpiece in any position, even when drilling is performed offset from the workpiece's centre axis, to provide the best possible position tolerances.

ProfiNet automation interface

The Profinet Automation Interface option ensures that your Schuster machine can communicate with robots or other automation solutions based on an international standard.

Floating PDA interface

Whether for automatic mode, malfunctions, repairs, part supply bottlenecks or piece counters – our PDA Interface option provides all the important information you need.

Portable handwheel

The portable handwheel can operate the axes in enabling mode with the door open to assist the worker in set-up and tooling tasks.

Process monitoring

We recommend using process monitoring software to ensure high precision throughout the system. The digital drive data can be used to monitor up to eight drives or axes. Monitoring is available from a bore diameter of around 3 mm for steel and aluminium workpieces.

Extendible measuring probe

Protected against chips and cooling lubricant, the extendible measuring probe enables you to take clean, reliable measurements on clamped workpieces.

Extraction system

The optional extraction system improves the air quality in your work rooms, contributing to the health of your employees.

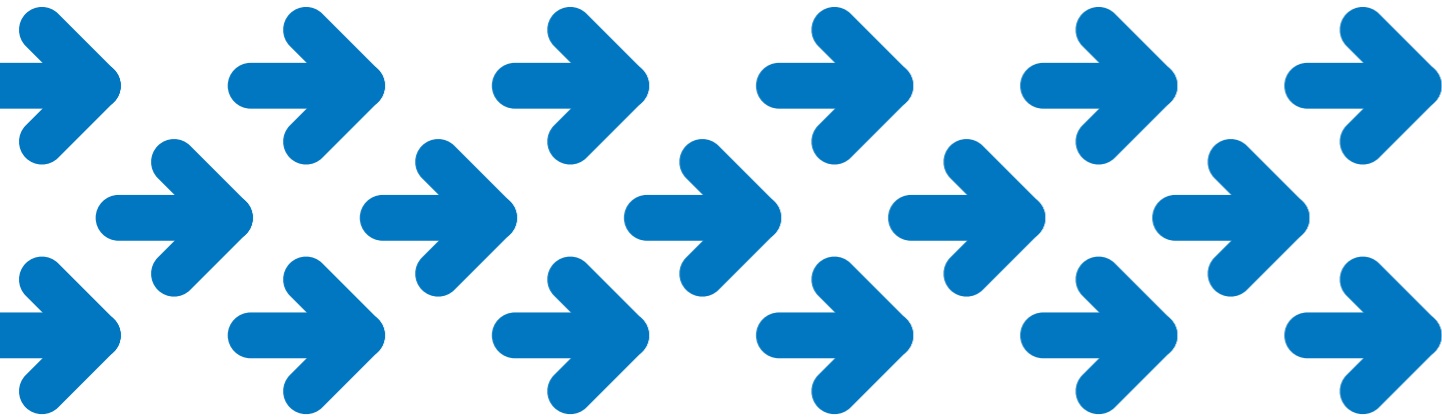
ADDED SAFETY. ADDED VALUE.



Cooperation over many years with renowned suppliers from Germany, Europe and around the world is another reason for Schuster's great reliability and exacting, steadily advancing quality standards.



FAST, EFFICIENT, SAFE AND VERSATILE.



Basic equipment: VDI 40 tool turret for fixed tools

Tool holders: 12 pcs VDI 40 DIN 69880

Extension: VDI 40 tool turret with driven tool

Tool turret (numerically controlled):
Tool holders: 12 pcs VDI 40 DIN 69880,
speed: max. 4,000 rpm, torque: max. 63 Nm,
power: max. 10 kW, max. coolant pressure:
25 bar. Turret locks hydraulically via the
Hirth teeth.

Extension: drill bracket

Productive drilling demands great stability and generates high forces. These forces are transferred directly into the machine column through our solid drill bracket – which securely accommodates your drilling tools via a standard VDI 40 or Capto C6 interface.

Basic equipment: circulating system (blank and finished-parts magazine with automated onward transport)

Workpiece carrier circulating system including base, not including workpiece carriers, capacity: 14 workpiece carriers from 140 to 200 mm diameter.

Extension: belt extension from 14 to 28 locations

Up to 14 additional workpieces can be transported using the belt extension to 28 locations, suitable for workpieces up to 140 mm in diameter.

Extension: drilling/reaming spindle, HSK63 version

Precision bore machining requires low run-out errors combined with high rigidity values. The Schuster nxt is available with an HSK63 drilling/reaming spindle to meet this requirement. For greater precision and process reliability compared to conventional driven tool holders.

YOU CAN DEPEND ON THIS:

- + Upwards and downwards compatibility of our control system
- + Virtual Y-axis permitting milling on turned parts
- + Very high reliability and longevity in all operating environments
- + Global support
- + 60 years' worth of CNC experience
- + More than 3.7 million installed CNC solutions

PRECISE, RELIABLE, DURABLE. THAT'S FANUC QUALITY.

Even with its basic equipment, your Schuster nxt lets you simulate a virtual Y-axis using the FANUC Cylindrical Interpolation function – enabling you to mill grooves on the face sides as well as on the circumference. All this at no extra cost.

FANUC iHMI was developed to ensure high machine user friendliness. Intuitive menus, a modern design and animated functions simplify complex machine operating tasks.

Fine Surface Technology helps you improve the surface quality of your workpieces.

Fast Cycle Time Technology assists you in shortening the run times of your subroutines and reducing cycle time.

FANUC PICTURE provides a wealth of different functions and tools for designing and implementing customer-specific user interfaces on FANUC CNC machines.

Fault diagnostics system

Piece counter

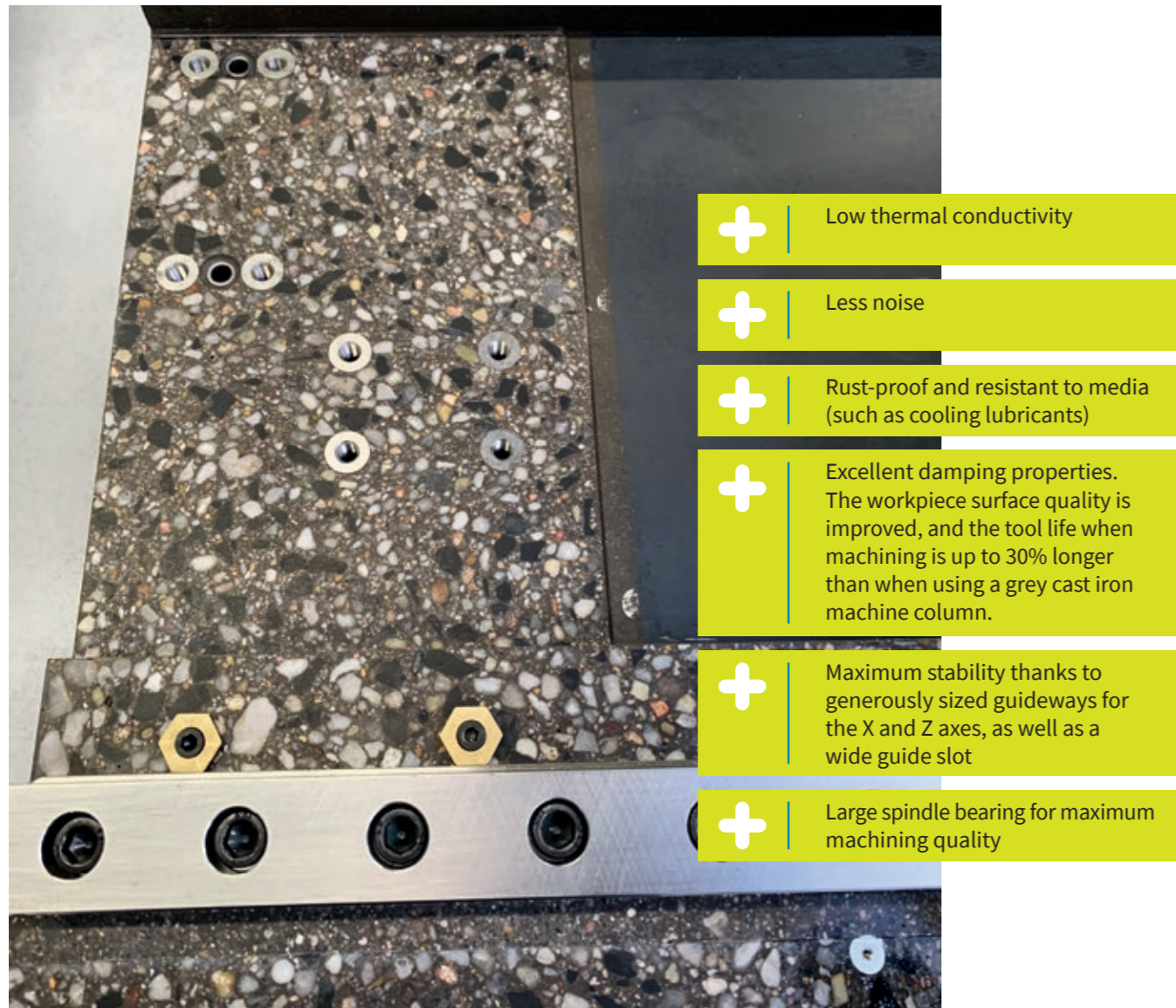
Cycle time indication

SPC part outward transfer

Tool life monitoring

Sister-tool management without allowance program and without measuring probe

MAXIMUM STABILITY THANKS TO 100% MINERALIT.

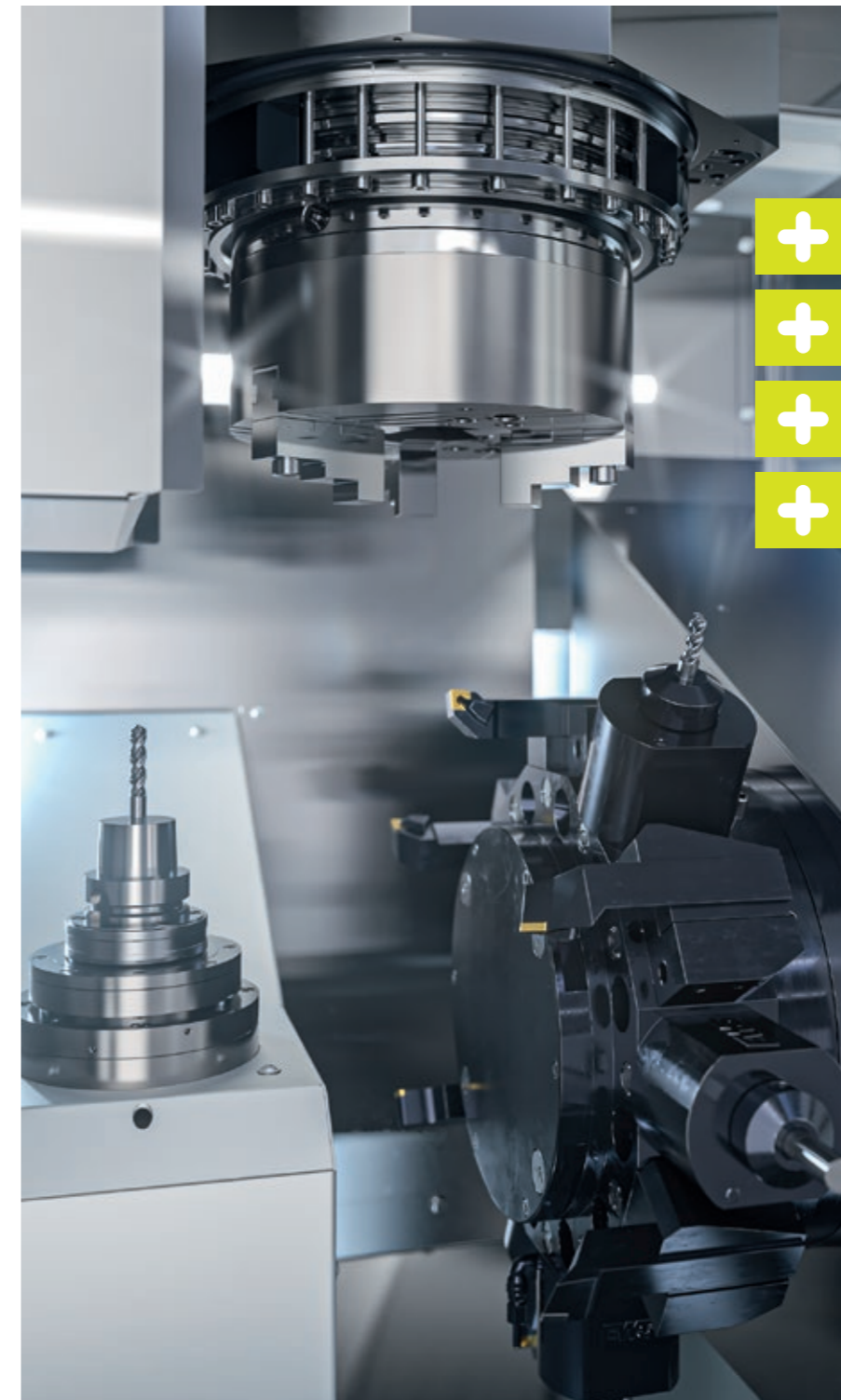


- +** Low thermal conductivity
- +** Less noise
- +** Rust-proof and resistant to media (such as cooling lubricants)
- +** Excellent damping properties. The workpiece surface quality is improved, and the tool life when machining is up to 30% longer than when using a grey cast iron machine column.
- +** Maximum stability thanks to generously sized guideways for the X and Z axes, as well as a wide guide slot
- +** Large spindle bearing for maximum machining quality

The machine column is the central element of the Schuster nxt. As in all machines from Schuster, the machine column of this pick-up lathe is made of cast Mineralit. It permits low-vibration machining for long tool life combined with uniformly high machining quality.



PATENTED SCHUSTER PRECISION.



- +** Extremely stable machining
- +** Free from vibrations
- +** Excellent damping properties
- +** Highly accurate positioning

The spindle clamp developed and patented by Schuster for the Schuster nxt also sets standards. It offers the best possible security with a clamping force of 300 Nm, whilst high holding forces permit faster machining during non-centric drilling and milling operations and increase tool life.

Direct positioning via the spindle nose effectively suppresses even micro-vibrations to increase precision. In other words, the spindle is held exactly where the vibrations originate. Clamping forces act near to the component instead of on the motor as is normally the case, enabling a significantly higher load-bearing capacity.

General specifications	
Max. component diameter	200 mm
Max. component height	200 mm
Max. component weight	30 kg
Machine weight	7500 kg
Connection rating	35 kW

Machine column	
Mineral casting	Epument 145/B
Weight	3800 kg

X-axis	
Travel	800 mm
Ball screw drive	50 mm diameter × 30 mm pitch, ground version. High rigidity and damping. Long service life. Large diameter-to-rotational-speed ratio permits high speed.
Feed force	5800 N
Max. speed	60 m/min
Guides	Recirculating roller bearing unit RUE, size 45, four guide trolleys (optionally six), central oil lubrication system. Maximum rigidity and damping. High load capacity and accuracy values. Optimal collision behaviour.
Guide spacing	450 mm / trolley spacing 600 mm
Measuring system	Make: Heidenhain LC 483, 5 µm accuracy, 0.1 µm resolution, maximum quality and accuracy

Z-axis	
Travel	390 mm
Ball screw drive	40 mm diameter × 15 mm pitch, ground version. High rigidity and damping. Long service life. Large diameter-to-rotational-speed ratio permits high speed.
Feed force	7500 N
Max. speed	45 m/min

Guides	Recirculating roller bearing unit RUE, size 45, four guide trolleys (optionally six), central oil lubrication system. Maximum rigidity and damping. High load capacity and accuracy values. Optimal collision behaviour.
Guide spacing	380 mm / trolley spacing 590 mm
Measuring system	Make: Heidenhain LC 495, 5 µm accuracy, 0.1 µm resolution, maximum quality and accuracy

Spindle	
Nominal power	(S1/100%): 20.9 kW / (S6/40%): 26.8 kW
Nominal torque	(S1/100%): 205 Nm / (S6/40%): 256 Nm
Nominal speed	1000 rpm
Max. speed	5200 rpm
Interface	A6
Thermal motor protection	PT1000
Motor cooling	Water with additive
Run-out accuracy	0.003 mm radially at the centring diameter, 0.003 mm axially at the centring flange
Rotary encoder	Lenord & Bauer / 256 increments
Special features	High rigidity. Robust bearing assembly designed for maximum service life. Extremely well balanced, minimal natural vibration. Global service.

Front bearing	
Bore diameter	120 mm
Mean bearing diameter	150 mm
Outer diameter	180 mm
Bearing configuration	<<>> M =
Bearing type	Spindle bearing
Rear bearing	
Bore diameter	70 mm
Mean bearing diameter	85 mm
Outer diameter	100 mm
Bearing type	Adjustable roller bearing

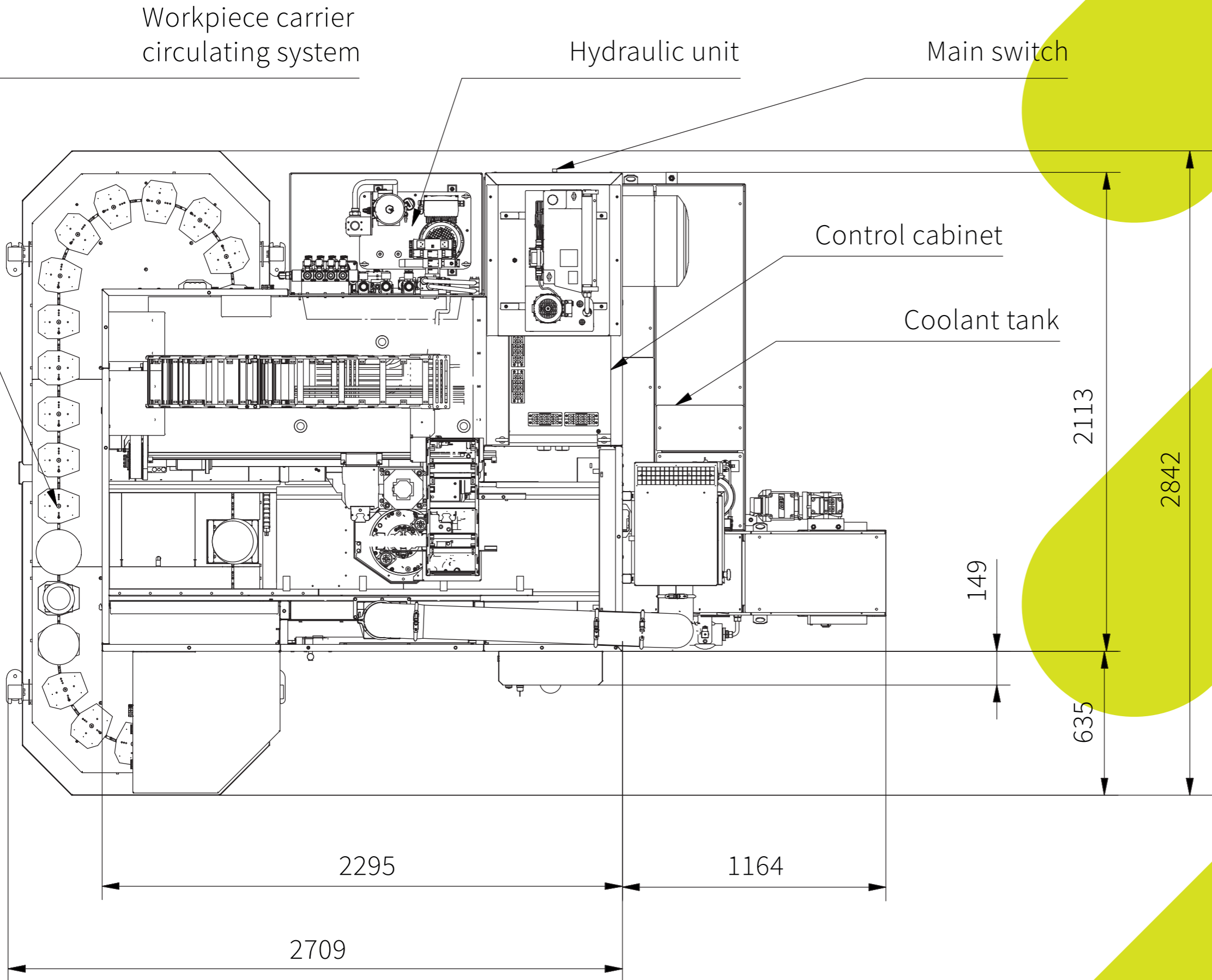
Turret without tool drive	
Tool disc	12-fold VDI 40 / width across flats: 320 mm
Max. coolant pressure	5–25 bar
Switching time	0.15 seconds (one tool location)
Tools	Use only tool holders / spindle heads with straight shank and O-ring in accordance with the DIN ISO 10889 standard (formerly DIN 69880)

Driven turret	
Tool disc	12-fold VDI 40 / width across flats: 320 mm
Driven tools	DIN 5480 20 × 0.8
Speed	4000 rpm
Max. torque	63 Nm
Drive power	10 kW
Max. coolant pressure	5–25 bar (contamination < 100 µ)
Switching time without tool drive	0.15 seconds (one tool location)
Switching time with tool drive	0.39 seconds (one tool location)
Tools	Use only tool holders / spindle heads with straight shank and O-ring in accordance with the DIN ISO 10889 standard (formerly DIN 69880)

Drilling spindle	
Nominal power	4.5 kW–20 kW
Nominal torque	25 Nm–70 Nm
Max. speed	3500 rpm, other speeds optionally available
Tool holder	HSK 63 / manual clamping flange
Coolant pressure transmitted through spindle	Max. 20 bar (contamination < 25 µ)

Drill bracket	
Bracket	Solid steel
Tool holder	VDI 40, optional: Capto C6 or C8
Supply and removal belts	
Number of workpiece carriers, standard	0–140 mm diameter / 28 pcs 141–200 mm diameter / 14 pcs
Number of workpiece carriers, optional	141–200 mm diameter / 14 pcs
Max. load	300 kg
Belt speed, standard	0.5–5 m/min
Belt speed with additional safeguard	0.5–12 m/min





**SOME SAY
LATHES ARE
BULKY.
WE SAY:
NOT WHEN
THE AXIS IS
VERTICAL.**

The variable arrangement of the workpiece supply and chip removal systems optimises adaptation of the machine's total footprint to the specific conditions, minimising the required space. In the layout as shown, the workpiece is supplied via the left-hand or right-hand side whilst the chips are discharged from the opposite side. Optionally, the chip discharge can be arranged at the rear and the chip conveyor at the front.



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