

540 CALIBER X-CNC

Technical data



- Highly productive, semi-automatic dual column band saw with multiple material feeding
- The saw is designed for cutting material in straight cuts
- The saw has the concept FVC = feeder - main vice - cut. The FVC concept enables cutting of single bars and bundles in an automatic cycle with short residue.
- The saw is used in serial production in industrial plants and it can cut a wide range of material grades including stainless and tool steels due its robust design.
- The saw is designed for cutting straight bars of steel material.

Control system:

- The machine is equipped with programmable PLC SIEMENS SIMATIC S7-1500. The saw blade drive and arm movement are completely controlled by SIEMENS technology.
- The colour touch screen HMI SIEMENS TP 700 COMFORT allows easy communication with the machine operator. It shows working states such as blade speed, cutting feed and the status of individual working movements.
- Display size 7" (93 mm x 153 mm)
- The saw allows you to work with two modes:
 - SEMI-AUTOMATIC (MANUAL) MODE: The saw immediately cuts the material in semi-automatic mode. The operator uses the saw's feeder to manipulate the material to be cut and to accurately move the material into the cut zone. The movement of the feeder is realized by manual buttons or by the GTO function. After starting the GTO function, the operator enters the position of the feeder and pressing the START GTO button moves the feeder to the entered position.
 - AUTOMATIC MODE: The feeder feeds the cut blank based on the set program. The operator sets the cutting program and the saw then executes these programs. The operator can store up to 100 programs. One program includes complete cutting settings: blade speed, cutting feed value, cutting bar height setting, bar length setting and number of cuts. The length and number can be set in 20 lines. The saw automatically feeds the different lengths entered.
- The saw uses the ATB system = automatic transport of the new bar exactly into the cutting zone. The saw operator does not have to cut the trim. Minimising time and costs.
- The regulation of the cutting feed is realized by the control system using a servo driver, servomotor, ball screw and a pre-tensioned nut located on the saw arm. This achieves a very precise cutting feed. The saw operator enters the desired cutting feed (mm/minute) into the program and the saw accurately adjusts this feed.
- Two basic modes of automatic system regulation (ASR): ARP and RZP.
 - RZP = Zone Control. The system allows the optimum cutting feed and saw blade speed to be set in 5 zones of the material to be cut, depending on the position of the blade.
 - ARP = Automatic cut regulation system depending on the cutting resistance of the material or the saw blade dullness. The system offers two basic ARP modes: BIMETAL and CARBIDE.
- The control panel is located on the console in a safe position. The control panel includes a digital display of the saw control system and a high quality foil keypad. The keypad is used to control the basic movements of the saw (movement of the arm, vice and feeder) and to start the saw's working cycle. The control panel is also equipped with a safety button to stop the saw.
- Safety module with self-diagnosis.
- 24V control

Construction:

- The band saw has a robust design to withstand extreme stresses in production conditions. All machine components are designed and optimized to minimize vibrations and allow maximum cutting performance of the machine.
- Saw blade speed range 15 – 150 m/min.
- The saw arm moves via 2 linear guide rails with 4 trolleys with pre-tensioned ball bearing. The linear guide is mounted on sturdy columns.
- The arm is a robust weldment and is designed to ensure the necessary rigidity and cutting accuracy
- Arm movement by linear guide, ball screw, preloaded nut, worm gearbox and servo drive.

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- The saw blade is guided on robust cast iron pulleys.
- WRS - Reinforcement of pulley mounting - drive pulley mounted directly on the output shaft of the gearbox. The pulley is supported on both sides by a bearing seat =minimizing the load on the shaft seat. The tension pulley is held/tensioned by two hydraulic cylinders at both ends of the centre pin =significant reduction of stress and extension of the life of the bearing. The tension pulley mounting is with zero play=conical bearings secured by KM nut.
- The arm uses a metering system to evaluate the position of the arm above the material. The working positions of the arm (upper and lower) are set numerically by the saw operator in the cutting program.
- The saw uses an absolute rotary encoder to determine the position = no need to reference the position when the machine is switched on.
- The main vise is a robust steel weldment.
- Movement of the long stroke jaws of the main vise along two rails of the linear guide, by means of a hydraulic cylinder. The long stroke jaw ensures full stroke = clamping even very small bars. The second jaw is fixed. Accessory at extra cost is a short stroke jaw = non-contact feeding of curved material. The short stroke jaw is mounted on a linear guide. The stroke of the short stroke roller is 15 mm
- Control valve for vise pressure adjustment, pressure indication on pressure gauge
- Feeder movement by linear guide, ball screw, preloaded nut, toothed belt transmission and servo drive.
- The saw operator manually selects one of five feeder speeds depending on the weight and accuracy of the material being fed.
- Precise positioning of the feeder is handled automatically by the SIEMENS servo driver, including acceleration and deceleration of the feeder before the target position. An incremental rotary encoder for indicating the position of the feeder is included in the servomotor.
- Material indication in the feeder: an optical sensor indicates that there is material in the feeder. If there is no material in the feeder, the saw finishes feeding the rest of the bar and waits for the next bar to be inserted.
- A roller conveyor supporting the fed material along its entire length passes through the saw.
- The feeding vise is a robust steel weldment. The jaws ensure secure clamping of the material.
- Movement of the jaws of the feeding vise along two rails of the linear guideway, using hydraulic cylinders. One jaw is long stroke hydraulic cylinder. The other jaw is short stroke. Short-stroke jaw = non-contact reverse motion of the feeder. Advantage when feeding crooked material.
- GTO function (go to position).
- The saw allows two basic feeding modes:
 - NORMAL: the feeder moves between the zero position and the position of the specified feed length.
 - INCREMENTAL: the feeder moves to the limit position, clamps the bar and feeds it sequentially into the cut.
- Feeder movement modes:
 - CONTINUAL: optimal for cutting longer bars
 - STEP BY STEP: requires cooperation with the machine operator when taking short pieces. Each step of the program must be confirmed by the machine operator
- CMU mode: opening of the cutting zone on the feeder side for non-contact movement of the saw blade to the upper position. It is used especially when using carbide blades
- Saw blade drive via bevel gearbox and three-phase electric motor with variable blade speed control by frequency inverter
- External fan cooling of the saw blade drive.
- Thermal protection of the electric motor.
- The blade is guided in guides with carbide plates, bearings, then on cast iron pulleys and in the upper part (reverse) the blade is supported by vibration dampers.
- The inclination of the saw blade against the plane of the vise is 7 degrees. This ensures higher performance when cutting profiles and bundles and at the same time increases the life of the saw blade.
- The saw has a guide on the drive side mounted on a fixed beam. On the tensioning side, the guide is mounted on a sliding beam.
- Blade guide beam adjustable over the entire working range. The movement of the guide is linked to the movement of the vice clamp. It is therefore not necessary to manually adjust its position.

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



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- The guide beam moves by means of a linear guide (2 rails, 3 trolleys) with high load capacity.
- A new way of mounting the guides - a solution with a regulated spacer.
- BGT-S - mechanical pressure of the saw blade in the guides by means of disc springs
- The space between the saw blade guide and the pulley is provided with a cover to protect the operator from the moving saw blade. The covers also protect the surrounding area from falling chips and cooling emulsion.
- The saw is equipped as standard with hydraulic saw blade tensioning - allowing ideal cutting conditions to be maintained at all times. The tensioning force is provided by 2 hydraulic cylinders.
- Automatic Indication of correct saw blade tension by means of a pressure sensor.
- The electric motor-driven brush ensures perfect cleaning of the saw blade.
- Robust base with chip tray and chip extractor. The base is adapted for handling the saw with a crane.
- Cooling system for cutting emulsion, fed into the blade guides and directly into the cutting channel using the flexible LoLine system.
- Microswitches for opening pulley covers.
- Hydraulic unit is located outside the base - better cooling and access. The hydraulic unit controls the saw functions: arm movement, opening and closing the main and feed vise and tensioning the saw blade. The hydraulic oil pump is located outside the oil tank.
- A complete bodywork that covers the arm and feeder movements. The bodywork minimizes the risk of injury and contamination of the saw surroundings by chips and cutting emulsion.
- The chip conveyor. Type. Drive: worm gearbox + electric motor. Thermal protection against motor overheating.
- Chip rinsing pistol
- LED strip for work area lighting.

Basic equipment of the machine:

- Saw blade
- Tool set for routine machine maintenance.
- Operating instructions in electronic form on CD.

Cutting parameters			
		 0°	
	D [mm]	550	x
	D [mm]	550*	x
	a x b [mm]	550 x 520	550 x 460

* recommended value. If the recommended maximum diameter is exceeded, the performance of the saw blade cannot be guaranteed! Cutting bundles without vertical clamp. HP = accessory at extra cost. When HP is used, the cutting parameters will be limited.

Cutting parameters		
The shortest cutting	mm	15
The smallest divisible diameter	mm	10
The shortest rest durring one cut	mm	40
The shortest rest durring automatic cut	mm	250
Single step of material feed Min	mm	3
Single step of material feed Max	mm	750
Single step of material feed W/HP Max	mm	715
Multiple feed	mm	12000

Movement speeds		
Frame up	m/min	1,4
Frame down	m/min	0,7
Vises	m/min	5
Feeder Min.	m/min	5
Feeder Max.	m/min	5

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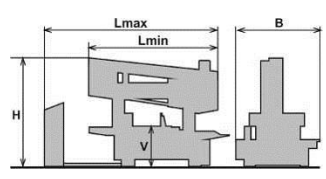
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Performance parameters		
Blade:		
Blade dimensions	mm	6200 x 41 x 1,3
Blade speed	m/min	20-120
Blade drive	kW	5,5
Blade inclination		7°
Drive of the hydraulic agregate	kW	0,75
Pump of the cooling emulsion	kW	0,12
Blade cleaning brush motor	kW	0,5
Chip conveyor motor	kW	0,25
Motor of the blade drive cooling	kW	0,06
Frame ballscrew motor	kW	0,5
Feeder ballscrew motor	kW	1,5
Control system	kW	0,35
Installed power Ps	kW	12,8
Electrical connection		3 x 400 V, 50 Hz, TN-S

Working movements	
Cutting feed	Servomotor + ball screw - BSB
Material feed	Servomotor + ball screw - BSF
Clamping of material	Hydraulically
Blade tension	Hydraulically
Cleaning of the blade	Electric motor
Cooling	Pump, nozzles at the saw blade guides and flexible distribution to the cutting area.

Saw dimensions						
Lenght		Width	Height		Height of the table	Weight
[Lmin]	[Lmax]	[B]	[Hmax]	[Hmin]	[V]	(kg)
3600	4300	1890	2550	2420	800	3790



Note: the dimensions are valid for the saw without optional accessories