340 KATANA X-CNC-LR (version 3)

It is a highly efficient automatic hydraulically controlled band-saw with multiple material feeding.
The band saw machine is designed for cutting in automatic cycle perpendicularly as well as angularly. It enables angle cuts to the right 0 - 60 degrees and left 0-45 degrees.
Automatic turning to angular cuts is a pert of cutting programms. A feeder movements using a ball screw A bow movements using a ball screw. Bow turning using gear train
The band saw machine suitable for cutting of steel constructions and profiles with a longstep feeder L=1000mm (one speed of feeder). The machine is constructed for automatic cutting of long bars, automatic turning included. Whenn the machine is cutting Automatic programm with angle cuts and with lenghts shorter thann 500mm, the machine automatically interrupts the automatic cycle and is waiting.
It is suitable for serial production and thanks to its robust construction enables to cut wide range of materials including stainless steels and tool steels both profiles and full materials.

Control system:

- Machine is equiped with programmable PLC SiEMENS SIMATIC S7-1200. Drive of band blade, movement of arm and movement of feeder are completely controlled and drive by SIEMENS technology.
- The coloured touch screen HMI SIEMENS TP 700 COMFORT enables easy communication with an operator. It shows working conditions (blade speed, moving to the cut, cutting parameters etc.)
- The machine enables to work with two modes:
  - SEMIAUTOMATIC CYCLE: The machine cuts the material immediatelly in a semiautomatic mode. The operator uses the feeder of the machine for the manipulation with the material and for the exact feed of the material into the cutting zone. The movement of the feeder is realized by manual buttons or by GTO function. After starting GTO function the operator sets the position of the feeder, presses START GTO button and feeder goes to the set position.
  - AUTOMATIC CYCLE: the feeder feeds the material according to the set programm. The operator sets the cutting programm, machine realizes these programms, it is possible to make 200 different programms.The part of one programm is a complete setting of the cut: blade speed, feed speed, setting of an automatic regulation, setting of the hight of the bar to be cut, setting of the lenght of the bar, angles values and number of pieces. The lenght and number of pieces it is possible to set in 99 lines, the machine feeds differently set lenghts automatically. Control system shows the feasibility of the cutting by the drawings
- Cutting feed rate is regulated by control system leaded by servomotor, ball screw and KM nut enabling very precise feed rate. The operator sets in the program needed feed rate (mm/min) and the machine will set it up.
- Two basic regimes of automatic system regulation (ASR): ARP a RZP.
  - RZP = Zone regulation. System enable to cut material in 5 zones, because of setting optional cutting feed and blade speed according on blade position. Operator can choose from 2 strategy settings: DEFENSIVE setting is approppriate for cutting very hard materials with use of carbide band blade. Cutting feed is in beginning and in the end reduced. OFENSIVE settings supports executive cutting logs. Cutting feed and band speed are in the beginning and in the end of cut increased. It´s about similar principle as ARP mode. Advantage is regulation of blade speed.
  - ARP = System of the automatic regulation of the cutting feed rate depending on the cutting resistance of the material or blunting the blade. Systém offers two basic modes of ARP: BIMETAL and CARBIDE.
    - BIMETAL mode is suitable for optimalization of the cutting feed when cutting profiles by bimetal blades. The cutting feed is higher if the blade cuts sides of the profile. As the blade reaches the full material, the system reduces the cutting feed automatically so that teeth gap of the blade would not be filled.
    - CARBIDE mode is suitable for cutting of full bars. If the blade is old (blunt), loaded is the cutting feed reduced Reaction time is slower than in mode BIMETAL.
- The ergonomical control panel is mounted on the movable console and its position does not depend on the turntable position at any angle. The control of the machine is optimalized with our control panel and the field of view is better for an operator. The control panel is equiped with mechanical buttons and digital display of the machine control system. Mechanical buttons controls basic saw movements (arm, vice, feeder and turntable movements) and cutting cycle start. The safety button is present on the panel aswell. All buttons are highly resistant in anti-vandal version.
- Safety module with autodiagnostics.

Construction:

- The machine is constructionaly designed in that way, so that it corresponds to extreme exertions in productive conditions. A robust construction of machine includes vice allows to take advantage of bimetal blades maximally.
- The arm of the machine is robust, heavy weldment and it is designed so that a toughtness and a precision of cut was ensured.
- The arm moves along two columns using a four row linear leading with a high loading capacity. Arm movement using ball screw.
- Drive pulley and tighten pulley are both metal castings.
- The arm uses incremental sensor for evaluation of current position above material. Upper working position of the arm is possible to set in control system.
- Down working position is set with adjustable mechanical stop and microswitch. Down working position of the arm is also possible to set in the saw control system. After reaching bottom working position the arm stops in the position set in the system.
- Main vice with massive casting jawfor material fixing, moving along linear leading. Its moving away from the blade is essential for left angular cuts. For perpendicular and right angles cuts is vice in its standard position. Open/close of the

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vice using hydraulic vice. Measuriong using magnetic tape and incremental sensor ELGO

- Jaws of the main vice move in steel leading using hydraulic cylinder. One jaw is longstroke (the movement by longstroke hydraulic cylinder), one is fixed.
- Regulation valves for setting a vice pressure in hydraulic system.
- Very rigid feeder with the feeding step 1000 mm is placed on the basement with support rollers by the linear leading.
- Feeder drive: frequency inverter, electromotor with encoder, gear using belt, ball screw, the nut of ball screw placed on the feeder.
- The feeder placed ot a linear leading using prestressed carriages
- Feeder position is controled by rotatory encoder. An operator choose one of three feeder speeds. It uses micro speed for reaching the correct position. Acceleration and decelerate movements are controlled by a frequency invertor.
- Indication of material in the feeder: optic sensor - it notices that there is a material in the feeder. If there is no material in the feeder, the signal reflects on the glass that is situated on movable jaw and it goes back to the sensor. The machine stops feeding and waits for another bar.
- Material moved to the cut zone is suported by 4 cylinders. Three of them are movable, one os stationary. Moving cylinders help to move the material to the optimal position. It is placed on input side.
- The feeder clamping vice is a robust steel weldment. Casting jaw ensures safety clamping of the material.
- Casting jaw of feeder vice in steel leading using longstroke hydraulic cylinder. Connecting of feeder vice and the base of machine is floating - elimination of material curvature
- Turn table is massive weldment. It is placed and fixed on base using massive shaft and precision double row bearings.
- Turning of the table for angle cuts is ensured by frequency invertor, electromotor with warm gear and gearing. RoTo function (rotate to position) with the automatic setting of the desired position.
- The angles indicated on the digital display on the control panel SIEMENS. Reading of angle by incremental sensor.

Basic equipment of machine:

- The blade leading in guides with hardmetal plates and leading bearings and along cast iron pulleys.
- The blade is 4 grades sloped regarding the level of the vice => higher performance when cutting, profiles, longer bladelife, higher performance when cutting full materials.
- There is a guide situated on the firm beam on the drive side. On the tightening side there is the guide situated on the moving beam.
- The guide beams of the blade are adjustable in the whole working range. Movements and fixing manualy.
- The guide beam is moving along of linear leading (1 rail, 2 carriages) with high loading capacity
- The saw-band is equipped with covers, which protects the operator from millings and cutting emulsion.
- Hydraulic tightening of band. Tightening controled by a lever placed on the valve (machine arm)
- Automatic indication of blade tension using micro switch.
- A passive driven cleaning brush for perfect cleaning and function of blade.
- Drive of machine is solved by worm gear box with maintenanceless oil filling. Three-phases electromotor with double winding, with a frequency converter for a fluent regulation of the blade speed from 20 to 100 m/min. Sturdy flange with shaft. Termoprotection of engine.
- The cooling system for emulsion, leaded to the guides of the blade and by LocLine system directly to the cut groove.
- Massive base with a tank for chips. Base is designed for manipulation manipulation with machine by any hight lift truck or by crane.
- Indication of blade tightening and opening of the cover.
- Controlling 24 V.
- Machine is equipped with hydraulic system which controles all functions of the machine. It pushes the arm to cut, pulls up the arm, opens and closes vices, turnins the turntable for angular cuts.
- Angles (degrees) are shown at the touch screen. Angle indication using incremental sensor and a magnetic tape.

Basic equipment of machine:

- Two massive cylinders for support of cutted materials. They are moving, so they are not a hinderance of arm turning. Theirs movements are along linear leading
- Spray gun for swarfs wash off
- Lighting of workink space.
- Band saw blade.
- Set of spanners for common service.
- Manual instructions in eletronic form (CD).

Operating cycle:

After start of the cutting machine clamp the vices, the cut will be done by ste speed. After reaching the down position, arm is going up automaticaly. Feeder move with next peace to the cuting zone (feeder vice is going between zero position and set position (length of cutted peaces). Main vice clamps the material, feeder vice is opening and moves to feed next peace. Whole cyclus starts again. Operator puts new material and remove cutted peaces only. It is possible change blade speed as well as shift speed during the cut.

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Cutting parameters:								
		0°	30°	45°	60°	30°	45°	b a O
	D [mm]	350	350	350	230	350	350	x
		250	220	180	130*	220	180*	x
b a	axb [mm]	500x340	500x340	385x340	220x340	480x340	350x340	500x180

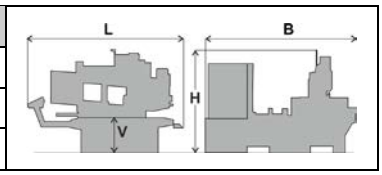
* Recommended values. Recommendations of band blade producers are to be followed when choosing to cut full material, their dimensions are limited by available size of the teeth for the specific type of the band.
O Cutting of the bundle withnout upper vice HP. HP = accesory for additional prie. The cutting parameters are limited when using.

Vertical cuts			Angular cuts	
			45°	30°
the shortest cutting in automatic cycle	mm	310	750	310
the smallest divisible diameter	mm	30		
the shortest rest durring one cut	mm	100		

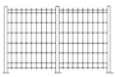
performance parameters		
drive of the blade	kW	3
drive of the hydraulic agregate	kW	0,6
drive of the bow turning to angular cuts	kW	0,12
pump of the cooling emulsion	kW	0,12
total input	kW	8,4
cutting speed – fluently set	m/min	20-100
diameter of the blade	mm	4780x34x1,1
electric connection		3x400V, 50 Hz , TN-S

Control	
feed of the Frame to the cut	Ball screw, motor, bevel gear box, invertor
feed of the material	Ball screw, motor, gear using a cog wheel, invertor
bow turning to angular cuts	Train of gears, motor, bevel gear box,invertor
Rotation fixing	hydraulically
clamping of material	hydraulically
bend tension	hydraulically
cleaning of the blade	Cleaning brush with the drive by moving rollers
Cooling	Performance (l/s) – 0,27 Obsah nádrže (l) - 60

Parameters							
lenght		width		Height		height of the table	weight
[Lmin]	[Lmax]	[Bmin]	[Bmax]	[Hmin]	[Hmax]	[V]	(kg)
2500	3030	2720	3150	1870	2000	800	2150



+ transport dimensions, dimensions without the safety fence


Front safety fence RNT is standart part of the saw, m= 395 kg

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