



## MANUAL AND CNC-OPERATED TOOLROOM MILLING MACHINES

**FNX30 | FNE40 | FNE50**





## Fabryka Obrabiarek Precyzyjnych

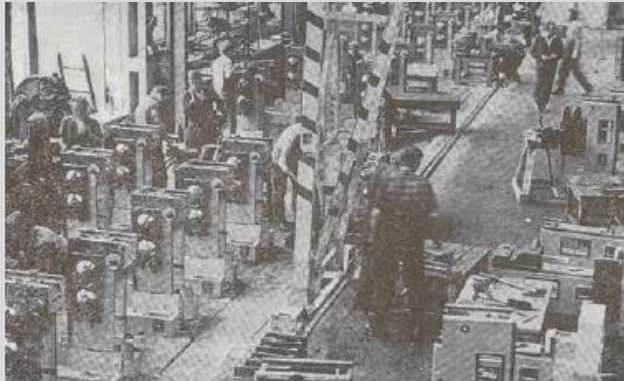
AVIA S. A.

### O NÁS...

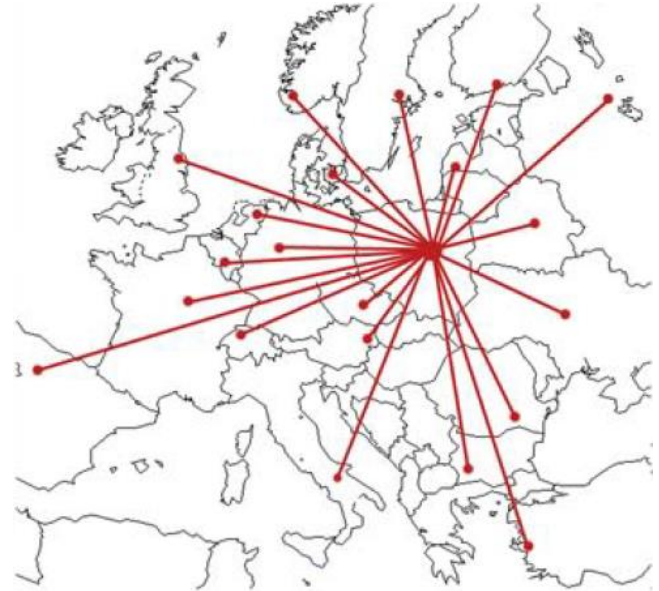
Fabryka Obrabiarek Precyzyjnych AVIA S.A. Warsaw, Poland (Machine Tool Factory AVIA S.A.) was founded in 1902 and is one from the oldest Polish industrial plants. For the past 70 years, AVIA has been one of the leading Polish manufacturers of high-quality, precision machine tools. Today, our brand is widely recognized in Europe, especially in Germany, where we have over 4,500 installations.

The presence of machine tools manufactured by us in demanding and industrialized markets ensures constant and continuous growth of production and increases the competitiveness of our customers. Proven AVIA machine solutions, depending on favourable prices, are also successfully featured in emerging markets in Eastern Europe.

At present, AVIA offers in its product line Vertical machining centres 3, 4 and 5-axis, CNC and Manual universal milling machines and CNC inclined bed lathes. AVIA is also a manufacturer of key components for machine tools such as: spindles or precision ball screws. We supply ball screws to some of the world's leading machine tool manufacturers.



Assembly line AVIA – Manual Universal Milling Machines - 1970



New machine designs are based on our own development and research department. The unique combination of very talented young engineers and very experienced designers who have worked at AVIA for many years ensures an ideal environment for development and research processes. Design proposals are created by computer systems such as:

- Solid Modelling Design (CAD-3D),
- Finite Element Method optimization,
- Computer Aided Manufacturing (CAM).

Our goal is not only to develop the latest technologies and deliver them to customers, but also to provide adequate training, service and maintenance of machines, as well as the availability of spare parts for many years after the machine has been handed over.

Company management and production:

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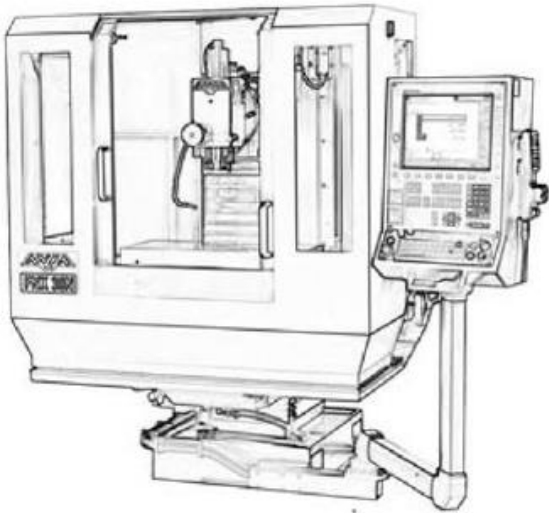
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## DISCOVER A WIDE RANGE OF MANUALS CNC AND TOOL MILLING MACHINES AVIA



### TOOLROOM MILLING MACHINES FNX30 SERIES

TRAVELS (X/Y/Z): 400x315x350 mm

SPINDLE ISO40: 3.000 ot/min

TABLE: 315x710 mm

TABLE LOAD: 200 kg

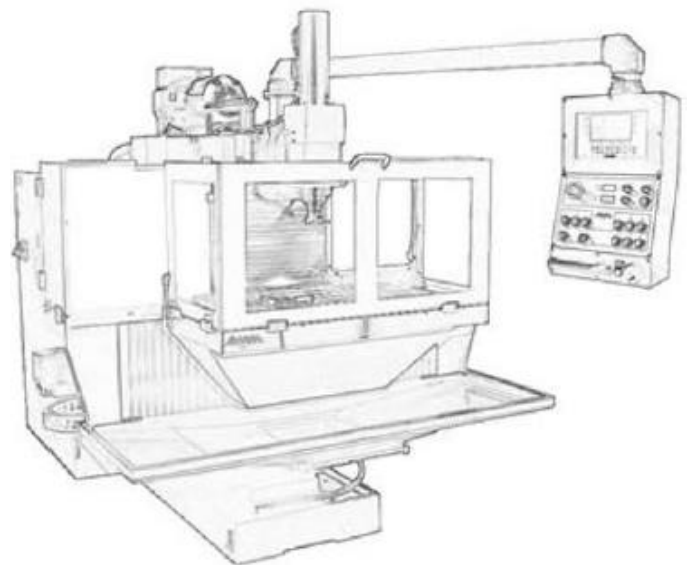
### TOOLROOM MILLING MACHINES FNE40 SERIES

TRAVELS (X/Y/Z): 620x420x400 mm

SPINDLE (H/V) ISO40: 4.000 ot/min

TABLE: 400x800 mm

TABLE LOAD: 400 kg



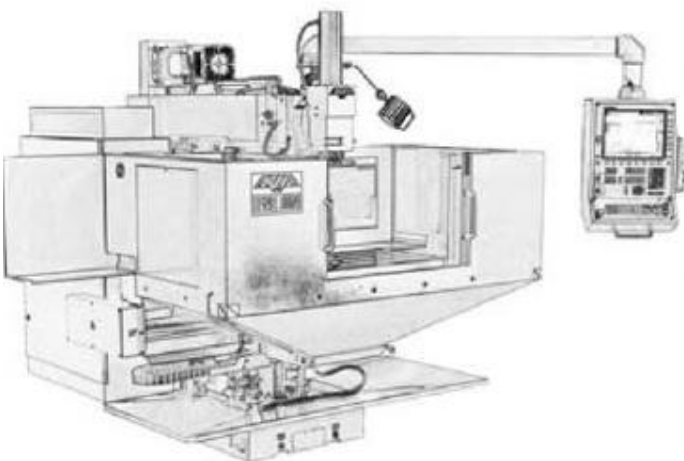
### TOOLROOM MILLING MACHINES FNE50 SERIES

TRAVELS (X/Y/Z): 800x500x420 mm

SPINDLE (H/V) ISO40: 4.000 ot/min

TABLE: 500x1000 mm

TABLE LOAD: 500 kg







**FNE 40P**



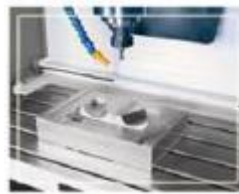
**FNX 30N**



Vertical spindle with movable quill



Horizontal spindle



Universal machining for prototyping, production of molds and tools



Steady rest for long milling arbors



Quality control of linear axes - special laser device



Box-type guideways for stability and rigidity



Manual handwheels



Electrical components from well-known European

# DISCOVER UNIVERSAL MILLING MACHINES

## DESIGNED FOR YOUR NEEDS

### HEIDENHAIN TNC 620 HSCI

- modern and reliable CNC systems from Heidenhain
- fully digital drives in version N
- processing time of one block 2 ms as standard
- 19" touch screen for convenient operation
- workshop programming
- adjustable position of the control panel



### DIGITAL READOUT ND 523

- digital measuring ND523 from Heidenhain in version P
- linear rulers on all axes
- electronic hand wheel on the panel for easy control of the axes
- hand wheels for all axes as standard for the FNX30 and FNE40 series



### STRAIGHT-CUT CONTROLLER TNC 128

The TNC 128 is a compact and modern system that always controls one axis. Thanks to simple and intuitive operation via built-in cycles, the TNC 128 is the ideal solution for a universal milling machine.



### MOST COMMON APPLICATIONS OF AVIA MILLING MACHINES

- production of moulds, dies and tools
- tool shops, prototype production
- maintenance department
- educational purposes
- subcontracting industry

### RELIABLE COMPONENTS

- solid cast iron construction to achieve high precision of machined parts
- universal and solid construction with horizontal and vertical spindle, movable quill and tilting milling head
- continuous spindle speed control for all AVIA milling machines
- backlash-free, precision AVIA ball screws on all axes
- FNE series: backlash-free roller linear guide ensures stability and accuracy
- FNX series: sliding guide ensures stability and rigidity and accuracy for a long time
- FNX and FNE are equipped with separate modern AC motors for each axis
- the motors have low energy consumption and high overload capacity
- CE-certified electrical components are from well-known European manufacturers with easy access to the market





# FNX30 SERIES

milling machines  
suitable for  
education and to  
workshops



## FNX30 SERIES

The characteristic design includes:

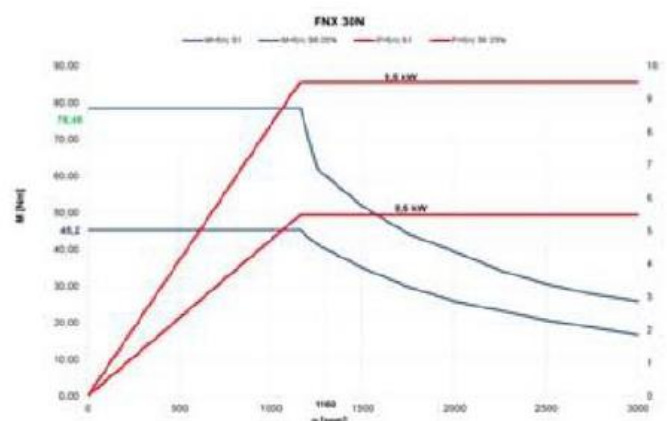
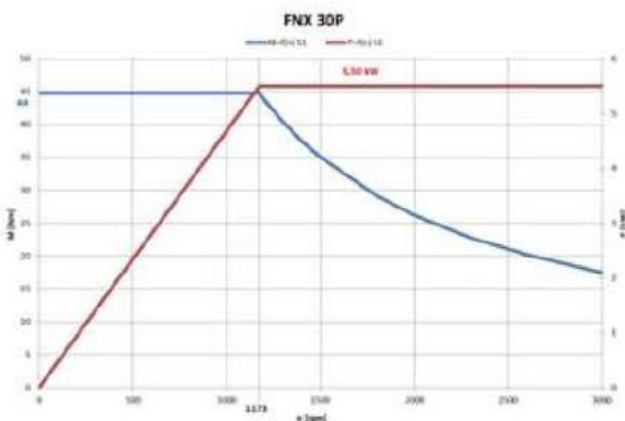
- solid cast iron construction to achieve high precision of machined parts
- Infinitely adjustable spindle speeds and feeds allow the setting of optimal parameters for modern tools
- separate motors for all axes with low energy consumption
- precision ball screws on all axes
- HIEDENHAIN TNC 620HSCI for version N or 128 for workshop programming
- backlash-free linear roller ensures stability and rigidity, eliminates stick-slip effect
- manual hand wheels for all 3 axes

Friendly machine control:

- adjustable and centrally located ergonomic control panel for comfortable machine operation
- optional use of electronic hand wheel to facilitate movements
- movable quill for drilling and milling deep pockets
- tool holder according to DIN 2080
- tilting milling head  $\pm 45$  deg

Wide range of optional accessories:

- bezel for long milling mandrels for horizontal spindle
- machine vices and other clamping accessories
- partition head with tailstock, turntables and much more



Technical Data		FNX 30P / FNX 30P NC	FNX 30N
<b>HORIZONTAL TABLE:</b>			
Table surface	mm	315 x 710	315 x 710
T-slots: number / size / distance	mm	5 / 14 / 63	5 / 14 / 63
Table load	kg	200	200
<b>TRAVELS:</b>			
Longitudinal X	mm	400	400
Cross Y	mm	315	315
Vertical Z	mm	350	350
Min. – max. spindle nose to table	mm	100 / 450	100 / 450
<b>FEEDS:</b>			
Feed rate control		step less	step less
Feed rate X / Y / Z	m/min	2 / 2 / 2	6 / 6 / 3
Rapid traverse X / Y / Z	m/min	5 / 5 / 2,5	6 / 6 / 3
<b>HORIZONTAL AND VERTICAL SPINDLES:</b>			
Spindle taper	ISO	40	40
Tool holders	DIN	2080	2080
Horizontal spindle speed	rpm	3000	3000
Vertical spindle speed	rpm	3000	3000
Spindle speed control		step less	step less
Tool clamping		manual	manual
Spindle power S1 / S6 (25%)	kW	5,5 / -	5,5 / 7,5
Spindle torque S1 / S6 (25%)	Nm	47,7 / -	45 / 78,3
Main motor	type	inverter controlled	digitally controlled
<b>VERTICAL HEAD:</b>			
Quill travel	mm	80	80
Swivel head angle	deg.	±45	±45
<b>CONTROL:</b>			
Digital readout Heidenhain	type	ND523 (FNX 30P)	-
Straight-cut control Heidenhain	type	TNC 128 (FNX 30P NC)	
CNC system Heidenhain	type		TNC 620HSCI
<b>MISCELLANEOUS:</b>			
Accuracy of positioning*	mm	-	+/- 0,01
Repeatability*	mm	-	0,005
Dimensions: X x Y x Z	mm	1520 x 2130 x 1950	1520 x 2130 x 1950
Net weight	kg	1700	1700
*acc to PN-ISO 230-2, with linear scales			
<b>STANDARD:</b>			
3-axis digital measuring ND523 (FNX30P)		The cooling system	
Single-axis control TNC 128 (FNX 30P NC)		Manual lubrication system	
HEIDENHAIN TNC 620HSCI CNC system (FNX30N)		Enclosed workspace	
Vertical and horizontal spindle		Lighting with 24V lamp	
Precision ball screws in all three axes		Standard colour RAL 7024/7035	
Linear roller guide on all three axes		Working tools	
Manual hand wheels with rulers for all axes		Instructions for use and programming	
Covers on lines		CE certificate	
<b>OPTIONS:</b>			
<b>CNC MACHINES</b>		<b>MANUAL AND CNC MACHINES</b>	
Linear rulers for 3 axes		Steady rest for long milling mandrels	Machine vice
Electronic hand wheel		Dividing head with tailstock	Drilling head
Tool probe		3 and 4-jaw chuck for dividing head	Tool holder, milling mandrels and more
CAD / CAM software			



# FNE40 SERIES

modern  
universal  
easy to use



## FNE40 SERIES

The characteristic design includes:

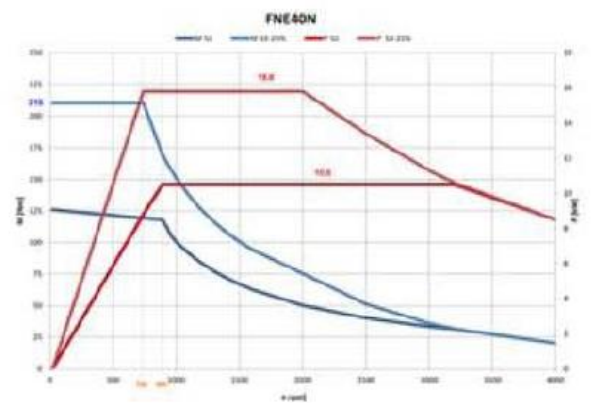
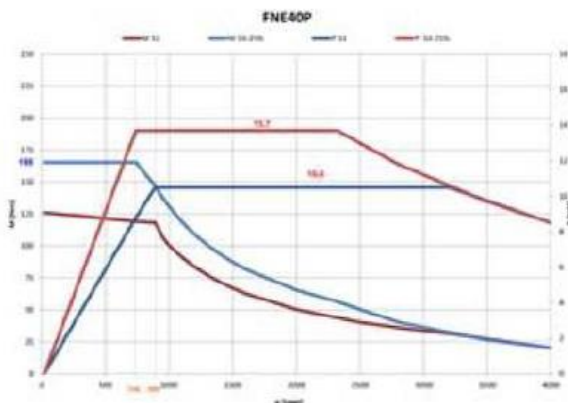
- solid cast iron construction to achieve high precision of machined parts
- Infinitely adjustable spindle speeds and feeds allow the setting of optimal parameters for modern tools
- separate motors for all axes with low energy consumption
- precision ball screws on all axes
- HIEDENHAIN TNC 620HSCI for version N or 128 for workshop programming
- sliding guide ensures stability and rigidity, TURCITE minimizes friction and eliminates contamination of the machine guide surfaces

Operator friendly machines:

- All controls are ergonomically placed on the panel
- electronic hand wheel for easy movement
- automatic lubrication system included in version N
- push-button control of tool clamping

Wide range of optional accessories:

- high-speed milling head up to 8000 rpm
- linear rulers on all 3 axes, tool and workpiece probe
- grooving head, dividing head with tailstock, rotary tables and much more





Technical Data		FNE 40P / FNE 40P NC	FNE 40N
<b>HORIZONTAL TABLE:</b>			
Table surface	mm	400 x 800	400 x 800
T-slots: number / size / distance	mm	5 / 14 / 80	5 / 14 / 80
Table load	mm	400	400
<b>TRAVELS:</b>			
Longitudinal X	mm	620	620
Cross Y	mm	420	420
Vertical Z	mm	400	400
Min. – max. spindle nose to table	mm	100 / 500	100 / 500
<b>FEEDS:</b>			
Feed rate control		step less	step less
Feed rate X / Y / Z	m/min	2 / 2 / 2	10 / 10 / 6
Rapid traverse X / Y / Z	m/min	5 / 5 / 4	10 / 10 / 6
<b>HORIZONTAL AND VERTICAL SPINDLES:</b>			
Spindle taper	ISO	40	40
Tool holders	DIN	69871A	69871A
Pull stud	ISO	7388/2 type B	7388/2 type B
Horizontal spindle speed	rpm	4000	4000
Vertical spindle speed	rpm	4000 / 8000*	4000 / 8000*
Spindle speed control		step less	step less
Tool clamping		hydraulic	hydraulic
Spindle power S1 / S6 (25%)	kW	5,5 / -	5,5 / 9,5
Spindle torque S1 / S6 (25%)	Nm	147 / -	145 / 252,5
Main motor	type	inverter controlled	digitally controlled
<b>VERTICAL HEAD:</b>			
Quill travel	mm	80	80
Swivel head angle	deg.	±45	±45
<b>CONTROL:</b>			
Digital readout Heidenhain	type	ND523 (FNE 40P)	-
Straight-cut control Heidenhain	type	TNC 128 (FNE 40P NC)	
CNC system Heidenhain	type		TNC 620HSCI
<b>MISCELLANEOUS:</b>			
Accuracy of positioning**	mm	-	+/- 0,01
Repeatability**	mm	-	0,005
Dimensions: X x Y x Z	mm	2000 x 2760 x 2050	2000 x 2800 x 2320
Net weight	kg	1900	2100
* optional high-speed vertical spindle			
**acc to PN-ISO 230-2, with linear scales			
<b>STANDARD:</b>			
3-axis digital measuring ND523 (FNE 40P)		Cooling system for tools	
Single-axis control TNC 128 (FNE 40P NC)		Line covered	
HEIDENHAIN TNC 620HSCI CNC system (FNE 40N)		Steady rest for long milling mandrels	
Vertical and horizontal spindle		Enclosed workspace	
Precision ball screws in all three axes		Pullers 3 pieces	
Sliding guide on all three axes		Instructions for use and programming	
Manual hand wheels with rulers for all axes		CE certificate	
<b>OPTIONS:</b>			
<b>CNC MACHINES</b>		<b>MANUAL AND CNC MACHINES</b>	
Linear rulers for 3 axes		High speed vertical head 8000rpm	Machine vice
Electronic hand wheel		Dividing head with tailstock	Straight table
Workpiece probe		3 and 4-jaw chuck for dividing head	Tilting table
Tool probe		Bezel for long milling mandrels	Drilling head
CNC rotary table (4th axis)		Grooved flange	Tool holder, milling mandrels and more
CAD / CAM software			



# FNE50 SERIES

larger  
stronger  
more productive



## FNE50 SERIES

The characteristic design includes:

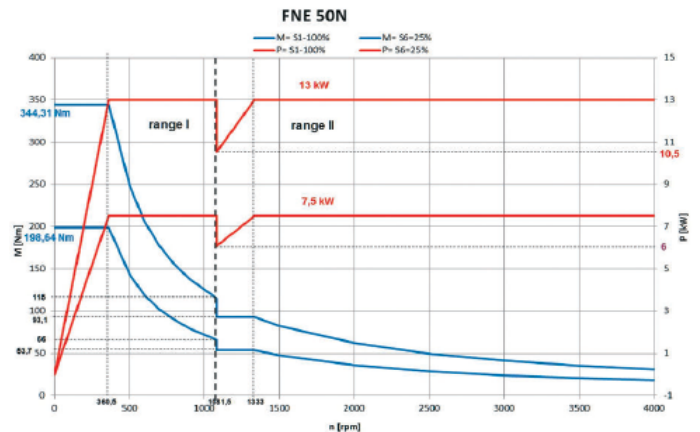
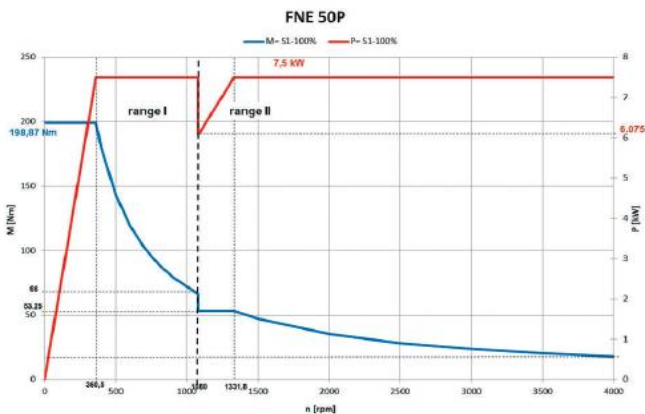
- solid cast iron construction to achieve high precision of machined parts
- continuously variable spindle speeds and feeds allow optimal setting of machining parameters for modern tools
- separate motors for all axes with low energy consumption
- precision ball screws on all axes
- the enlarged enclosed working space allows a load of up to 500 kg
- HEIDENHAIN TNC 620HSCI for version N or 128 for workshop programming
- Box-type guide for stability and rigidity, TURCITE minimizes friction and eliminates stick-slip effect

Operator friendly machines:

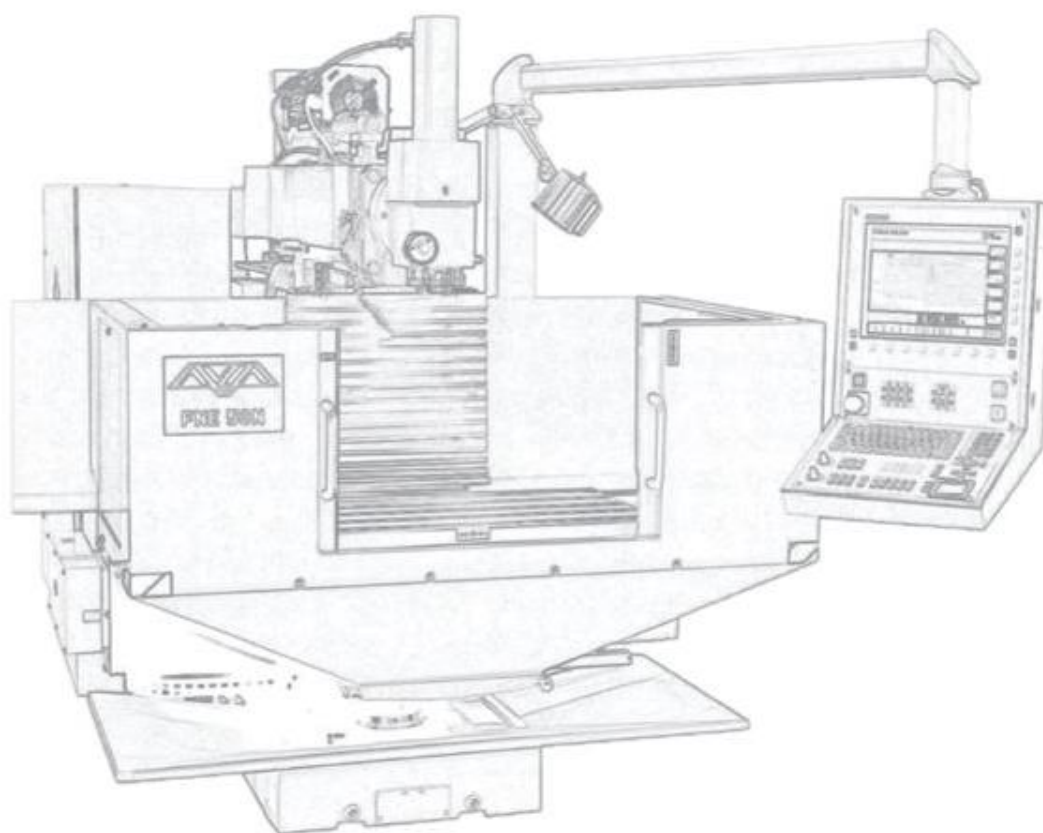
- all controls are ergonomically placed on the panel
- optional use of electronic hand wheel to facilitate movements
- automatic lubrication system included in version N
- push-button control of tool clamping

Wide range of optional accessories:

- high-speed milling head up to 8000 rpm.
- linear rulers on all 3 axes, tool and workpiece probe
- grooving head, dividing head with tailstock, rotary tables and much more



Technical Data		FNE 50P / FNE 50P NC	FNE 50N
<b>HORIZONTAL TABLE:</b>			
Table surface	mm	500 x 1000	500 x 1000
T-slots: number / size / distance	mm	5 / 18 / 100	5 / 18 / 100
Table load	mm	500	500
<b>TRAVELS:</b>			
Longitudinal X	mm	800 / 1000	800 / 1000
Cross Y	mm	500	500
Vertical Z	mm	420	420
Min. – max. spindle nose to table	mm	115 / 535	115 / 535
<b>FEEDS:</b>			
Feed rate control		step less	step less
Feed rate X / Y / Z	m/min	2 / 2 / 2	10 / 10 / 7
Rapid traverse X / Y / Z	m/min	5 / 5 / 4	10 / 10 / 7
<b>HORIZONTAL AND VERTICAL SPINDLES:</b>			
Spindle taper	ISO	40	40
Tool holders	DIN	69871A	69871A
Pull stud	ISO	7388/2 typ B	7388/2 typ B
Horizontal spindle speed	rpm	4000	4000
Vertical spindle speed	rpm	4000 / 8000*	4000 / 8000*
Spindle speed control		step less	step less
Tool clamping		hydraulic	hydraulic
Spindle power S1 / S6 (25%)	kW	7,5 / -	7,5 / 13
Spindle torque S1 / S6 (25%)	Nm	198,8 / -	198 / 344
Main motor	typ	inverter controlled	digitally controlled
<b>VERTICAL HEAD:</b>			
Quill travel	mm	80	80
Swivel head angle	deg.	±45	±45
<b>CONTROL:</b>			
Digital readout Heidenhain	type	ND523 (FNE 50P)	-
Straight-cut control Heidenhain	type	TNC 128 (FNE 50P NC)	
CNC system Heidenhain	type		TNC 620HSCI
<b>MISCELLANEOUS:</b>			
Accuracy of positioning**	mm	-	+/- 0,01
Repeatability**	mm	-	0,005
Dimensions: X x Y x Z	mm	2450 x 3200 x 2100	2450 x 3200 x 2100
Net weight	kg	2900	3000
* optional high-speed vertical spindle			
**acc to PN-ISO 230-2, with linear scales			
<b>STANDARD:</b>			
3-axis digital measuring ND523 (FNE 50P)		Cooling system for tools	
Single-axis control TNC 128 (FNE 50P NC)		Line covered	
HEIDENHAIN TNC 620HSCI CNC system (FNE 50N)		Steady rest for long milling mandrels	
Vertical and horizontal spindle		Enclosed workspace	
Precision ball screws in all three axes		Pullers 3 pieces	
Sliding guide on all three axes		Instructions for use and programming	
Manual hand wheels with rulers for all axes		CE certificate	
<b>OPTIONS:</b>			
<b>CNC MACHINES</b>		<b>MANUAL AND CNC MACHINES</b>	
Linear rulers for 3 axes		High speed vertical head 8000rpm	Machine vice
Electronic hand wheel		Dividing head with tailstock	Straight table
Workpiece probe		3 and 4-jaw chuck for dividing head	Tilting table
Tool probe		Bezel for long milling mandrels	Drilling head
CNC rotary table (4th axis)		Grooved flange	Tool holder, milling mandrels and more
CAD / CAM software			



Company management and production:

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