

## MILLING MACHINES

**CE-Norms**

**Made in Bulgaria**

### Horizontal Milling Machine Models FU251, FU321 and FU401



**CE Norms**

**Made in Bulgaria**

Technical characteristics		<b>FU 251</b>	<b>FU 321</b>	<b>FU 401</b>
Table size	mm	250x1120	320x1350	400x1600
"T" slots – number x size x dist.	mm	3x14	3x18	3x18x80
Table swivel – left and right	(°)	45	45	45
<b>Longitudinal table travel</b>				
- manual	mm	820	1000	1250
- automatic	mm	800	980	1230
<b>Cross table travel</b>				
- manual	mm	280	340	340
- automatic	mm	260	320	320
<b>Vertical table travel</b>				
- manual	mm	410	460	460
- automatic	mm	390	440	440
Max. Distance from table top to spindle axis	mm	440	490	490
Spindle nose taper	ISO	40	50	50
Number of spindle speeds		stepless	stepless	stepless
Spindle speed range	rpm	40...2000 standard (50...2500)* against payment	32...1600 standard (40...2000)* against payment	32...1600 standard (40...2000)* against payment
Number of table feeds		stepless	stepless	
<b>Table feed rate</b>				
- x,y	mm/min	10...1000	10...1000	10...1000
- z	mm/min	4...415	4...415	4...415
Table rapide traverse	mm/min	2500/1040	2500/1040	2500/1040
Main motor power	kW	4	7.5	7.5
Feed motor power	kW	1.5	2.2	2.2
Machine weight	kg	2000	3200	3500

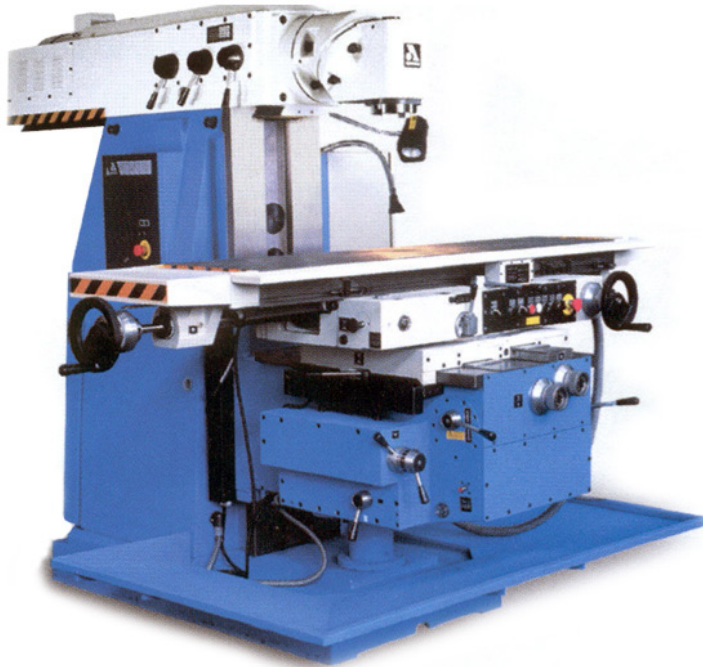
## Universal Milling Machines Models FUV321 and FUV401



**Made in Bulgaria**

Technical characteristics		FUV 321	FUV 401
Table size	mm	320x1350	400x1600
"T" slots – number x size	mm	3x18	3x18
Table swivel – left and right	(°)	45	45
<b>Longitudinal table travel</b>			
- manual	mm	1000	1250
- automatic	mm	980	1230
<b>Cross table travel</b>			
- manual	mm	340	340
- automatic	mm	320	320
<b>Vertical table travel</b>			
- manual	mm	460	460
- automatic	mm	440	440
<b>Max. Distance from table top to:</b>			
- horizontal spindle axis	mm	490	490
- vertical spindle axis	mm	630	630
<b>Spindle nose taper</b>			
- horizontal	ISO	50	50
- vertical	ISO	50	50
Milling head rotation around 2 axes	(°)	360	360
<b>Number of spindle speeds</b>			
- horizontal	-	stepless	stepless
- vertical	-	stepless	stepless
<b>Spindle speed range</b>			
- horizontal	Rpm	32....1600 (40....2000)* against payment	32....1600 (40....2000)* against payment
- vertical	Rpm	45....2000	45....2000
Number of table feeds		stepless	stepless
<b>Table feed rate</b>			
- x, y	mm/min	10...1000	10...1000
- z	mm/min	4...415	4...415
Table rapid traverse	mm/min	2500/1040	2500/1040
<b>Main motor power</b>			
- horizontal	kW	7.5	7.5
- vertical	kW	4	4
Feed motor power	kW	2.2	2.2
Machine weight	kg	3500	3575

## Vertical Milling Machines Models FV321 and FV401



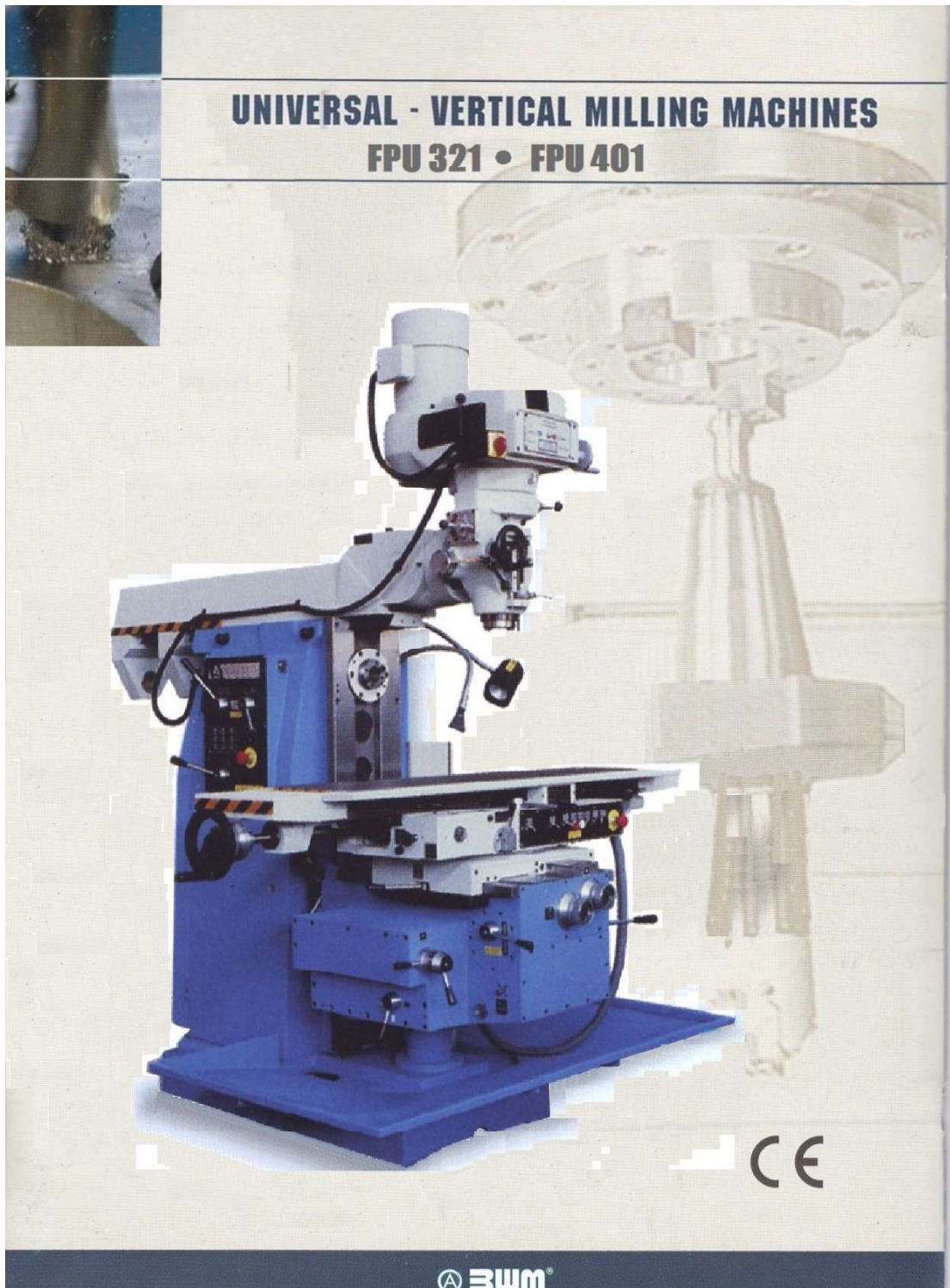
Made in Bulgaria (CE-norms)

Technical characteristics		<b>FV 321M</b>	<b>FV 401</b>
Table size	mm	320x1350	400x1600
"T" slots – number x size	mm	3x18	3x18
Table swivel – left and right	(°)	45	45
<b>Longitudinal table travel</b>			
- manual	mm	1000	1250
- automatic	mm	980	1230
<b>Cross table travel</b>			
- manual	mm	340	340
- automatic	mm	320	320
<b>Vertical table travel</b>			
- manual	mm	460	460
- automatic	mm	440	440
Spindle nose taper	ISO	50	50
Number of spindle speeds		stepless	stepless
Spindle speed range	rpm	45...2000	45...2000
Number of table feeds		stepless	stepless
<b>Table feed rate</b>			
- x,y	mm/min	10...1000	10...1000
- z	mm/min	4...415	4...415
Table rapide traverse	mm/min	2500/1040	2500/1040
Main motor power	kW	4	4
Feed motor power	kW	2.2	2.2
Machine weight	kg	3100	3175

## OPTIONAL ACCESSORIES FOR MILLING MACHINES

### FU/FUV/FV All Models

	Vertical milling head	
	VFG 281	VFG 325
		
Distance from spindle center to vertical guideways, mm	349	435
Spindle nose taper	ISO 40	ISO 50
Weight, approx. kg	100	150
	Rotary index table	
	KDM 320-03	KDM 320-04
		
Table diameter, mm	320	
Height, mm	110	
Central hole diameter, mm	32H6	
Key, mm	14/18	
Weight, approx. kg	74	
	Slotting head	
	SG 251	SG 321
		
Max. working travel, mm	110	110
Distance from vertical guideways to inner side of the toll, mm	327	332
Weight, approx. kg	110	120
	Universal indexing device	
	UDA 125	UDA 160
		
Centers height, mm	125	160
Spindle nose taper	MT 4	MT 5
Weight, approx. kg	40	44
	Horizontal Swivel vice	
	160	
		
Width of jaws, mm		
	Arbors (short and long)	
	22, 27, 32, 40	
		
Diameter, mm		



## TECHNICAL DATA

			FPU 321	FPU 401
Table size		mm	320x1350	400x1600
T-slots:	- number x size x dist.	mm	3x18x63	5x18x80
Table swivel:	- left and right	deg	45	45
Longitudinal table travel:	- manual	mm	1000	1250
	- automatic	mm	980	1230
Cross table travel:	- manual	mm	320	320
	- automatic	mm	300	300
Vertical table travel:	- manual	mm	460	460
	- automatic	mm	440	440
Distance from table top to				
- horizontal spindle axis	- min	mm	30	30
	- max	mm	490	490
- vertical spindle axis	- min	mm	170	170
	- max	mm	630	630
Spindle nose taper	- horizontal	ISO	50	50
	- vertical	ISO	40	40
Number of spindle speeds	- horizontal	-	18	18
	- vertical	-	stepless	stepless
Spindle speed range:	- horizontal normal	rpm	32...1600	32...1600
	- horizontal option			
	- vertical	rpm	80...2700	80...2700
Number of table feeds			stepless	stepless
Table feed rate:	- x, y / z	mm/min	10...1000/4...415	10...1000/4...415
Table rapid traverse:	- x, y / z	mm/min	2500/1040	2500/1040
Main motor power	- horizontal	kW	7,5	7,5
	- vertical	kW	3,75	3,75
Feed motor power		kW	2,2	2,2
Machine weight		kg	3500	3575



### STANDARD FEATURES

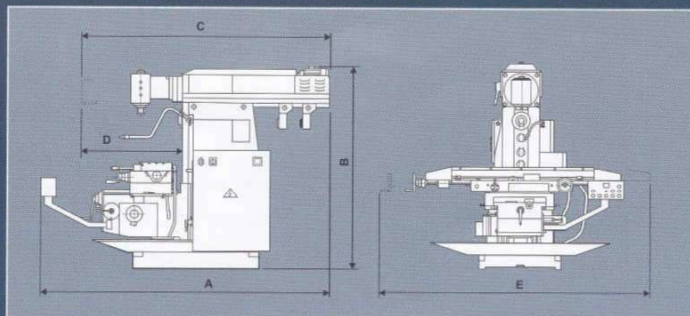
- Stepless regulation of the feeding • Cooling system • Working lighting • Machine maintenance tool kit • Automatic lubrication

### ACCESSORIES

- Rotary index table • Universal index device • Arbors • Horizontal swivel vice • Collet chuck with a collet set • Clamping kit • Safety guard

### OPTIONS

- Digital readout system • Panel control of feeding towards three axes • Universal milling head • Digital readout of feeds for X and Y axes • Automatic cycle for longitudinal movement • Protection of Y axis • Mechanism for longitudinal screw travel without backlash



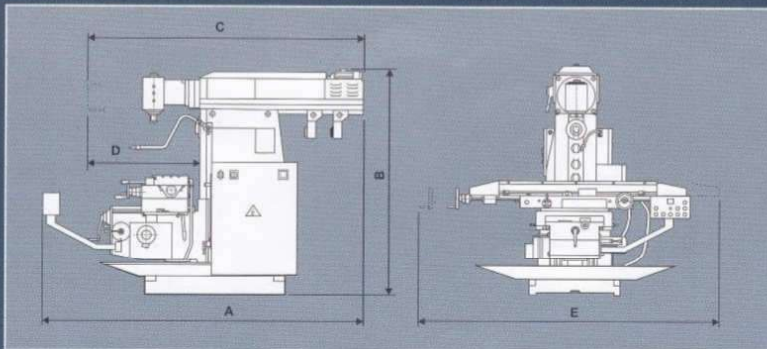
Size	FPU 321M	FPU 401
A	2755	2755
B	2000	2000
C	2775	2775
D	1230	1230
E	3090	3590





## TECHNICAL DATA

			FPV 321	FPV401
Table size		mm	320x1350	400x1600
T-slots:	- number x size	mm	3x18x63	5x18x80
Table swivel:	- left and right	deg	45	45
Longitudinal table travel:	- manual	mm	1000	1250
	- automatic	mm	980	1230
Cross table travel:	- manual	mm	320	320
	- automatic	mm	300	300
Vertical table travel:	- manual	mm	460	460
	- automatic	mm	440	440
Quill travel		mm	127	127
Spindle nose taper		ISO	40	40
Spindle speed range		rpm	80 - 2700	80 - 2700
Number of spindle speeds		-	stepless	stepless
Table feed rate:	- x,y	mm/min	12.5-630	12.5-630
	- z	mm/min	5-262	5-262
	- x,y / z	mm/min	2500/1040	2500/1040
Table rapid traverse:	- x,y / z	mm/min	2500/1040	2500/1040
Quill feed rate		mm/rev	0.04/0.08/015	0.04/0.08/015
Main motor power		kW	3,75	3,75
Feed motor power		kW	2,2	2,2
Machine weight		kg	3500	3575



Size	FPV 321(401)
A	2620
B	2345
C	1920
D	1220
E	3090(3590)