



# AIM 4310 3-AXIS ALUMINIUM PROFILE PROCESSING CENTER







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## **1.OVERVIEW**

AIM 4310 is 3-axis CNC controlled machining center which is designed for the working of all kinds of aluminum & PVC profiles, light alloys in general and thin walled steel profiles. By means of additional aggregate tool, various profiles can be machined with 4-axis movement.

The machine can be used in tandem mode, a work method that allows to machine stop times to be reduced to a minimum as it allows workpiece change time (loading/unloading) to be run "while the machine is operating.

The machine has automatic vise positioning feature (with CAMPROX software) and equipped with magazine unit holding 8 tool-units (second magazine unit optional) with the possibility of placing 2 aggregate tools and 1 milling saw to perform machining on the 5 sides of the pieces.

Isolated cabinet reduces the noise of machine and provides safety of the operator.



## **2. TECHNICAL INFORMATION**

#### **2.1 General Features:**

- Designed for all kinds of drilling, grooving, notching, taping etc. on aluminum profiles
- Uninterrupted machining property by means of the tandem mode to reduce the workpiece change time
- B&R automation system enabling CNC movement on 3 axis
- 8 tool magazine unit , 6 for cutter bits, 1 for aggregates and 1 for saw blade
- Tapping feature up to M8
- Special sound insulation cabinet around the machining center
- PLC controlled misty coolant spray system with 3 pcs of outlets
- 4 x automatic clamps used for grabbing the work piece firmly
- 2 x pneumatic rests used for resetting the work piece in X direction
- 15" color touch screen
- Fast programming using 8 preset macros
- Program import via USB flash memory stick
- Technical support via remote connection capability
- Standard ISO 'G' code programming language
- Multi-language support
- Operator safety barrier
- LED lighting in the cabinet



### 2.2 Technical Features:





WORKING CAPACITY	AIM 4310			
X-axis (mm)	4000 (13 ft)			
Y-axis (mm)	*350 (14")			
Z-axis (mm)	200 (8")			
ELECTRO SPINDLE				
Max. Speed (rpm)	24,000			
Power (kW)	7.5			
Spindle taper	ISO 30			
AUTOMATIC TOOL MAGAZINE				
Tool capacity	8			
Magazine type	In line type			
Max. saw blade diameter (mm)	180			
Max. number of aggregate loadable in the tool magazine	2			
Max. tool weight (kg)	3			
FUNCTIONS				
Multi-piece operations (holes, slots, saw blade cuts , tap- ing etc.)				
With straight tool (top surface)				
	2+2			
With aggregate tool (side faces and ends)	2+2			
FEEDRATE				
Axis speed (m/min.)	X-axis:100 / Y-axis :31 / Z-axis :21			
3-axis servo motors (kW)	X-axis:1.0 / Y-axis:0.4 / Z-axis: 0.4			
GENERAL				
Machine weight (kg)	1.870 - 2100 (4,114 - 4,620 lbs)			
Net/Packing dimensions (L x W x H) (mm)	5000 X 1470 X 2000 / 5100 X 1540 X 2120 (197" x 58" x 79") / 201" x 61" x 83")			
Air supply required (bar)	6 (90 psi)			
Voltage-Frequency	400V 3P-50/60Hz - 208V/220V/440V 3P			
Total power (kW)	11			
WORKPIECE CLAMPING				
Standard number of vises	4			
Max. number of the vises	6			
Vice positioning through the X-axis	Automatic via CAMPROX software			

We reserve the rights to modify above specifications without notice

\* In case of geared tool (aggregate) usage 200 mm



	TOTAL POWER							kg	kg
AIM 4310	16 kW	3000 RPM	D: 180 max. d: 30 mm	Ømax: 20 mm.	6 Bar	140 lt/ min	W=5180 H= 1700 L=2340	1870	2100

# **3.FEATURES OF PROCESSING CENTER**

The parts of processing center are as following,

• Single piece of processing center produced by steel profiles





Main Milling Unit: 9 (S6) kW, 7.5 (S1) kW 24.000 RPM HSD motor X, Y and Z servo motors: X : 1 kW, Y: 0.4 kW , Z: 0.4 kW Accuracy of Machining: (X, Y, Z): +/- 0.02 mm

• Magazine on which 8 pieces of tool sets can be placed



• Noise isolation cab around the machining head







• 4 pieces of automatically operated clamps to hold the workpiece



• 2 pieces of Pneumatically operated supports to determine the reference of workpiece in X- direction



Machine is produced with steel profiles and sheet, and designed for the ergonomy that allows operator easy installation of workpieces by hand.

Metal parts are painted with Electrostatic Powder Paint which provides resistance against corrosion. Front section of machine is covered with moving door with transparent plexiglass windows so that operator can easily follow the machining process of workpiece. This door also provides safety for operator.

## **4.MAIN SPINDLE**

Spindle is of HSD brand, having 4 poles, power of 7.5 kW, rotating speed of 24.000 rpm, ISO30 certification. The power of spindle depending on the rotation speed is provided below.







## **5. NUMERICAL CONTROL**

## **5.1.Numerical Control Hardware**

Each numerical control hardware includes the below given components.

- Intel Atom Z530 CPU board
- 1600 MHz, single core,
- 533 MHz FSB
- 512 kB L2 cache
- RS 232 Serial and Parallel ports
- 3 USB port
- 15" Colorful Touch Screen
- 2 Ethernet ports for connecting to network
- Control board for 3 axes and speed of spindle

### **5.2.Numerical Control Software**

Numerical Control Software provides the control of the following functions.

- Displaying position of axes on screen, clamps, rotational speed of spindle, manual control of axes, automatic lubrication, cooling, profile support, machine safety door, etc.
- Tool Table: It is used for storing tool parameters and can also be utilized for offset.
- CNC Set-up Tables: Machine parameters which allows the maintenance (Axial length, origins, number of clamps, number of magazines, offset values)

## 6. MACRO PROGRAMS





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P2 MARTINE		Z	0.00	R	15:00	INS 71 MOG ING 510000	100			
		1		D	10.00	N7 620 634 N0 620 681	E1 F000			
		x	105.00	R.	100.00	810 mX-14	-50 pW-130 0 mY-65 m2-0	-On I-Re IC-Ja	WU97	
P3 cara	~	Y	15.00	D	10.00	#12 mX-13	00 mH-00 m2-0	nl-60 mW-30 m	49-15 m0-18 LP2	
		Z	0.00			#13 mX-25	00 m7-20 m2-0	ml,-60 mW-30 m	di-3 mD-10 LP8	
-	Contra 1	х	1500.00	L	40.00					
P4 346	Starte.	Y	75.00	w	12:00					
ar mm	public .	Z	0.00	R	20.00					
	the de			D	15-00					
		х	400.00	1						
P6 mm	$(\rightarrow)$	Y	75.00	R	25.00					
		Z	0.00	D	0.00					
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Machine includes default macro programs (for 8 types of operations) which execute main processes These macros provide easy and user- friendly programming capability. After a short training, operator can start to use these macros.

Macro programs are ready for automatic operation, and operator can easily write a routine by filling in required areas with desired values.

Processes that can be performed with macros

- 1-Quadrilateral channel
- 2-Channel with radius
- 3-Line removal
- 4-Barrel hole in right
- 5-Barrel hole in left
- 6-Circle
- 7-Single or sequential holes or points

8-Consecutive and incremental/ horizontal or vertical holes or markings

In the development of macro routines, ISO programming language (G and M codes) is utilized to allow easy coding. ISO programming language not only provides ease of programming for any kind of machine operations but also convenience in management of all machine functions. When measurement values, needed by Macro, are entered by operators, machine generates the program automatically. While programming the macro, rotation, cutting speed, tool number, and profile reference are allowed to be changed.

Moreover, without aligning the tool according to profile, program can be operated quickly by entering the profile height and width on the display.

Optionally, **CAMPROX** software allows generating of customer specific operations with ISO G codes, vise repositioning and then program can be transmitted to machine.













# **7.REMOTE ACCESS**

Yilmaz Makine Technical Service has the opportunity of having remote access to CNC machine. This connection is provided by LAN (Local Area Network) via Ethernet board. Remote access allows quick upgrade of software versions, and change or detailed analysis of machine parameters for maintenance purposes.

## **8. PROFILE CLAMPING SYSTEM**

Profile clamping system is composed of 4 clamps. Each two of four clamps are operated at the same time by different hand buttons. The main purpose of utilizing the two clamps at a time is to allow processing of two different profiles simultaneously on machine bed (See Figure 8).

Clamps are covered with teflon material in order not to leave scratches on profiles.

Clamps can be repositioned automatically by machine depending on the processes performed on workpiece by means of CAMPROX software.







## 9. ACCURACY OF PROCESSING CENTER

Machine has repeatable pointing accuracy of  $\pm 0.02$  mm/ meter. Positioning accuracy of machine is  $\pm 0.02$ 

## **10.DECLARATION OF CE CONFORMITY**

Machine is delivered in accordance with UL & CSA safety directives, and with CE sign and Certificate of CE Conformity to the customer. (Machine complies with the AT 2006/42EC, EN ISO 12100, 2006/95-EC Low Voltage Equipment, 2004/108-EC Electromagnetic Compatibility and EN 60204-1 standards).

## **11.PROJECT MANAGEMENT**

Machine is developed depending on the needs of customer and in accordance with Yilmaz Makine Quality Procedures.

#### 11.1.Design

When order is confirmed, technical properties of equipments in quotation is detailed together with customer. Non-standard parts are designed by Research and Development (R&D) Department of Yil-maz Makine. Standard parts are provided under the control of qualified R&D personnel.

#### 11.2.Manufacturing and Assembly

Based on the design documents, parts, which are not standard, will be manufactured and controlled by Yilmaz Makine. Machine will be assembled later.

#### 11.3.Internal Tests

Having completed the assembly of machine, machine is tested according to Internal Test Procedure. These tests include mechanical checks, setting up different software parameters, machine tests, repeatability- accuracy tests, electrical and safety tests.

### **11.4.Installation and Commissioning**

Installation and commissioning will be decided.

#### 11.5.Training

Yilmaz Makine shall provide necessary training to customer. The content of the training is as following;

![](_page_14_Picture_0.jpeg)

![](_page_14_Picture_1.jpeg)

- Presentation of Processing Center and parts
- Macro Programming
- ISO programming language
- Maintenance of Processing Center
- Support for programming the customer specific operation

Customer should assign an operator, who will be responsible of efficient operation and maintenance of machine, for this training.

## **12.DOCUMENTATION**

Machine is delivered with the following documents to customer:

- AIM User and Maintenance Manuals
- Electrical and Pneumatic Connection Documents
- ISO Programming Guide
- Programming Guide
- SW Licenses
- CAMPROX Software Guide (if purchased)

## **13.TERMS OF SALE**

#### 13.1.Guarantee

YILMAZ Makine asserts that all machines are manufactured in accordance with international standards and tested before delivery.

Guarantee period is 24 months from the date of shipment and it does not cover electrical equipment.

Items under guarantee:

- All faults and failed parts, due to manufacturing processes in factory, are fixed and or replaced without any payment (Notice that the delivery cost of parts are invoice to customer).
- In case the faults or failed parts of machine is fixed or replaced by our technical service, transportation, accommodation and daily allowance of technical personnel is under responsibility of customer.

Guarantee does not cover any kind of faults due to following conditions.

- Not following the instructions in user manual
- Wrong electrical supply
- Misusage or using the machine other than what it is designed for
- Using unqualified or non-original machining tools
- Programming faults
- Not cleaning the machine or not applying protective maintenance on machine

• Any damage while replacing the machine in shop or carrying the machine to another production plant

- Natural disasters (lightning, fire, flood)
- Any damage when failed machine is forced to operate.

#### \*IMPORTANT NOTE:

**1)** By the macro program;

- Manual clamp moving is available
- Saw blade and aggregate operations are not available
- 2) By the CAMPROX Program
  - special milling operations,
    - Saw blade and aggregate operations,

![](_page_15_Picture_0.jpeg)

![](_page_15_Picture_1.jpeg)

- Automatic clamp moving before the operation,
- Automatic clamp repositioning between two operation during the processing
- Tapping operations up to M8 are available

#### 13.2.Equipments and Service Included in Quotation

Equipments and services included in proposal are listed below:

![](_page_15_Picture_7.jpeg)

![](_page_16_Picture_0.jpeg)

![](_page_16_Picture_1.jpeg)

![](_page_16_Picture_2.jpeg)

## Software and Equipment

1 pc of B&R operating system

![](_page_16_Picture_5.jpeg)

8 pc of ISO 30 tool holder fork

![](_page_16_Picture_7.jpeg)

![](_page_17_Picture_0.jpeg)

![](_page_17_Picture_1.jpeg)

![](_page_17_Picture_2.jpeg)

![](_page_17_Picture_3.jpeg)

4 pcs of profile holding clamps

![](_page_17_Picture_5.jpeg)

1 set of misty coolant spray system

![](_page_17_Picture_7.jpeg)

![](_page_18_Picture_0.jpeg)

![](_page_18_Picture_1.jpeg)

1 pc of automatic machine lubrication system

![](_page_18_Picture_3.jpeg)

1 set of ISO 30 tool holder setup kit (assembled)

![](_page_18_Picture_5.jpeg)

1 set of Chip pan

![](_page_18_Picture_7.jpeg)

#### 13.3 Optional Parts

AIM 4310 LIST OF OPTIONALS								
PART #	PICTURE	STOCK CODE	PART NAME					
1	1 6	3UA740030-0078	-6 router bits (2 x Ø5, 1 x Ø6, 1 x Ø8, 1 x Ø10, 1 x Ø12) -6 Tool holders -6 Collets( 3 x Ø5-6, 1x Ø7-8, 1 x Ø9- 10, 1 x Ø11-12) -8 Height parts					
2	cam <sup>P</sup> rox 🗡	0AA020000-0836	CAMPROX CamQuix for 3 Axis milling center					

![](_page_19_Picture_0.jpeg)

![](_page_19_Picture_1.jpeg)

3		1SK050000-0038	Ø 5*15 L50-Z1 Single flute carbide bit
4		1SK050000-0039	Ø 6*18 L57-Z1 Single flute carbide bit
5		1SK050000-0040	Ø 8*20 L63-Z1 Single flute carbide bit
6		1SK050000-0018	Ø 10*72-Z2 Double flute carbide bit
7		1SK050000-0072	Ø 12*83-Z2 Double flute carbide bit
8		1SK050000-0056	Ø13-Z2 Double flute carbide tip
9		3UA740030-0070	AIM 4310 SK 30 Ø180 Special saw blade kit
10		3AU740030-0046	AIM 4310 AGREGA KIT
11		1SK050000-0026	ISO 30 TOOL HOLDER
12		1SK110000-0401	ER32 Ø3-4 COLLET
13		1SK050000-0023	ER32 Ø5-6 COLLET
14		1SK050000-0057	ER32 Ø7-8 COLLET

![](_page_20_Picture_0.jpeg)

![](_page_20_Picture_1.jpeg)

15	Ť	1SK050000-0024	ER32 Ø9-10 COLLET
16	Ť	1SK050000-0073	ER32 Ø11-12 COLLET
17	Ť	1SK050000-0058	ER32 Ø13-14 COLLET
18	Ť	1SK050000-0048	ER32 Ø19-20 COLLET
19		2TU013210-0196	MOULD HEIGHT PART
20		3UA740030-0021	AIM 4310 CLAMPING UNIT
21		1EL190000-0251	TOOL LENGTH MEASUREMENT UNIT
22	Contra .	3UA740030-0045	AIM 4310 TAPPING CHUCK (M4- M8)
23		3UA740030-0042	AIM 4310 CHIP REMOVAL CONVEYOR
24		1EL320000-0011	BARCODE READER( QD2130) (CAB-327 - RS 232)
25	A A A A A A A A A A A A A A A A A A A	3UA740030-0036	AIM 4310 ADDITIONAL MAGAZINE UNIT (WITHOUT TOOLS)

![](_page_21_Picture_0.jpeg)

![](_page_21_Picture_1.jpeg)

26		1EL180000-0047	ET3U-16kVA IN 3x208-220-240V / OUT 3x400V PE TRANSFORMER
27		1EL180000-0500	C/A3-010A VOLTAGE STABILIZER
28		1EL070003-0030	MISTRAZE OIL MIST BLOWER (AIM 4310)
*29			CONTROL UNIT WITH CAM APPLICATION
30		3UA740030-0047	AIM 4310 HIGH SAFETY FENCE
31		3UA740030-0500	AIM DOUBLE PRESSURE CLAMPING
32	cad <sup>×</sup> tract	0AA020000-0842	CADXTRACT PROGRAM (3D STEP FILE IMPORT)

\* 4UN110030-0003 AIM 4310 t is included with 4UN110030-0003 AIM 4310

#### **13.4 Equipment and Services Excluded from Proposal**

The below equipments and services are excluded in price proposal.

- Customer is responsible for electrical and pneumatic connections of machine before delivery
- Special Clamps
- Customer specific machining software
- Shipment