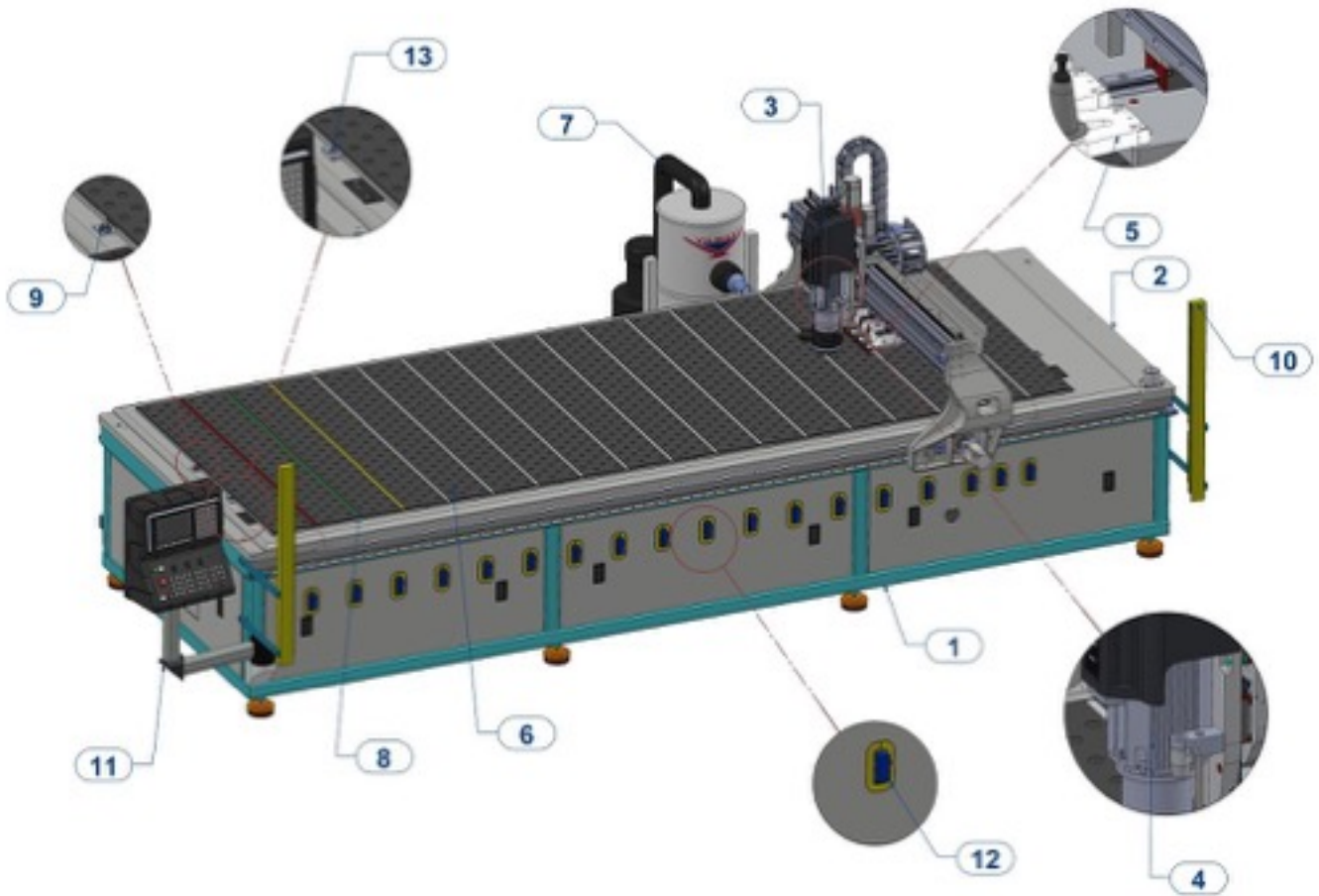


# CPM 4150 COMPOSITE PANEL PROCESSING MACHINE



## 1. OVERVIEW

CPM 4150 is a CNC controlled machine which is specifically designed to process any kind of panels, such as composite, aluminum, and plexy panels in the market. The machine is able to perform the operations such as grooves on composite panels that are required for bending, drills round and oval holes, sizing the panels according to required size etc. CPM 4150 has the programming feature which provides minimum waste and maximum amount of production. Operator places composite panels of maximum size of 1600 x 4100 mm (63" x 162") on the vacuum table of the machine, and presses on start button. The machine processes the panel in a short time according to required dimensions with a accuracy of 0.02 mm by using its high performance spindle of brand HSD or G Colombo. In CPM 4150, the tool magazine is placed next to the spindle on the moving frame in order to minimize tool changing time. In this way, the roundtrip time of spindle to tool magazine is saved. The LED lights on the machine provide ease of following fault, waiting and processing status of the machine. The panel processing routines can be coded in a short time by using ALPHACAM software. Specially designed vortex chip remover, around the spindle, allows clearing off all chips flawlessly from work environment. Vacuum table has a suction capacity of 7.5 kW which provides the feature of holding even small panels. When operated inversely, vacuum table provides easy removal of large panels by hand on the machine table. The servo motors provide super-smooth motion, and a feedback loop to ensure perfect accuracy.

➤ YILMAZ R&D holds the design registry of the machine.

➤ The equipments of the machine are given below.

|                                  |                               |
|----------------------------------|-------------------------------|
| 1-Main Body                      | 8-LED Lights                  |
| 2-Electricity Panel              | 9-Automatic Tool Measurement  |
| 3-Vacuumed Chip Removal Manifold | 10-Light Barrier              |
| 4-Spindle                        | 11-Control Panel              |
| 5-Tool Magazine                  | 12-Vacuum Table On/Off Valves |
| 6-Vacuum Table                   | 13-Support Piston             |
| 7-Chip Removal Manifold          |                               |

- Materials processed in machine: Aluminum composite panel, aluminum panel, plexy panel etc.
- NC automation system with 3 axis of movement
- Application of special cutting processes with YILMAZCAM software = **Easy to operate**
- 2 pcs of Pneumatic reference support systems.( Second one is for the processing of the panels bigger than 4100 mm)
- Magazine unit with capacity of 6 sets of tool on the bridge= **Minimum tool change time**
- Vacuum manifold with a flow rate of 350 m<sup>3</sup>/ h to remove chips
- Superior 'gantry' design gives rigidity = **Maximum accuracy**
- Specially designed vacuum table for processing the small pieces = **no skimming**



- Air flow system to move the big size of the plate on the table easily = **means more efficiency**
- AUTOMATIC Tool Measurement System to reduce the tool setup time = **Minimum set-up time**
- Vortex chip removal system. Clean all the chips on the work plate= **chip free environment**
- Z axis heat compensation system that adjusts the Z position of the cutter bit automatically considering to the elongation on the spindle because of the thermal changes.(Patented
- Multi language support for control unit
- PLC controlled tool cooling system
- Superior hold-down vacuum system comes from 7.5 KW vacuum pump
- Control panel with color display for CNC control
- Handle for setup and manual motion control
- Easy program transfer with USB memory stick
- Creating programs by using display
- Technical support with remote access
- Automatic linear bearing and pinion rack lubrication system = **simple maintenance**
- 1 set of tool mounting apparatus and wrench
- Optional tools, tool holders and clips

## PROCESSING AREA

|        |                |
|--------|----------------|
| X-Axis | 4100 MM (162") |
| Y-Axis | 1625 mm (64")  |
| Z-Axis | 150 mm (6")    |

## ELECTRO SPINDLE

|                 |               |
|-----------------|---------------|
| Max. speed      | 24,000 R.P.M. |
| Power (S6)      | 9 kW          |
| Spindle taper   | ISO 30        |
| Type of cooling | air cooling   |

## AUTOMATIC TOOL MAGAZINE

|  |                           |
|--|---------------------------|
| Max. number of tools loadable in the tool magazine         | 6                         |
| Automatic Tool Magazine Type                               | In-line Type on the grant |
| Tool shank   | ISO30                     |
| Automatic Touch Probe system for positioning on the Z axis | Exist                     |
| Max. tool height   | 60 mm                     |
| Max. tool diameter   | 50 mm                     |

## VACUUM TABLE

|  |                  |
|--|------------------|
| Vacuum blower  | 7.5 kw -400 m³/h |
| Partial vacuuming of table with valve control                            | Exist            |
| Air flow system to move the big size of the plate on the table with easy | Exist            |

## FEEDRATE

|                           |   |
|---------------------------|---|
| Positioning speed (X/Y/Z) | X:40 m/min、 Y:40 m/min、 Z:15 m/min                    |
| 3 axis servomotors /      | X-Axis: 2 pc. X 0,75kw、 Y-Axis:0.75kw、 Z-axis 0.75 kw |
| Positioning accuracy      | X-axis: ±0.02mm, Y-axis: ±0.02mm, Z-axis: ±0.02mm     |
| Cutting-feed rate         | F:1~15,000 mm/min                                     |

## GENERAL

|                               |                                       |
|-------------------------------|---------------------------------------|
| Machine net & packaged weight | 1.720 - 2045 kg                       |
| Machine Dim. LxWxH)           | 4780 X 2300 X 1800 (188" x 91" x 71") |
| Packing Dim. (LxWxH)          | 4860 X 2250 X 2000 (191" x 89" x 79") |

|   |                               |
|---|-------------------------------|
| Air required                                      | 6 bar (90 psi)                |
| Voltage-Frequency-current                         | 400V 3P-50/60Hz, 208-220-440V |
| Total power                                       | 18 kW                         |
| Automatic and centralized mist and cooling system | exist                         |

### CHIP VACUUMING SYSTEM

|                                |                  |
|--------------------------------|------------------|
| External chip vacuuming system | 2.2 kW, 350 m³/h |
|--------------------------------|------------------|

Specifications are subject to change without notice

### 3. SPINDLE

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

**-fast start-up & shut down procedures-**



**Motor Power: 7.5 kW (S1) 9 kW (S6) 0-24.000 rpm HSD motor**

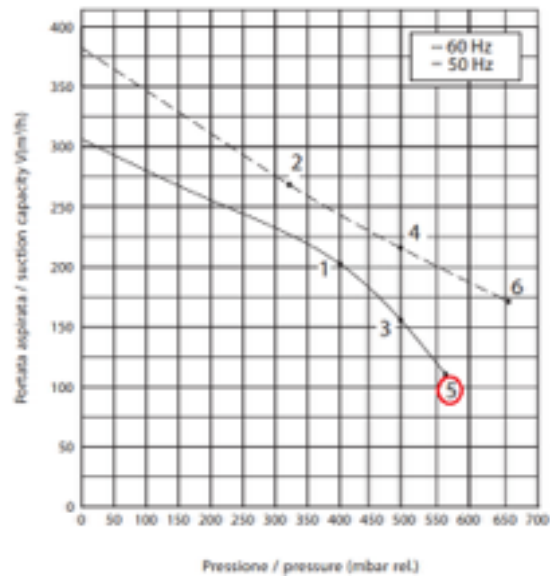
### 4. VACUUM TABLE

Vacuum table is composed of sections which can be controlled independently from each other. This allows easy processing of the small parts. By means of the air flow system on the table it is possible to move the big size of the plate easily.

**-a secure panel for greater accuracy-**



#### COMPRESSIONE / COMPRESSION



**- less skimming means more efficiency-**



## 5. CHIP REMOVAL

Chip removal manifold is placed on spindle frame and has vortex property, which provides removal of almost all of the chips that is generated during processes. The design registration of chip removal manifold is hold by YILMAZ R&D.

In order to remove chip from the table of machine, a vacuuming device of Italian brand is used.

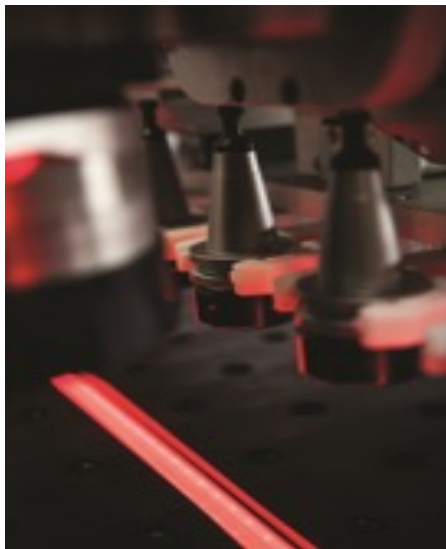
**-a safe, clean and dust-free environment-**



## 6. TOOL MAGAZINE

It is an opportunity to use 6 different sets of tools and magazine with tool changing unit for 6 set. As tool magazine is placed on the frame where which spindle is mounted, it moves together with spindle along X-axis. The tool changing time is minimized as the tool changing distance is short.

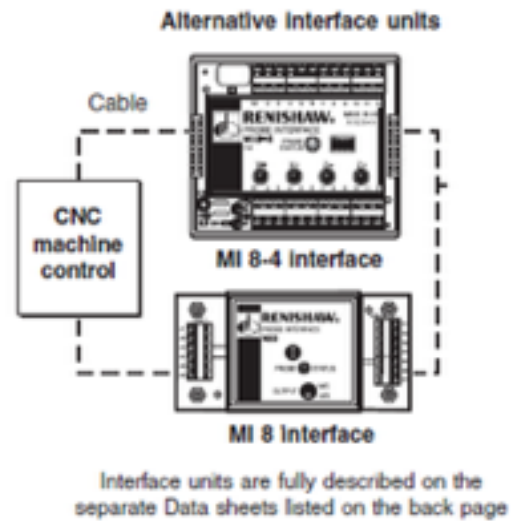
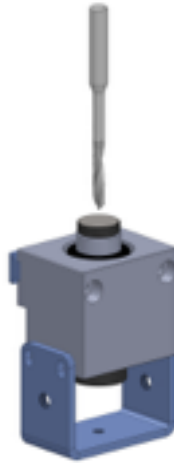
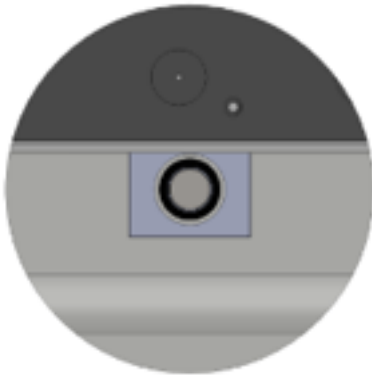
**-Minimum tool change time-**



## 7. AUTOMATIC TOOL MEASUREMENT DEVICE

The dimensions of the tool mounted on spindle are automatically measured with 0.02 mm sensitivity by using Automatic Tool Dimension Measurement Device. CNC stores the dimension of the machine and allows processing the composite panel with 0.01 mm sensitivity at required depth. This system is delivered to the customer as standard equipment along with the machine.

**- no worrying about cutting too deep & minimum set-up time-**



## 8. NUMERICAL CONTROL



**-complete & flexible control  
for the operator-**

### 8.1.Numerical Control Hardware

- Display : 8" Color TFT LCD ( 800 x 600 )
- Servo/Spindle: 3 servo axes / 1 spindle
- Interpolation: Linear 3 axes, Curved 2 axis
- Block processing time: 0.5 m/sec



- Graphic: 2-D Graphic
- Communication Interface: Ethernet 10/100 BaseT, USB 2.0
- Preprocessing (look ahead) block: 200 blocks
- Internal PLC :
  - Step number : 10000 step
  - PLC I/O (16/16, 12/12) (Remote I/O 32/32, 8 max)
  - Basic Order: 0.7µs/step
- DMC net:
  - Speed of Data Transfer: 20Mbps

#### **HMI:**

- File management
- Online editing (G code, MLC)
- Parameter management
- Condition Monitoring
- Servo tuning and diagnosis
- Soft panel
- Multi language selection option

#### **NC:**

- G code analyzer
- Canned cycle control
- Macro programs
- Preprocessing (Look ahead)
- Interpolation
- Tool compensation

#### **MLC:**

- MLC interpreter
- Execution of main cycle routine
- Execution of routines in ISR

## **8.2.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)

## **9. MACRO PROGRAMS**

Processing orders of machine are supplied by AlphaCAM. Machine automatically executes the orders within required limits by analyzing the data. In AlphaCAM software, Nesting (panel optimization) can be performed as standard.

Machine can be utilized by an operator who has completed a short training which includes usage of CNC panel. Moreover, an operator, who has experience in FANUC or the other type of CNC machines, can easily drive the machine.

All programming codes (G & M ) are provided by AlphaCAM. If it is required, operator can enter and edit the program manually by using the display.



All G codes in ISO standard is recognized and processed by machine. Programs are composed of G and M codes, and machine runs automatically by reading these codes.

## **10.REMOTE ACCESS**

Yilmaz Makine Technical Service has the opportunity of having remote access to CNC machine. This connection is provided by either LAN (Local Area Network) via Ethernet board of USB 3G internet service. Remote access allows quick upgrade of software versions, and change or detailed analysis of machine parameters for maintenance purposes.

## **11.DECLARATION OF CE CONFORMITY**

Machine is delivered in accordance with UL & CSA safety directives, and CE sign and Certificate of CE Conformity to the customer. (Machine is manufactured in accordance with the EC 2006/42 Machinery Directives)

## **12.PROJECT MANAGEMENT**

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

### ***12.1.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 Yilmaz Makine. Standard parts are provided under the control of qualified R&D personnel.

### ***12.2.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.

### ***12.3.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- sensitivity tests, electrical and safety tests.

### ***12.4.Installation and Commissioning***

Installation and commissioning will be decided.

### ***12.5.Training***

Yilmaz Makine provides necessary training to customer.

The content of the training is as following;

- Presentation of Processing Center and parts
- Macro Programming
- ISO programming language
- Maintenance of Processing Center
- Information on the data transmitted from optimization software to machine.

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

### 13.DOCUMENTATION

Machine is delivered with the following documents to customer:

- CPM 4150 User and Maintenance Manuals
- Electrical and Pneumatic Connection Documents
- Guides for driver and electrical parts

### 14.TERMS OF SALE

#### 14.1.Warranty

YILMAZ Makine Limited Company 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

#### 14.2.Equipment and Service Included in Quotation

Equipments and services included in proposal are listed below:

| <b>Mechanical Parts</b>                                     |
|---|
| 1 piece of Machine Body                                     |
| 1 piece of Vacuum Table with LED lighting                   |
| 1 piece of CNC Control Panel                                |
| 1 piece of hand – held pendant station                      |
| 1 piece of Automatic Tool Dimension Measurement             |
| 1 set of Light Barrier                                      |
| 1 piece of Spindle with brand HSD/Italy (ES 929 A 4P 7.5kW) |
| 1 piece of Chip Remover (2.2 KW) and accessories            |
| 1 piece of Vacuum Blower (7.5 KW ) and accessories          |
| 1 piece of Safety Barrier around the Machine                |


|   |
|---|
| 1 piece of Tool Cooling System  |
| <b>Software and Equipment</b>   |
| 1 piece of DELTA Automation system  |
| 1 piece of DELTA Programming Software   |
| 1 piece of Automatic Machine Lubrication System   |
| <b>Additional Parts and Hardware</b>  |
| 1 piece of YILMAZCAM CAM software   |
| 1 set of Cutting Tool Set <ul style="list-style-type: none"> <li>• 2 pcs of ISO 30 tool holder</li> <li>• 2 pcs of tool spanner (Ø 6mm, and Ø 10mm)</li> <li>• 2 pcs of Ø10,0 * 15 90° L72 -10- Z2 Alu chamfer mill</li> <li>• 2 pcs of Ø 4,0 * 10 L57 -6- Z1 Alu chamfer mill</li> </ul> |
| <b>DISCOUNTED TOTAL PRICE</b>   |

### 14.3. List of Optionals

| PART # | PICTURE   | STOCK CODE     | PART NAME  |
|--------|---|----------------|--|
| 1      |  | 0AA020000-0832 | ALPHACAM ESSENTIAL<br>ROUTER<br>For special cutting operations   |
| 2      |  | 1EL180000-0047 | ET3U-16kVA IN 3x208-220-240V /<br>OUT 3x400V PE TRANS-<br>FORMER |
| 3      |  | 1EL180000-0500 | C/A3-010A VOLTAGE<br>STABILIZER (10 KVA)                         |

|             |   |                |   |
|-------------|---|----------------|---|
| 4<br>(NEW)  |    | 3ST010030-0391 | VCE 1465 (FLAT TABLE IV2-4-100-310) VACUUM EXTRACTOR )<br>(4 KW & 100 liter of chip tank)       |
| 5           |    | 3ST010030-0393 | CPM SCREENING HEAD SET(PVC)   |
| 6           |    | 3ST010030-0394 | CPM SCREENING HEAD SET<br>(COMPACT LAMINATE)  |
| 7           |  | 1SK050000-0040 | Ø 8*20 L63-Z1 SINGLE FLUTE<br>CARBIDE TIP   |
| 8           |  | 1SK050000-0438 | 5x8x50 TIOLN CARBIDE TIP<br>(CPM 4150)  |
| 9           |  | 1SK050000-0439 | ALUCOBOND DIA FOR GROOV-<br>ING ON ALUMINUM AND B1 & A2<br>RATED COMPOSITE PANELS               |
| 10<br>(NEW) |  | OKT020400-0014 | Ø8 CUTTER FOR CARBON AL-<br>LOYED COMPOSITE PANELS  |
| 11<br>(NEW) |  | 1SK050000-0088 | Ø12 CUTTER FOR KEVLAR AND<br>CORBONY FIBER ALLOYED<br>HONEYCOMB PANELS (CBDB<br>0600-KCN05)     |
| 12<br>(NEW) |  | 1SK050000-0089 | Ø6 CUTTER FOR KEVLAR AND<br>CORBONY FIBER ALLOYED<br>HONEYCOMB PANELS (CBDB<br>1200 AXAS-KCN05) |



|             |   |                |                               |
|-------------|---|----------------|-------------------------------|
| 13<br>(NEW) |  | 3UA790030-0060 | CPM 4150 COLD AIR JET<br>UNIT |
|             |   |                |                               |

#### **4. Commissioning**

- INSTALLATION AND TRAINING ARE INCLUDED IN TOTAL PRICE.
- 2- WAY FLIGHT TICKET, ACCOMMODATION AND DAILY ALLOWANCE OF TECHNICAL PERSONNEL ARE UNDER THE RESPONSIBILITY OF CUSTOMER.

#### **14.6. Equipment and Services Excluded from Quotation**

The below equipments and services are excluded in price proposal.

- Customer is responsible for electrical and pneumatic connections of machine before delivery
- Special Clamps, tool holders and tools
- Additional Tools (excluding 7 pieces of mills on the machine)
- Customer specific machining software
- Shipment