

AUO 3000/4000 Series Semi-Automatic PCB Separator Upgraded Software

DEC 2020

Equipment appearance



www.aurotek.com.tw

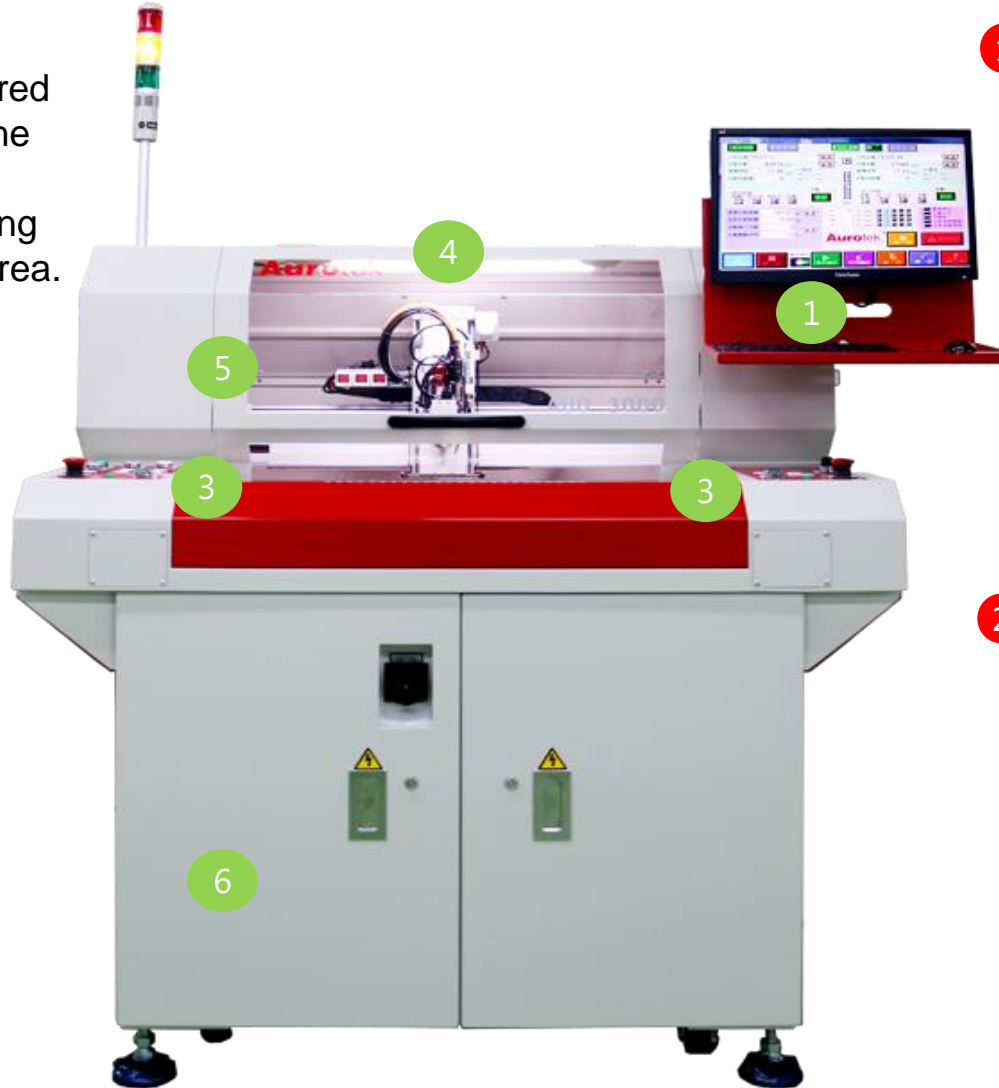
Feature Introduction

3 Safety Device
Use block-out infra-red sensors to reduce the risk of personnel inadvertently intruding on the processing area.

4 Spindle Motor
High-speed spindle motor to reduce mechanical stress during cutting

5 Axial Motor
Uses a high precision/ response AC servo motor and modular actuator.

6 Controller
PC-based 4-axis motion controller.



1 Graphical User Interface
The user interface is based on the Windows GUI operating system and is easy to use. A CCD camera is also used to display a 10X image of the PCB to improve training precision.

2 Work Exchanger
This work exchanger provides an alternative in-and-out working space to limit the idle time, which in turn reaches the utmost output value.

Specification

MODEL NO.	AUO 3000 / 3000C	AUO 4000 / 4000C
WORKING AREA	X:330 mm Y:350 mm	X:450 mm Y:520 mm
Working Table	2	
PCB Thickness	0.8 ~ 3.0 mm	
PCB Component Height (Max.)	Upward: 15 mm / Downward: 35 mm (Max. 45 mm with specific jig)	
Motion Control	4 Axes AC Servo Motors	
Moving Speed	Standard : X, Y=1,000 mm/s; Z=750 mm/s Max. : X, Y=1,200 mm/s; Z=750 mm/s	
Cutting Speed	0~100 mm/s	
Cutting Accuracy	±80 μm	
Positioning Repeatability	±10 μm	
Cutting Modes	Linear, Circular, U-Curve, Arc, L-Curve	
Standard Bits	Ø 1.0 mm, Ø 1.2 mm, Ø 1.6 mm, Ø 2.0 mm	
Operating System	Windows 7	
Pneumatic Pressure	0.5/0.6 Mpa (5/6 Bar)	

Specification

MODEL NO.	AUO 3000 / 3000C	AUO 4000 / 4000C
WORKING AREA	X:330 mm Y:350 mm	X:450 mm Y:520 mm
Working Height	890 ~ 940 mm	
Dimensions (W*D*H)	1565*1110*1462 mm + Signal Light 561 mm	1789*1400*1435 mm + Signal Light 561 mm
Net Weight (Approx.)	460 KGS	620 KGS
Vacuum Cleaner	3HP or 5HP	
Standard Spindle	Standard: 4026, 265W, (Max.) 58,000 rpm, Torque: 4.5 Ncm Option 1: 4025DC-T, 470W, (Max.) 30,000 rpm, Torque: 15 Ncm Option 2: AP 008-ESD, 500W, (Max.) 80,000 rpm, Torque: 8.4 Ncm	
Standard Monitor	19" LCD Monitor	
Power Supply	3 Phase AC220 V \pm 5% 50 Hz/60 Hz, 4.0 kw	

Product Advantages

Efficient

- A. High horsepower industrial dust collectors
- B. Small dust-collecting duct design for upward or downward dust extraction systems.
- C. Duct is close to the milling area, removing dust at once while depaneling.

Accurate

- A. KURODA high precision ball screw
- B. Panasonic servo motor
- C. Sycotec spindle
- D. Advantech IPC
- E. Aurotek motion control card

F. Aurotek vision system

We guarantee: Cpk >= 1.33
Positioning Repeatability ± 10µm
Cutting Accuracy ± 80 µm

Speedy

- A. High-speed axis modules reaches up to (max.) 1200 mm/s
- B. Maximum cutting speed up to 100mm/s
- C. Dual table processing, maximizes production throughput while minimizes idle time.
- D. Customized fixture and tools, production changeover can be done in just a few minutes.

Yield Increasing

Easy to use is a must.
We design machines for:

- A. Manageability
- B. Usability
- C. Safety
- D. Traceability

Advantageous Genes

Aurotek



KURODA
JENATEC



ADVANTECH



Aurotek



► Syco Tec



Panasonic

Aurotek

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Product Overview

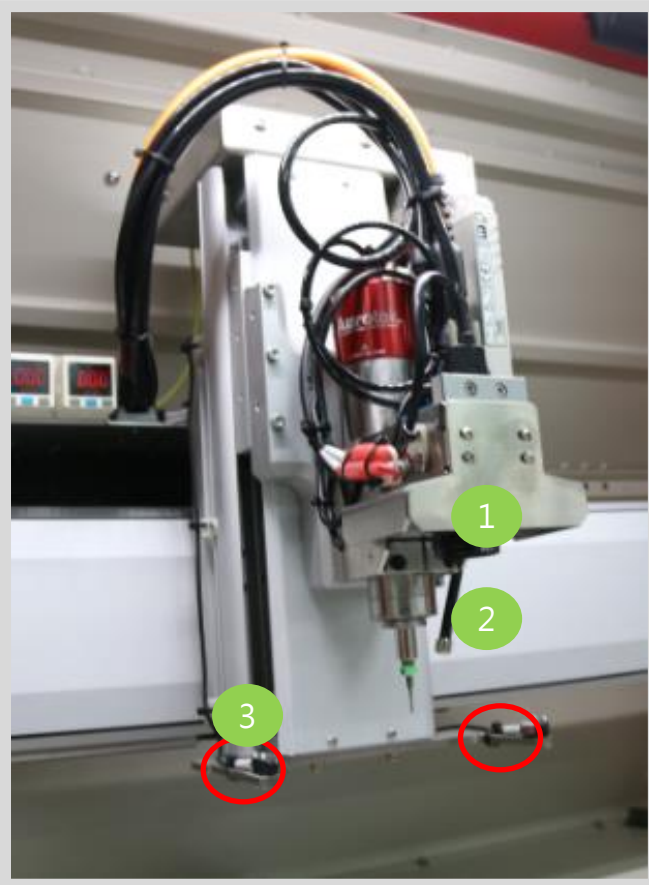
Strong machine structure & precise motion

High accurate single-axis motion module designed by Aurotek.

X, YL, YR, Z axes equip with independent Panasonic servo motors ◦



Product Overview



1 CCD camera with LED light

CCD camera (1A) and LED Light (1B)
Supports coordinate setting. It checks fiducial marks and simulate cutting routes before actual cutting.

2 Ionizer

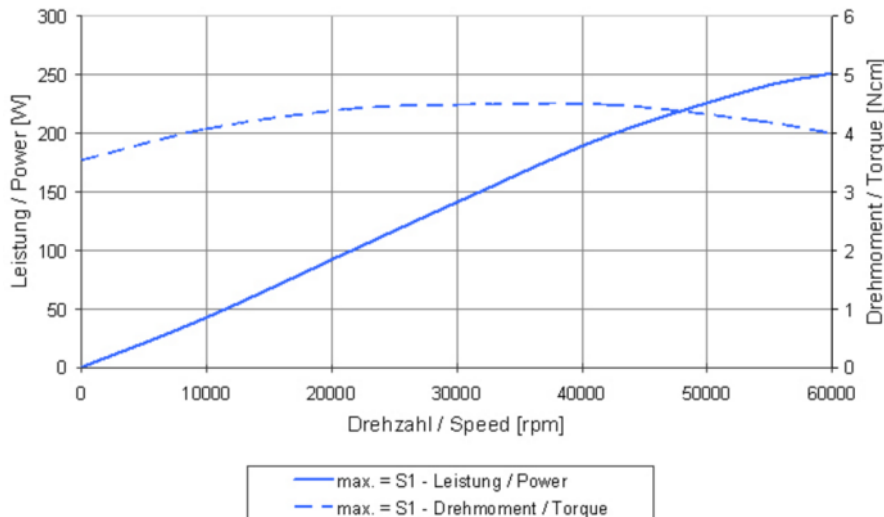
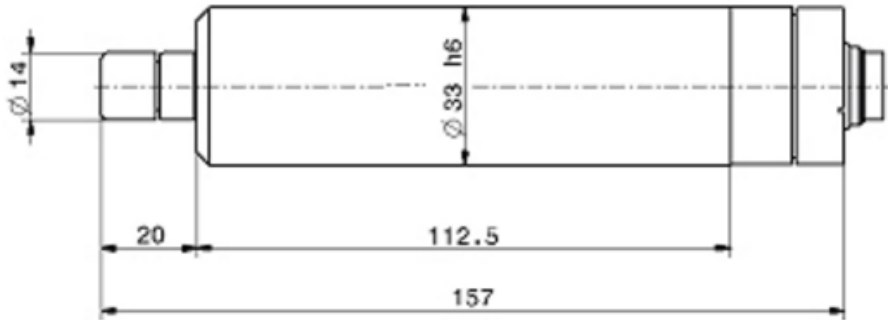
Ionizer focuses on cutting point during cutting process. It reduces electrostatic discharge effectively.


3 Bit break check sensor

A standard item in AUI series. Sensor detects bit breakage after every cutting movement.

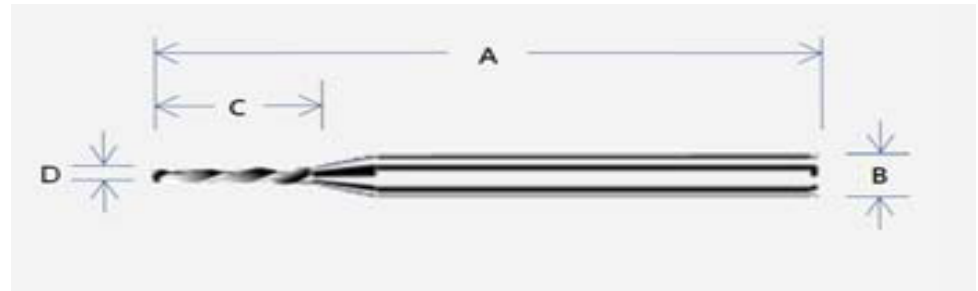
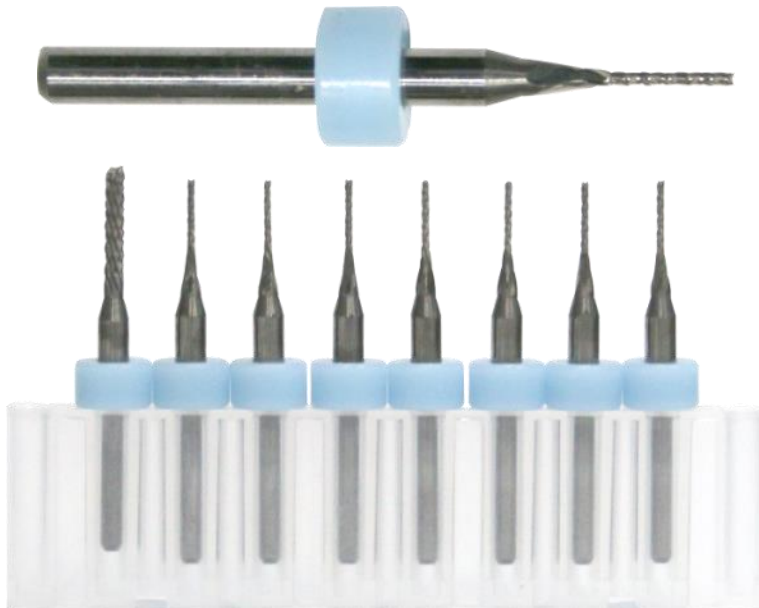
Spindle & Motor

SycoTec 4026 Spindle



Motor system : 3 phase asynchronous motor
 Speed range : 5,000~60,000 rpm
 Voltage : 30V
 Current : max. 8A
 Torque : 4.5 Ncm
 Frequency : 83~1,000 Hz
 Power : 265W
 Weight : 700g
 Bearing system : 2x Hybrid, 1 x Steel, lifetime lubricant
 Protection category : IP 20
 Working position : 
 Load direction: axial + radial
 Run-out (taper): $\leq 1.5 \mu\text{m}$
 Cooling system : Self-ventilation fan
 Cooling via clamping bracket
 Housing material : Stainless steel

Router bits



Bit diameter
Ø 1 ~ Ø2 mm

LEFT HAND CUTTER

RIGHT HAND CUTTER

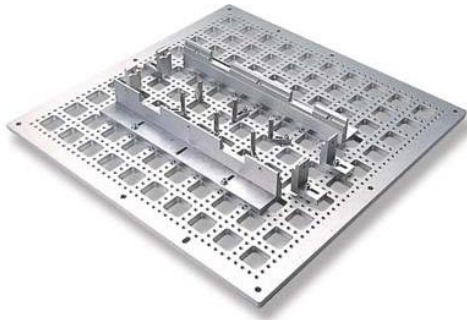


LEFT HAND SPIRAL

RIGHT HAND SPIRAL

Left-hand bit;
Downward cutting;
Carbide end mills
Overall Length (A): 38.2 ±0.30 mm
Shank Diameter(B): 3.175 mm
Cutting Length(C): 6 ±0.50 mm
Cutting Diameter(D): 1.00/ 1.20/ 1.60 /2.00 mm

Dedicated jigs

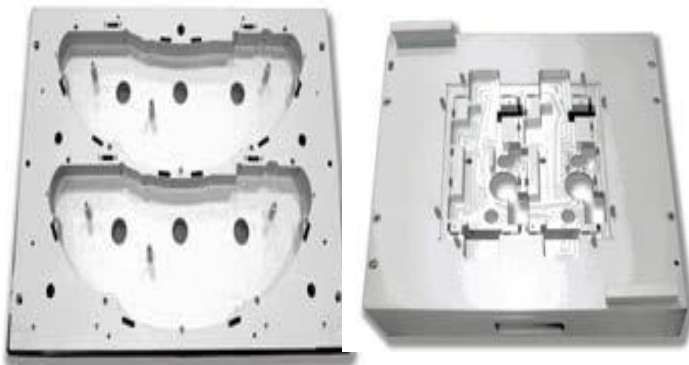


Universal Jig

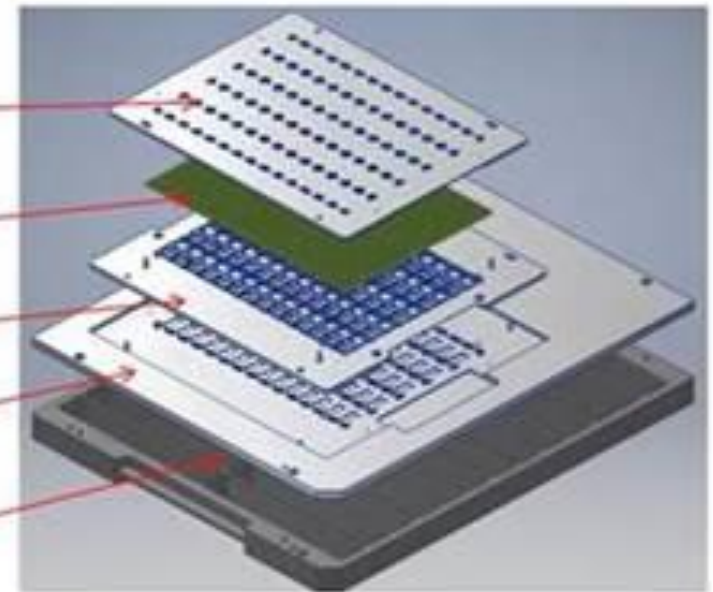
Suitable for various PCB sizes and shapes.

Option: Specific Jig (Customized Jig)

Greatly improve the cutting stability and provide a precise cutting environment.



- Top Cover
- PCB
- Top Jig
- Upper Fixed
- Jig Base



Vacuum Cleaner

YSF Series Dust Collector

YSF vacuum cleaner is designed for PCB Separator Series to collect the dust & scrap generated by router cutting. High horse power motor & high efficiency fan ensure the suction with excellent efficiency.



MODEL NO.	YSF-V553	YSF-V605
Dimensions (WxDxH)	665x635x1610mm	780x665x1900mm
Weight	195 KGS	230 KGS
Power Supply	3 phase 50 Hz / 60 Hz 220 V	
	2.2 kw	3.7 kw
Motor Power	3 HP	5HP
Inlet Wind Speed	26 m/sec	28 m/sec
Inlet Wind Capacity	28 m ³ /min	40 m ³ /min
Inlet Wind Pressure	300 mm-Ag	300 mm-Ag
Inlet Diameter	150 mm	150 mm
Outlet Diameter	203 mm	203 mm

Superb Product Features



1. Dual Working Table

This provides an alternatively in-and-out working space to limit idle time, which in turn reaches the utmost output value.



2. Area Sensor

By using sensor curtain, equip with the emergency stop button to prevent the foreign matter to enter the working area in order to avoid damage to products and for protecting the operator as well.



3. Manual Sliding door

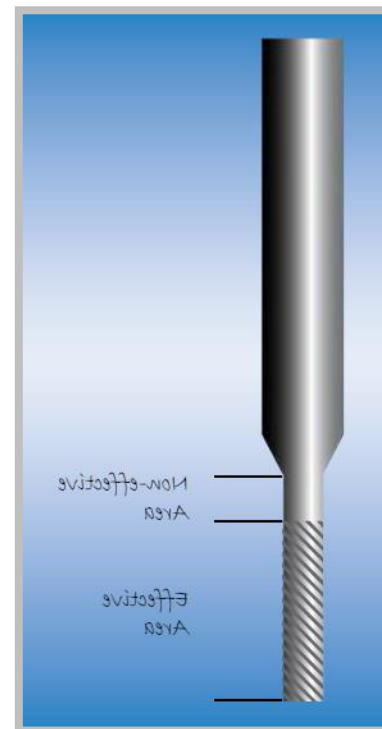
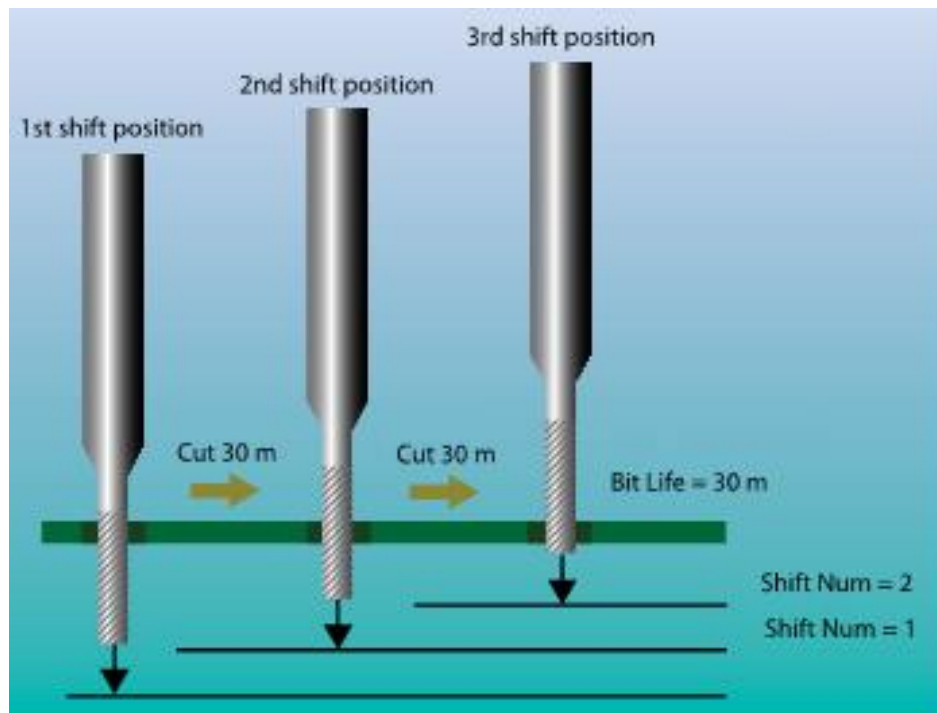
Avoids foreign matter entering the working area, prevents to cause damage on the products, it also reduces the noise during work and protects operators as well.

Superb Product Features

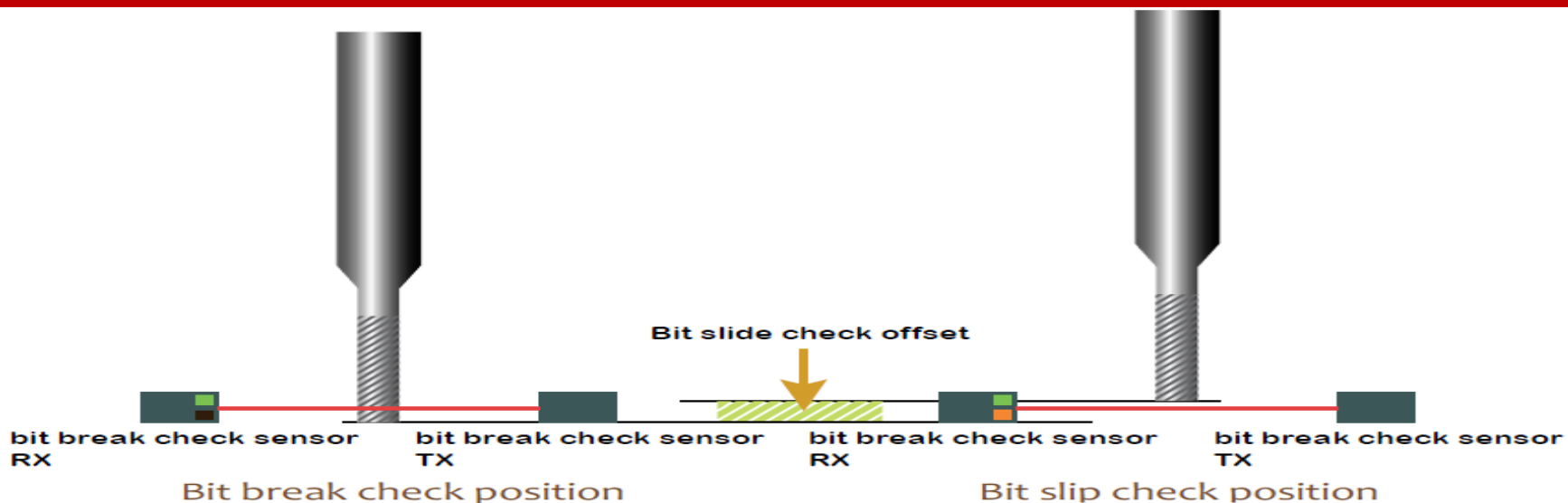
3. Maximum 9 Routing Bit Sectioning

The user can set the milling length of each cutting segment according to the PCB thickness, when the cumulative milling distance has been ran out, the Z axis will automatically drop to next cutting segment. °

Note: depends on PCB thickness.



Superb Product Features



4. Bit break detection Sensor

During every routing task, the system detects any variable change of bit, and notices the user with alarm system.

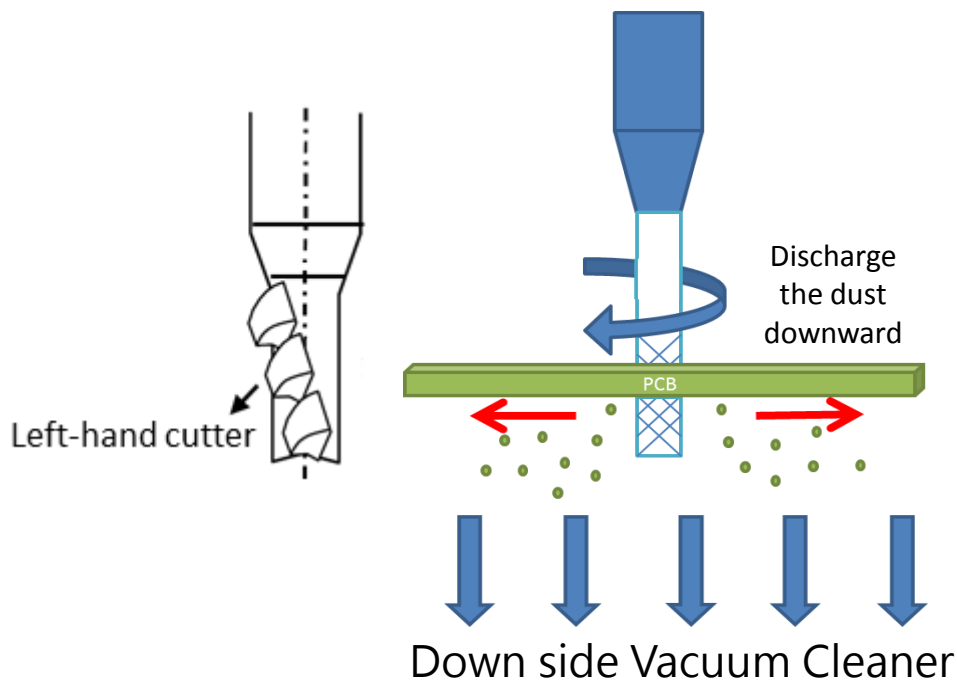
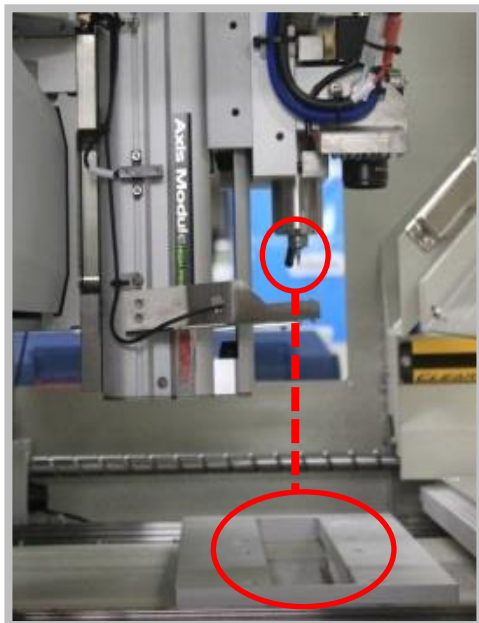
5. Bit Slip Detection Sensor

All of Aurotek machine equip with bit slip check in order to make sure the router bit is firmly held in place.

Superb Product Features

6. Small Dust Orifice

The vacuum suction is just under bit cutting position, which focuses on the actual cutting area. Together with the use of ionizer that remove ESD during bit cutting, these enhance dust collection efficiency significantly.



Superb Product Features

7. Graphical User Interface

0629.rcp - PCB Separator

Home **Run** **Stop** **Change Bit** **Buzzer** **Off-Line** **L** **R** **Simulation** **AutoRun Test** **Log** **Machine Status** **Recipe** **Report** **Maintain** **Setting** **Logout** **Exit**

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A Complete Solution from One Source

Cutting Path

Status

Cutting Status

Idle Stand By Cutting Waste Unload

Bit Status

Statistics Info

TurnOn : 000 days 00:01:37
Run Time : 000 days 00:00:00
IdleTime : 000 days 00:01:37
AlarmTime : 000 days 00:00:00
Input : 0
Output : 0

Spindle/Bit Info

Bit Life : mm
Cut Distance : 1610... mm
Auto Shift Num :
Spindle Hours : 16.25... hr

Handshake

PCB OnLoader
 PCB On CarryL PCB On CarryR
 PCB On TableL PCB On TableR
 Machine Ready
 UPL Request
 PCB Available
 DNL Ready

Alarm

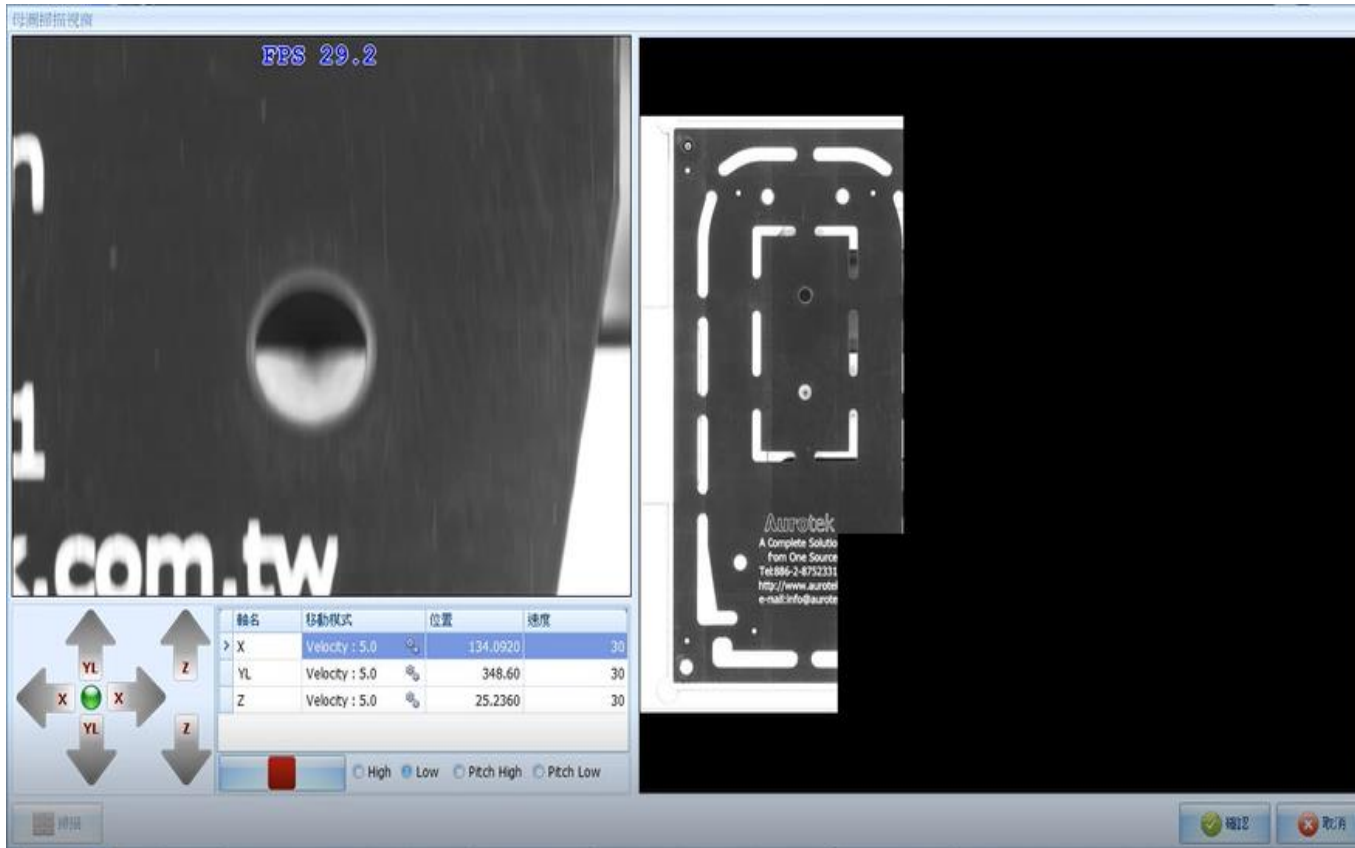
EMO
 Air Down
 Door Open
 Ionizer Alarm
 L Table Area Sensor
 R Table Area Sensor

```
HRESULT: 0x8007007E
[18:27:01] Load Device : CO [FAIL]
[18:27:01] The port 'COM3' does not exist.
[18:27:02] Load Device : Cognex1500 [FAIL]
[18:27:02] Load Device : CarryIn [OK]
[18:27:02] Load Device : CarryOut [OK]
[18:27:02] Load Device : LoadControl [OK]
[18:27:02] Load Device : CutControlR [OK]
[18:27:02] Load Device : CutControlL [OK]
[18:27:02] Load Device : UnloadControl [OK]
[18:27:02] Load Device : AutoChangeBitL [OK]
[18:27:02] Load Device : AutoChangeBitR [OK]
[18:27:03] 沒有發現設備
[18:27:03] Load Device : CCD [FAIL]
```

V1.0.0.0 Model : AUI_UCSLPlus User : Administrator 2020/07/06 18:28:33

Superb Product Features

8. CCD image Canvas scanning



Similar with AOI system, scan the actual panel and transfer to a canvas.

After scanning, you can make cutting points on the canvas directly.

Superb Product Features

9. Multiple Fiducial Mark Alignment

Enable Base Alignment or Enable SubBoard Alignment according to product requirements.

Fiducial Point

Enable Base Alignment Train

Enable SubBoard Alignment Train

Parameter Setting:

Threshold

Tolerance(%)

Location (X)

Location (Y)

Width

Height

Train Mark

Recognition: Pattern Match
Color Mode: WhiteToBlack

Threshold: 60
Tolerance(%): 10.0
Location (X): 276
Location (Y): 196
Width: 88
Height: 88

Pattern

Find Result :
Center (X) : 0
Center (Y) : 0
Offset (X) : 0
Offset (Y) : 0

Axis Name	Move Mode	Position	Speed
X	Velocity : 5.0	0	0
YL	Velocity : 5.0	0	0
Z	Velocity : 5.0	0	0

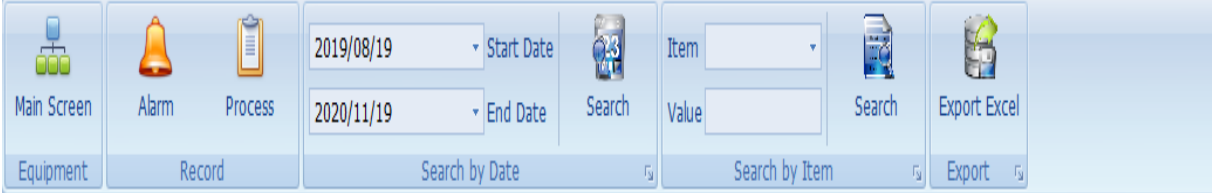
High Low Pitch High Pitch Low

Find Align OK Cancel

Superb Product Features

11. Traceability

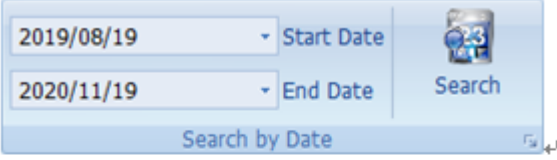
1. Showing PCB ID, information, cutting time, message...etc.
2. Search function.



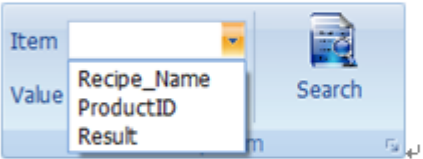
The interface includes buttons for 'Main Screen', 'Alarm', and 'Process'. Below these are search filters for 'Start Date' (2019/08/19) and 'End Date' (2020/11/19), an 'Item' search field, and an 'Export Excel' button.

SN	ProductID	Recipe Name	Length(mm)	Width(mm)	Thickness	Conveyor Speed...	Start Time	End Time	Tack Time(sec.)	Result	Sh
1	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:11:53	2019-11-05 13:14:44	171	X	
2	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:13:59	2019-11-05 13:15:10	70	X	
3	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:14:12	2019-11-05 13:15:37	84	X	
4	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:14:52	2019-11-05 13:16:03	71	X	
5	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:15:17	2019-11-05 13:16:30	72	X	
6	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:15:44	2019-11-05 13:17:05	80	X	
7	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:16:10	0001-01-01 00:00:00	-63708556570	X	
8	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:16:38	0001-01-01 00:00:00	-63708556598	X	
9	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:17:12	0001-01-01 00:00:00	-63708556632	X	
10	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:18:13	0001-01-01 00:00:00	-63708556693	X	
11	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:18:22	0001-01-01 00:00:00	-63708556702	X	0 0 0 MainForm Test
12	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:20:15	2019-11-05 13:21:07	51	X	0 0 0 Separator-AUI3000 MainForm Test Update
13	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:20:23	2019-11-05 13:21:41	77	X	0 0 0 Separator-AUI3000 MainForm Test Update
14	Auro-11-05 13:...	1001	0	0	0	0	2019-11-05 13:20:35	2019-11-05 13:22:11	96	X	0 0 0 Separator-AUI3000 MainForm Test Update


Search by date, as shown below:↵



Use the item search, as shown below:↵



Press the export button to save as an Excel file:↵



Superb Product Features

12. Bit & Spindle Lifespan Management. Statistics Info, Alarm

Spindle/Bit Info		
Bit Life	<input type="text" value="1000000"/>	m
Cut Distance	<input type="text" value="1610837.645"/>	m
Auto Shift Num	<input type="text" value="0"/>	
Spindle Hours	<input type="text" value="16.25"/>	hr

Statistics Info	
Turn On	<input type="text" value="000 days 00:01:16"/>
Run Time	<input type="text" value="000 days 00:00:00"/>
Idle Time	<input type="text" value="000 days 00:01:16"/>
Alarm Time	<input type="text" value="000 days 00:00:00"/>
Input	<input type="text" value="0"/>
Output	<input type="text" value="0"/>

Alarm
<input type="radio"/> EMO
<input type="radio"/> Air Down
<input type="radio"/> Door Open
<input type="radio"/> Ionizer Alarm
<input type="radio"/> L Table Area Sensor
<input type="radio"/> R Table Area Sensor

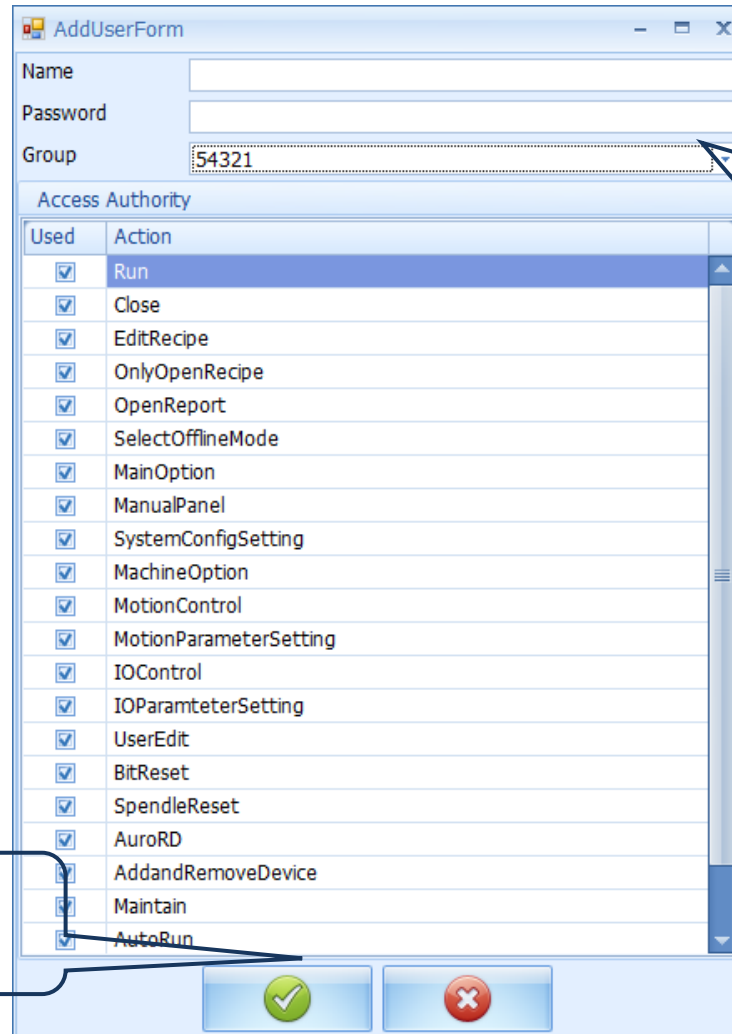
Superb Product Features

13. User Access Management



Group Management

Users with "Group Management" permission controls groups with lower permission.



Used	Action
<input checked="" type="checkbox"/>	Run
<input checked="" type="checkbox"/>	Close
<input checked="" type="checkbox"/>	EditRecipe
<input checked="" type="checkbox"/>	OnlyOpenRecipe
<input checked="" type="checkbox"/>	OpenReport
<input checked="" type="checkbox"/>	SelectOfflineMode
<input checked="" type="checkbox"/>	MainOption
<input checked="" type="checkbox"/>	ManualPanel
<input checked="" type="checkbox"/>	SystemConfigSetting
<input checked="" type="checkbox"/>	MachineOption
<input checked="" type="checkbox"/>	MotionControl
<input checked="" type="checkbox"/>	MotionParameterSetting
<input checked="" type="checkbox"/>	IOControl
<input checked="" type="checkbox"/>	IOParamteterSetting
<input checked="" type="checkbox"/>	UserEdit
<input checked="" type="checkbox"/>	BitReset
<input checked="" type="checkbox"/>	SpendleReset
<input checked="" type="checkbox"/>	AuroRD
<input checked="" type="checkbox"/>	AddandRemoveDevice
<input checked="" type="checkbox"/>	Maintain
<input checked="" type="checkbox"/>	AutoRun

Step 1:
Enter name, password
and group.

Step 2:
Press OK to
complete.

Superb Product Features

14. Off-line Editing Program--- > Upgraded the cutting program file can be opened/edited in your laptop and input to machine by USB.

20201210 - PCB Separator

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Left Table

- Board
- SubBoard_01
- Layout
- Group
- Line
- Line
- Line

X:136.808 Y:241.965 Scale:88.221%

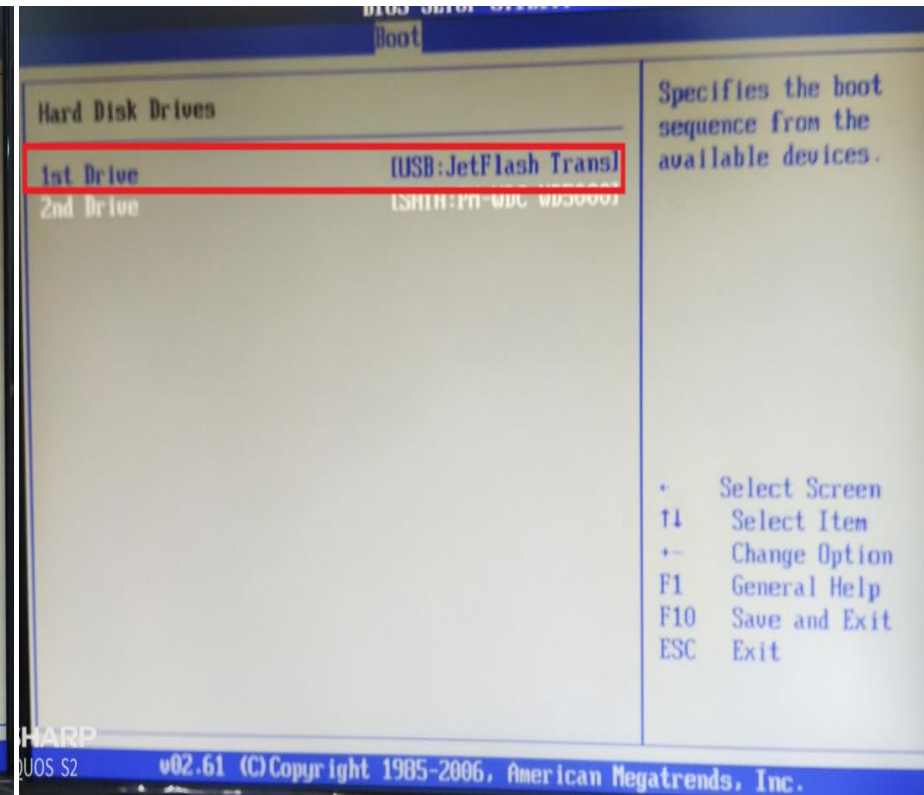
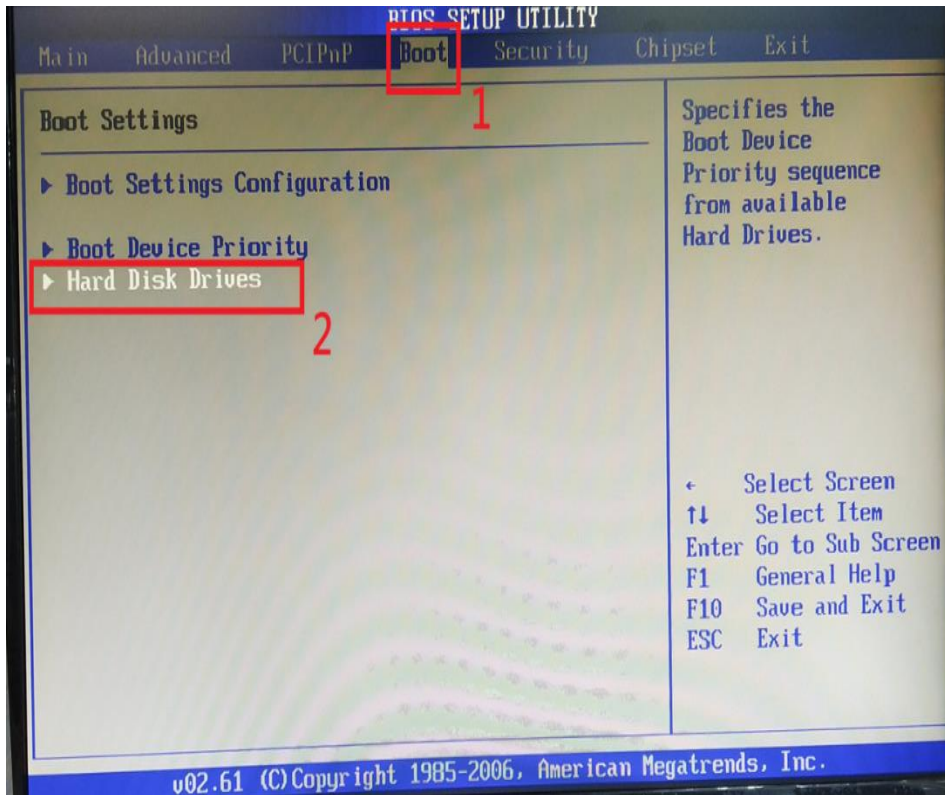
V1.0.0.0 Model: AUI User: Administrator

2020/12/10 17:11:18

Superb Product Features

15. USB back up

Before shipping the device, we will burn the operating system, software applications and related parameter files into Arconis recovery image file and save it in USB flash drive.



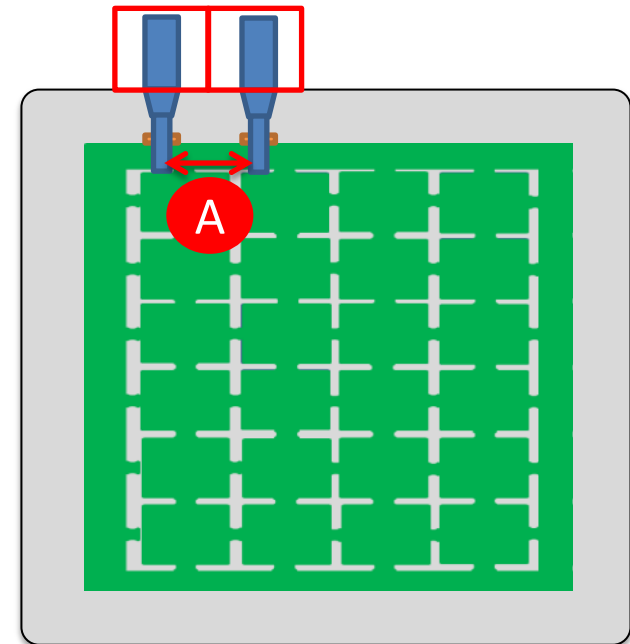
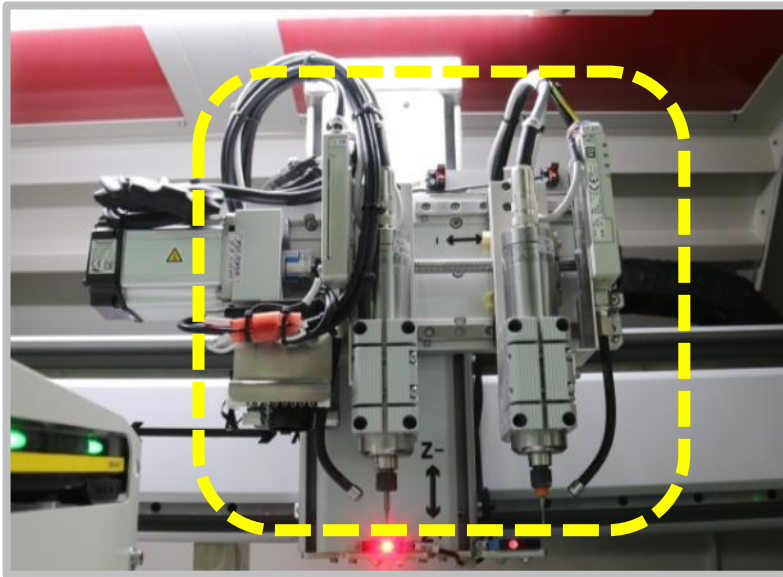
Option & Customized Solutions

A. Dual Spindle System

Aurotek knows that production efficiency matters. With dual spindle system, it cuts off work cycle time while double up the overall output.

Area A spacing limit :

1. Min. distance is 43mm, Max. distance is 113mm. (4026 spindle)
2. PCB Board : X-axis is a even number cutting segment.



Spindles : Sycotec 4026, 4033AC

Option & Customized Solutions

B. FR-4 & Aluminum CUTTING

For cutting FR-4 & aluminum PCB panels, request high torque and High rpm spindle.



High Spec Spindle:

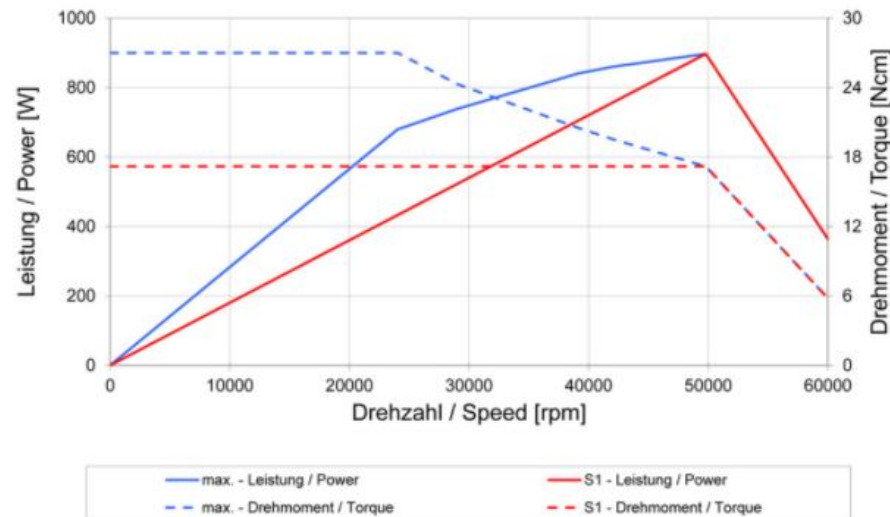
SycoTec 4033DC-T-CS Max. 900W Max. 60,000rpm

***Torque Max. 27Ncm



Routing Bit & Cast Alloys:

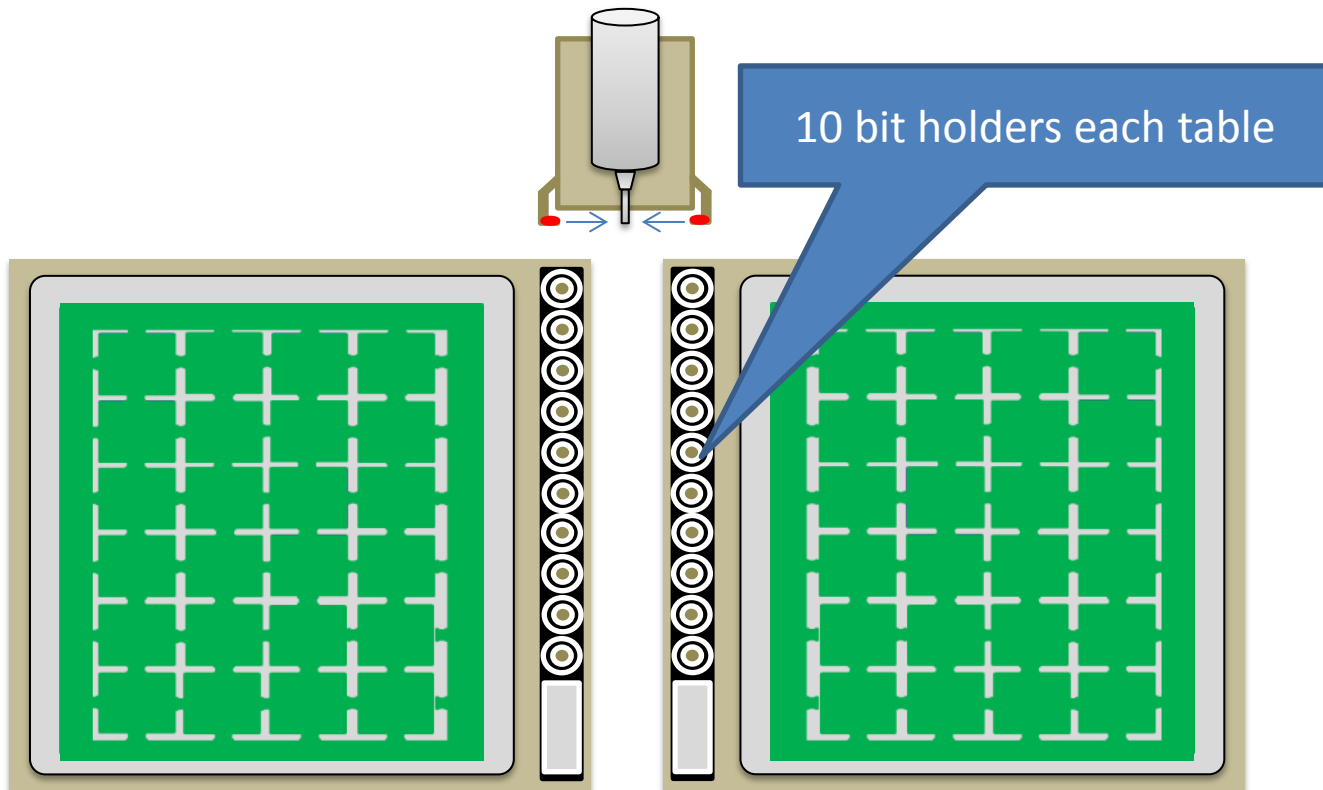
Please inform Aurotek aluminum alloy codes of MCPCB panel in order to get best cutting performance.



Option & Customized Solutions

C. Automatic Bit Changer System

Automatic Bit Change System equips with SycoTec 4033 AC-ESD-LN15 pneumatic spindle, when the router bit almost reaches its life time, the system will drop the bit which is implementing cutting task and automatically replace a new bit and continue the cutting process, reduces labor cost in the production line.

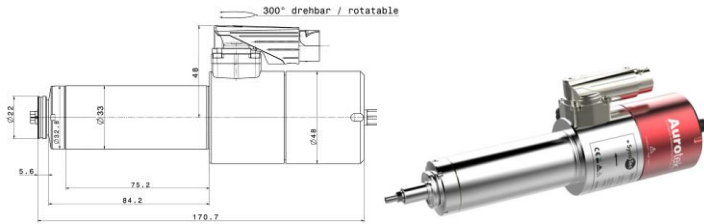


Option & Customized Solutions

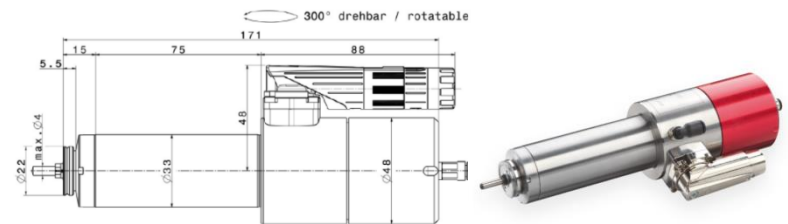
SycoTec 4033AC-ESD-LN15



SycoTec 4033DC-T-CS



Motor system : 3 phase asynchronous motor
Speed range : 6,000~80,000 rpm
Voltage : 60V
Current : max. 8A
Torque : max. 8.4 Ncm
Frequency : 100~1333 Hz
Power : 500W
Weight : 1kg
Bearing system : 3x Hybrid, lifetime lubricant
Protection category : IP 55/57
Load direction: axial + radial
Run-out (taper) : $\leq 1\mu m$
Cooling system : Cooling via clamping bracket
Housing material : Stainless steel



Motor system : 3 phase asynchronous motor
Speed range : 5,000 - 60,000 rpm
Voltage : 49V
Current : max. 24A
Torque : max. 27 Ncm
Frequency : 83 – 1,000 Hz
Power : 900W
Weight : 1kg
Bearing system : 3 x Hybrid, lifetime lubrication
Protection category : IP 55/57
(with sealing air + optional accessory: sealing cap 2001 2618)
Load direction: axial + radial
Run-out (taper) : $\leq 1\mu m$
Cooling system : Cooling via clamping bracket
Housing material : Stainless steel

Option & Customized Solutions

E. Linking Barcode Module & CIM / MES Function

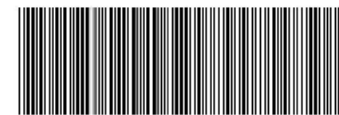
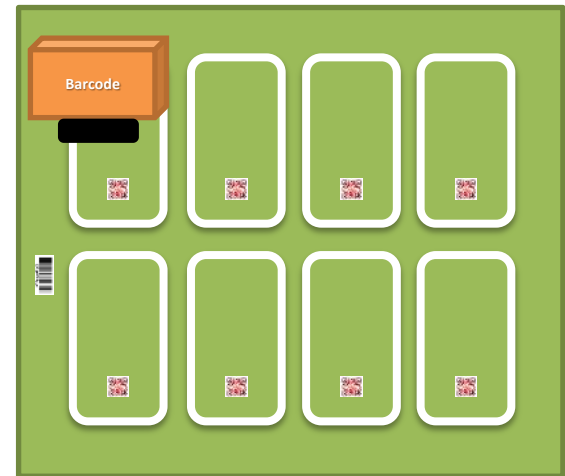
We provide software customized service to meet various production information needs in the market, instantly obtains the actual production status through the central monitoring system in order to provide the most appropriate schedule and production configuration accordingly.



Automatic :
Cognex DM150Q
Install on Z axis



Manual :
DENSO AT21Q-HM



12345678avc



Option & Customized Solutions

Product Name	L Serial NO.	L Start Cutting Time	L End Cutting Time	R Serial NO.	R Start Cutting Time	R End Cutting Time	Total Qty	Cycle Time(sec)
ABC	ABC0001	2020/07/31 13:05:00	2020/07/31 13:05:52				1	40
ABC				ABC0002	2020/07/31 13:06:00	2020/07/31 13:06:42	2	40.1
ABC	ACB0003						2	
ABC				ABC0004	2020/07/31 13:07:20	2020/07/31 13:07:59	3	39

Standard Traceability data

F. Bit Diameter Detection

G. UPS System for IPC

H. Spindle Rpm Digital Adjustment

Spindle speed can be adjusted on the screen, no need to manually adjust mechanical parts.

Option & Customized Solutions

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機械手臂單軸型錄	category	2018-10-08 15:25:41	9.14 MB	↓

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y-S168S1ST Maintenance Procedures

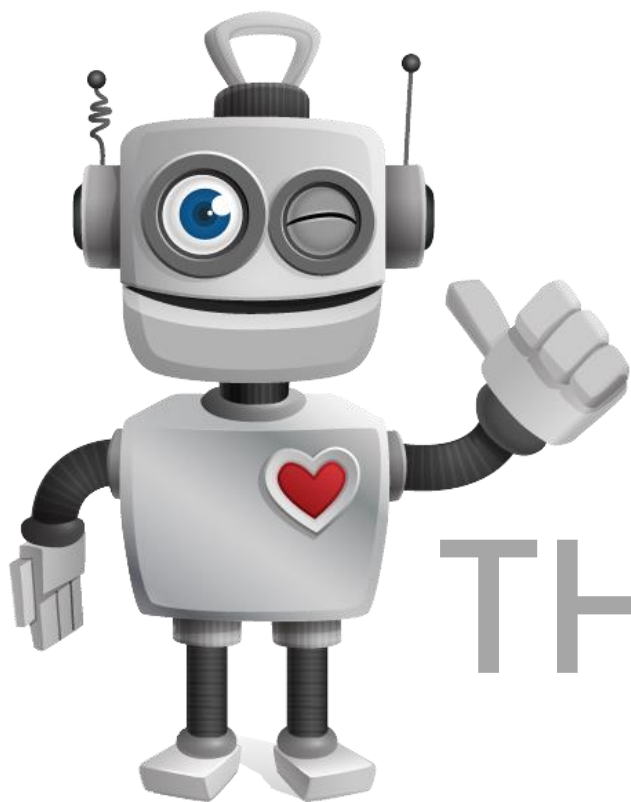
01 Manual - Introduction to material types

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