

PDC31B

Specifically Designed For Steel Industry

**CNC High-speed Drilling, Cutting and Marking Machine for Plates Model
PDC31**

The Relevant Technical Description Herewith Enclosed

CNC High-speed Drilling, Cutting and Marking Machine for Plates Model PDC31



1. Technical Specification of PDC31B

Item	value
Material Grade of Plate	Q235、Q345、Q420
Max. Length	12000 mm
Min. length	2500 mm
Max. Width	3100mm
Min. Width	400mm
Thickness range of plate	10~130 mm
Max. weight of plate	7500 kg
Weight of plate/meter	≤750kg
Max. drilling diameter	40 mm
Max. moving speed of X & Y axis	30000 mm/min
Hole taper of spindle	BT50
Power of spindle motor	20Kw
Max. rotation speed of spindle	3000 rpm/min
Max. rotation speed of marking unit	Approx. 103.4 Rpm/min
No. of plasma cutting unit	1 set
No. of gas cutting unit	1 set
No. of marking unit	1 set
Marking force	80 KN
No. of characters for marking	38
Tool store	1 set
No. of tools in tool store	6 pieces
CNC system	Fagor8055
Auto programming software	I set
Total power	Approx. 75kW

2. Main outsourcing components list of PDC31B

No.	Name	Quantity	Brand	Country	remark
1	Air cylinder	1	AIRTAK	Taiwan	
2	Pneumatic components	1	AIRTAK	Taiwan	
3	Linear Roll Guideway	1	HIWIN	Taiwan	
4	Linear column Guideway	1	SCHNEEBERGER	Switzerland	
5	Ball screw	1	I+F	Germany	
6	Spindle	1	KENTURN	Taiwan	
7	Precision Reducer	2	ATLANTA	Germany	
8	Wheel swinging reducer	1	SUMITOMO	Japan	
9	Towline	1	IGUS + KABELSCHLEPP	Germany	
10	Solenoid valve	1	ATOS	Italy	
11	CNC system	1	FAGOR	Spain	
12	Switch	1	BALLUFF	Germany	
13	Electric Components	1	SCHNEIDER	France	
14	Lubrication system	1	HERG	Japan	
15	Plasma Cutting and Torch Height Adjusting System	1	Hyper	USA	
16	Dust Exhaust System	1	Kaitian	China	
17	Servo moter	1	YASKAWA	Japan	

CNC Drilling & Cutting Combined Machine Model PDC31B

Standard System Configuration

MA	Main machine
MA -01	Marking unit
MA -02	Drilling unit
MA -03	Cutting units
MA -04	Tool store
MA -05	Conveyor inside the main machine
MA -06	Chip cleaner
IN	In-feed Carriage including pincher
OU	Out-feed Carriage including pincher
CO	Infeed conveyor including side positioning mechanism
OC	Out-feed conveyor
RO	Rotation worktable
AI	Air and cooling systems
LU	Lubricating system
HY	Hydraulic system
DU	Dust exhaust system
EL	Electric system
ST	Standard painting
TD	Technical documentation

Description of Mechanical/Electric/Hydraulic/Pneumatic/cooling Groups

MA **MAIN MACHINE**

MA -01 **Marking unit**

Disk making, using more characters, changing characters easily, making clearly.

Marking force: 80 KN

No. of characters : 38

Max. rotation speed of the disk: About 103.4 rpm

MA -02 **Drilling unit**

Adopts Taiwanese precision spindle (hollow), internal and external cooling working simultaneously (both are mist cooling). Spindle is driven by a servo motor, feeding axis is donr by servo motor and precision ball screw. A hydraulic cylinder provides the power to hold the plate when working , linear guide controls the orientation.

Number of spindle : 1 set

Hole taper of spindle: BT50

Spindle motor power: 20 kW

Max. speed of spindle motor : 3000 rpm/min

Machining Accuracy

1) Distance between drilled holes,

Axis X: $X \leq \pm 0.15\text{mm}/400\text{mm}$; $X \leq \pm 0.3\text{mm}/1000\text{mm}$

2) Distance between drilled holes,

Axis Y: $Y \leq \pm 0.15\text{mm}/400\text{mm}$; $Y \leq \pm 0.3\text{mm}/1000\text{mm}$

MA -03 **Cutting unit**

This system is composed of a plasma cutting system and gas cutting system, the customer can choose the system according to his requirements. If the thickness of the plate is from 10mm to 25mm, a plasma cutting system can be used. If the thickness is more than 25mm, a gas cutting system is then used.

Plasma cutting system is a Hypertherm (HT2000) and height adjusting system is a ArcGlide THC

Max. Power of HT2000: 30KW

Air pressure:

Oxygen (plasma air) : 0.83Mpa

Nitrogen(plasma air): 0.83Mpa (It is put into use when adjusting the air source, but not cutting)

Compressed air (protection air): 0.62 (clean, dry, no oil included)

For example: if we put oxygen as the plasma air, and compressed air as the protection air, this combination is good for getting the max cutting speed , min slag, min oxidizing and best cutting performance.

If we cut carbon steel, and choose the max cutting current, Hyspeed 200. The detailed parameter are as follows:

Thickness of plate (mm)	cutting speed (mm/min)
12	3000
15	2500
20	1900
25	1300

High adjusting system (ArcGlide THC) can ensure the best performance of cutting, and protect the cutting torch.

Gas cutting unit

Cutting system adopt flame cutting, cutting axis is driven by servo motor, CNC controls the position.

Take propane as the fuel, equipped with automatic ignition which is convenient, reliable, and greatly increase the processing efficiency. when the machine cuts the steel plate, the cutting speeds are as following:

Thickness of plate (mm)	Cutting speed (mm/min)
10~20	700~800 (1# Nozzle)
20~40	450~600 (2# Nozzle)
40~60	400~450 (3# Nozzle)
60~80	340~400 (4# Nozzle)
80~100	280~320 (5# Nozzle)
100~130	200~280 (6# Nozzle)

MA -04 Tool store

This use an air cylinder, linear guid-way , beam and 6 sets of tool pocket

Capacity of the tool store: 6 tools.

MA -05 Conveyor inside the main machine

This is made up of roller and pushing device, this provide support for feeding and drilling.

MA -06 Chip cleaner

This is made up of a lifting frame, steel wire brush roll and hydraulic motor, used to clean the chips off the plate, ensuring the next process will not be hindered by swarf.

IN INFEEEDING CARRIAGE- INCLUDING PINCHER

This is one of the X axis, which is made up of an out-feed shelf, out-feed carriage, linear guideway, rack-and-pinion, servo motor, precision reducer and hydraulic clamp.

Max. Moving speed: 3000mm/min

OU OUTFEEDING CARRIAGE -INCLUDING PINCHER

This is another part of the X axis, which is made up of out-feed shelf, out-feed carriage, linear guideway, rack-and-pinion, servo motor, precision reducer and hydraulic clamp.

Max. Moving speed :3000mm/min

CO

CONVEYOR INCLUDING SIDE POSITIONING MECHANISM

Support and position the raw plate.

OC

OUTFEED CONVEYOR

Used for supporting the scrap

OR

ROTATION WORKTABLE

The rotation worktable is made up of a base foundation, rotation shelf and hydraulic cylinder. This is used for unloading the finished work-piece. This is also the worktable for cutting and drilling. This rotation worktable requires the size of finished work-piece not to be bigger than 3100 X 500 mm.

AI

AIR AND COOLING SYSTEMS

1.Air:

Mainly used for positioning plate, tools changing and cooling the drill bit.

1) Pressure of Compressed air: ≥ 0.7 M pa

2) Displacement of Compressor: ≥ 0.4 m³ /min

2.Cooling system:

Adapts both internal and external cooling.

LU

LUBRICATING SYSTEM

Adopts both central automatic lubrication system and self lubrication system

HY

HYDRAULIC SYSTEM

This provides the power for marking, plate pressing, plate pushing, plate holding and chip cleaning.

Specifications:

1) Volume of tank: 200L

2) Pump motor Power: 7.5KW

3) Motor Speed: 1450 r/min

4) Flow rate: 56.7L/min

5) System pressure : 6.6 Mpa

EL

ELECTRIC SYSTEM

CNC system is FAGOR8055 / Fanuc / Siemens

1) Power Supply: 3 phase ,

2) Control Voltage: 240V

3) Operation Voltage: 24V

4)Total Power Consumption: 75Kw

4) Ambient Temperature: 0-40 °C

PA

STANDARD PAINTING

The system is painted in the following standard colors:

- BLACK GREY
- YELLOW

Note: requests of different colors are available.

TD

TECHNICAL DOCUMENTATION

The system is supplied with the following technical documentation:

- Programming,
- maintenance,
- Use and instruction manual
- Electric diagrams
- Drawing for wearing parts



Complete

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