

C. MACHINE SPECIFICATIONS

1. Features

- DAD340 features

The DAD340 manually chucks wafers having a diameter of up to 8 inches, effects alignment, and carries out dicing with a diamond blade mounted high-power air spindle system.

- DAD380 features

The DAD380 manually chucks square wafers of up to 12 inches in size, effects alignment, and carries out dicing with a diamond blade mounted high-power air spindle system.

2. Functions

The DAD340/DAD380 offers the advantages of its predecessors with the addition of the following new features.

- (1) User-friendly software

The operator can operate this machine simply by manipulating the operation panel controls in response to inquiries appearing on the CRT. Even an inexperienced operator can operate it without taking any special training.

If an error occurs, the relevant instructions appear on the CRT, making it easy to perform troubleshooting.

The operating instructions appearing on the CRT consist of kanji (Chinese ideographs) and hiragana/katakana (native Japanese characters).

- (2) X-axis

With the θ -axis and chuck table sections mounted on the X-axis slide plate, a servomotor drives a leadscrew.

Speed adjustments are to be made by entering program data and manipulating the operation panel controls. A servomotor is combined with a precision leadscrew to continuously vary the speed from low to high.

- (3) Y-axis

The slider carries the Z-axis and microscope, and the Z-axis supports the spindle. Note that a linear guide free from sticking and slipping is employed as the slide.

(4) Z-axis

A high-rigidity straight-acting Z-axis is employed to attain an increased degree of repeatability.

(5) θ -axis

To offer an enhanced degree of reliability, the drive mechanism section employs a direct-drive motor which directly drives the chuck table and provides rotary encoder based closed-loop control.

3. Machine specifications

• DAD340 specifications

(1) Cutting section

1) X-axis

Drive system	AC servomotor driven ball-bearing leadscrew drive
Maximum stroke	445 mm
Cutting range	163 mm areas on both the right- and left-hand sides of spindle center
Workpiece width setting range	0 to 8" (0 to 203.2 mm)
Cutting speed setting range	0.1 to 400 mm/s
Maximum traveling speed	400 mm/s (standard value)

2) Y-axis

Drive system	Pulse motor driven ball-bearing leadscrew
Maximum stroke	210 mm
Cutting range	105 mm areas on both the front and rear sides of table center
Workpiece width setting range	0 to 8" (0 to 203.2 mm)
Index setting range	0.0001 to 203.2 mm
Minimum index step	0.1 μ m
Index speed	25 mm/s max.
Scale resolution	0.1 μ m

3) Z-axis

[800 W spindle mounted version]

Drive system	Pulse motor driven ball-bearing leadscrew
Maximum stroke	40 mm
Traveling stroke	33.6 mm max. (when 50.8 mm OD blade mounted) 20.9 mm max. (when 76.2 mm OD blade mounted)
Minimum step	1 μm

[2200 W spindle mounted version]

Drive system	Pulse motor driven ball-bearing leadscrew
Maximum stroke	40 mm
Traveling stroke	31.9 mm max. (when 76.2 mm OD blade mounted) 19.2 mm max. (when 101.6 mm OD blade mounted)
Minimum step	1 μm

4) θ -axis

Drive system	Direct drive by direct-drive motor
Maximum rotation angle	330° (-100°, +230°)
Minimum step	2.0 s
Indexing method	Direct-drive motor based closed-loop system

(2) Spindle section

[800 W spindle mounted version]

Mechanism	High-frequency built-in motor air-bearing system
Rotating speed	7,200 to 60,000 min^{-1} (rpm) (Programmable)
Blade used	2" diameter hub type blade (standard) Compatible with the M-flange type
Output rating	800 W

[2200 W spindle mounted version]

Mechanism	High-frequency built-in motor air-bearing system
Rotating speed	3,000 to 30,000 min^{-1} (rpm) (Programmable)
Blade used	3" diameter hub type blade (standard) Compatible with the L2-flange type
Output rating	2,200 W

- 4) Water drainage
Connection port Duct hose nominal size: 32 mm
- 5) Duct
Capacity 1.5 m³/min or larger
(If the duct capacity is smaller than 1.5 m³/min, contact your
local DISCO office.)
Connection port Duct hose nominal size: 75 mm
- 6) Main outside dimensions
Main body: 863 W x 1235 D x 1235 mm H (without protrusions)
- 7) Weight
Approx. 900 kg
- 8) Paint color
Munsell No. 2.5GY8.0/0.5

• DAD380 specifications

(1) Cutting section

1) X-axis

Drive system	AC servomotor driven ball-bearing leadscrew drive
Maximum stroke	445 mm
Cutting range	197 mm areas on both the right- and left-hand sides of spindle center
Workpiece width setting range	0 to 12" (0 to 304.8 mm)
Cutting speed setting range	0.1 to 400 mm/s
Maximum traveling speed	400 mm/s (standard value)

2) Y-axis

Drive system	Pulse motor driven ball-bearing leadscrew
Maximum stroke	310 mm
Cutting range	155 mm areas on both the front and rear sides of table center
Workpiece width setting range	0 to 12" (0 to 304.8 mm)
Index setting range	0.0001 to 304.4 mm
Minimum index step	0.1 μ m

Index speed	25 mm/s max.
Scale resolution	0.1 μm
3) Z-axis	
Drive system	Pulse motor driven ball-bearing leadscrew
Maximum stroke	40 mm
Traveling stroke	33.6 mm max. (when 50.8 mm OD blade mounted) 20.9 mm max. (when 76.2 mm OD blade mounted)
Minimum step	1 μm
4) θ -axis	
Drive system	Direct drive by direct-drive motor
Maximum rotation angle	330° (-100°, +230°)
Minimum step	2.0 s
Indexing method	Direct-drive motor based closed-loop system
(2) Spindle section	
Mechanism	High-frequency built-in motor air-bearing system
Rotating speed	7,200 to 60,000 minUUU-1UUU (rpm) (Programmable)
Blade used	2" diameter hub type blade (standard) Compatible with the M-flange type
Output rating	800 W
(3) Wheel section	
Standard hub blade	55.56 mm or 50.6 mm in diameter
Washer type	Blade OD : 76.2 mm max. M-flange OD : 48.2 mm min.
(4) Microscope section	
Microscope	Monocular single-object-lens microscope
Magnification	325X (on the CRT)
Visibility range	X direction: Entire table surface Y direction: Entire table surface

(5) Operator's console section

1) Console display

A 12-inch monochrome display is employed to show microscope images, cutting data, error messages, and other relevant information on screen.

2) Keyboard

Used for mode selection, data input, screen selection, and other function execution initiation.

(It consists of function keys, numeric keys, cursor keys, single-function keys, and axis movement keys.)

(6) Signal tower

The buzzer ON/OFF and indicator lamp steady illumination/blinking setup is programmable.

Colors: Red, yellow, and green

Indicator lamp factory setup

Steady green light ······ The machine is operating in the automatic mode.

Steady yellow light ······ The machine is in the standby state.

Blinking red light ······ An alarm (error or emergency) condition has occurred.

(7) Accuracy

1) Chuck table upper surface parallelism (measured at 22°C)

5 μm /125 mm

6 μm /150 mm

8 μm /200 mm

10 μm /300 mm

2) Y-axis index accuracy

Single index error : 3 μm or less

Accumulated index error : 5 μm /305 mm or less

3) Z-axis repeatability

1 μm (range)

(8) Utilities

1) Power requirements

Input voltage	Three-phase, 200 VAC±10%, 50/60 Hz
Power consumption	3.0 kVA max.
Noise	Less than 2000 V when the pulse width is 500 ns (square wave).
Grounding	The machine must be properly grounded.

2) Air supply source

Air	
Pressure	0.49 MPa·G (5.0 kgf/cm ² ·G)
Flow rate	250 NI/min or higher
Dew point	-15°C or lower
Residual oil content	0.1 PPM Wt/Wt
Connection port	Rc (PT) 1/4" female

3) Water used

Wheel coolant	
Pressure	0.29 MPa·G (3.0 kgf/cm ²)
Flow rate	3.0 l/min or higher
Connection port	Rc (PT) 1/4" female
Spindle coolant	
Pressure	0.29 MPa·G (3.0 kgf/cm ²)
Flow rate	1.5 l/min or higher
Connection port	Rc (PT) 1/4" female

4) Water drainage

Connection port	Duct hose nominal size: 32 mm
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5) Duct

Capacity	1.5 m ³ /min or larger (If the duct capacity is smaller than 1.5 m ³ /min, contact your local DISCO office.)
Connection port	Duct hose nominal size: 75 mm

6) Main outside dimensions

Main body: 1028 W x 1550 D x 1235 mm H (without protrusions)

7) Weight

Approx. 1200 kg

8) Paint color

Munsell No. 2.5GY8.0/0.5

4. Standard accessories

- DAD340 standard accessories

The DAD340 comes standard with the accessories listed in Table C-1.

No.	Name	Description (size)	Part number	Qty.
1	Universal chuck table	6 inches	MODDN005--G	1
2	Torque wrench	[For 800 W spindle]		
		Torque driver	MOELN010	1
		Hexagonal bit	MOELN011	1
3	Halogen lamp	12 V, 100 W	AQLM-100	1
4	Fuse	Glass (250 VAC, 1 A)	APG00001A250	1
		Alarm (7.5 A)	APPL475L7.5A	1
		Alarm (3.5 A)	APSP435L3.5A	1
		Alarm (3.0 A)	APSP430L	1
		Alarm (1.0 A)	APSP410L-1A	1
5	Carbon brush assembly	800 W (2 assemblies per bag)	LAA076A-0000	2
		or 2200 W (2 assemblies per bag)	NAK076B-0000	
6	Duct hose	Nominal diameter: 32; 2 m	MSTDH32T	1
		Nominal diameter: 75; 2 m	MSTDH75T	1
7	Pipe band	32-35	MSBAK-1035	2
		75-80	MSBAK-1080	2
8	Instruction manual	Japanese or English		2

Table C-1