AUTOMATIC DICING SAW
DAD3000 series

DAD3220 : Compact model
DAD3230 : Wide model
DAD3430 : High accuracy model

Contents

- DAD3220/3230/3430 overview
- Main features
  - Feature 1: New electrical unit & GUI built-in
  - Feature 2: Auto alignment function
  - Feature 3: Enhanced automated functions
  - Feature 4: Condition monitoring function
  - Feature 5: Highly functional & compact structure
  - Feature 6: Newly developed 1.5 kW spindle
  - Feature 7: How to hold spindle
  - Feature 8: Improved throughput
  - Feature 9: Improved CoO
- Options
- Specification
- Accessories
- DAD3220/3230/3430 Dimensions

New lineup in 3000 series

160 mm sq workpiece is processable

DAD321

DAD3220
Compact model

DAD522

DAD3230
Wide model

DAD562

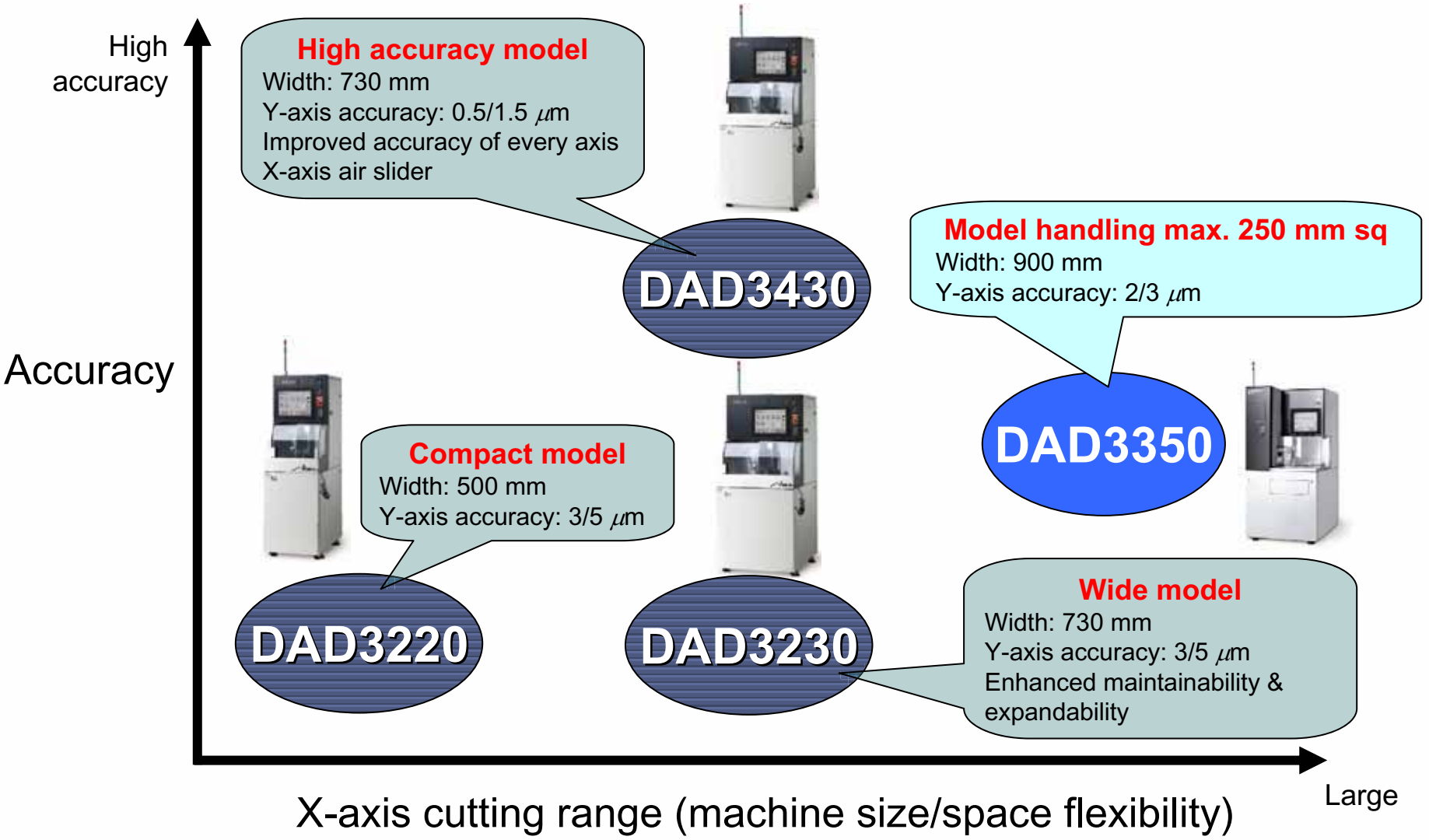
DAD3430
High accuracy model

(Reference)
ϕ8" (max. 250 mm sq)
workpiece processable

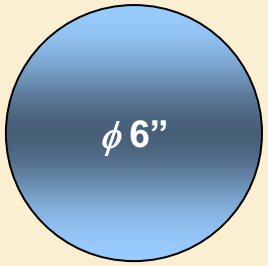
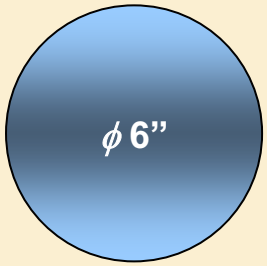
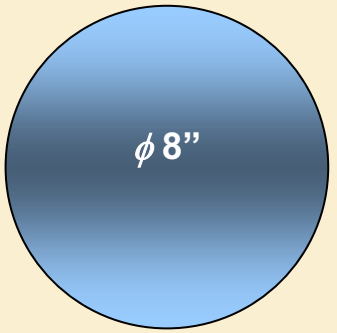
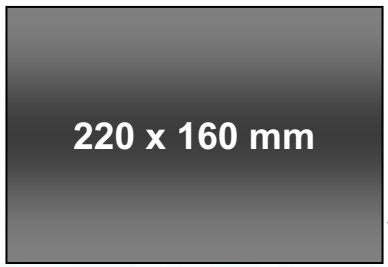
DAD341

DAD3350

DAD3000 series map



Maximum processable workpiece size

	DAD3220	DAD3230 DAD3430	DAD3350 (Reference)
Standard **Standard or optional accessory chuck table is used.**			
User-specified **Jig and chuck table corresponding to user-specified specification are necessary.**	 *1	 *1  *2	

*1: Jig is necessary.

*2: Rotating range of the θ-axis is restricted.

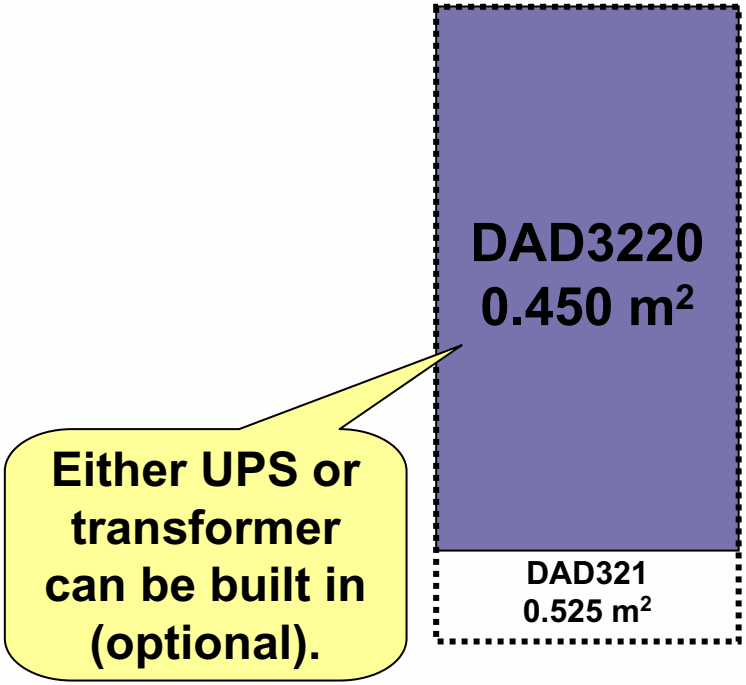
Footprint (Comparison with conventional machines)

	Width [mm]	Depth [mm]	Area [m^2]
DAD3220	500	900	0.45
DAD321	500	1050	0.525
DAD3230/3430	730	900	0.657
DAD5*2 series	760	850	0.646

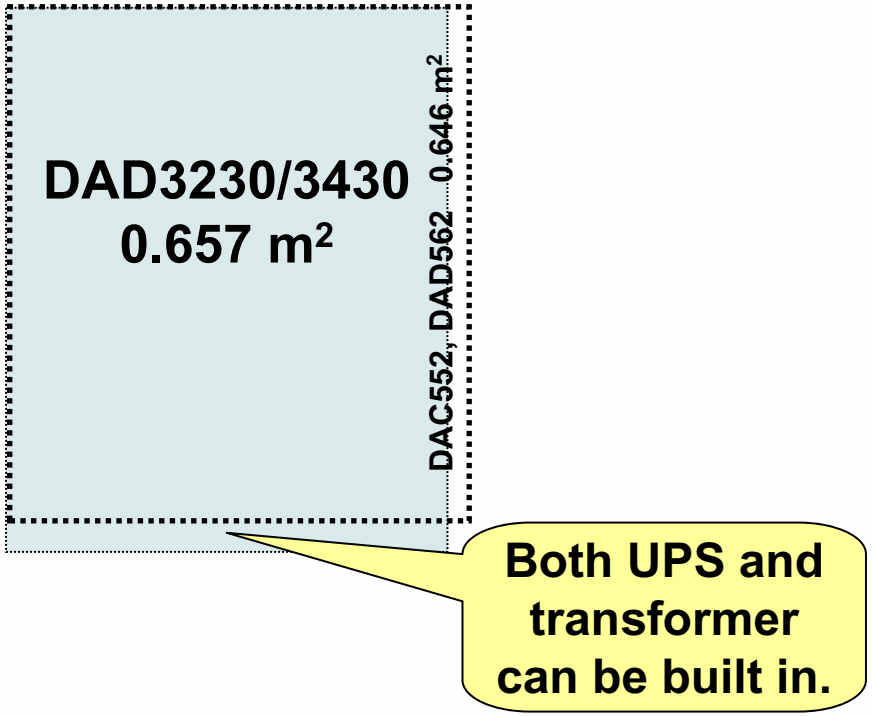
Reduced about 24%

Almost the same
30 mm narrower width

DAD3220 vs. DAD321



DAD3230/3430 vs. DAC552/DAD562



Main specification items (excerpts)

Specification		Unit	DAD3220	DAD3230	DAD3430
Max. workpiece size		-	ϕ6" diameter 6" square	6" square 220 x 160 mm	6" square 220 x 160 mm
X-axis	Cutting range	mm	160	220	220
	Transfer speed	mm/sec	0.1 to 500	0.1 to 500	0.1 to 300
Y-axis	Cutting range	mm	162	162	162
	Index step	mm	0.0001	0.0001	0.0001
	Positioning accuracy	mm	Within 0.005/160	Within 0.005/160	Within 0.0015/160
		mm	(Single error) Within 0.003/5	(Single error) Within 0.003/5	(Single error) Within 0.0005/5
Z-axis	Maximum stroke	mm	32.2 (with 2" diameter blade)	32.2 (with 2" diameter blade)	32.2 (with 2" diameter blade)
	Moving resolution	mm	0.00005	0.00005	0.00005
	Repeatability	mm	±0.001	±0.001	±0.001
	Max. available blade diameter	mm	58 (with 1.5 kW)	58 (with 1.5 kW)	58 (with 1.5 kW)
θ-axis	Maximum rotating angle	deg	320	320	320
Spindle	Rated output	kW	1.5 at 30,000 min^{-1}	1.5 at 30,000 min^{-1}	1.5 at 30,000 min^{-1}
	Rated torque	N·m	0.48	0.48	0.48
	Revolution speed range	min^{-1}	3,000 to 40,000	3,000 to 40,000	3,000 to 40,000
Maximum processable frame		-	2-6-1	2-6-1	2-6-1

*DAD3220/3230

When linear scale specification (optional accessory) is selected

Y-axis positioning accuracy: 0.002 mm/160 mm

Single error : 0.001 mm/5 mm

High accuracy

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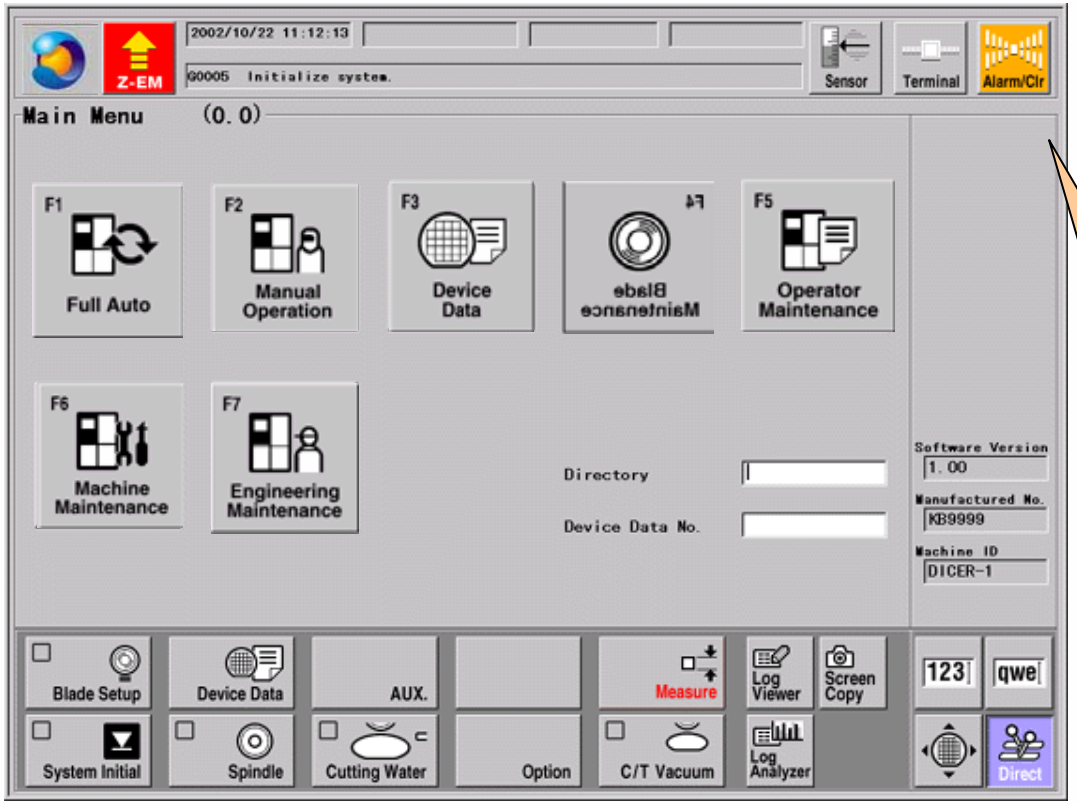
- Dimensions

Feature 1: New electrical unit & GUI built-in

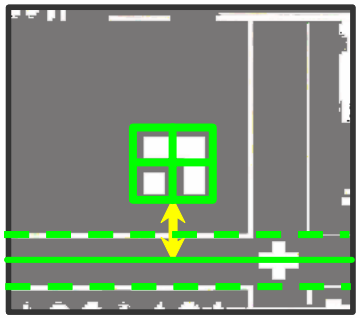
- New electrical unit already used in the DFD6000 series and DAD3350 is built in.
- Software adopting GUI (Graphical User Interface) has been developed for the operational screens
  - Interactive operations adopted in the 300 and 600 series has further evolved and operability in the 500 series is also considered.
  - Quick, accurate and easy operations are realized.



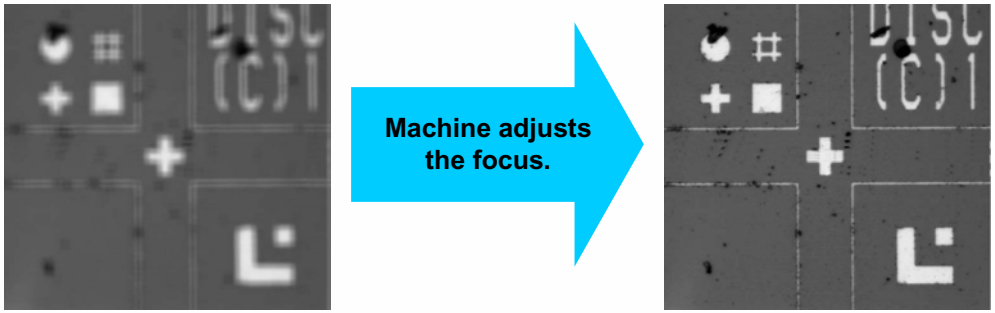
- XGA 15” LCD display
- Pressure-sensitive touch panel that can be operated while wearing gloves
- Large and eye-friendly icon display
- FDD and HDD, previously optional, are built in as standard. Large volume device data can be saved.

Feature 2: Auto alignment function

Auto alignment

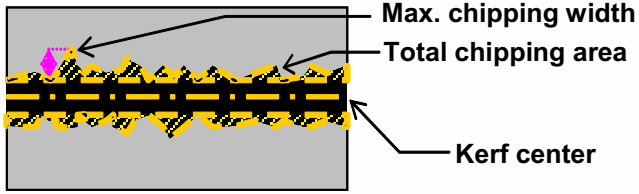


Auto focus



Kerf check

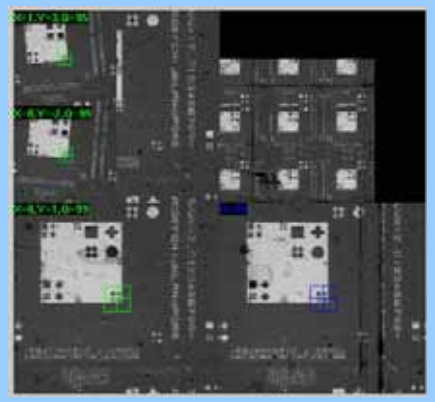
(Checking a cut line)



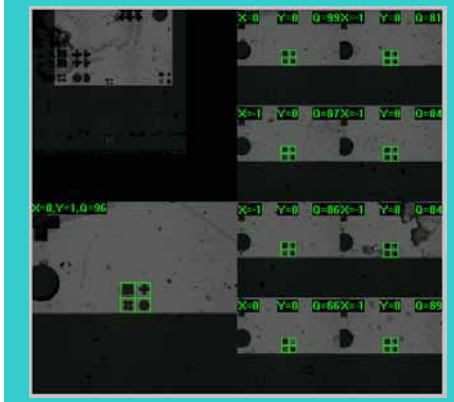
Auto light level

- Direct lighting: LED lamp
- Oblique lighting: Halogen lamp

Macro alignment (option)



Rough alignment
by macro alignment



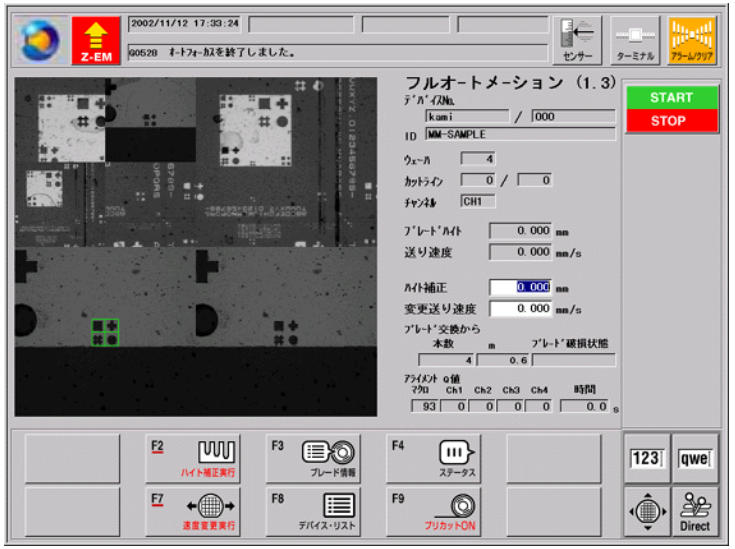
Fine alignment
by micro alignment

Feature 3: Enhanced automated functions

- Automated functions almost identical to the full auto machine are built in as standard, effective for preventing operational errors, enhancing uniformity, and reducing extra labor.
  - Auto alignment
  - Auto kerf check (cut line auto check)
  - Auto focus
  - Auto light level adjustment (co-axial direct & oblique lighting)
  - Lens shutter for preventing foreign substance from adhering
  - Scope blow

Reference document →

- An LED is adopted for the co-axial direct lighting.
  Response at the time of light level adjustment is good, realizing longer life and energy saving
  - The co-axial direct lighting can be changed to halogen for a workpiece whose reflectance is low (optional).



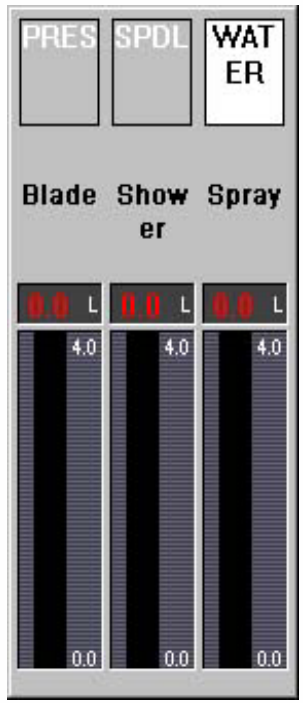
Feature 4: Condition monitoring function

- Condition monitoring function, which can check various conditions of the machine on a real time basis, is built in. → Processing condition can be checked easily.
- Data logging is also possible and effective for processing traceability.

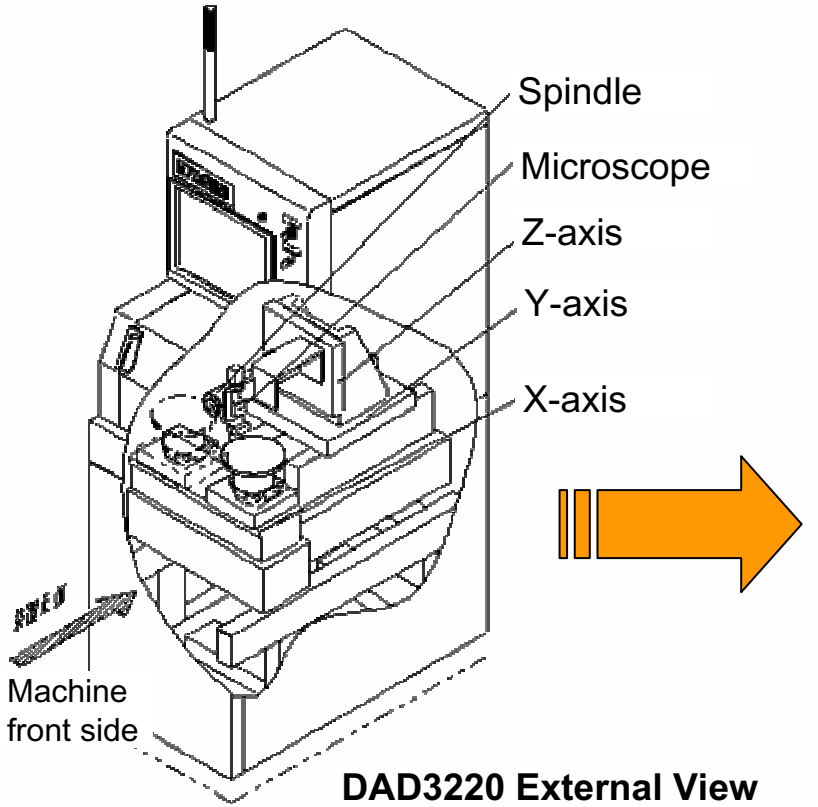
Chuck table vacuum pressure
(standard)

Spindle current value
(standard)

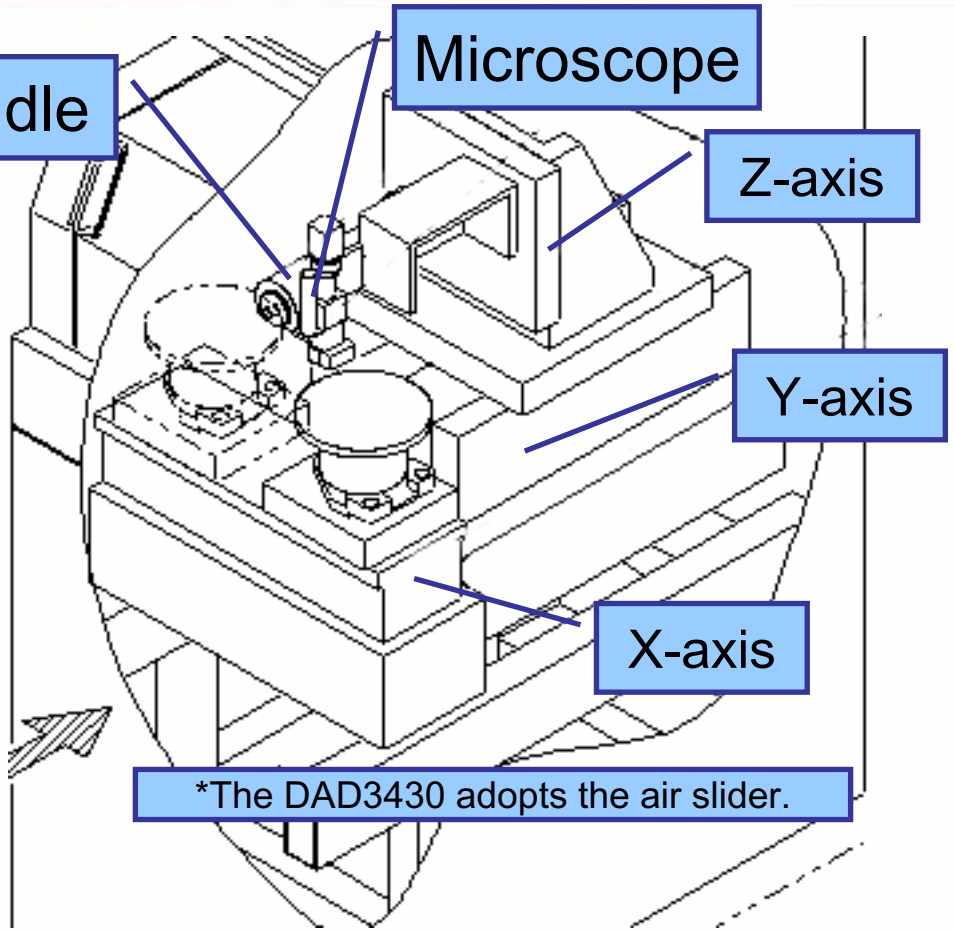
Wheel coolant flow meter
(option)



Feature 5: Highly functional & compact structure



DAD3220 External View



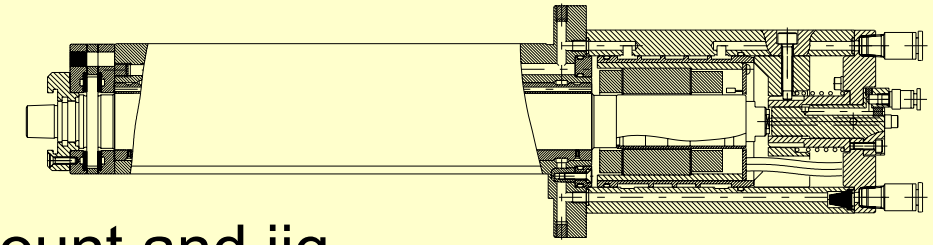
Expanded View of the DAD3220 Inside

For the DAD3430, a highly accurate air slider is installed to the X-axis. This, together with the high positioning accuracy of the Y-axis, provides high quality processing.

Feature 6: Newly developed 1.5 kW spindle

<<Newly developed spindle is built in>>

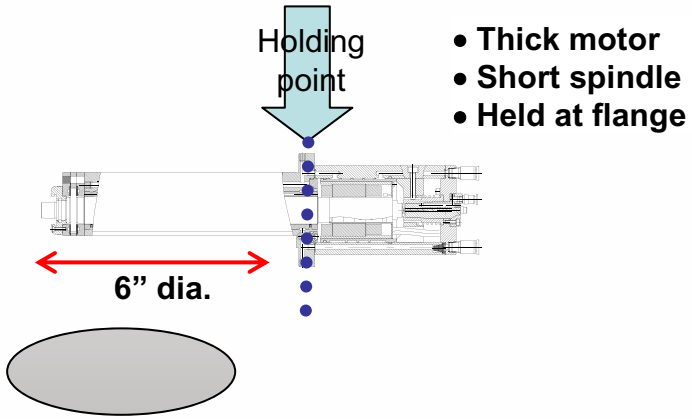
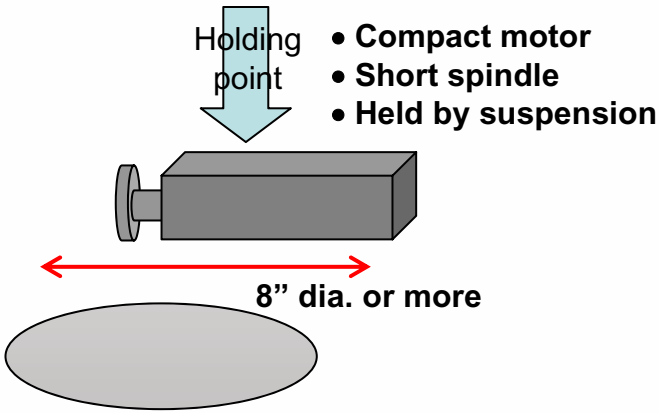
- A dedicated spindle has been newly developed.
  * 1.5 kW - 30,000 rpm, 0.48 N·m
- Front thrust structure
- Shaft lock mechanism
- Flange (R-type), wheel mount and jig
  → Common to the DAD3350
- Min. flange size: 48.2 mm diameter
- Low expansion spindle
  (optional accessory)
- ϕ 3” diameter blade usable
  (user-specified specification)
  (Note: except for DAD3220)



Blade replacement

Feature 7: How to hold the spindle

In the DAD3220/3230/3430, as the spindle is held at the flange located at the backside, such structure is hard to be influenced by heat and contributes to compactness.

	DAD3220/3230/3430	DAD3350
Structure and applicable workpiece		
Characteristics	Small diameter workpiece processable → Short spindle Adoption of high-torque spindle → Thick motor Held at the spindle backside flange	Suitable for large diameter workpieces (8” or more), held by suspending at the front side of the spindle from the gate-shaped frame
Spindle thermal expansion/ contraction	Small thermal influence as the spindle is short and held at the flange	Small influence as the spindle is short and held at the front side

Feature 8: Microscope 1

- Binocular microscope (standard specification)
  - 7.5x ½ camera
    Magnification on the monitor: 223x Y-direction viewpoint range: 0.64 mm
  - Lens shutter as standard accessory
  - Macro microscope installable (optional)
  - Objective lens magnification and camera size selectable (optional)
- LED lighting as direct lighting source (standard)
  - Direct lighting halogen lamp (optional)
- Ring-light lighting using halogen lamp (Option)
  - Especially when using the auto alignment, the use of ring-light is recommended. It makes easier to search the target pattern)

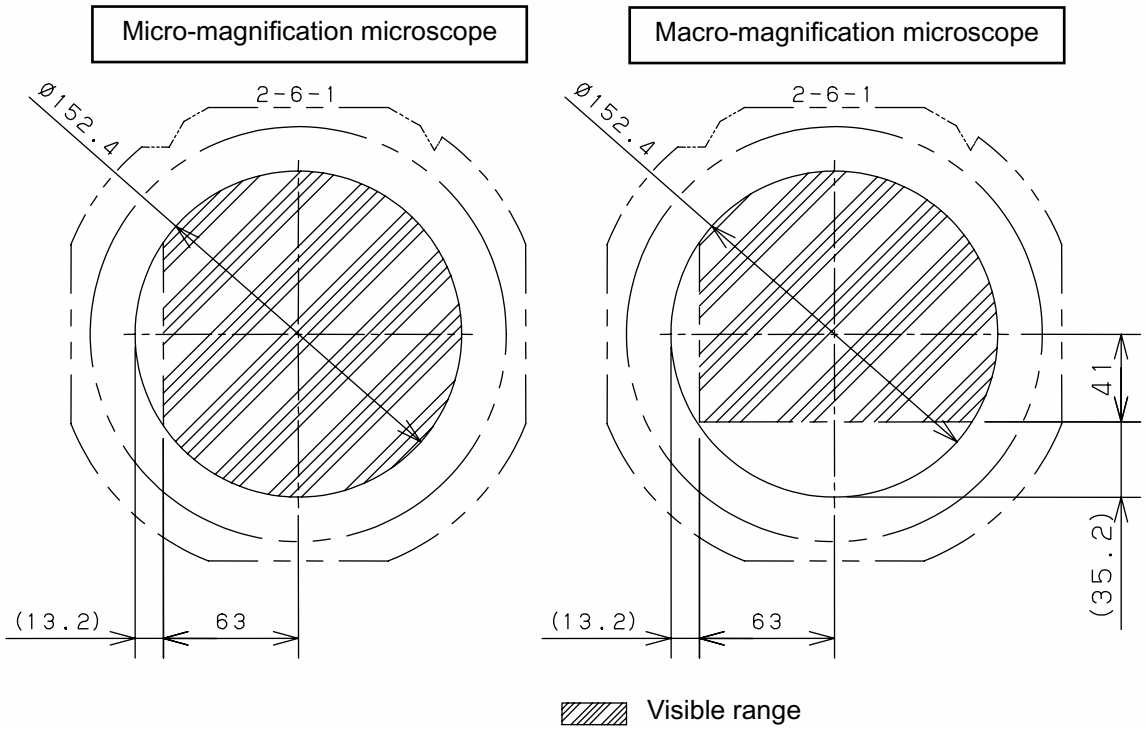
Feature 8: Microscope 2

- Microscope viewable range
  - DAD3220 : Refer to the table below.
  - DAD3230/3430 : Workpiece whole surface

    Values are as a reference.

    The range varies with the position of a workpiece placed on the chuck table.

DAD3220	Visible range from the center of the table
Right	Full workpiece surface
Left	63 mm
Front	Micro-magnification microscope: 81 mm Macro-magnification microscope: 41 mm
Rear	Micro-magnification microscope: 81 mm Macro-magnification microscope: 81 mm



- **Improved CoO**
  - Energy saving
    - Spindle air and spindle coolant are turned off when power is turned off.
    - Energy saving mode can be set at the time of machine stand-by.
  - Maintenance saving
    - Less frequency of lubrication
    - Concentration of grease nipples

Options

1. Macro/Micro alignment
2. NCS (non-contact setup)
3. BBD (blade breakage detector)
4. Cutting water flow rate control
5. Low expansion spindle
6. Measurement alignment package software
7. UPS (uninterruptible power supply)

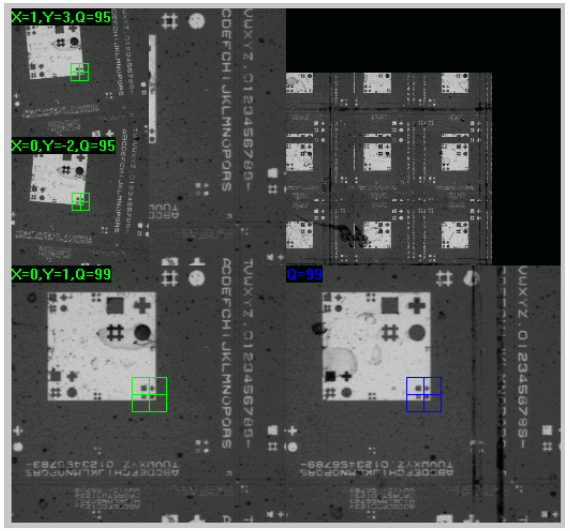
Option 1: Macro/Micro alignment

<<Addition of macro (low magnification) microscope>>

Even in cases where accuracy of manual mounting and tape mounting accuracy cannot be secured, error can be reduced and alignment can be made speedily.

Macro alignment

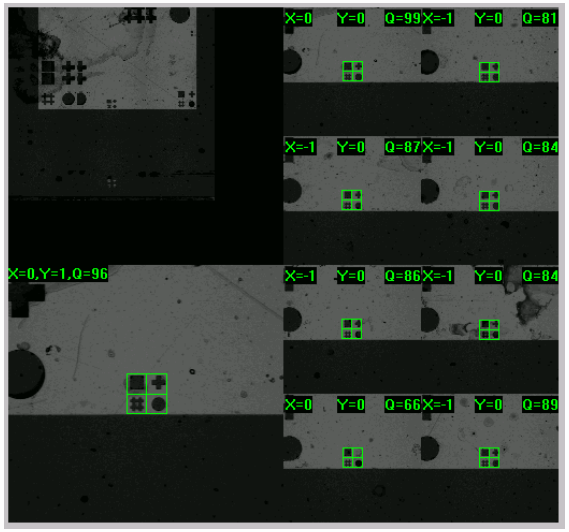
- Rough alignment using large targets -



(Low-magnification microscope is used)

Micro alignment

- Fine alignment using small targets -



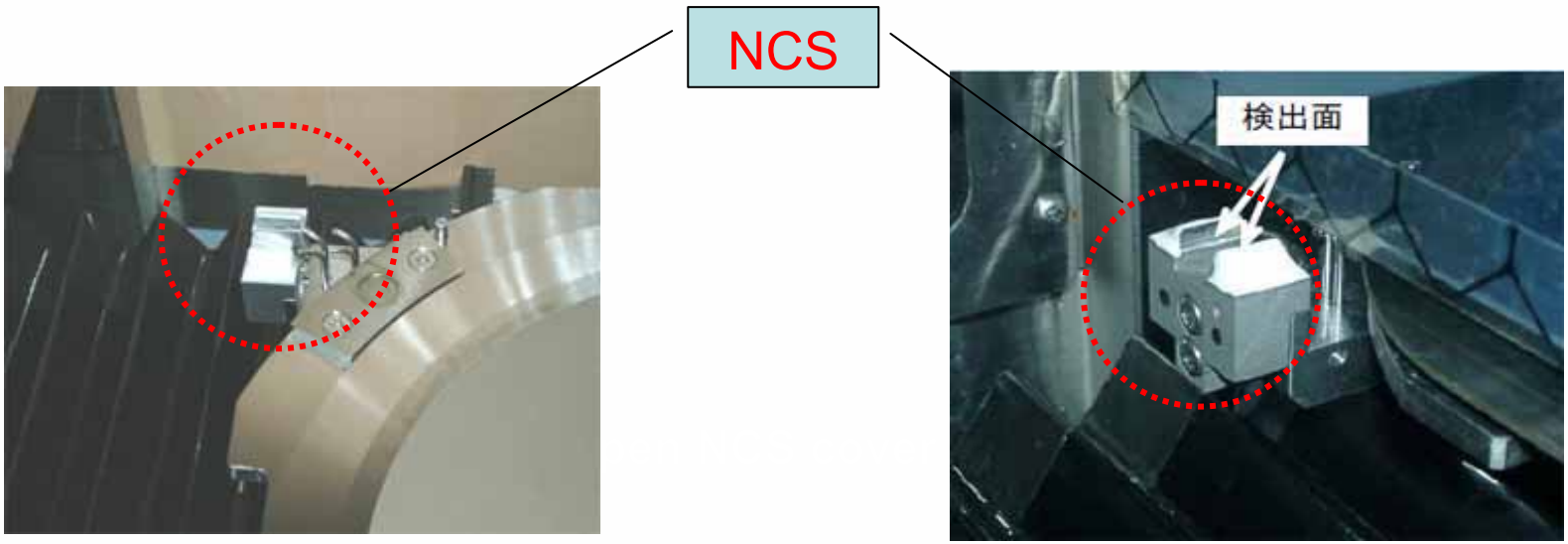
(High-magnification microscope is used)

Option 2: NCS (non-contact setup)

Setup method using the transmission sensor

Difference between the chuck table upper surface and the sensor position is obtained, thereby being able to position the table upper surface, without performing a contact setup.

Prevents the blade tip from being damaged to enhance cutting quality

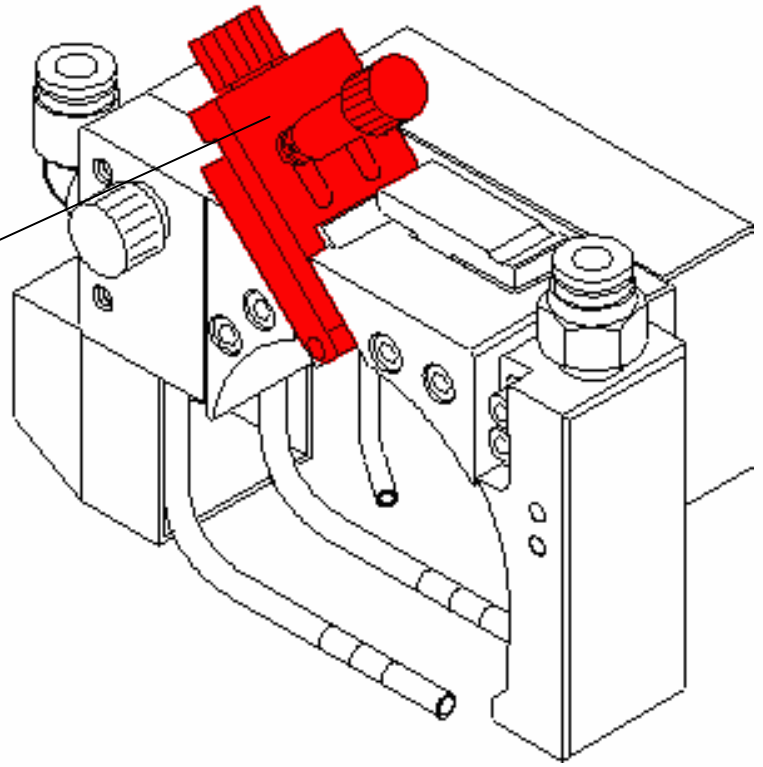


Option 3: BBD (blade breakage detector)

- This accessory detects a blade breakage condition and stops the cutting operation immediately, thereby preventing yield loss caused by any damage due to a broken blade in the middle of the cut operation.

Sensor block

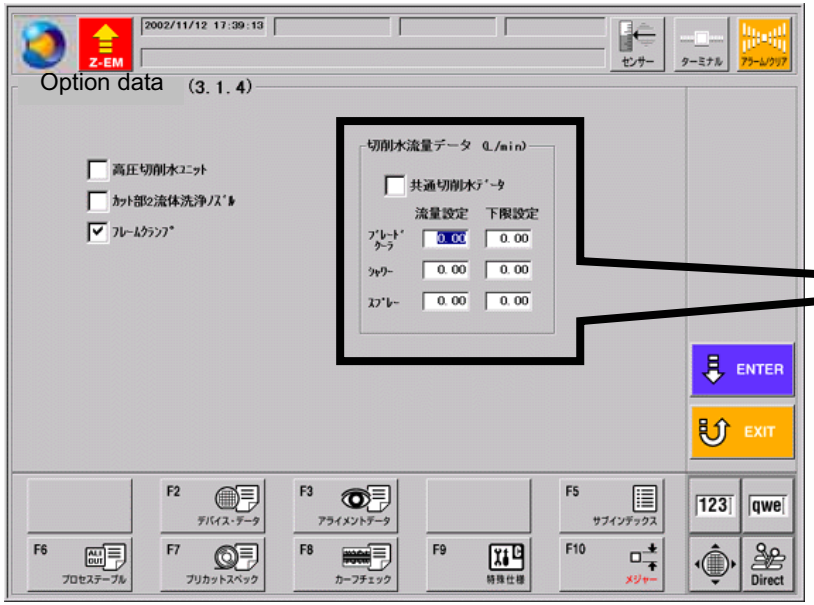
The transmission sensor detects blade breakage and abnormal wear.

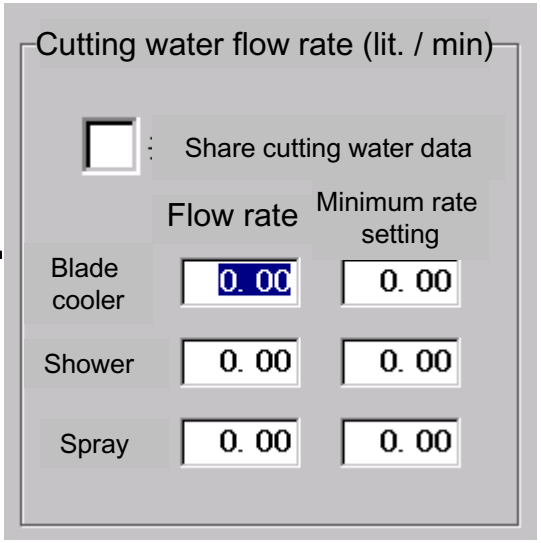


Wheel cover with BBD

Option 4: Wheel coolant flow rate control function

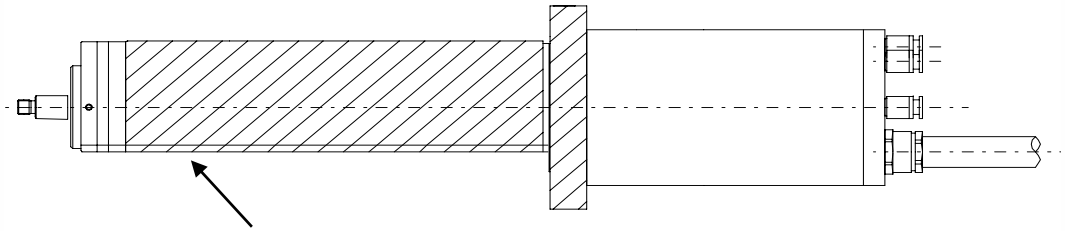
- Wheel coolant data is controlled and automatically managed, thereby reducing extra labor for processing control and enhancing processing reliability.
  - Loop control using the flow rate sensor is adopted so it is advantageous to stably supply wheel coolant and cope with fluctuation of source pressure.
  - Deteriorated processing quality due to adjustment error is avoidable.
  - Cutting water flow rate can be set for each device data.





Option 5: Low expansion spindle

- A material that is hard to expand is used for the spindle outer section so that the spindle displacement due to temperature fluctuation is reduced.



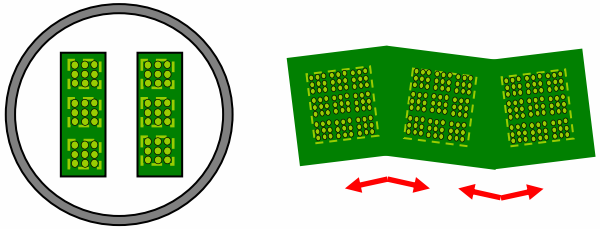
Area whose material has been changed (housing section)

	Low expansion type	Standard type
Material (housing section)	**Super Invar**	**SUS431**
Displacement due to temperature fluctuation of coolant	**Deviates 0.2 to 0.3 μm per 1°C**	**Deviates 2 to 3 μm per 1°C**

> If the temperature of the coolant is controlled, even the standard spindle has less displacement.

Option 6: Measurement alignment package

- Multiple workpiece mounting: Up to sixteen workpieces
- Handling of workpiece expansion/contraction

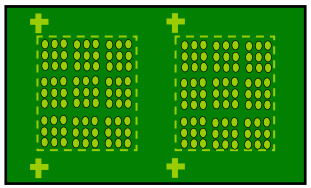


Measurement alignment function

Measurement alignment type	Application
(1) 1-point alignment	Effective for workpieces whose contraction between blocks is extreme
(2) 2-point alignment	Effective for workpieces whose contraction in blocks is extreme
(3) All-line alignment	Effective when highly accurate cutting is required

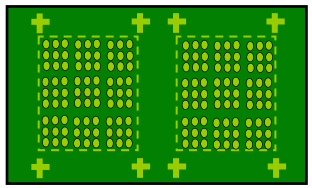
Note: Including a part of AB alignment function (right and left different targets)

1-point alignment



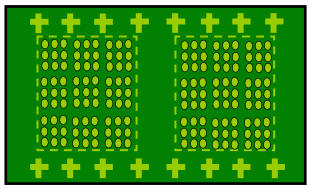
At each block

2-point alignment



At start and end of each block

All-line alignment



At cut line

Option 7: Uninterruptible power supply (UPS)

- Thanks to the addition of the UPS, the machine and workpiece can be protected even in a region where the power supply condition is unstable or during an unprepared for power supply trouble (e.g. power interruption)
  - Function to assure the power supply at the time of a momentary power interruption

    When the voltage drop or power interruption ends within two seconds, power is supplied by battery and the machine operation is guaranteed.

  - Power interruption compensation function

    When the voltage drop or power interruption continues over two seconds, the function transfers to the compensation function to assure power supply during the momentary power interruption and the machine axis escapes.

When this accessory is built in
Photo taken from the machine lateral side
Photo: DAD3350

Options : Others

Based on a request of a customer, DISCO can provide various individual specifications.
For details, contact your DISCO sales representative.

Specification

Note: Installation of optional accessory is required. For details, contact your DISCO sales representative.

Specification			Unit	DAD3220	DAD3230	DAD3430
Workpiece size			-	ϕ6” diameter 6” square (*1) *1: Jig is necessary.	6” square 220 x 160 mm (*1 & 2, user-specified) *2: Rotating angle of the θ-axis is restricted.	6” square 220 x 160 mm (*1 & 2, user-specified)
X-axis	Cutting range		Mm	160	220	220
	Transfer speed		mm/sec	0.1 to 500	0.1 to 500	0.1 to 300
Y-axis	Cutting range		mm	162	162	162
	Index step		mm	0.0001	0.0001	0.0001
	Positioning accuracy		mm	Within 0.005/160	Within 0.005/160	Within 0.0015/160
			mm	(Single error) Within 0.003/5	(Single error) Within 0.003/5	(Single error) Within 0.005/5
Z-axis	Maximum stroke		mm	32.2 (with 2” diameter blade)	32.2 (with 2” diameter blade)	32.2 (with 2” diameter blade)
	Moving resolution		mm	0.00005	0.00005	0.00005
	Repeatability		mm	±0.001	±0.001	±0.001
	Maximum available blade diameter		mm	58 (with 1.5 kW)	58 (with 1.5 kW)	58 (with 1.5 kW)
θ-axis	Maximum rotating angle		deg	320	320	320
Spindle	Rated output		kW	1.5 at 30,000 min^{-1}	1.5 at 30,000 min^{-1}	1.5 at 30,000 min^{-1}
	Rated torque		N·m	0.48	0.48	0.48
	Range of revolution speed		min^{-1}	3,000 to 40,000	3,000 to 40,000	3,000 to 40,000
Maximum processable frame			-	2-6-1	2-6-1	2-6-1
Utilities	Power supply		-	3-phase, 200 to 240 VAC (standard) *3	3-phase, 200 to 240 VAC (standard) *3	3-phase, 200 to 240 VAC (standard) *3
	Power consumption	When processing	kW	0.5	0.5	0.5
		During warm-up	kW	0.4	0.4	0.4
	Maximum power		kVA	3.5	3.5	3.5
	Air pressure		MPa	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8
	Air maximum consumption		L/min (ANR)	170	170	200
	Wheel coolant water	Pressure	MPa	0.2 to 0.4	0.2 to 0.4	0.2 to 0.4
		Max. consumption flow rate	L/min	0.2 to 4.0	0.2 to 4.0	0.2 to 4.0
	Spindle coolant water	Pressure	MPa	0.2 to 0.4	0.2 to 0.4	0.2 to 0.4
		Max. consumption flow rate	L/min	1.5	1.5	1.5
	Duct capacity		m^3/min	1.5	2.5	2.5
	Machine dimensions (W x H x D)		mm	500 x 900 x 1,670	730 x 900 x 1,670	730 x 900 x 1,670
	Machine weight		kg	550	600	600

*3: Use under a power voltage fluctuation range from 180 to 250 V.

Accessories

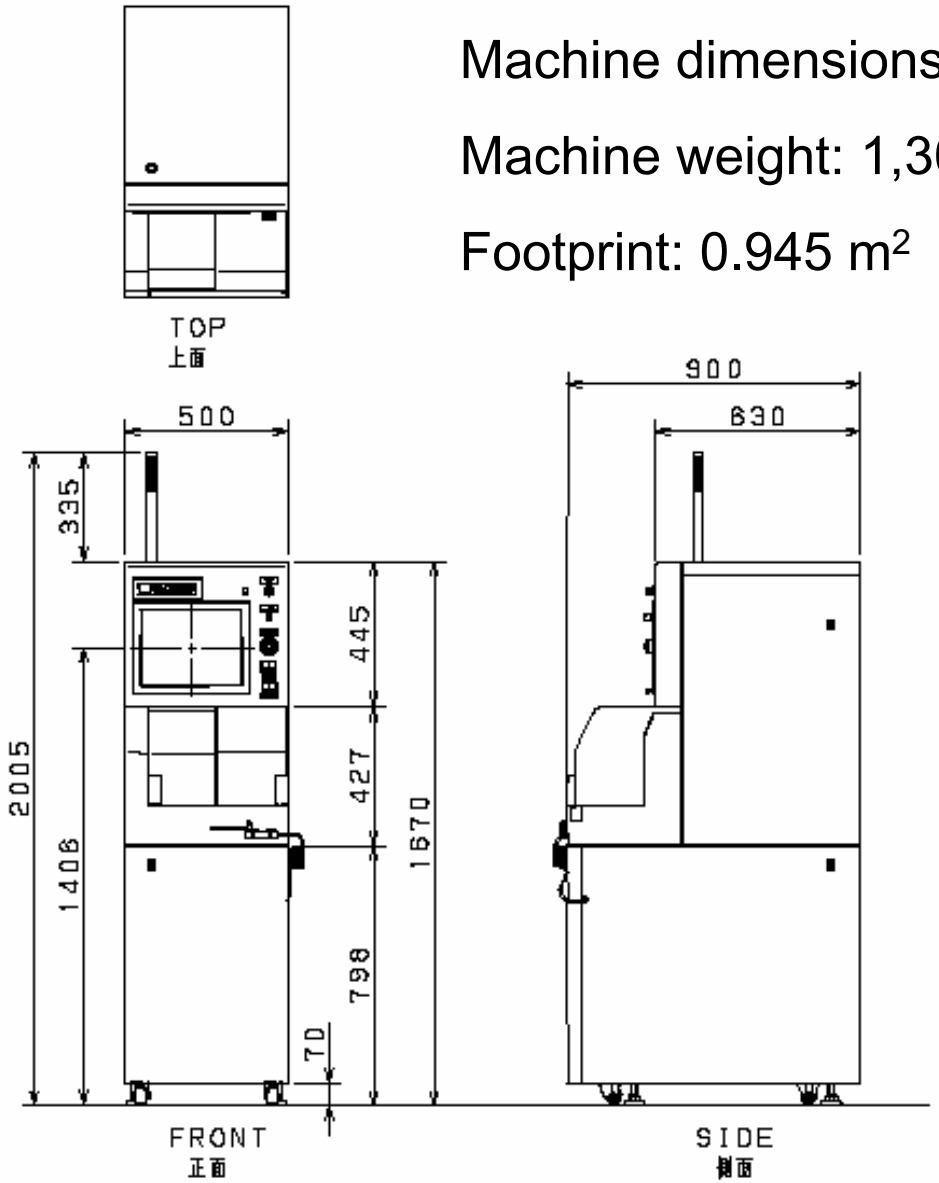
Standard accessories
Fuse set (Glass) (3.15 A, 250 V)
Halogen lamp (7.5 V, 50 W)
Floppy disk case
Floppy disk
LED light
Universal chuck table (6”)
Torque screwdriver
Bit
Duct cuffs (nominal: 32)
Duct cuffs (nominal: 50)
Duct hoses (nominal: 32)
Duct hoses (nominal: 50)
Pipe band (nominal: 32)
Pipe band (nominal: 50)
Carbon brush assy. (for 1.5 kW spindle)
Locating pin
Axis metal fixture
Wheel cover assy.

Standard built-in
External memory storage device (FDD)
Hard disk use selection
Coolant flow switch selection
Scope blow selection
Vacuum switch unit selection
Microscope lens shutter selection

Elective accessories
Flange selection
Label selection
Attached manual selection

Optional accessories
Braided hose joint selection
Braided hose selection
Pipe band selection
Tool set (bag) selection
Chuck table selection
Abrasive material for Non-contact setup sensor selection
Lifting jig set selection
Machine fixation anchor metal selection
Metal fixture for crating
Spare hub mount selection
Spare R-type flange selection
Axis metal fixture selection
Non-contact setup selection
Blade breakage detector selection
Uninterruptible power supply selection
Duct fan unit selection
Transformer unit for overseas use selection
Power cables selection
Spare manuals selection
Microscope specification selection
Macro microscope
Halogen lamp specification
θ-axis rotating angle limitation selection
Wheel cover selection
Wheel coolant (shower) flow switch selection
Wheel coolant (blade cooler) flow switch selection
Controller for the wheel coolant water flow rate selection
Water leakage sensor selection
Kerf center alignment specification selection
Slow-in cutting function selection
Linear scale specification selection (standard built-in for 3430)
Microscope lighting specification selection
Low-expansion spindle-axis unit selection
Auto blade dress function selection (except for 3220)

DAD3220/3230/3430 dimensions



Machine dimensions: 900 W x 1,050 D x 1,800 mm H

Machine weight: 1,300 kg

Footprint: 0.945 m^2

Fin.