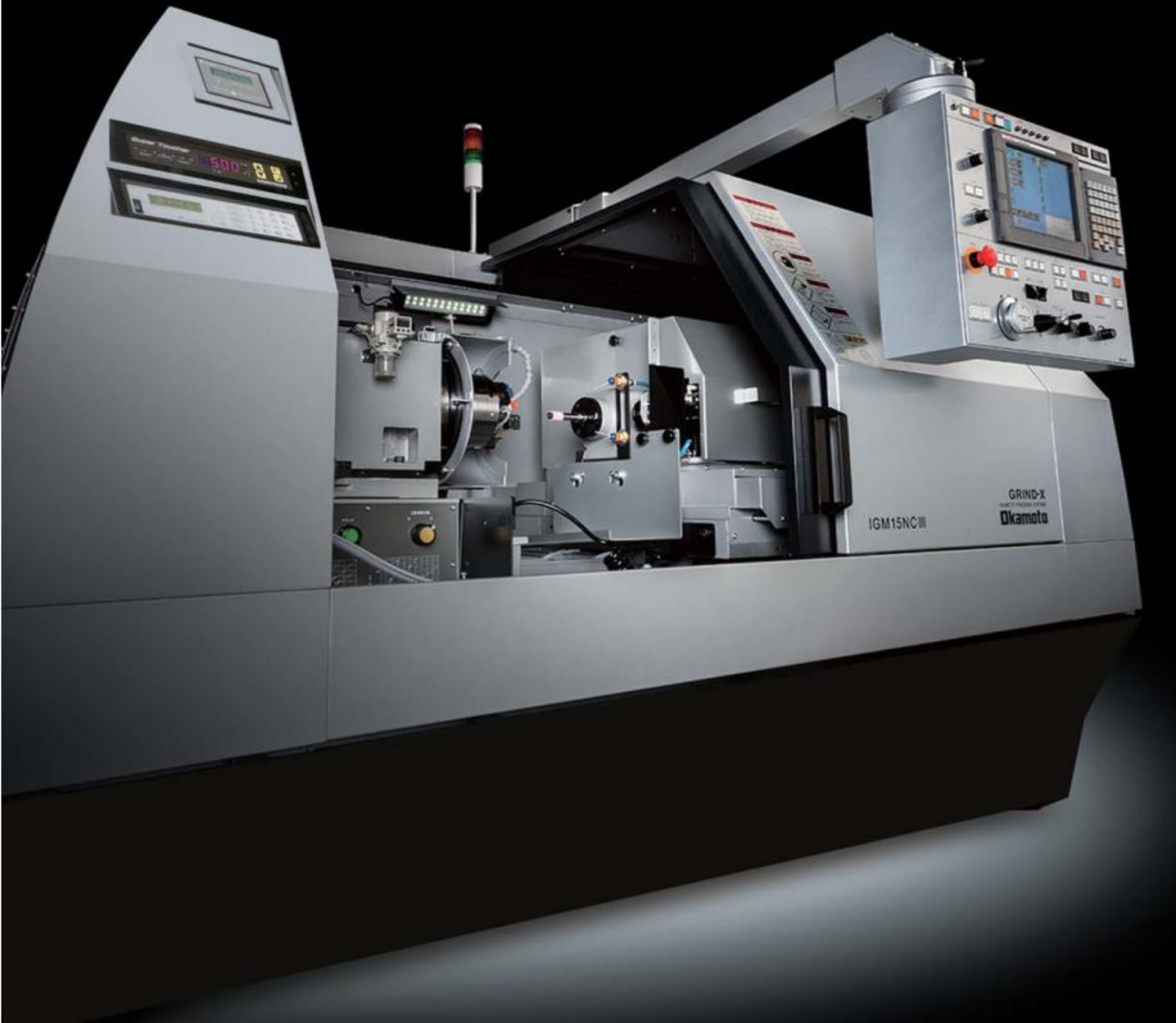
Okamoto

Precision Internal Grinding Machine
IGM Series



High Precision + High Efficiency

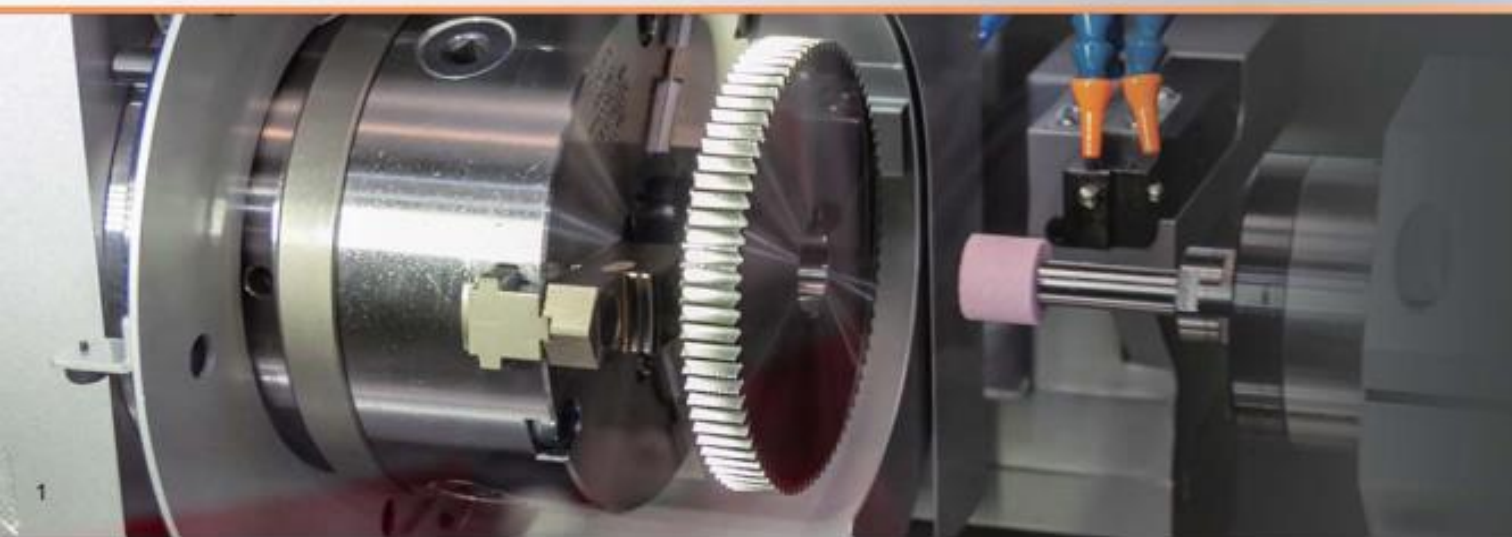
IGM Series will meet your demand for high precision internal grinding

Okamoto Machine Tool Works is known as the leader of grinding machine manufacturing in Japan, and getting praise around the world. We have been providing the high-precision high-quality grinding machines since the development of the first surface grinding machine in Japan in 1953.

We started developing the internal grinding machines in 1954, and the lineup has expanded from a versatile general-purpose type to a specialty including automated type with use of robot loaders for mass production.

IGM series is widely used in a variety of automobile parts, gears, medical equipment, semiconductor manufacturing equipment, and precision machinery industries. The roundness, concentricity and cylindricity of manufactured workpieces are producted and repeated. Okamoto holds a high market share of internal grinding machines both in Japan and overseas.

You can obtain higher level of precision grinding by utilizing the internal grinding machine IGM series.



Precision Internal Grinding Machine

15NCⅢ•15NCⅢ-2•15NCⅢ-2B

Interactive software (common to all models)

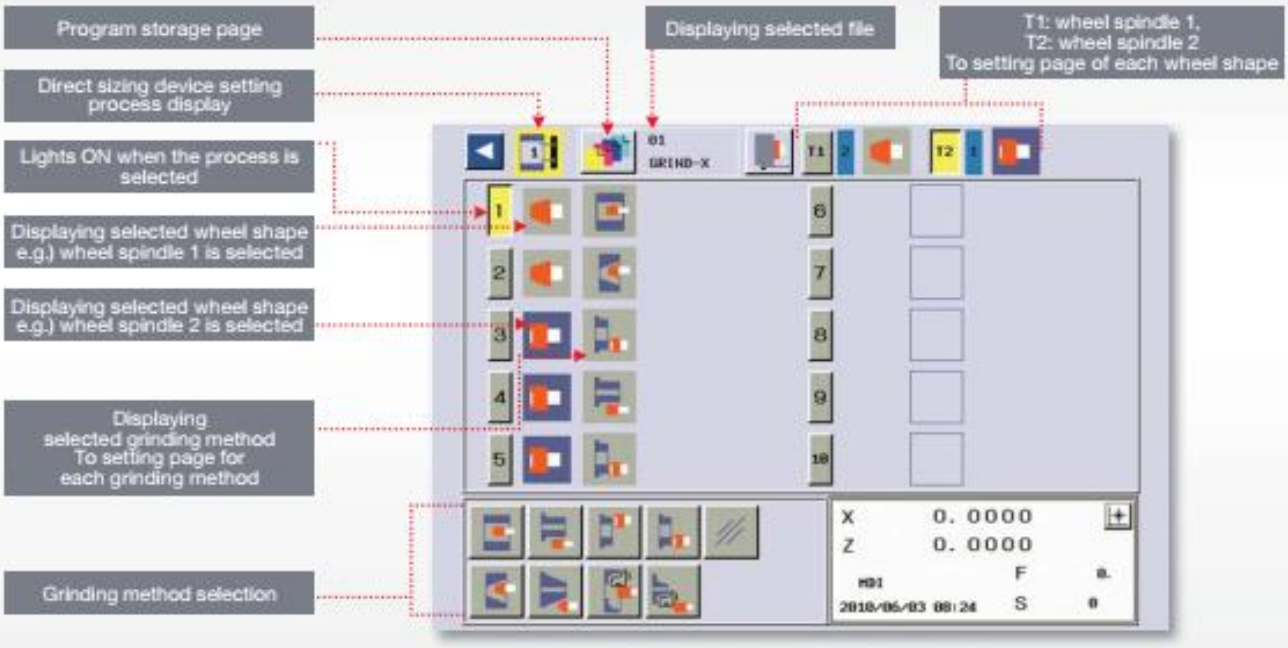
Grinding data auto set function

Just by inputting the wheel abrasive size (diameter and width) and workpiece size dimensions, the optimum grinding conditions and dressing conditions are automatically created. Computed values are generated based on our expertise of the grinding theoretical values.

Touch screen input

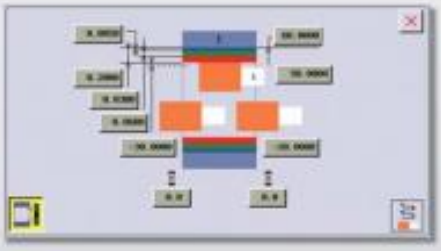
There are no letters on the screen. Utilizing the touch and teach functions, even complicated shapes can be ground.

[Main menu]

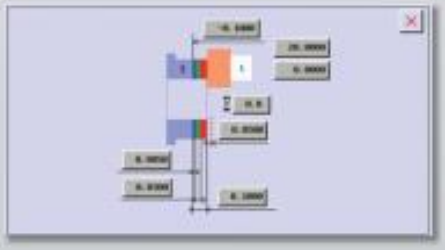


Main pages

Straight grinding setting page (standard on all models)



End face grinding setting page (standard on all models)



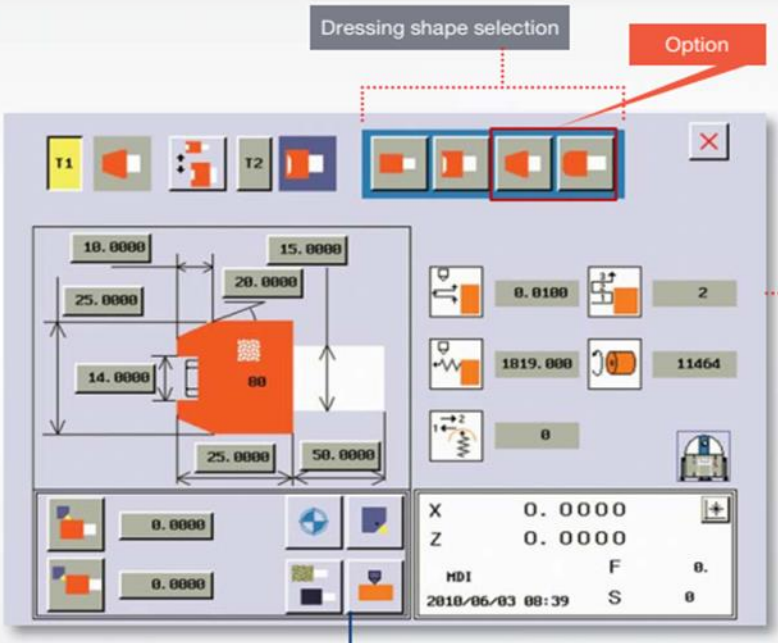
Interactive software is used

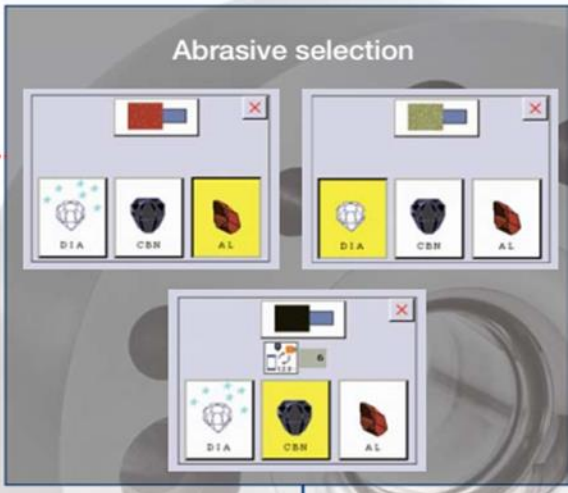
File management

Data Storage includes wheels (6) and workpieces (21) as standard

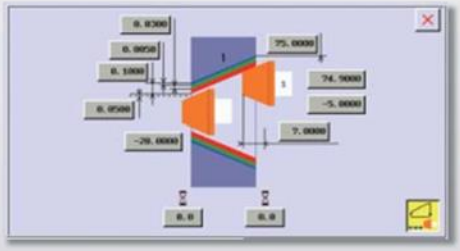
Same operation system as OKAMOTO cylindrical grinding machine OGM series is used.

[Wheel shape select page]

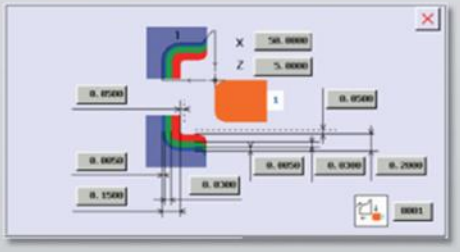




Taper grinding data setting page
(IGM15NCⅢ, 15NCⅢ-2 option)



Contour grinding page
(IGM15NCⅢ, 15NCⅢ-2 option)



EDELAC Win Program - dedicated software for contour grinding option

Mirror finish contour grinding for cold forge dies

When grinding difficult-to-cut materials such as carbide, the rigidity of the spindle itself is required in addition to the rigidity of the machine body.
In the carbide grinding, the stock removal often exceeds ϕ1 mm, and if there is no rigidity, it will keep sparking due to the bouncing of the wheel.
In addition, it is necessary to accurately synchronize the contour grinding with the commands of simultaneous 2-axis control.
Okamoto machines have the advantages of supporting it with the standard model, without having a costly higher-precision option.

Optional software that enables complex grinding and contour grinding

In the case of a workpiece to be ground along the shape, contour grinding is possible by creating the passage to grind along the workpiece based on the workpiece drawings, creating the passage program, and reflecting the passage program to the interactive software.
This software not only allows you to create programs by importing CAD data, but also simulates the passage of the wheel on the screen of your computer, so it is especially effective for complex internal features where it is difficult to visually check the interference between the wheel and the workpiece.

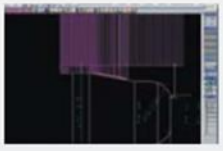
Program flow

Passage drawing

Create workpiece and wheel passage in the same way as CAD

Simulation

Activate the wheel and simulate the movement

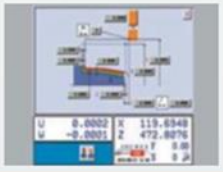


Programming

If no problem is found, the program is created.

It is uploaded into the interactive software

The created program is registered. Set the conditions to start grinding.



IGM Series

Specifications

Item		Unit	IGM15NCⅢ	IGM15NCⅢ-2	IGM15NCⅢ-2B
Grinding hole diameter		mm	φ6～150	φ6～100	φ6～150
Grinding stroke		mm	max125		
Swivel on the table		mm	φ600		
Swivel in the chuck cover		mm	φ260		
Height from the bottom of the frame to the center of the chuck		mm	1000		1050
Wheel spindle infeed (X axis)	Maximum travel distance	mm	170	300	360
	Grinding feed speed	mm/min	0.001～10000		
	Rapid feed speed	mm/min	10000		16000
Table longitudinal feed (Z axis)	Maximum travel distance	mm	500		510
	Grinding feed speed	mm/min	10000		0.001~10000
	Rapid feed speed	mm/min	10000		16000
Minimum increment	X axis	mm	φ0.0001		
	Z axis	mm	0.0001		
Work Spindle Revolution Speed		min^{-1}	100～850		
Work spindle swivel angle		deg.	−5～15		
Motor	For main spindle	kW	1.8		
	For wheel spindle	kW	3.7	4.5	5.5×2
	For X axis	kW	1.2		2.2
	For Z axis	kW	1.2		2.2
Power requirement (Including optional coolant unit)		kVA	12	18	22
Floor space requirement (width x depth x height) (including optional coolant unit)		mm	2525×3092×1786	2525×3292 ×1786	2500×1940 ×1600
Net weight		kg	2600	2800	4500

Power requirement, floor space requirement, and others are subject to change without notice.

Required air source (standard specification): 0.4～0.6 MPa, 300～400 L/min

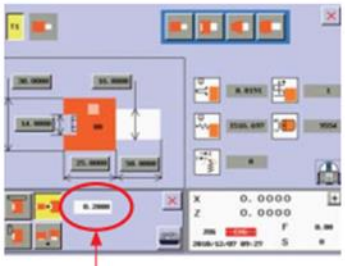
High-Level Software (standard on NCⅢ)

Correction grinding

If you want to perform additional grinding after the automatic grinding is completed, you can quickly approach the air cut position and perform grinding in fine grinding mode, so time loss can be minimized.

Automatic dressing on wheel replacement (for mass production)

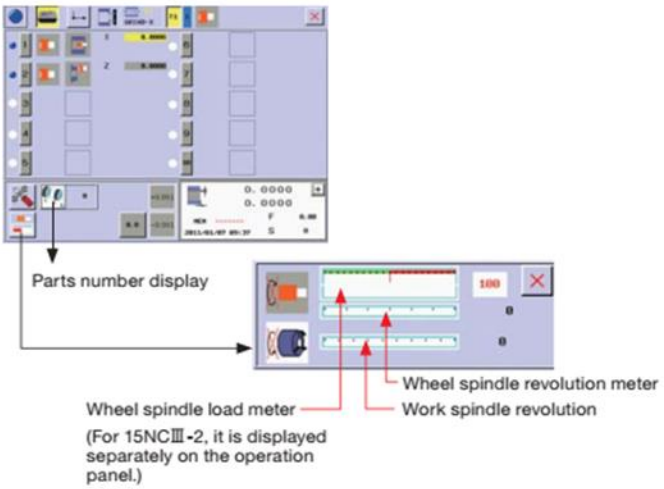
In addition to the initial truing, if you want to repeatedly use the same specification wheel for mass production, it can automatically perform the wheel truing when you replace the wheel.



Interrupt function during cycle operation

Interrupt dressing, infeed retract and cycle end are available.

Wheel spindle load meter, work spindle & wheel spindle inverter, additional components

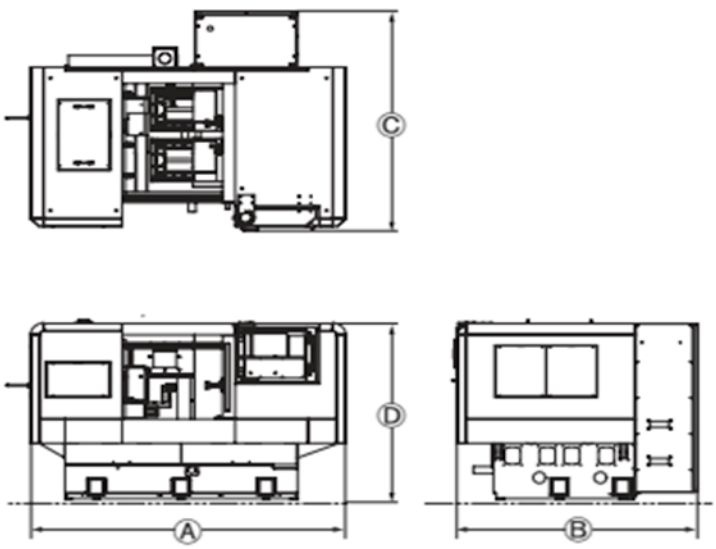


IGM Series

Standard accessories

Item	IGM15NC Ⅲ	IGM15NC Ⅲ-2	IGM15NC Ⅲ-2B
X-axis (infeed axis) closed loop model	○	○	○
Wheel spindle and X-axis ball screw oil-chilled	—	○	—
Holder integrated type wheel spindle 20000 min^{-1} (oil mist type)	○	—	○
Oil mist lubrication unit (micro oil supply type) & drip-feed verifier	○	○	○
Sleeve type grinding wheel spindle 10000min^{-1}, 20000min^{-1}	—	—	○
High frequency spindle 10000min^{-1}, 20000min^{-1}	—	○	—
Inverter for high frequency spindle	—	○	—
Wheel spindle AC spindle motor	○	—	○
Work spindle AC servo motor	○	○	○
Tool nose radius correction	○	○	○
10-Face grinding, no keyboard, straight & end face grinding model	—	—	—
10-Face grinding, with keyboard + G code input	○	○	○
Dressing coolant, center coolant	○	○	○
Table washing nozzle	○	○	○
Dust collection port	○	○	○
LED light inside the cover	○	○	○
Main spindle shift base	○	○	○
Wheel spindle load meter	○	○	○
Work spindle revolution meter	○	○	○
Cycle time display / components count display	○	○	○

IGM15NC Ⅲ-2B



Unit: mm

	Ⓐ Width	Ⓑ Depth (machine installation width)	Ⓒ Depth (including coolant unit)	Ⓓ Height
IGM2MB	2450	1361	2050	1848

IGM Series

Optional accessories

Item	IGM15NCⅢ	IGM15NCⅢ-2	IGM15NCⅢ-2B
1. Coolant unit			
1) with magnetic separator	○	○	○
2) with magnetic separator and paper filter	○	○	○
3) with magnetic separator, paper filter and coolant temperature automatic regulator	○	○	○
4) with magnetic separator, paper and cartridge filter, and coolant temperature automatic regulator	○	○	○
2. Sleeve type wheel spindle (high frequency spindle, mist lubricatio			
1) OH-10MB (10000min^{-1})	○	Standard	○
2) OH-20MB (20000min^{-1})	○	Standard	○
3) OH-30MB (30000min^{-1})	○	○	○
4) OH-40MB (40000min^{-1})	○	○	○
5) OH-50MB (50000min^{-1})	○	○	○
6) OH-60MB (60000min^{-1})	○	○	○
3. Sleeve type wheel spindle (mist lubrication type)			
1) GS-5 (60000min^{-1}、40000min^{-1})	○	–	–
2) B-32M (30000min^{-1})	○	–	–
3) B-23M (20000min^{-1},16000min^{-1},13000min^{-1})	○	–	–
4) R-7B-A (10000min^{-1})	○	–	–
4. Holder integrated type wheel spindle (grease lubrication type)			
1) OH-10G (10000min^{-1})	○	–	–
2) OH-15G (15000min^{-1})	○	–	–
3) OH-20G (20000min^{-1})	○	–	–
4) OH-30G (30000min^{-1})	○	–	–
5) OH-40G (40000min^{-1})	○	–	–
6) OH-50G (50000min^{-1})	○	–	–
5. Holder integrated type wheel spindle (mist lubrication type)			
1) OH-10M (10000min^{-1})	○	–	–
2) OH-20M (20000min^{-1})	Standard	–	–
3) OH-30M (30000min^{-1})	○	–	–
4) OH-40M (40000min^{-1})	○	–	–
5) OH-60M (60000min^{-1})	○	–	–
6. Sleeve type wheel spindle holder	○	–	–
7. Various chucks *specifications shall be selected depending on the workpiece.			
1) Three-jaw scroll chuck	○	○	○
2) Four-jaw independent chuck	○	○	○
3) Microcentric chuck	○	○	○
4) Diaphragm chuck	○	○	○
5) Collet chuck	○	○	○
6) Finger chuck	○	○	○
7) Diaphragm finger chuck	○	○	○
8) Gear chuck	○	○	○
9) Various power chucks	○	○	○
10) Air drive unit for power chuck	○	○	○
8. End face grinding device	○	○	○
9. Steady rest	○	○	○
10. Dresser coolant system	Standard	Standard	Standard
11. Work spindle nc swiveling, minimum increment: 0.00001°	○	○	○
12. Graphic interactive software for setting the work spindle nc swivel angle	○	○	○
13. Work spindle rotation constant control	○	○	○
14. Simultaneous 2-axis taper and contour grinding software	○	○	○
15. Wheel form grinding software (taper, free shape)	○	○	○
16. Automatic programming software EDELAC Win	○	○	○
17. Automatic shut down system	○	○	○
18. Direct sizing device	○	○	○
19. Rotary dresser	○	○	○
20. Signal light tower	○	○	○
21. Work light	Standard	Standard	Standard

*Some of the above optional accessories need to be discussed before installation.


3. Sleeve type wheel spindle


4,5. Holder integrated type wheel spindle


7.1) Three-jaw scroll chuck


7.2) Four-jaw independent chuck


7.4) Diaphragm chuck


7.5) Collet chuck


7.6) Finger chuck


7.7) Diaphragm finger chuck


7.8) Gear chuck


8. End face grinding device

Wheel Spindle Type and Grinding Hole Diameter

Sleeve type wheel spindle
Peripheral speed:1885m/min(maximum wheel diameter)

Wheel spindle	Rotation speed (min^{-1})	Standard wheel dimension	Standard quill diameter ×length	Approximate grinding whole diameter
B-7B-A	10,000	φ45×20	φ27×58	φ60～φ80
B-23M	13,000	φ25×15	φ16×40	φ42×60
	16,000	φ25×15	φ16×40	φ28×42
	20,000	φ25×15	φ16×40	φ20×28
B-32M	30,000	φ20×15	φ14×32	φ14～φ20
GS-5	40,000	φ8.5×8	φ5×25	φ8～φ17
	60,000	φ6.5×8	φ5×25	φ6～φ11

Holder integrated type wheel spindle (mist lubrication type)
Peripheral speed:1885m/min(maximum wheel diameter)

Wheel spindle	Rotation speed (min^{-1})	Standard wheel dimension	Standard quill diameter ×length	Approximate grinding whole diameter
OH-06M	6,000	φ100×40	φ40×100	φ80～φ120
OH-10M	10,000	φ60×30	φ27×80	φ60～φ80
OH-15M	15,000	φ40×25	φ22×70	φ35～φ60
OH-20M	20,000	φ30×25	φ16×50	φ20～φ35
OH-30M	30,000	φ20×15	φ14×40	φ14～φ20
OH-40M	40,000	φ15×10	φ10×25	φ8～φ17
OH-60M	60,000	φ10× 8	φ6×20	φ6～φ11

Holder integrated type wheel spindle (grease lubrication type)
Peripheral speed:1885m/min(maximum wheel diameter)

Wheel spindle	Rotation speed (min^{-1})	Standard wheel dimension	Standard quill diameter ×length	Approximate grinding whole diameter
OH-10G	10,000	φ60×30	φ27×80	φ60～φ80
OH-15G	15,000	φ40×25	φ22×70	φ35～φ60
OH-20G	20,000	φ30×25	φ16×50	φ20～φ35
OH-30G	30,000	φ20×15	φ14×40	φ14～φ20
OH-40G	40,000	φ15×10	φ10×25	φ8～φ17
OH-50G	50,000	φ10× 8	φ6×20	φ6～φ11

High frequency wheel spindle
Peripheral speed: Used at 2000 m/min or less

Wheel spindle	Rotation speed (min^{-1})	Standard wheel dimension	Standard quill diameter ×length	Approximate grinding whole diameter
OH-10MB	10,000	φ60×30	φ27×80	φ40～φ120
OH-20MB	20,000	φ40×25	φ22×70	φ20～φ80
OH-30MB	30,000	φ30×25	φ16×50	φ14～φ35
OH-40MB	40,000	φ20×15	φ14×40	φ8～φ20
OH-60MB	60,000	φ15×10	φ10×25	φ6～φ17

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JQA-QMA10960

CAUTION

*Prior to and while using our products you are requested to thoroughly go through the articles on danger, warning and attention for the sake of safety described in operation manual attached to the machine and also in the warning plates mounted on the machine.
*When the products fall under the export controlled goods stipulated in *Foreign Exchange and Foreign Trade Act*, it requires the license or approval of Government of Japan whebn exporting out of Japan.
*Specification subject to change without notice.

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