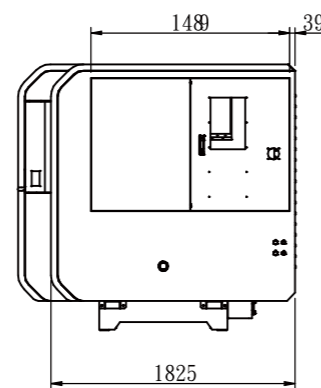
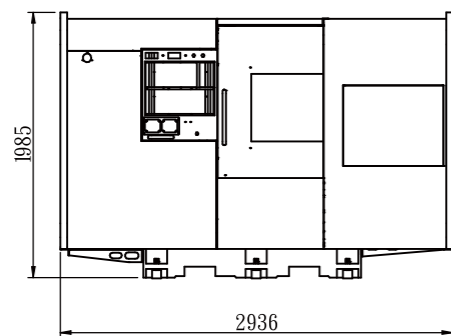
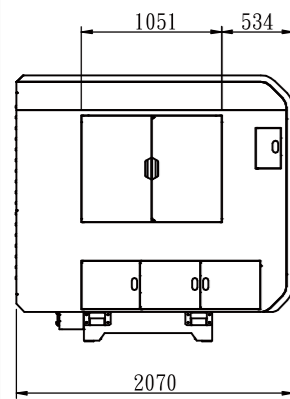


GM-45CNC



CNC ID/OD & NON-ROUND Complex Grinding Machine

POWERMASTER SERIES
GRINDMASTER SERIES

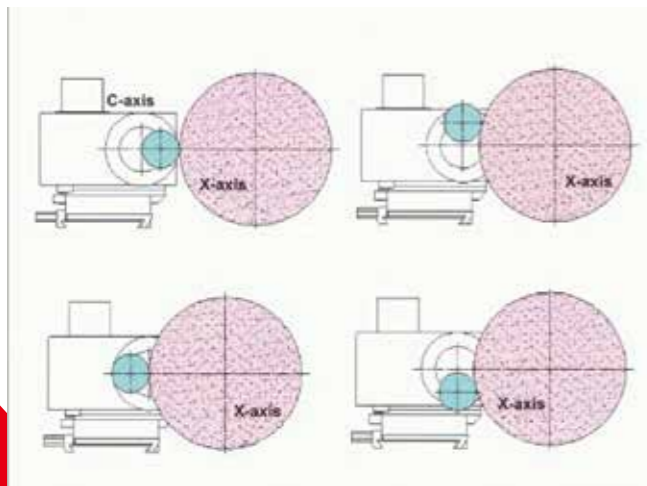


Grinder Professionals

POWERMASTER:

The Supertec POWERMASTER CNC series is designed for grinding round ("A" SERIES) and non-round ("B" SERIES) complex parts in a single setup as well as small and large batch production. Distances of 24" and 40" between centers with a swing of 12.6" are offered. All PMG CNC models come equipped with an automatic swiveling B-axis on the wheelhead and can perform OD, Plunge, OD traverse, shoulder taper, and end-face grinding. A separate ID spindle allows for accurate ID grinding during the same set-up. The FANUC CNC control on the "B" SERIES allows the grinder to move the C-axis and X-axis simultaneously in order to grind non-round workpieces such as eccentric shafts, cams or polygonal parts. These machines are especially suitable for the automotive, machine tool, and aerospace, hydraulic, pneumatic and electric motor industries. The reinforced ribbed box-type base is made of Meehanite cast-iron to ensure high rigidity and stability of the machine. A combination of high precision hand scraped Turcite-B coated V and flat guideways, and a hydrodynamic lubrication system guarantee a long lifetime of accuracy and dependability.

X-axis is driven by high precision ballscrew and servo motor with close-loop system (Absolute Inductive scale with 1µ resolution and ±5µ grating accuracy), and it can be moved simultaneously with the rotation of the C-axis for grinding non-round or eccentric parts, shown in following illustrations.



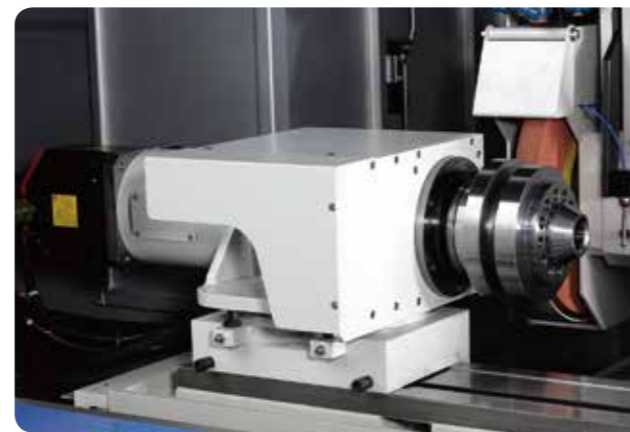
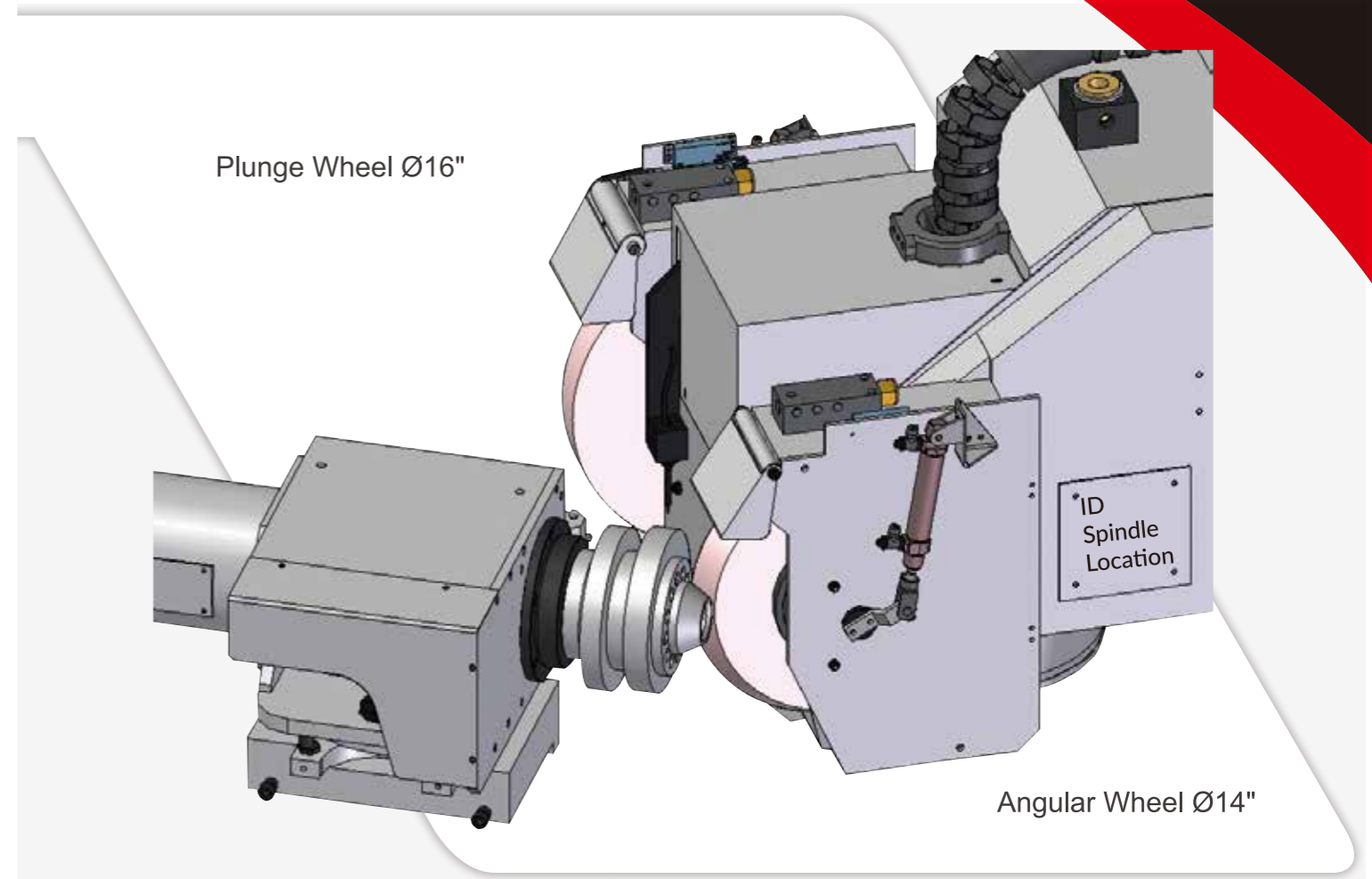
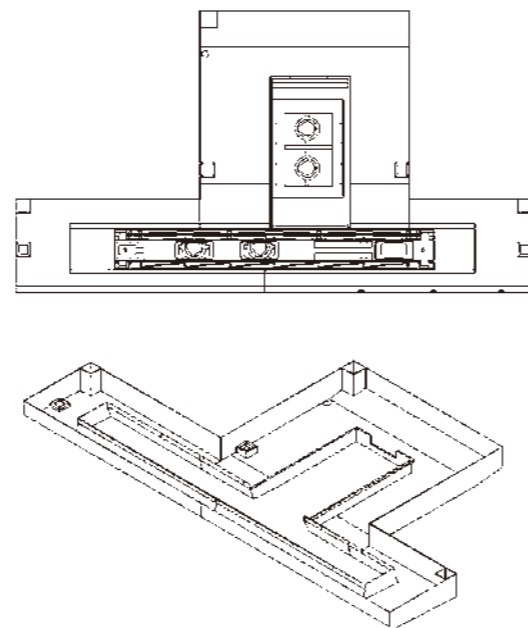
TURRET WHEEL HEAD (B-axis)

The universal wheel head has been designed for OD plunge, OD angular and ID grinding in a single clamping.

- Roller Gear Index Table, and automatic swivel by servo motor
- Automatic swiveling in any position range from 35°CCW to 195°CW
- B-axis servo motor output 2.5 kw
- OD spindle motor output 5HP (opt. 7.5HP)
- High-Frequency Built-In ID Spindle.
- Grinding wheel (LH) 16"x 2"x 5"
- Grinding wheel (RH) 14"x 1 1/2"x 5"
- X-axis FANUC servo motor output 1.6 kw (2.7 kw for B type)
- Hydrodynamic lubrication system
- Safety Wheel Guards design
- Variable wheel spindle speed controlled by default program, ensure constant peripheral speed of grinding wheel

WORK HEAD

- Variable Spindle speed (controlled by program) range from 30 to 350 rpm
- C-axis Interpolation
- Center taper MT4 (opt. MT5) for grinding round (A Type)
- A2-5 spindle for grinding Non-round (B Type)
- Servo motor output 1.5 kw (3 kw for B type)



● C-AXIS (B SERIES)

The B SERIES workhead is equipped with a "C" axis spindle (A2-5) which allows the operator to program and grind non-round workpieces such as CAM shafts or crank shafts.

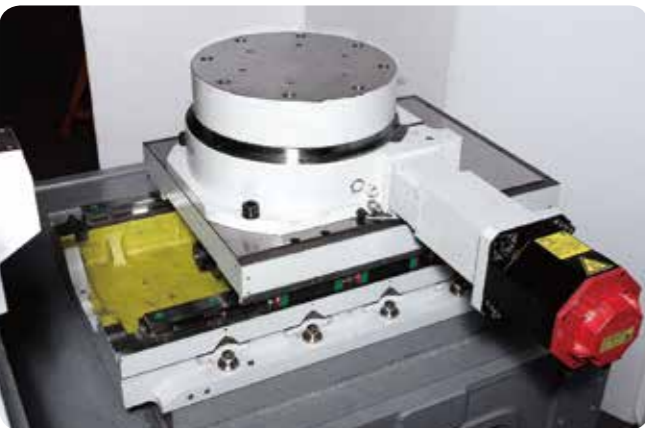
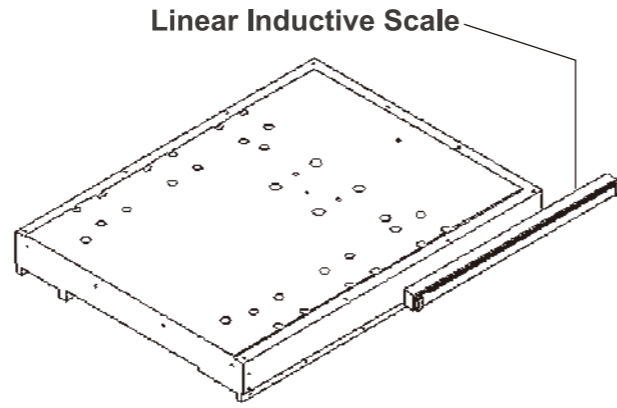
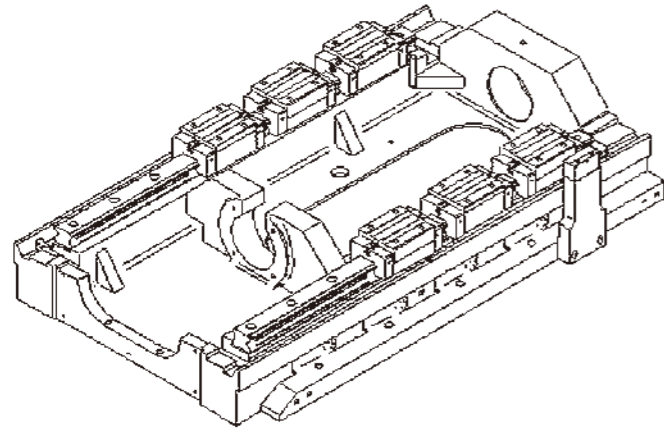


● HIGH-FREQUENCY ID SPINDLE

The PMG series incorporates a water-cooled high-frequency spindle (Max. rotation speed 40000 rpm) with a built-in motor for higher torque and lower resonance performance. This design also allows for a more compact wheelhead design.

● **LINEAR SCALE AND LINEAR GUIDEWAYS**

Linear guideways and linear absolute inductive scales are used in the X-axis for smoother movement and more accurate positioning.

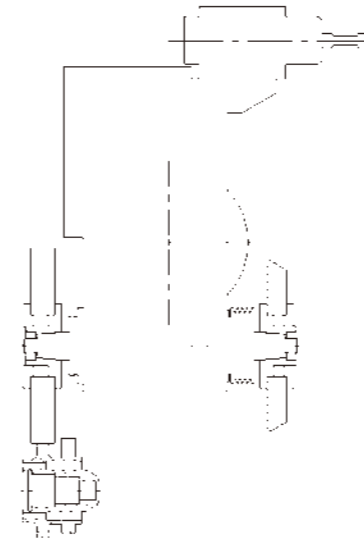


● The Fanuc control operates 3 or 4 axes. "A" SERIES: X/Z/B (3-axis) controlled by FANUC. "B" SERIES: X/Z/B/C (4-axis) controlled by FANUC.

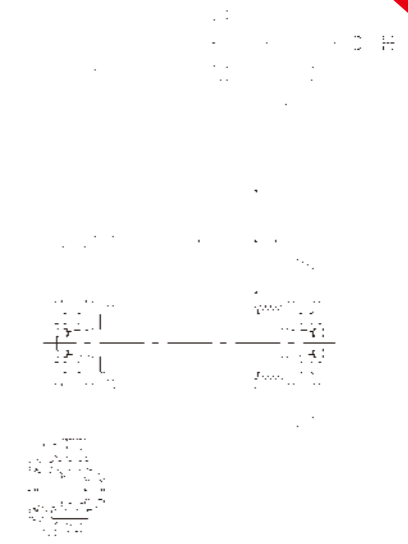
● **HYDRAULIC TAILSTOCK WITH FOOT PEDAL**

The hydraulic tailstock is operated by a foot pedal which allows the operator to use both hands when loading and unloading the workpiece.

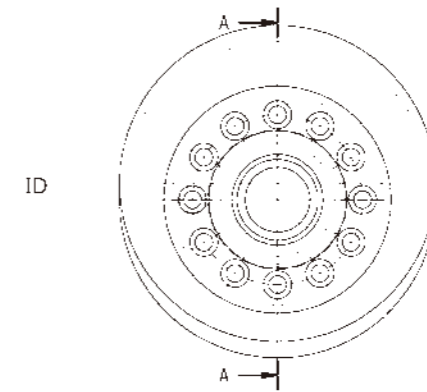
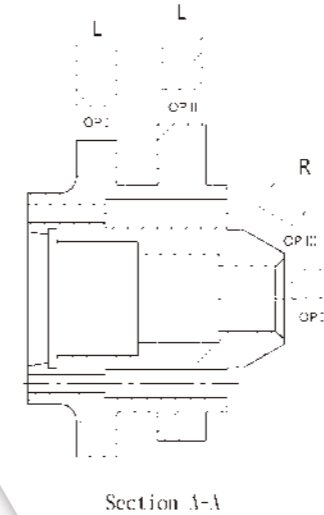
● **OPI-OD GRINDING**



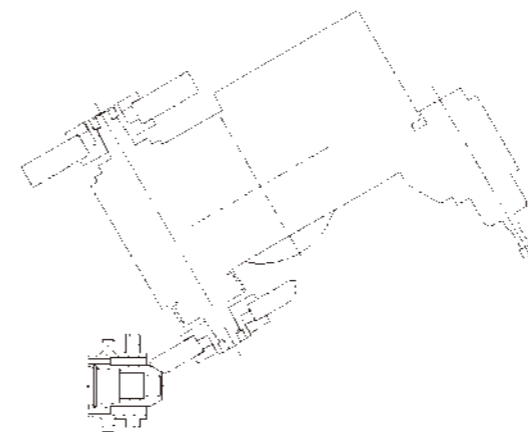
● **OPII-CAM GRINDING**



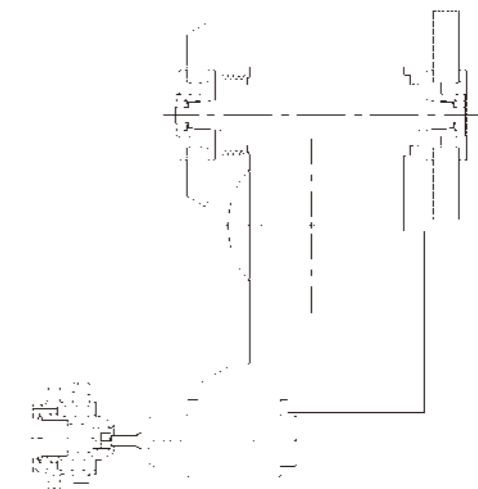
● **NON-ROUND WORKPIECE GRINDING OPERATIONS**



● **OPIII-TAPER GRINDING**



● **OPIV-ID GRINDING**



FEATURES OF GRINDMASTER 35/45/80 CNC



The GRINDMASTER SERIES are 3-axis complex CNC ID/OD grinders. The GRINDMASTER I/I and I/O models use a FANUC CNC to control the workhead (X-axis), ID or OD wheelhead (Y-axis) and ID wheelhead (Z-axis). The GRINDMASTER I/I/O model uses a FANUC CNC to control the workhead (X-axis), ID and OD wheelhead (Y-axis), swivel axis (B-axis) and ID wheelhead (Z-axis).

With just a single chucking action the GRINDMASTER SERIES can perform complex and precision grinding operations such as internal diameter, outside diameter, shoulder grinding taper grinding and end-face grinding. The ID and OD wheelhead (Y-axis) has a programmable automatic swivel function allowing for a smooth transition from one grinding function to another during a single program. It is the perfect solution for grinding complex parts in single piece and small batch production runs. With the incorporation of an automatic loading / unloading system the GRINDMASTER SERIES becomes idea for large batch production, saving valuable time and cutting total cycle times by as much as 60%.

High precision roller type linear guideways on the X, Y and Z axes ensure superior positioning accuracy of all 3 axes. Superior concentricity, roundness accuracies and finishes can be achieved easily with the use of the GRINDMASTER SERIES making it the ideal grinder for the automotive, machine tool, aerospace, hydraulic, pneumatic, and electric motor industries.

B-axis is driven by Fanuc servo motor.

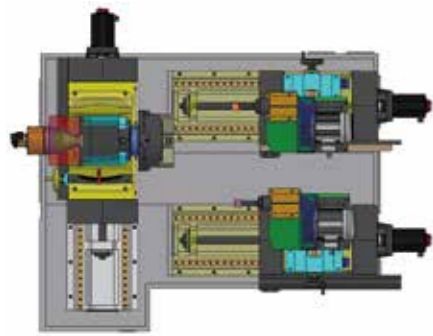


The reinforced ribbed box-type machine base is made of high strength Meehanite cast-iron to ensure the high rigidity and stability of the machine. A full enclosure with a large sliding door provides ample space for calibration, set-up, part loading/unloading, and grinding operations. The GRINDMASTER SERIES are made to stringent CE certification standards. The CAD/CAM modularized design of the GRINDMASTER SERIES ensures the high accuracy performance of the machine. A closed loop linear scale feedback system on the X-axis ensures the high precision required for grinding operations. Further more a touch probe can be added to improve accuracy even more.



ADVANTAGES

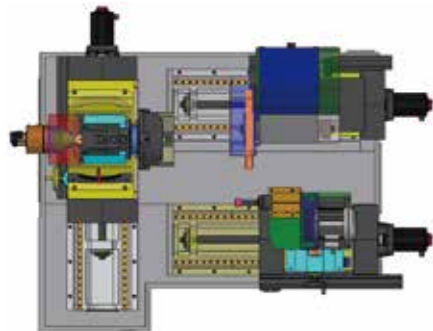
I/I-Type :



Y/Z-axis Dual Independent Wheel Head Design

- ◆ I/I-type : Z-axis equipped ID wheel head; Y-axis equipped ID wheel head
- ◆ I/O-type : Z-axis equipped ID wheel head; Y-axis equipped OD wheel head
- ◆ I/I/O-type : Z-axis equipped ID wheel head; Y-axis equipped ID/OD wheel head
- B-axis automatic swivel by servo motor
- B-axis servo motor output 1.2 kw
- ◆ ID Spindle Motor Output 3 HP (2P)
- ◆ Grinding wheel (ID) 1.5" x 1.5" x 3/8"
- ◆ OD Spindle Motor Output 5 HP
- ◆ Grinding wheel (OD) 16" x 2" x 5"
- ◆ Y/Z-axis Fanuc Servo Motor Output 1.8 kw

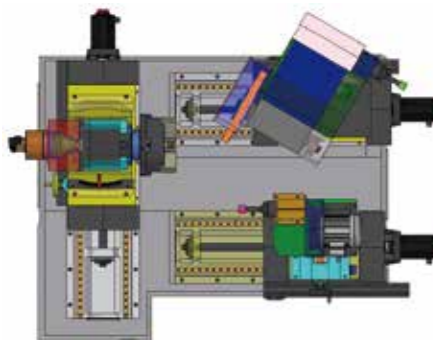
I/O-Type :



X-axis Work Head

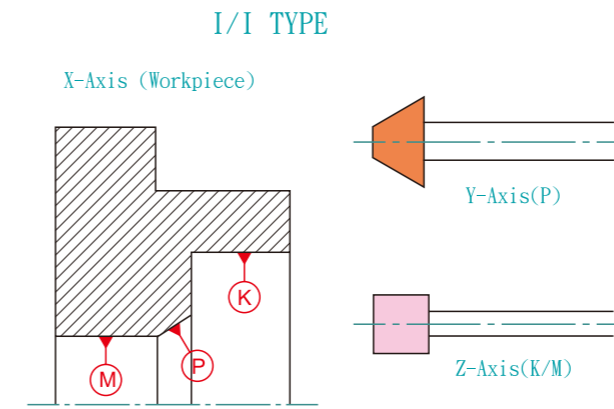


I/I/O-Type : GM-80 ONLY

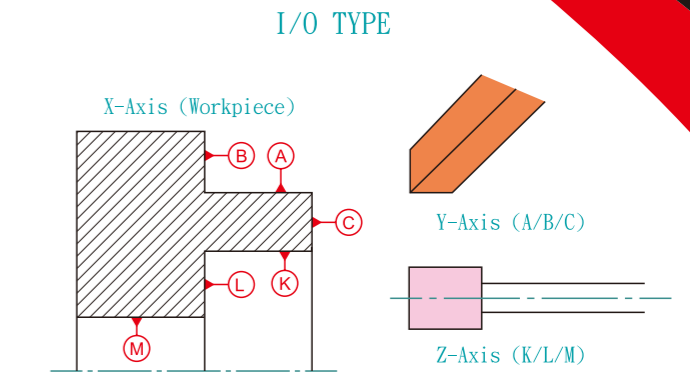


- ◆ Standard 6" 3-Jaw Hydraulic Chuck (GM-35/45)
- ◆ Standard 8" 3-Jaw Hydraulic Chuck (GM-80)
- ◆ Manual Swivel
- ◆ Swing Over Diameter :
 - Grindmaster 35: 11.8"
 - Grindmaster 45: 17.7"
 - Grindmaster 80 : 31.5"
- ◆ Spindle Servo Motor Output 3kw
- ◆ X-axis Fanuc Servo Motor Output 1.8 kw

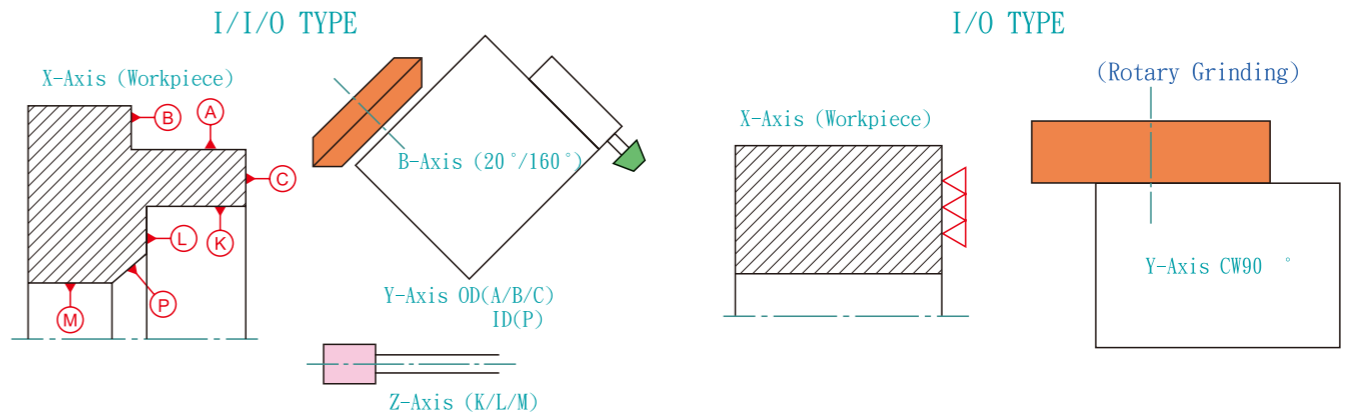
Grinding Applications (I/I Type)



Grinding Applications (I/O Type)

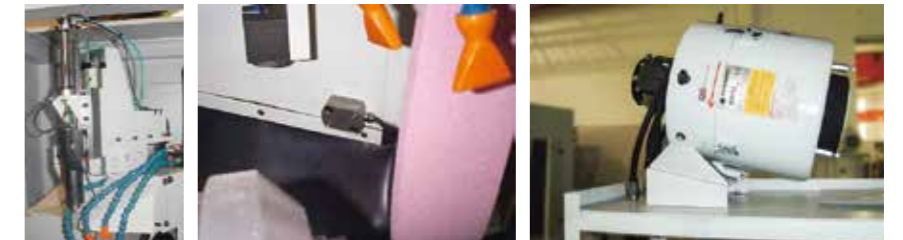


Grinding Applications I/I/O Type GM-80 Only



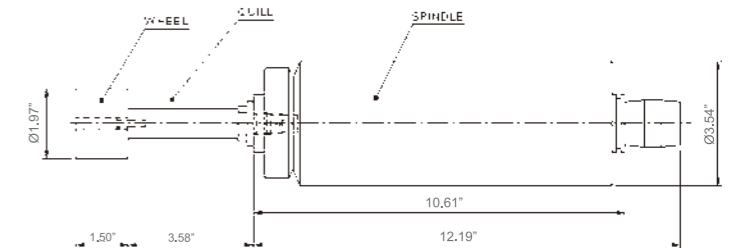
Standard Accessories

- ◆ FANUC CNC Controller
- ◆ Touch Probe (OD)
- ◆ Coolant System with Magnetic Separator & Paper Filter
- ◆ 6" (GM-35/45)/8" (GM-80)3-Jaw Hydraulic Chuck
- ◆ Full-Enclosure Cover with Oil and Mist Separator
- ◆ Internal Grinding Spindles : 8000/15000/20000/30000 rpm
- ◆ Work Head Spindle Nose : A2-5(GM-35/45)/A2-6(GM-80)/MT4(PMG)



Optional Accessories

- ◆ Auto Sizing Device
- ◆ Wheel Auto-Balancing Device
- ◆ Y/Z-axis Linear Scales
- ◆ Work Head Spindle Nose Upgrade : A2-6(GM-35/45)/A2-8(GM-80)/MT5(PMG)
- ◆ 8" (GM-35/45)/10" (GM-80)3-Jaw Hydraulic Chuck
- ◆ Internal Grinding Spindles : 8000/15000/20000/30000 rpm



MODEL		PMG-60/100CNC(A)		PMG-60/100CNC(B)	
CAPACITY	Swing Over Table	Ø14"			
	Distance between Centers	24"	40"	24"	40"
	Max. Grinding Length	20"	32"	20"	32"
	Max. Weight between Centers	330 lbs			
WHEELHEAD	Wheel Size–LH(DxWxB)	16" x 2" x 5"			
	Wheel Size–RH(DxWxB)	14" x 1 1/2" x 5"			
	OD Spindle Speed(50/60Hz)	1575/1795 rpm			
	Wheel Peripheral Speed	99 ft/sec			
	ID Spindle Cartridge Diameter	3.94"			
	ID Spindle Speed	24000 High-Frequency Built-in			
	ID Shaft Diameter	0.27"~1"			
	Feed Angle	90°			
	Min. Programmable Increment	Ø0.00001"			
	Max. Traverse Speed	246 in/min			
	Total Stroke	10.8"			
	WORKHEAD	Variable Spindle Speed (Programmable)	30~350rpm		
Center Taper		MT-4			
TAILSTOCK	Quill Stroke	2"			
	Center Taper	MT-4			
TABLE	Swiveling Angle(CCW)	5°	3°	5°	3°
	Max. Traverse Speed	393 in/min			
	Min. Feed Unit Set	0.00001"			
MOTORS	Controller	Fanuc			
	OD Spindle Motor	5HP (Opt. 7.5HP)			
	B-axis Servo Motor	3.62 HP			
	Workhead Spindle Motor	2 HP		4 HP	
	Hydraulic Motor	1HP(4P)			
	Coolant Pump	1/2HP(4P)			
	X-axis Feed Servo Motor	2.15 HP		3.62HP	
Z-axis Feed Servo Motor	2.15 HP				
MACHINE	Packing Dimensions (LxWxH)	15.3'(17.3' for 100 CNC) x 7.3' x 7'			
	Machine Net Weight	12320 lbs	13640 lbs	12540 lbs	13860 lbs

MODEL		GM-35 CNC	GM-45 CNC	GM-80 CNC	
CAPACITY	ID Grinding Range	Ø 0.24"~ 7.87"	Ø0.24"~ 15.7"	Ø0.24"~ 23.6"	
	Max Grinding OD Diameter	Ø 11.81"	Ø17.7"	Ø31.5"	
	Swing Over Work Head	Ø 15.74"	Ø19.7"	Ø32.3"	
	Max Weight of Workpiece	110 lbs	110 lbs	176 lbs	
	Type of Wheel Head	Dual Independent Wheel Head			
WHEELHEAD	ID Wheel Size (DxWxB)	Ø1.5" x 1.5" x Ø0.3"			
Y-axis	ID Spindle Speed	8000 / 15000 / 20000 / 30000 rpm			
	OD Wheel Size (DxWxB)	Ø 14" x 2" x 5"	Ø 16" x 2" x 5"	Ø16" x 2" x 5"	
	Swiveling Mechanism (I/I/O)	N/A	N/A	Automatic Swivel	
	Swiveling Angle (I/I/O)	N/A	N/A	-30°/ +210°	
	Travel	16"	20"	20"	
	Max. Rapid Feedrate		394 in/min		
	Min. Programmable increment		0.00001"		
	WORKHEAD	Type of Chuck	A2-5 6" 3-Jaw Hydraulic Chuck	A2-5 6" 3-Jaw Hydraulic Chuck	A2-6 8" 3-Jaw Hydraulic Chuck
	X-axis	Travel	16"	23.6"	23.6"
		Max. Rapid Feedrate		394 in/min	
Min. Programmable Increment			Ø 0.00001"		
	Spindle Speed		0~1000 rpm		
WHEELHEAD	ID Wheel Size (DxWxB)	1.5" x 1.5" x 0.3"			
Z-axis	ID Spindle Speed	8000 / 15000 / 20000 / 30000 rpm			
	Travel	16"	20"	20"	
	Max. Rapid Feedrate		394 in/min		
	Min. Programmable Increment		0.00001"		
MOTORS	Y-axis ID Spindle Motor	3 HP (2P)			
	Y-axis OD Spindle Motor	5 HP (2P)			
	X-axis Spindle Servo Motor (workhead)	2 HP (4P)			
	Z-axis Spindle Motor	3 HP (2P)			
	B-axis Swiveling Servo Motor	1 HP (Fanuc)			
	Y-axis Feed Servo Motor	1.6 HP (Fanuc)	1.6 HP (Fanuc)	2.4 HP (Fanuc)	
	X-axis Feed Servo Motor	1.6 HP (Fanuc)	1.6 HP (Fanuc)	2.4 HP (Fanuc)	
Z-axis Feed Servo Motor	1.6 HP (Fanuc)	1.6 HP (Fanuc)	2.4 HP (Fanuc)		
MACHINE	Gross Wt./Net Wt.	11440 / 10340 lbs	17600 / 16500 lbs	17600 / 16500 lbs	
	Packing Dimensions (LxWxH)	192"x90"x88"	132"x91"x77"	134"x91"x79"	