



# **PALMRY**

*A Total Dedication to New Technological Level*



## **INTERNAL GRINDING MACHINE**

**NC SERIES**



**Precise, Perfect and Excellent**

## PALMARY NC Internal Grinding Machine Automatic Grinding Operations

# Maximum Operational Convenience

“Further PALMARY technical breakthroughs - the NC series internal grinding machines - are designed and engineered according to the highest standards. Great attention is paid to every detail of the entire machine. This fully reflects PALMARY's state-of-the-art manufacturing techniques. In addition, the NC series are equipped with a conversational operation interfacing control that makes your internal grinding more easy and more accurate.”

### Outstanding Features:

1. The entire machine is ergonomically designed for user-friendly operation. The machine bed is manufactured from high quality cast iron, specially heat treated and precision machined to ensure deformation-free performance, year after year.
2. All slideways are lubricated by the static pressure automatic lubrication system, thereby providing extremely smooth movement and maximum wear resistance.
3. All the grinding motions - from rough grinding, dressing, finish grinding to spark out - are fully automatically operated. This provides high accuracy, convenient operation and greatly upgrades productivity. Also, it is excellent for mass production as well as small quantity, flexible workpiece grinding.
4. The workhead spindle runs on a high precision roller bearing featuring high accuracy, high rigidity and silent running. The workhead can be swiveled at 8° forward and 7° backward, allowing for grinding tapered workpieces.
5. Precision ball screw combined with servomotor drive provide variable feed speed change.
6. The servomotor features compact construction, superior torque output, fast speed response, high accuracy and stability.
7. The slide reciprocating movement is driven by a hydraulic system, providing variable speed change and superior stability.
8. NC controlled automatic dressing with compensation.
  - (1). In case a diamond or CBN grinding wheel is applied, a selection of no dressing is available.
  - (2). For hard-to-grind parts, a multiple dressing mode can be selected to ensure the desired grinding quality.
9. To meet mass production requirements, automatic loading and unloading equipment is available to provide a fully automatic operation.

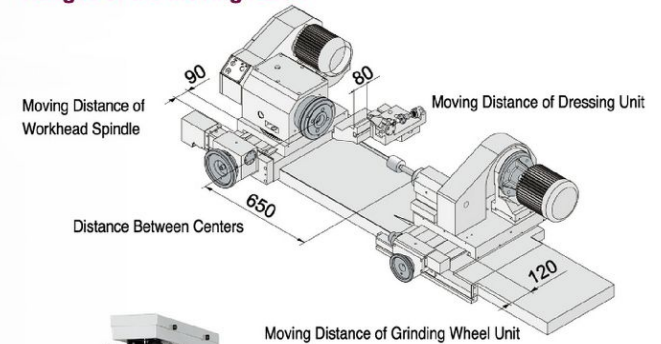


Face Grinding Operation



Internal Grinding Operation

### Ranges of the Moving Parts:



### Advanced NC Control

- The NC controller employs conversational operational interface. It applies words or graphics to replace the conventional lamp indication for added operational convenience.
- Increased control functions and easy change assure maximum operational convenience and flexibility.
- Trouble history records combined with troubleshooting instructions greatly upgrade servicing efficiency and quality.
- Fully digitized machining for upgrading machining accuracy, establishing standardization and ensuring product quality.



# PALMARY's NC Internal Grinding Machine Internationally Recognized!

“ Since the company was established, PALMARY has been committed to upgrading grinding accuracy and humanified operational performance. The NC internal grinding machines from PALMARY are outstanding because they integrate the accuracy, user-friendly operation and lifetime stability as you've come to expect. All these combined with PALMARY's rigorous quality control system will assure you of the top performance in internal grinding. ”

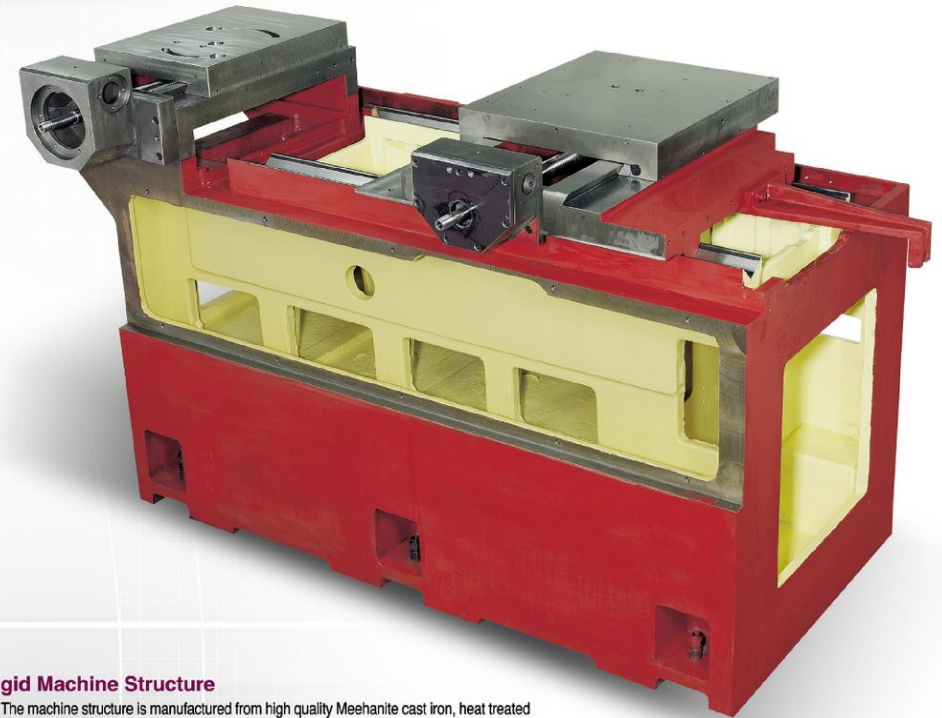


## High Performance Control Circuit

- The control circuit, which consists of high quality electronic components, meets safety regulations and assures maximum control performance dependability.
- The control box is equipped with a heat exchanger to ensure constant temperature in the control box, and is also dust-proof.

## Face Grinding Attachment (Optional)

- Upon request, the machine is available to equip with a face grinding attachment to allow internal grinding and face grinding operations accomplished at one time. This assures outstanding perpendicularity accuracy while enormously upgrading efficiency.
- The face grinding attachment accommodates a common grinding wheel or a CBN grinding wheel (optional).
- Equipped with manual dressing device.



## Rigid Machine Structure

- The machine structure is manufactured from high quality Meehanite cast iron, heat treated and stress relieved before machining.
- Slideways are high frequency hardened and precision ground. Maximum material stability for deformation-free and outstanding wear resistance.



## Wheel Head Slide

- Providing a selection of automatic or manual feed modes.
- Dressing amount is set through the conversational human-machine interfacing controller. Minimum setting unit is 0.001 mm.
- Wheel dressing amount is set as desired.
- Dressing position can be memorized.



## Work Head Slide

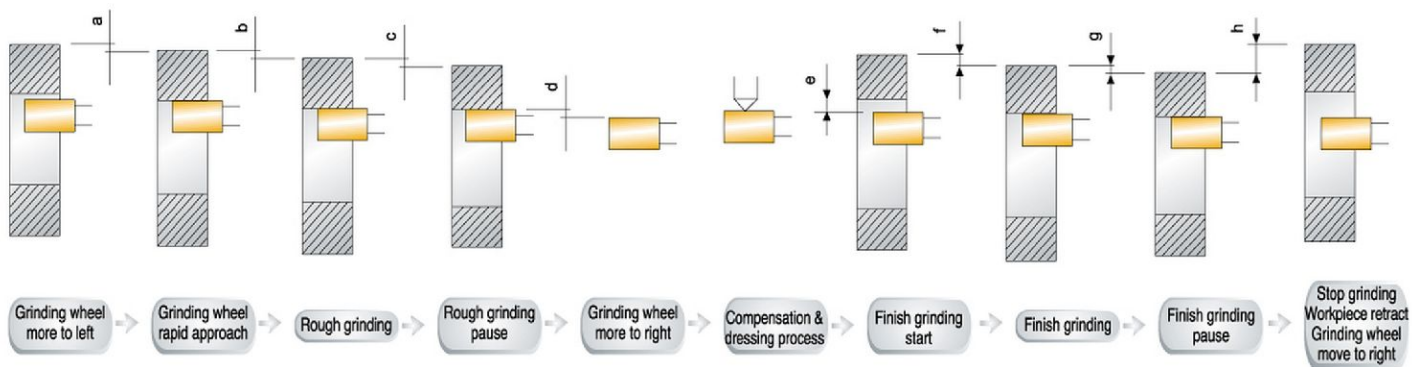
- Employs Japan Mitsubishi servomotor for feed drive.
- The conversational control provides variable speed setting and feed setting.



## Automatic Belt Tension Adjustment

- Belt tension is automatically controlled by the motor weight to ensure full power transmission at all times while avoiding belt loosening that can affect grinding quality.

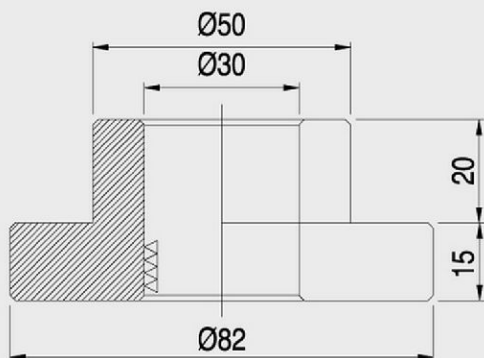
## Flow Chart for Auto Programmable Plunge Grinding Cycle



- a** Grinding wheel rapid approach
- b+c** Rough grinding
- d** Rough grinding pause
- e** Compensation & dressing process
- f+g** Finish grinding start > Finish grinding pause
- h** Stop grinding > Workpiece retract > Grinding wheel move to right

## Working Example

**Model** BUSH  
**Material** SCM415(JIS)  
**Dimensions** Ø82 x 35 x Ø30 mm  
**Stock removal** 0.25 mm / 60 Sec.  
**Hardness HRC** HRC 55±2°  
**Tolerance** 5 μm  
**Spindle speed** 20,000 r.p.m.  
**Roundness** 2 μm  
**Cylindricity** 3 μm

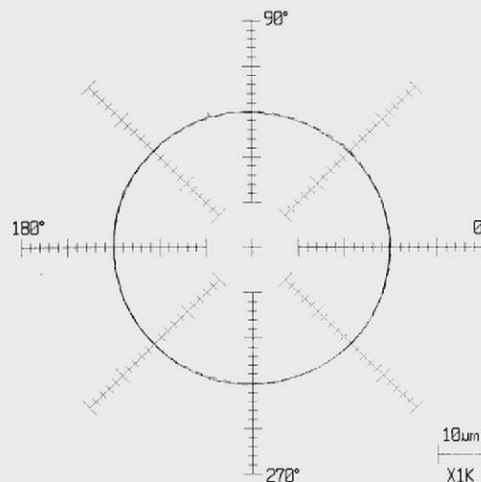


### 真円度

中心法 : MCC  
 フィルタ(N) : 50 山/回転  
 測定倍率 : 5K  
 無効角尺 :  
 ワーク名 :  
 日時 : 04.07.23 09:59  
 測定者 :  
 上限値 :  
 下限値 :

Z-POS.	P	V	MLA	E	A	Pc
[mm]	[μm]	[μm]	[μm]	[μm]	[DEG]	
A 69.9	0.3	-0.3	0.2	0.4	148°48'	3

P-P : 0.6 μm



ワーク名: NO\_NAME  
 コメント:  
 測定者: M. L. HSIANG

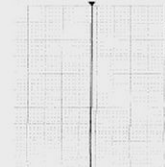
粗さ測定 (JIS' 94)

評価長さ = 2.500mm  
 測定速度 = 0.3m/s  
 カットオフ値 = 0.25mm  
 フィルタ種別 = ガウシアン  
 測定レンジ = ±40.0μm  
 傾斜補正 = R面  
 カットオフ比 = 無し

Ra = 0.103μm  
 Rmax = 1.022μm

<断面曲線>

表示縦倍率 = 50  
 表示横倍率 = 20  
 縦目盛 = 200μm / 10mm  
 横目盛 = 500μm / 10mm



<断面曲線>

表示縦倍率 = 50  
 表示横倍率 = 20  
 縦目盛 = 200μm / 10mm  
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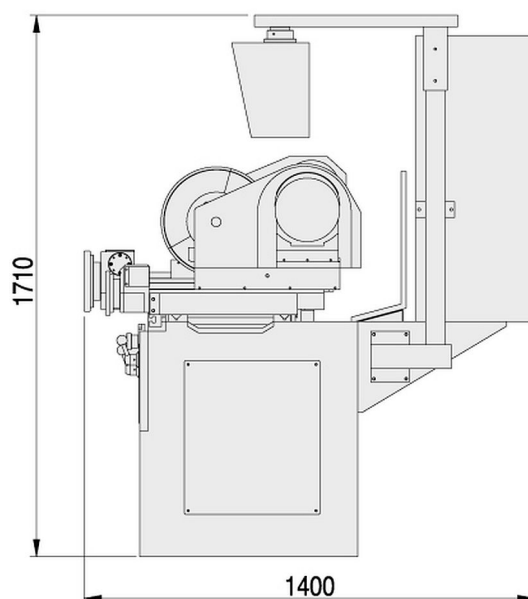
## Internal Grinding Spindles



The appropriate ratio of grinding hole and length should be 1:3, the maximum length extended over 150 mm is not permitted.

Grinding	Grease type	A	B	C	D	E	F	G	H	I	J	SW	Oil mist type	Grinding hold
Ø65 ~ Ø150	8,000rpm	42	16	Ø40 x 100 Ø40 x 85 Ø40 x 55	12	Ø12	Ø50	Ø58	M26 x 2P	Ø28	M8 x 1.25P	41		
Ø40 ~ Ø80	10,000rpm	29	14	Ø30 x 90 Ø25 x 70 Ø20 x 60	10	Ø10	Ø32	Ø38	M16 x 1.5P	Ø17	M8 x 1.25P	24		
Ø35 ~ Ø70	15,000rpm	29	14	Ø30 x 90 Ø25 x 70 Ø20 x 60	10	Ø10	Ø32	Ø38	M16 x 1.5P	Ø17	M8 x 1.25P	24	20,000rpm	Ø24 ~ Ø40
Ø24 ~ Ø40	20,000rpm	28	11	Ø24 x 80 Ø20 x 60 Ø16 x 40	8	Ø8	Ø26	Ø32	M14 x 1.5P	Ø15	M6 x 1.0P	19	30,000rpm	Ø15 ~ Ø25
Ø15 ~ Ø25	30,000rpm	21	9	Ø16 x 40 Ø13 x 30 Ø10 x 25	6	Ø6	Ø21	Ø26	M10 x 1.5P	Ø10.5	M4 x 0.7P	17	40,000rpm	Ø12 ~ Ø16
Ø12 ~ Ø16	40,000rpm	20	8	Ø12 x 35 Ø10 x 30 Ø8 x 25	x	x	Ø18	Ø23	M8 x 1.25P	Ø8.5	M4 x 0.7P	14	50,000rpm	Ø9 ~ Ø13
Ø9 ~ Ø13	50,000rpm	18	7	Ø8 x 30 Ø7 x 25 Ø6 x 20	x	x	Ø15	Ø20	M7 x 1P	Ø7.5	M4 x 0.7P	11	60,000rpm	Ø7 ~ Ø10
		13	6	Ø6.7x 25 Ø6 x 20 Ø5.7x 15	x	x	Ø11	Ø14	M5 x 0.8P	Ø5.5	M4 x 0.7P M3 x 0.5P	8	80,000rpm	Ø6 ~ Ø8

## Dimensions and Floor Occupation



## Machine Specifications:

MODEL	IG-150-NC
Grinding capacity	6~150 mm
Max. workpiece length	150 mm
Swivelling over table dia.	520 mm
Workhead cover swivelling dia.	320 mm
Max. table traverse	540 mm
Max. table feeding speed - Z-axis	7.2 m/min (Hydraulic/1Axis)
Spindle speed	0~550 RPM
X-axis feed speed	5 m/min
X-axis minimum travel unit	0.001 mm
Z-axis minimum travel unit	-
Workhead swivel	(Front) forward 8° (Back) backward 7°
Height from wheel spindle to floor	1060 mm
Capacity of hydraulic oil tank	60 L
Workhead motor	1 HP, 4P
Hydraulic pump	2 HP, 4P
Grinding wheel motor	2 HP, 2P
Cooling system motor	1/8 HP, 4P
Workhead slide feeding motor	400 W
Gross weight	2100 kgs

### STANDARD ACCESSORIES



Work lamp x 1 set  
(mounted on machine)



Standard coolant system x 1 set

### OPTIONAL ACCESSORIES



Magnetic coolant separator



Magnetic and paper filter



3-jaw scroll chuck



Hydraulic chuck

### STANDARD ACCESSORIES

NC control  
Hydraulic system  
Coolant system  
Diamond dresser  
Splash guard  
Belt tension auto. adjustment  
Leveling pad  
Tool box  
Grinding wheel spindle (alternative of 10,000 ~ 30,000 r.p.m.)

### OPTIONAL ACCESSORIES

Hydraulic 3-jaw chuck  
3-jaw scroll chuck  
Magnetic coolant separator  
Paper filter  
Face grinding attachment  
Wheelhead oil lubricator  
Spare G.W. spindle  
Oil cooler  
Rotary dresser  
Soft jaw machining device



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