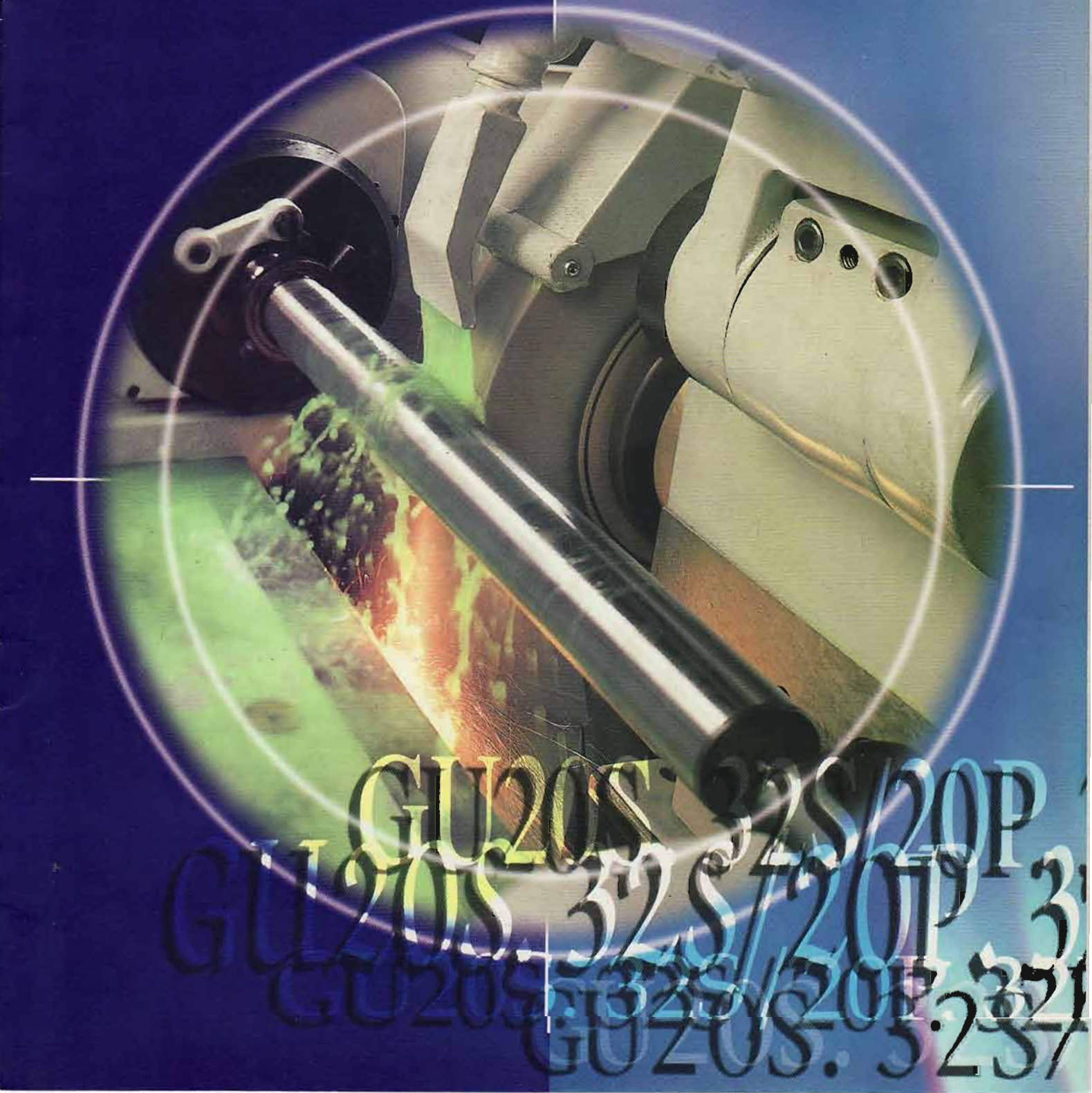
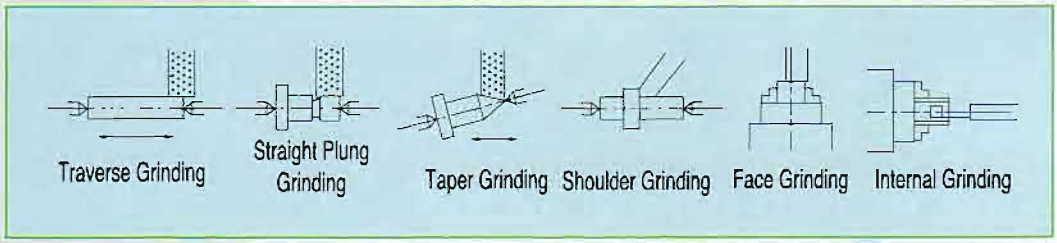
PARAGON

UNIVERSAL CYLINDRICAL GRINDING MACHINE

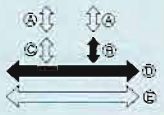


HERE'S VERSATILITY FOR JOBS LIKE THESE

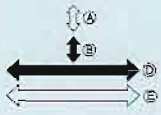
UNIVERSAL CYLINDRICAL GRINDER



Automatic feed



Manual feed



Ⓐ Wheelhead rapid advance feed

Ⓑ Wheelhead manual feed

Ⓒ Wheelhead automatic feed

Ⓓ Table manual feed

Ⓔ Table hydraulic feed

MAX. DISTANCE BETWEEN CENTERS

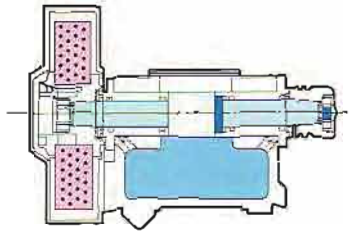
350mm(14)	model GU20X35
500mm(20)	model GU32X50
750mm(30)	model GU32X75
1,000mm(40)	model GU32X100

GU32 x 50P

With PARAGON HYDROSTATIC BEARING you get.....

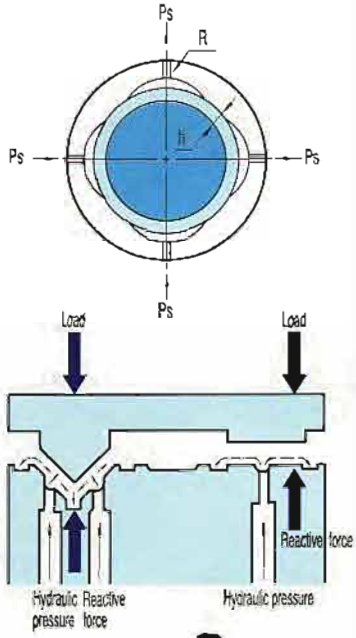
GUARANTEED LONGER LIFE

PEERLESS GRINDING RESULTS



Unique "PARAGON" hydrostatic bearing

The grinding wheel spindle is equipped with unique "PARAGON" hydrostatic bearing which has been successfully developed for years. The hydrostatic bearing not only has the same features as the hydrodynamic bearing but also has the following outstanding features: no metal-to-metal friction, no overheat and no oil leakage as no oil seal is used. It makes spindle run very smooth, light, high accuracy and long lasting etc.



Hydrostatic lubrication on slideways

Hydrostatic lubrication on wheelhead and table slideways ensures consistently accuracy.

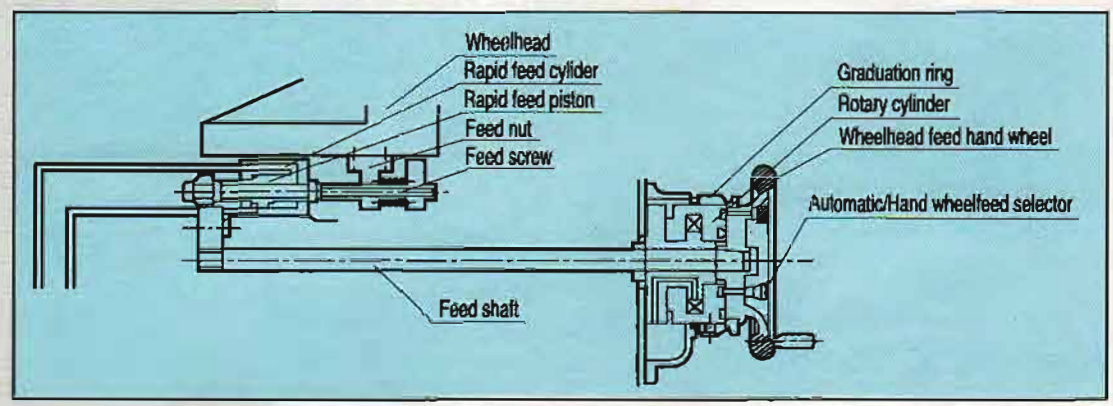
GU20 x 35P

DIFFERENCE BETWEEN P AND S MODELS

■MODEL: P

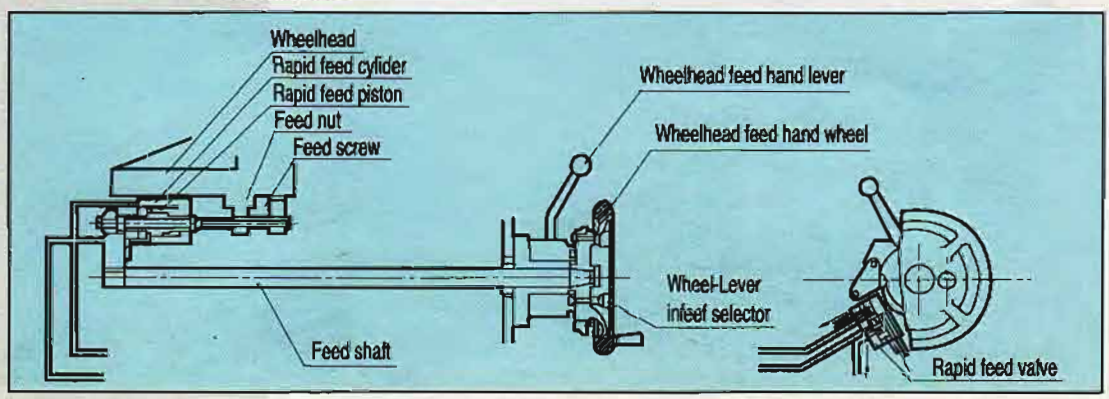
This machine provides complete feed mechanism by power or by hand for fine accuracy. Every control and operating feature is designed for maximum simplicity and safety.

- HYDRAULIC RAPID ADVANCE AND RETRACTION with cushioning at stroke end, actuated by pushbuttons, provides time saving and safe working area to load and unload the components.
- AUTOMATIC INTERMITTENT INFEED is effective for diameter reduction from 0.0025 mm to 0.04mm (0.0001 in to 0.0016 in) in traverse grinding, and its position is selective at right only, left only or both ends.
- MANUAL WHEEL FEED is included to adjust position of wheelhead for initial setup and stock variations.
- HANDWHEEL INFEED with positive stop is effective for handy plunge grinding in small lot production.
- AUTOMATIC INFEED with positive stop is effective for effortless continuous plunge grinding, in conjunction with electronic spark-out timer.



■MODEL: S

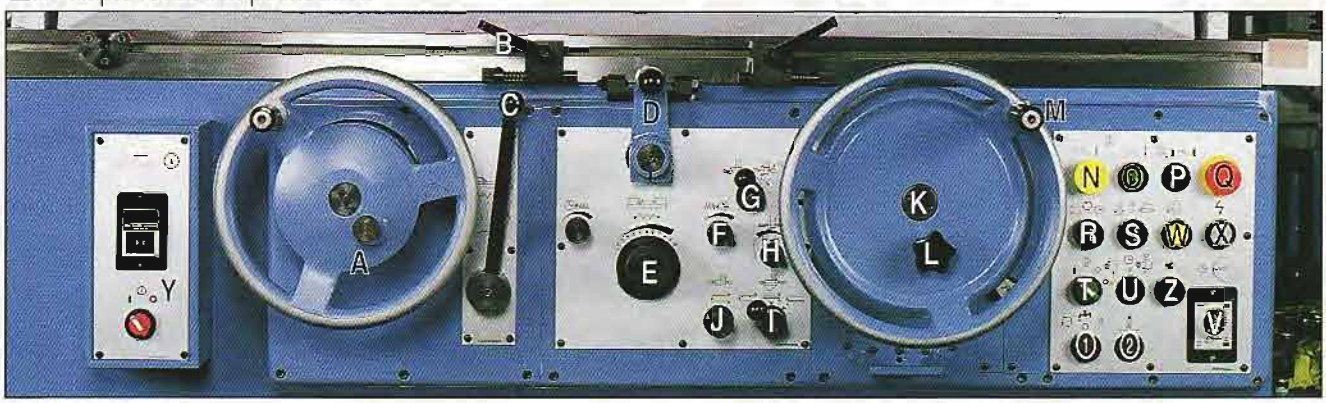
This machine provides: Manual wheel feed/Hydraulic rapid advance and retraction by handlever/Handlever infeed with positive stop for handy plunge grinding/Hand ratchet infeed for traverse grinding.



CENTRALLY GROUPED CONTROLS FOR CONVENIENT SETUP AND OPERATION

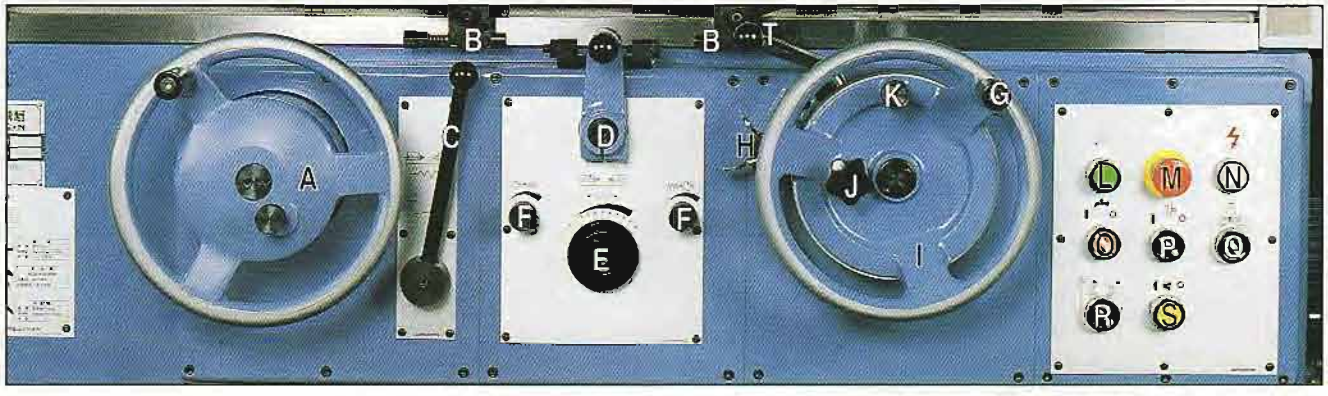
MODEL: P

- A. Table feed handwheel
- B. Table-traverse reversing dogs
- C. Hydraulic/Hand table feed selector lever
- D. Table-traverse reversing lever
- E. Hydraulic table feedrate control knob
- F. Tarry time controll knobs
- G. Rough feedrate control knob (also used as Plungs/Traverse cycle selector)
- H. Fine feed slow
- I. Intermittent infeed position control knob
- J. Intermittent infeed amount control knob
- K. Wheelhead feed handwheel
- L. Automatic/Hand wheelfeed selector
- M. Graduation ring clamper
- N. Rapid retraction pushbutton
- O. Rapid advance pushbutton
- P. O.D./I.D. Selector
- Q. Emergency stop
- R. Auto. cycle selector
- S. Plunge/Traverse cycle selector
- T. Work rotation start/stop selector
- U. In-process gauge selector (option)
- V. Electronic spark-out-timer (for plunge grinding)
- W. O.D./I.D. Grinding "start" pushbutton
- X. Power lamp
- Y. Electronic spark-out-timer (for traverse grinding)
- Z. Hydraluc on/off
- ❶ Coolant on/off
- ❷ G.W. Dressing device (option)



MODEL: S

- A. Table feed handwheel
- B. Table-traverse reversing dog
- C. Hydraulic/Hand table feed selector lever
- D. Table-traverse reversing lever
- E. Hydraulic table feedrate control knob
- F. Tarry time control knobs
- G. Wheelhead feed handlever
- H. Microfeed lever
- I. Wheelhead feed handwheel
- J. Handwheel/Handlever infeed selector
- K. Graduation ring clamper
- L. G.W. "start" pushbutton
- M. Emergency stop
- N. Power Lamp
- O. Coolant on/off
- P. Work spindle rotation on/off
- Q. G.W.Dressing (option)
- R. I.D./O.D. Grinding selector
- S. Hydraulic on/off
- T. Rapid feed selector



VERSATILE OPERATION

• STRAIGHT PLUNGE GRINDING

Automatic infeed allows good results in small lot production, inconjuction with electronic spark-out timer supplied as standard accessory.
Fine combination of automatic dual infeed and automatic 2-step in process gauging, available at extra price, offers the best production rate and grinding results in large lot production.

• TRAVERSE GRINDING

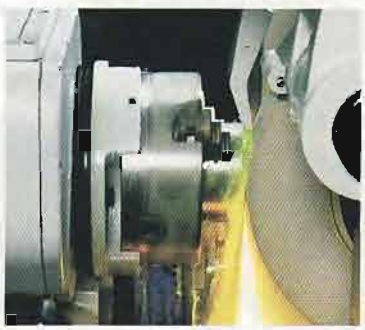
Automatic intermittent infeed and hydraulic table-traverse permit to get efficient traverse grinding jobs.

• SHOULDER GRINDING

Grinding diameter and adjacent shoulder on a component held between centers in a single infeed. With a reversible wheel guard and drives, an grinding wheel can be mounted on the right side of wheelhead set in angular position.

• FACE GRINDING

Grinding a face with workhead set at 90 degrees from an ordinary position. a combination live and dead spindle permits an easily-changed chuck working.



• TAPER GRINDING

Grinding a tapered component held between centers or by chuck. Table is easily swiveled for this operation. Tapers beyond capacity of swivel table can be ground with a compound swivel feature of table and wheelhead.

• INTERNAL GRINDING

Grinding an internal diameter with a hinged type internal grinding attachment, available at extra price, permitting a fast grinding action. Internal grinding spindle is quickly swung down into a grinding position.

FEATURES

WHEELHEAD RIGIDLY CONSTRUCTED FOR EASY SETUP AND FINE FINISH

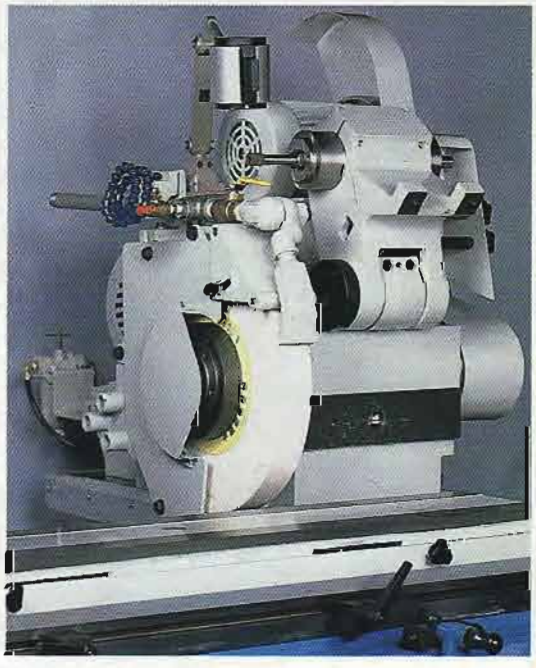
Wheelhead is composed of two sections a sub-slide mounted on the Vee and flat shaped, pressure-lubricated slideways of a fixed base-a swiveling wheelhead body supported on the sub-slide. Swiveling feature ranged from 0 to 30 degrees toward workhead or footstock assures angular setting, and graduations provided at the rear side help quick and easy setup.

Grinding wheel and guard can be mounted at the right side of the wheelhead for angular grinding.

Wheelhead body can be moved back manually by 95mm(3.7 in), providing an extra capacity for large diameter commponent for internal grinding.

Grinding wheel spindle, set in BEARING, is driven through vee-shaped belts by a powerful (5 hp) motor. Two grinding wheel speeds can be obtained by means of pulley change, permitting selection of suitable surface speed for wheel diameter from 355mm (14 in) to 220mm(8.7 in). The minimum grinding wheel can grind component of diameter more than 20mm (0.79 in).

WHEELHEAD WITH PRECISION C1 GRADE BALL SCREW TO ACHIEVE HIGH ACCURACY



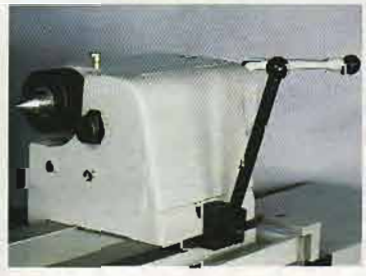
FEATURES

SOLID UNIVERSAL WORKHEAD

- Precisely aligned workhead providing the solid support to assure accurate grinding results in various operations.
- Graduated swivel base for easy swiveling up to 90°toward wheelhead and up to 30° away from wheelhead.
- Dynamically balanced motor to deliver adequate power for various work diameters at all speeds.
- Workhead spindle speed 10-250RPM controlled by inverter
- Automatic start-stop control in conjunction with automatic advance-retraction of wheelhead.
- Work inching by pushbutton to assure easy checking of component mounted between centers or on chuck.
- Combination live and dead spindle providing quick exchangeability from centerto chuck operation or vice versa.

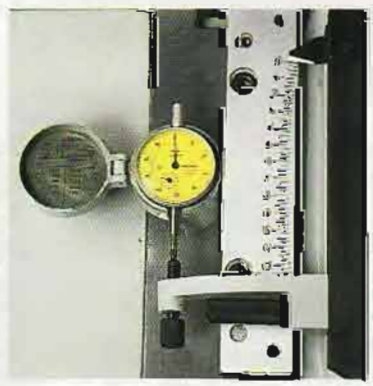
QUICK-ACTING FOOTSTOCK

- Precisely aligned footstock providing the solid support to assure accurate grinding results.
- Precision axial movement of center in the precisely machined sleeve.
- Lever-clamping for quick movement of footstock to the desired position along table.
- Quick-acting retraction of center by a spring-loaded lever.
  Spindle can be locked at fully retracted position, so it does not readvance unexpectedly.
- Sensitive adjustment of center position by screw at the rear end of the footstock.
- Spring-tension adjustment by screw to get suitable center pressure for the component.
- Double protection by covers and bellows against intrusion of coolant or dust.



SWIVEL TABLE AND SLIDE TABLE

Structually rigid swivel table is arranged to swivel in counterclockwise directions by a crew-adjustment at the left end ofthe table. A graduated scale on the end ofthe slide table is calibrated in degree for approximate angular setting. A dial indicator attachment is effective for fineangular setting or taper correction in 0.01 mm or in 0.001 inch divisions. Hydraulic traverse speed is adjustable in range of 50 thru 4,000mm (2 thru 157 in) per minute, and its traverse stroke is also adjustable by positioning two dogs. Tarry time is independently adjustable at each stroke end. Both smooth reversal and fine reciprocation of min. 3 mm (0.12 in) allow oscillation grinding.



SERVICEABLY LOCATED HYDRAULIC EQUIPMENT

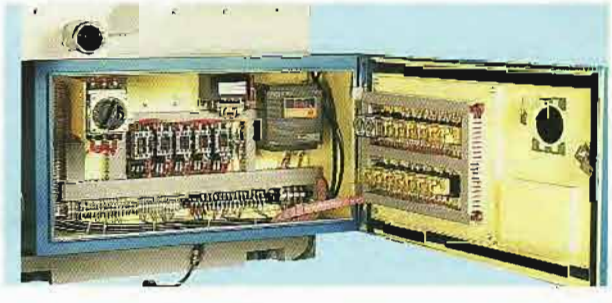
Hydraulic mechanism is carefully designed to provide instant accessibility for simplified adjustment and maintenance. Convenient grouping of motor-driven duplex pump, filters, relief valves, solenoid valves, pressure gauges permits easy simplification of service actions. Two detachable side covers of tank permit easy cleaning of oil, and level of oil is indicated by a sight gauge. Isolated location of the power unit eliminates possibility of vibration and thermal distortion to the machine alignments.

COMPLETE COOLANT SUPPLY EQUIPMENT

Coolant is supplied by a motor-drivenpump mounted on a separate coolant tankof 150 liters (39.6 u.s. gals.), and is dischargedfrom the bed into the tank.Isolated location of the tank is ready foreasy cleaning and replacing. In additionton the manually operated cock-lever operation, coolant flows and stops automatically according to the advance andretraction of wheelhead. Magnetic coolant separator is availableat estra price, to automatically remove all metallic chips and abrasive particles and to obtain better surface finish.

RELIABLE ELECTRICAL CONTROLS

Electrical control panel, adopting water-proof switches, is built in the apron ofthe machine. This arrangement assureseasy, safe and efficient operation.Electrical control box with no-fusebreaker is fitted to rear left side of themachine, and it permits prompt operationonly by connecting the power source toits primary terminal after installation. All motors, totally-endclosed fan-cooled type or totally-enclosed type, have been taken into account of static and dynamic balances and other quality.



STANDARD ACCESSORIES
OPTIONAL ACCESSORIES

■ STANDARD ACCESSORIES

1. Grinding wheel with flange.	1 set
2. Hydraulic tank with pump.	1 set
3. Table mounted type diamond tool holder, without diamond tool.	1 set
4. Spanner, screw-drivers, etc.	1 set
5. Carbide-tipped work centers Morse Taper No. 4 or No.3.	2 pcs
6. Coolant equipment.	1 set
7. Standard Electric equipment.	1 set

■ OPTIONAL ACCESSORIES

1. Diamond tool holder with micrometric feed, table-mounted type, without diamond tool.
2. Diamond tool holder, footstock-mounted type, without diamond tool.
3. Diamond tool holder for external and internal grinding wheel, table-mounted type, without diamond tool.
4. Angular turing attachment, turing angle 0 thru 90° , table-mounted type, without diamond tool.
5. Radius truing attchment, truing radius 0 thru 15mm(0 thru 0.6 in), table-mounted type, without diamond tool.
6. Cam-locked type work driving dog: 10,20,30,40,50,60mm dia. 6 pcs/set. (0.4, 0.8, 1.2, 1.6, 2.0, 2.4 in dia.)
7. Work holder, table-mounted type, 2 pcs/set, 10 thru120mm (0.4 to 4.8 in) dia. capacity.
8. Adjustable 2-point steady rest, table-mounted type, 10 thru 100 mm (0.4 to 4.0 in) dia. capacity.
9. Independent 4-jaw chuck, 200mm (8 in) dia., (100mm, 4" dia-for GU20) with reversible jaws and adaptor to spindle nose.
10. Adjustable 3-jaw scroll chuck, 178mm (7 in) dia., (100mm,4" dia. for GU20), with reversible jaws and adaptor to spindle nose.
11. Magnetic coolant separator.
12. Paper filter.
13. Balancing stand and arbor.
14. Internal grinding attachment.
15. Automatic In-Process gauge.
16. Hydraulic wheel forming attachment. (mounted on wheelhead)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12

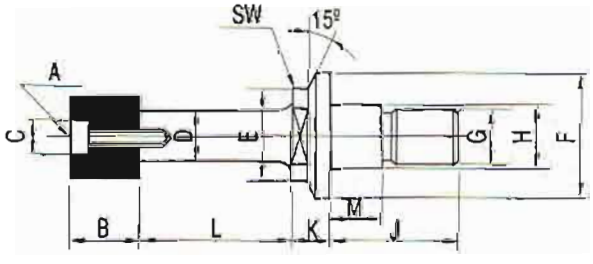
HINGED TYPE INTERNAL GRINDING ATTACHMENT(available at extra cost)

HINGED TYPE INTERNALGRINDING ATTACHMENT

Wheelhead-mounted, hinged type internal grinding attachment assures minimum setup and quick grinding action. This rigid bracket can be swung down into the grinding position and solidly clamped to the hand-scraped level by a clamping bolt.This simple method allows grinding of both external and internal diameters in a single chucking with perfect concentricity. Tapered hole can be ground by swiveling either workhead or table. Internal grinding spindle is driven through an endless flat belt by its own 0.75 kw (1 hp) motor, and rotation of the spindle can be stopped whenever desired. Safety device prevents unexpected retraction of wheel-head while internal grinding operation. Automatic coolant flow control is built in for convenient internal grinding operation.

INTERNAL GRINDING SPINDLES

A wide selection of spindles, quills and wheels covers the generally useful job-range and assures optimum performance on internal grinding operations.

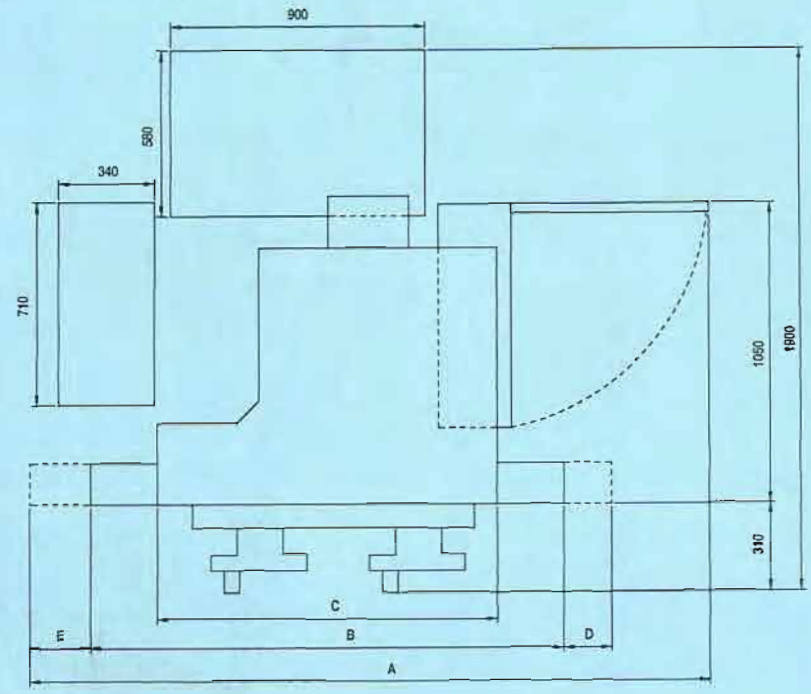


Type	A	B	C	D	L	E	F	G	H	J	K	SW	M
1. GREESE-PACKED 10,000 RPM	M8	10	10	18 22 25	50 80 70	32	38	M16X1.5	17	29	15	24	12
2. GREESE- PACKED 20,000 RPM	M6	8	8	15 18 22	30 50 80	24	32	M14X1.5	15	27	10.5	19	11
3. GREESE-PACKED 30,000 RPM	M4	8	6	10 12 16	25 30 40	21	26	M10X1.5	10.5	21	9.5	17	9
4. GREESE-PACKED 40,000 RPM	M4	X	X	8 10 12	25 30 40	17	23	M18X1.25	8.5	19	8.5	14	7
5. GREESE-PACKED 50,000 RPM	M4	X	X	6 7 8	20 25 30	15	20	M7X1.0	7.5	18	7	11	7

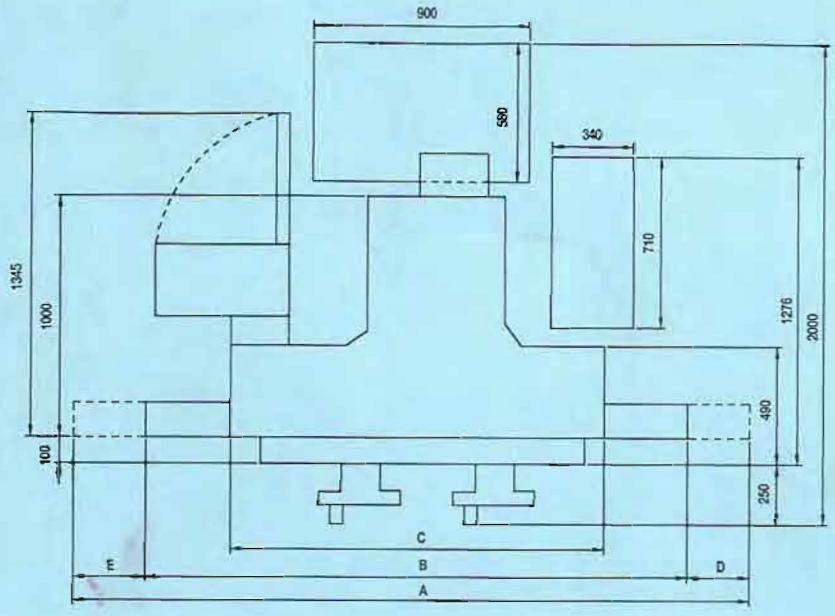
■ SPECIFICATIONS:

		P				S			
		20x35	32x50	32x75	32x100	20x35	32x50	32x75	32x100
GENERAL									
Max. distance between centers	mm(in)	350(14)	500(20)	750(30)	1000(40)	350(14)	500(20)	750(30)	1000(40)
Max. swing over table	mm(in)	200(8.0)	320(12.6)			200(8.0)	320(12.6)		
Max. diameter of component to be ground with full size wheel	mm(in)	160(6.3)	280(11)			160(6.3)	280(11)		
Max. load held between centers	kg(lb)	60(132)	150(330)			60(132)	150(330)		
WHEELHEAD									
Swiveling angle (toward workhead-toward footstock)	degree		±30°				±30°		
Total stroke	mm(in)	160(6.30)	295(11.6)			160(6.30)	295(11.6)		
Handwheel feed stroke	mm(in)	135(5.30)	160(6.3)			135(5.30)	160(6.3)		
Additional stroke by sliding on sub-slide base	mm(in)	95(3.70) (Total stroke 295)							
Automatic rapid feed stroke	mm(in)	25(1.0)	40(1.6)			25(1.0)	40(1.6)		
Automatic intermittent infeed amount (infinitely variable)	mm(in)	0.00125-0.03 (0.00005-0.0012)	0.0025-0.04(0.0001-0.0016)						
Automatic infeed stroke, with positive stop	mm(in)	0.08 (0-0.0315)							
Handlever infeed stroke, with positive stop	mm(in)					0-0.35 (0-0.0138)			
Movement per graduation of handwheel	mm(in)	0.0025(0.0001)							
Movement per turn of handwheel	mm(in)	1.0(0.04)							
GRINDING WHEEL									
Diameter ×Width ×Hole	mm(in)	305x38x127(12x1.5x5)	355x56x127(14x2x5)			305x38x127(12x1.5x5)	355x56x127(14x2x5)		
Wheel speed (Pulley change)	rpm	2,085 / 2,495	1,790/2,195			2,085 / 2,495	1,790/2,195		
TABLE									
Swiveling angle (counterclockwise)	degree	12.5	12.5	12	10	12.5	12.5	12	10
Traverse speed (infinitely variable)	mm/min (in/min.)	50-4,000(2-157)							
Min. automatic reciprocating stroke	mm(in)	5(0.2)							
Movement per turn of handwheel	mm(in)	20(0.78)							
WORKHEAD									
Swiveling angle (counterclockwise-clockwise)	degree	90-30							
Center taper, Morse Taper	No.	3	4			3	4		
Spindle hole diameter	mm(in)	12(0.47)	20(0.78)			12(0.47)	20(0.78)		
Spindle speed	rpm	100-500(4 steps)	10-250 (INVERTER 1HP)			100-500(4 steps)	10-250 (INVERTER 1HP)		
FOOTSTOCK									
Center taper, Morse Taper	No.	3	4			3	4		
Max. retracting stroke of center	mm(in)	25(1)							
ELECTRIC MOTOR									
For wheel drive	(hp)	3HP 4P	5HP 4P			3HP 4P	5HP 4P		
For work drive	(hp)	1/4HP 6P	1HP 4P			1/4HP 6P	1HP 4P		
For hydraulic oil pump drive	(hp)	1HP 4P							
For lubricating oil pump drive, wheel spindle bearings	(hp)	1/4HP 2P							
For coolant pump drive	(hp)		1/4HP 2P				1/4HP 2P		
For internal grinding	(hp)	1/4HP 2P	1HP 2P			1/4HP 2P	1HP 2P		
TANK CAPACITY									
For hydraulic and lubricating oil	l(u.s.gal)	65 (17.2)							
For lubricating oil, wheel spindle bearings	l(u.s.gal)	12 (3.2)							
For coolant fluid	l(u.s.gal)	150 (390.6)							
NET WEIGHT	kg	1,400	2,300	2,700	3,100	1,400	2,300	2,700	3,100

GU 20 X 35 LAY-OUT



GU 32 LAY-OUT



	A	B	C	D	E
GU20X35	2400	1670	1200	170	215
GU32X50	2810	2260	1555	275	275
GU32X75	3665	2865	2020	400	400
GU32X100	4630	3580	2475	525	525

EXCELLENT TECHNOLOGY DELICATED PRODUCTS

PARAGON

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