

JENA

TEC

Spindle CATALOGUE

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INTRODUCTION

JENA

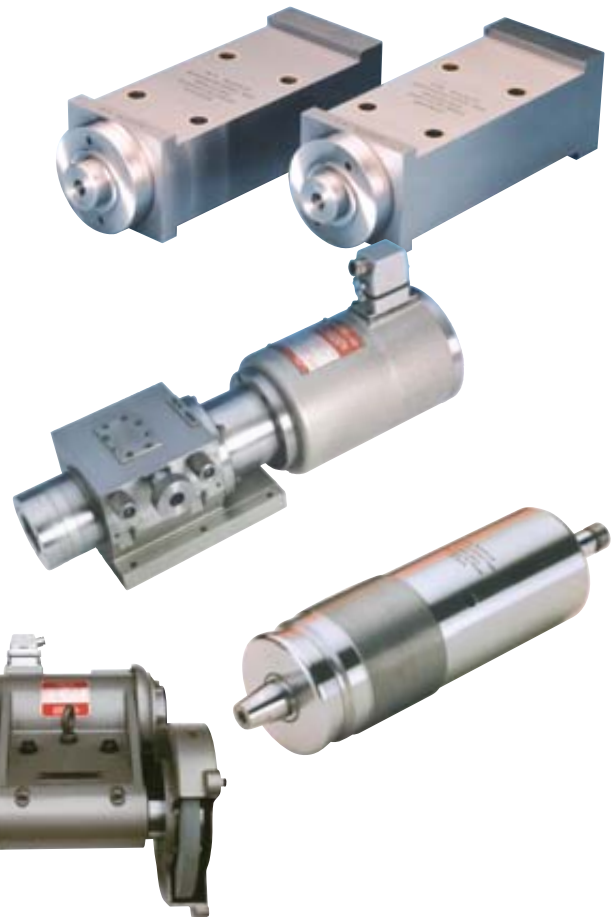


TEC



Manufacturing plant - UK

Manufactured to the highest engineering standards within the new *Jena rotary technology centre* - B&T Spindles are suited to a wide range of applications, including machines for BORING, TURNING, GRINDING, MILLING and DRILLING etc. This PDF catalogue provides details on the broad range of B&T spindle solutions - customised spindles can be produced for most special purpose applications and machines not listed.



Incorporating:
BONEHAM PRECISION SPINDLES
BONEHAM & TURNER SPINDLES

B&T[®]
SPINDLES



HIGH FREQUENCY SPINDLES - OVERVIEW

VOLTAGE AND SPEED

High Frequency Spindles use the rule that the speed of an AC Induction motor is proportional to the frequency of the electric supply. So, on a 2-pole motor, a 50Hz supply will give a synchronous speed of 3000 rpm and increasing the supply frequency to 100Hz will give a synchronous speed of 6000 rpm. The variation in frequency is most commonly obtained from a Static Frequency Inverter which also allows control of the voltage of the supply to the motor. The voltage/frequency ratio together with the design of the motor windings is critical to the performance characteristics of the system. Thus, a spindle required to operate with adequate power over a speed range might differ in design from a spindle running at a constant high speed where compact dimensions and ultimate power are the main considerations. High rotational speeds may impose limits on bearing dimensions and load carrying capacity. Jena Rotary Technology High Frequency Spindles are fitted with high precision angular contact ball bearings chosen and arranged for optimum performance. Hybrid bearings with ceramic balls are used if the specification demands.

LUBRICATION

The lubrication system is chosen to suit the application of the spindle. Grease lubrication is simple, clean and efficient but to achieve the highest speeds an oil/air system is necessary. The low pressure air used to convey the oil through the spindle also helps prevent contaminants entering. Air purge can usually be added to a grease lubricated spindle to give similar protection.

See Diagram - Lubrication - page 8

COOLING

Thermal movements on the spindle from motor generated heat can be minimised by surrounding the motor portion with a water jacket. Water circulation may be sourced from a large storage tank having stable temperature conditions or from a compact chiller and pump unit. Inverter Drive, Lubricator, Air Purge and Chiller can be supplied as separate units or in any combination assembled as a spindle supply system.

See Diagram - Cooling - page 9

All spindles are specifically constructed to match requirements and many options and accessories are available. They are generally fitted with permanent magnet (cold rotor) water cooled brushless spindle servomotors giving compact design with very high torque and wide speed range for rated power output as well as positioning capability for tool changing. Manual, or in most cases, power drawbars are available to suit SK30, SK40, or SK50 size tool holders. For higher speed HSK tapers to DIN69893 in sizes 32, 40, 50 and 63 are available. The maximum speed of a spindle depends on many factors so the table is to be used as a guide only and the total specification has to be known for reliable prediction of attainable power and speed characteristics.

SERVICE MODULE

These spindles can be supplied with a Service Module.

See Diagram - Service Module - page 10

SERVICE MODULE INCLUDES:

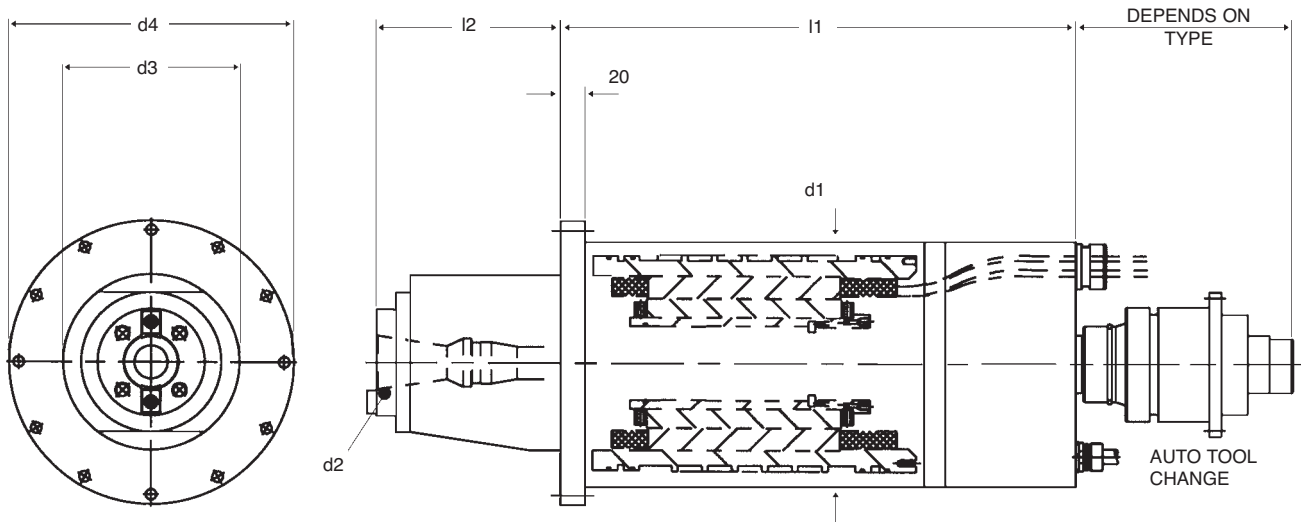
- Inverter Drive for Motor.
- Air supply for sealing front of spindle.
- Cooling Water Chiller.
- Bearing Lubricator Unit if oil and not grease is selected for lubrication.

Optionally it can also include:

- Hydraulic power supply for power drawbar.
- Sensors, fitted to monitor coolant flow, lubricant level, air and oil pressures on systems chosen.

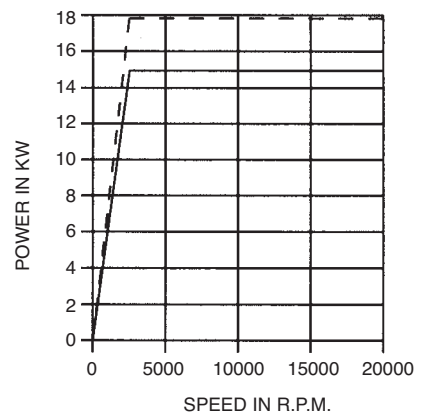
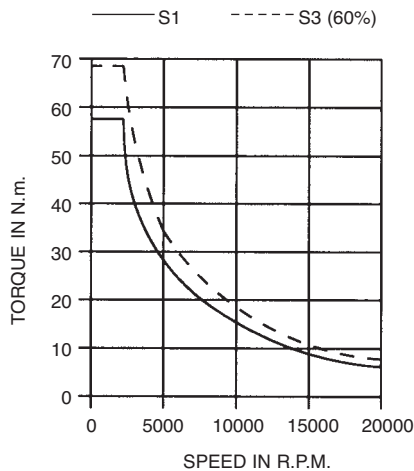
See Schematic - Typical arrangement - 11

STANDARD HIGH FREQUENCY SPINDLES - MILLING / DRILLING / ROUTING

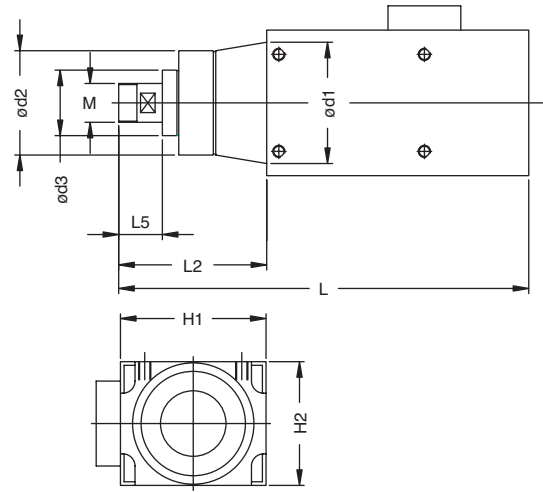
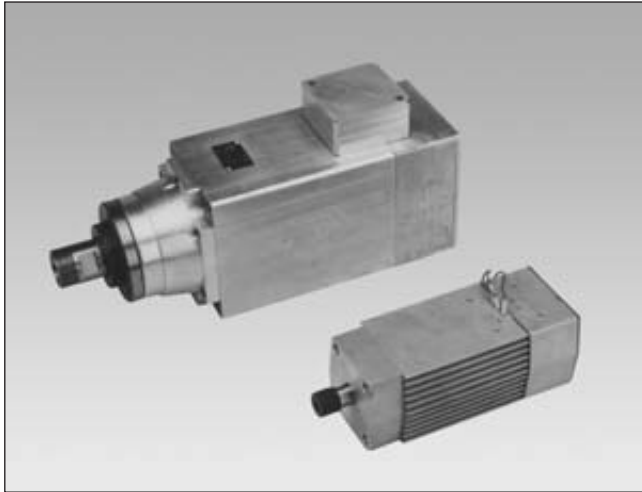


Spindle	Max Speed r.p.m.		Power (KW)		d1	d3	d4	l1	l2	NOSE d2	
	oil	grease	S1	S3							
HF835	24,000	18,000	4.5	5.5	170	135	205	195	90	SK30	HSK32
HF836	24,000	18,000	10	12	170	135	205	245	90	SK30	HSK40
HF827	18,000	15,000	10	12	215	150	240	360	120	SK40	HSK40
HF826	18,000	15,000	16	20	215	150	240	360	120	SK40	HSK50
HF833	20,000	15,000	15	18	215	150	240	420	120	SK40	HSK63
HF837	12,000	10,000	18	-	320	190	370	500	180	SK50	HSK63
HF838	12,000	10,000	30	-	320	190	370	650	200	SK50	HSK63

Typical Power Characteristics
Example HF833

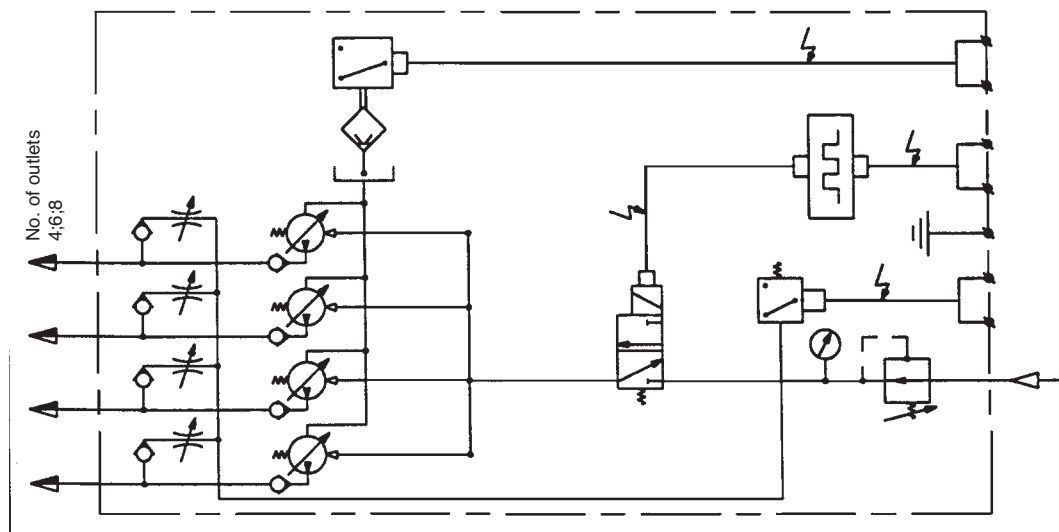
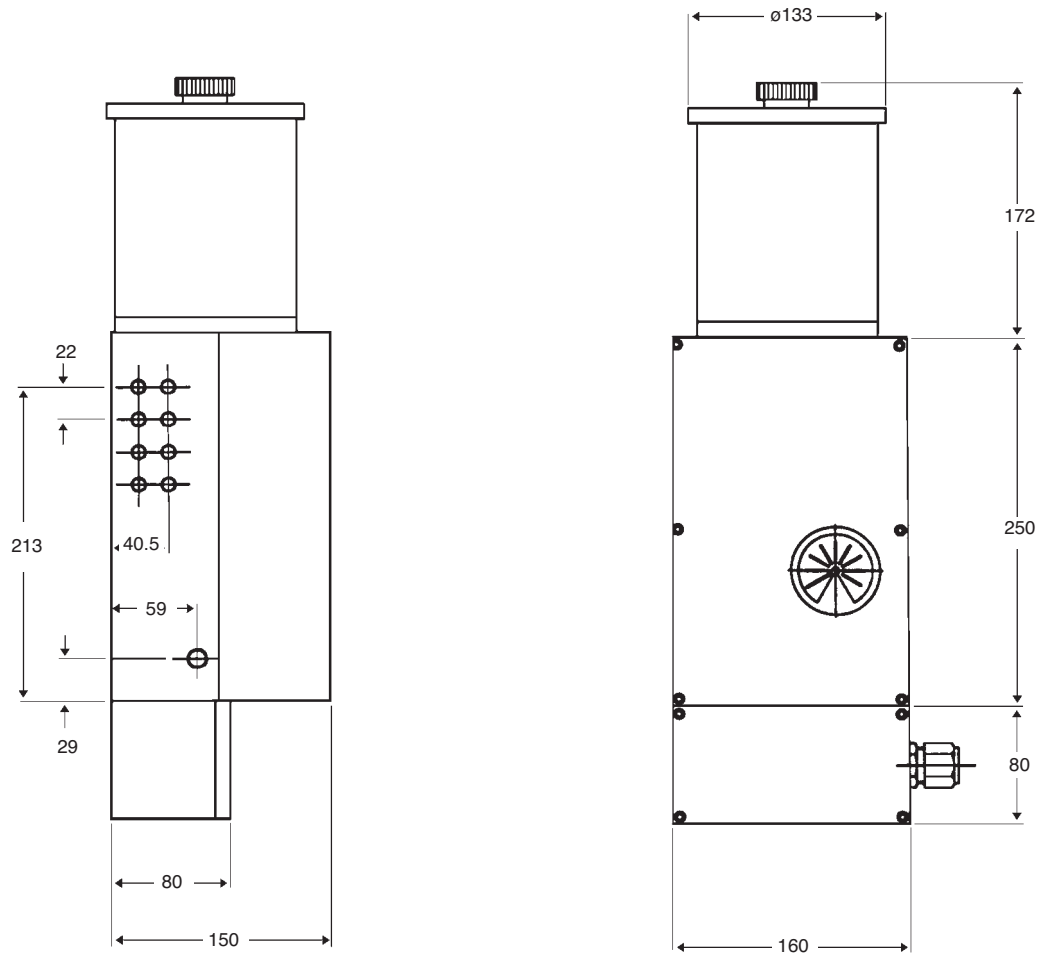


HIGH FREQUENCY SPINDLES - WOODWORKING



Spindle type	Speed (r/min)	Motor				Dimensions (mm)									
		KW	V	A	Hz	H1	H2	d1	d2	d3	M	L	L2	L5	
YM60 - 18 / 3.37	18000	3.37	380	7.1	300	120	102	100	86	54	M32 x 1.5	338	122	36	
MZ40 - 12 / 0.12	12000	0.12	220	5.5	200	74	80	49		20	M19 x 1	200	30	15	
MZ40 - 24 / 0.25	24000	0.25	220	1	400	74	80	49		20	M19 x 1	200	30	15	
MZ40 - 24 / 0.7	24000	0.7	220	2	334	74	80	49		20	M19 x 1	240	30	15	
MDJ14 - 7 / 2.5	7000	2.5	380	6.6	118	142	142	110		40	M30 x 2	479	215	60	
MZJ14 - 7 / 4	7000	4	380	10	233	142	142	110		40	M30 x 2	500	215	60	
YJ60 - 12 / 1.5	12000	1.5	380	3.5	200	120	102	100	92	23	M14	335	105	65	

OIL/AIR LUBRICATION



Electrically controlled Oil-air pump set.

Application: Min. oil lubrication. Continuous bearing lubrication for high-speed spindles.

Compact construction.

Continuous oil flow.

Technical data: Air pressure (inlet): 2.5 - 6.0 (bars)

Tank volume: 1.5(l)

Temperature range: 0-50°C

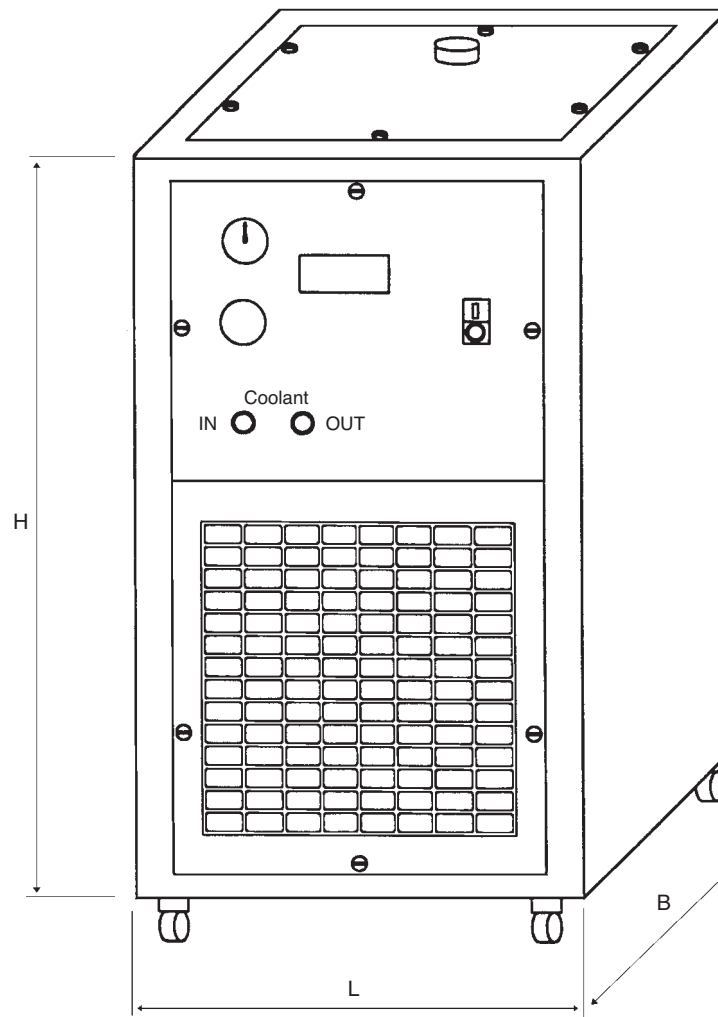
COOLING

Jena Rotary Technology supply refrigerated process coolers for dispersal of heat from the motor & bearings.

These coolers use FCKW free refrigerant.

Coolant temperature is maintained at 20°/21°C.

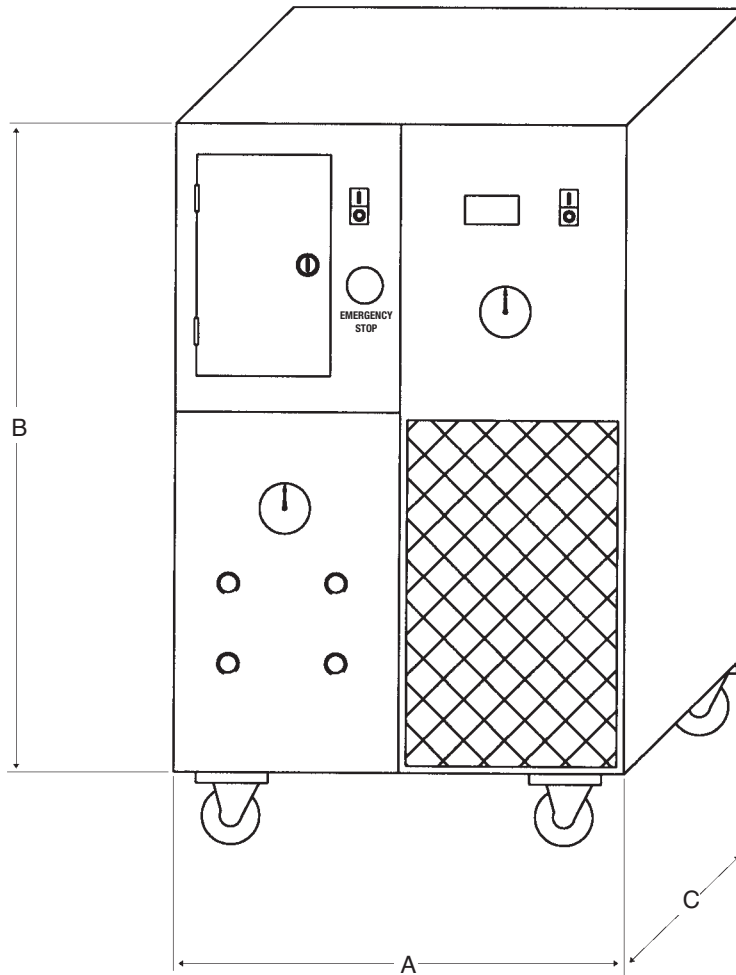
These units are acceptable in environments where temperatures vary from +10°/+40°C.



Type	Cooling Capacity (Kw)	Tank Capacity (l)	For Spindle Power (Kw) S6-40%	Supply Voltage	Dimensions L x B x H (mm)
CM10	1.25	10	8	230V-1PH-50HZ	351 x 400 x 717
CP15	1.60	10	11	230V-1PH-50HZ	400 x 460 x 745
CP20	2.40	10	15	230V-1PH-50HZ	400 x 460 x 745
CP30	3.40	40	20	230V-1PH-50HZ	500 x 650 x 767
CP50	5.60	100	30	400V-3PH-50HZ	650 x 840 x 965

SPINDLE SERVICE MODULE

Included:- Inverter, Chiller, Air supply for Spindle nose sealing. .
 Extra (to be specified):- Oil/Air Lubrication. Power Unit for Autochange Drawbar.



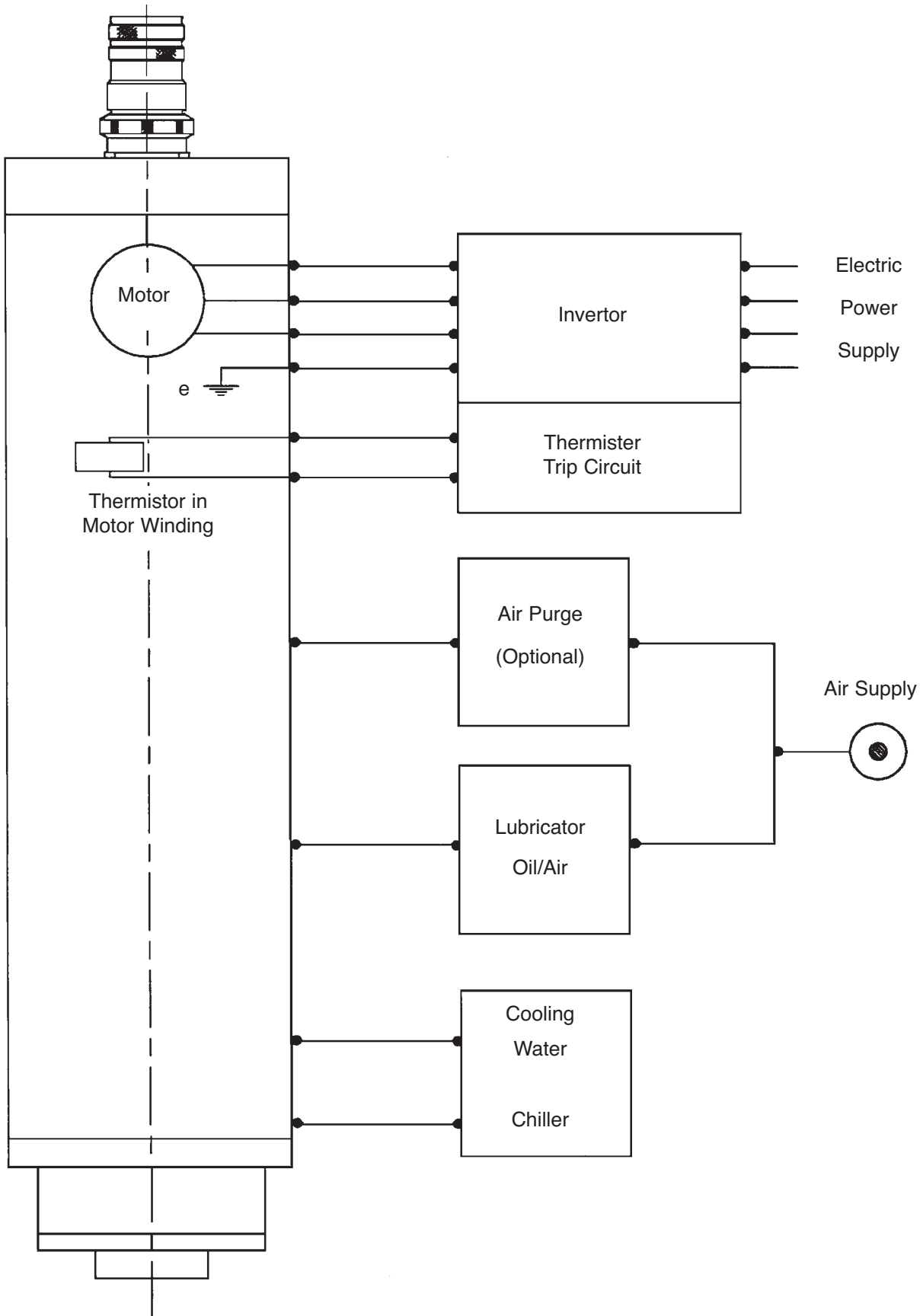
Basic Sizes

Dimensions in mms

Spindle Power Max. kW	Chiller litre/min	a	b	c
8	3	1250	1800	650
15	8	1250	1800	800
22	18	1500	2000	1000
30	25	1500	2000	1000

HIGH FREQUENCY SPINDLE / SPINDLE SERVICES - MILLING

Typical arrangement



MOTORISED SPINDLES - OVERVIEW

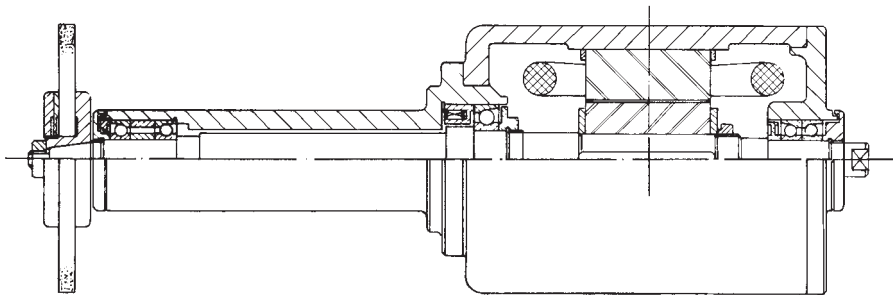
This type of spindle has a synchronous speed motor built direct onto the spindle shaft thus forming a complete self contained unit which is carefully balanced to remove all traces of vibration. All driving complications are eliminated and the unit can be made very compact. The spindles are fitted with super precision pre-loaded angular contact ball bearings.

This type of spindle is put into many uses including, surface, slideway, cutter, broach and form grinding etc. Spindles can be supplied to run horizontally, vertically or at any angle in the event of heavy coolant requirements special design considerations need to be incorporated. We require full details of the applications with your enquiry.

Motorised spindles can be supplied to operate at any of the common voltages listed below and others to specification.

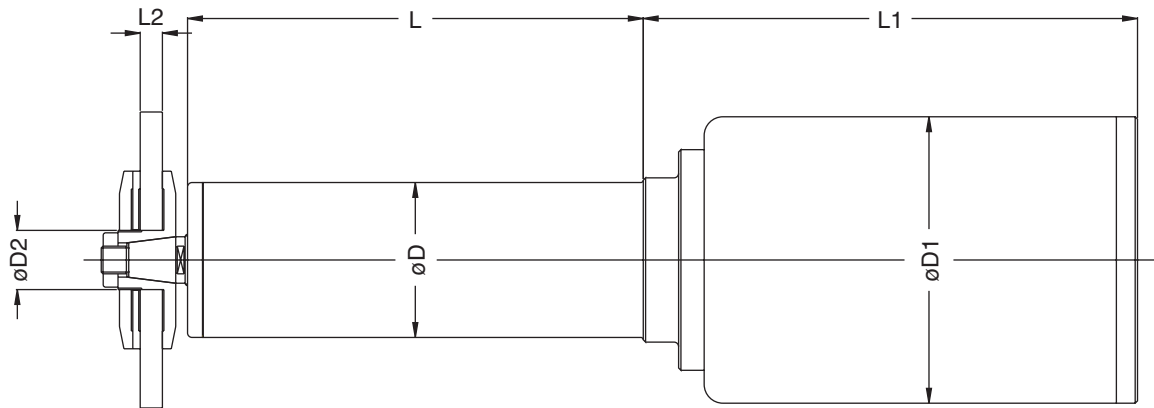
Volts	Phase	Cycles	Volts	Phase	Cycles
220	3	60	550	3	60
380	3	50	415	3	50
440	3	60	220/440	3	60

Note that a 60 cycle motor runs at approx 1/6 greater than the speed of a 50 cycle motor.



MOTORISED SPINDLES

STANDARD RANGE - Surface Grinding, Form Grinding, Broach Grinding and other Applications



INCH RANGE

Reference	D	L	D1	L1	D2	L2	Power Output
MGS1052	3"	12 ¹ / ₈ "	5 ³ / ₄ "	8 ⁵ / ₈ "	1 ¹ / ₄ "	1 ¹ / ₂ "	.75Kw @ 3000
MGS1051	3"	12 ¹ / ₈ "	6 ³ / ₈ "	9 ¹ / ₈ "	1 ¹ / ₄ "	1 ¹ / ₂ "	1.1Kw @ 3000
MGS1039A	3"	12 ¹ / ₈ "	6 ¹ / ₂ "	10 ¹ / ₂ "	1 ¹ / ₄ "	1+"	1.5Kw @ 3000
MGS1039	3"	12 ¹ / ₈ "	7 ⁵ / ₈ "	11 ³ / ₈ "	1 ¹ / ₄ "	1+"	2.25Kw @ 3000
MGS902	3"	14"	8"	12 ¹ / ₂ "	1 ¹ / ₄ "	1 ¹ / ₂ "	1.1Kw @ 1500
MGS857	3"	14"	8"	13 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "	1.5Kw @ 1500
MGS859	3 ¹ / ₂ "	12"	8"	13 ³ / ₄ "	1 ¹ / ₂ "	1 ¹ / ₂ "	1.5Kw @ 1500
MGS864	4"	14"	8"	15 ¹ / ₄ "	2"	1"	2.2Kw @ 1500
MGS587E	2 ¹ / ₂ "	12"	6"	9 ¹ / ₂ "	1 ¹ / ₄ "	1 ¹ / ₂ "	.75Kw @ 3000
MGS17	3 ¹ / ₂ "	12"	6"	9 ¹ / ₂ "	1 ¹ / ₂ "	1 ¹ / ₂ "	.75Kw @ 3000

METRIC RANGE

Reference	D	L	D1	L1	D2	L2	Power Output
MGS912	80mm	350mm	205mm	320mm	30mm	15mm	1.1Kw @ 1500
MGS877	80mm	350mm	205mm	350mm	30mm	15mm	1.5Kw @ 1500
MGS884	100mm	350mm	205mm	390mm	50mm	25mm	2.2Kw @ 1500
MGS835	60mm	300mm	150mm	240mm	30mm	10mm	.75Kw @ 3000
MGS842	80mm	300mm	150mm	240mm	30mm	10mm	.75Kw @ 3000
MGS914	90mm	375mm	205mm	320mm	40mm	15mm	1.1Kw @ 1500
MGS880	90mm	375mm	205mm	350mm	40mm	15mm	1.5Kw @ 1500
MGS885	100mm	450mm	205mm	390mm	50mm	25mm	2.2Kw @ 1500
MGS853	90mm	335mm	150mm	240mm	40mm	15mm	.75Kw @ 3000

MOTORISED SPINDLES

For Surface Grinding

This motorised spindle incorporates a two speed motor, or alternatively single speed motors as shown below.

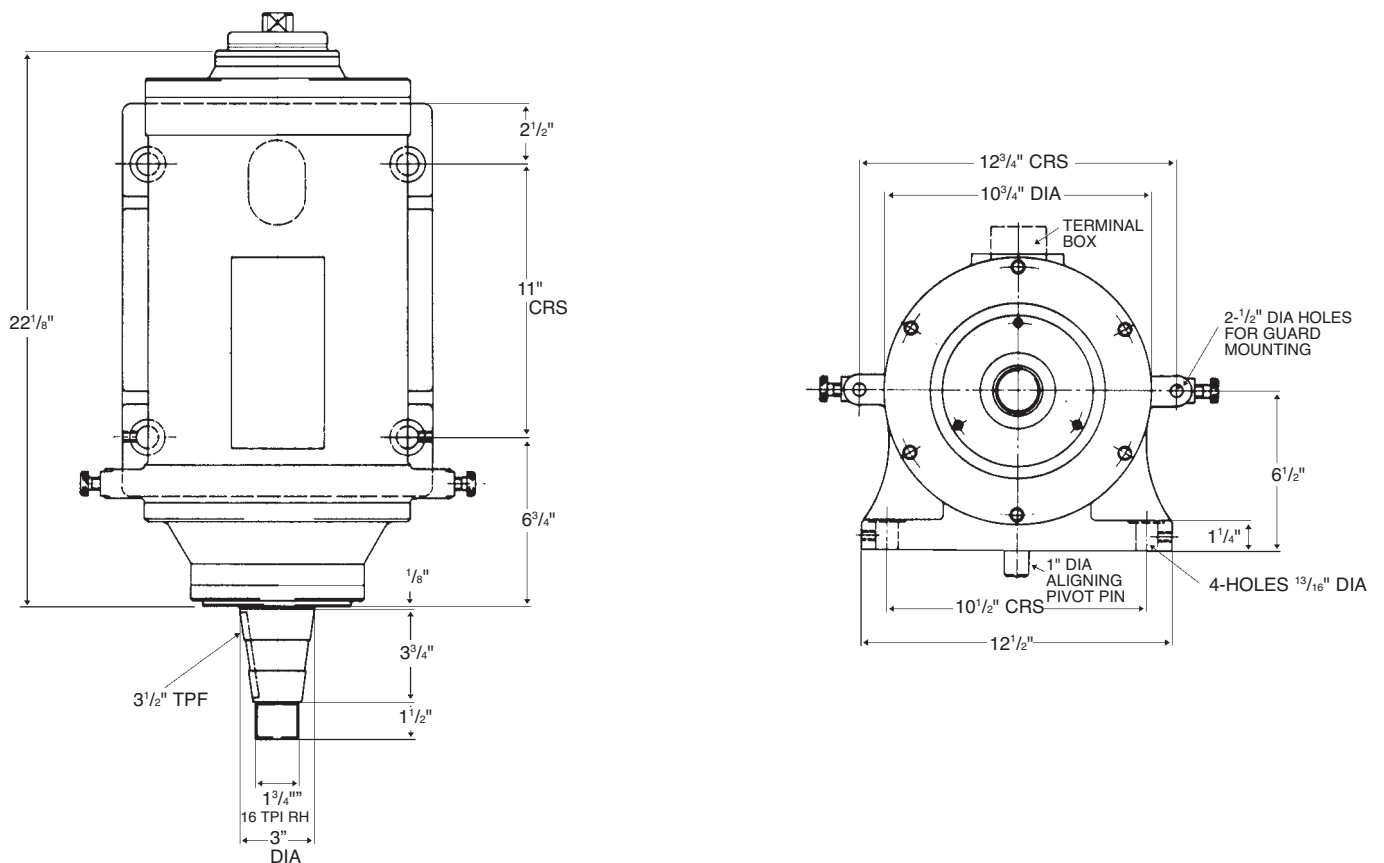
Voltages can be supplied to order.

Spindles have "Sealed" for life lubrication.

Grinding Wheel adaptors to suit cup wheels 6"-8" diameter for 3,000 r.p.m. spindles, 12"-14" diameter for 1,500 r.p.m. spindles and 16"-18" for 1,000 r.p.m. spindles.

Rear end of spindle shaft is threaded to suit Rotary Coolant Union.

Standard rotation anti-clockwise viewing on grinding wheel end.



Ref	Dual Output
MGS.664	5 h.p. at 3,000 r.p.m. and 5 h.p. at 1,500 r.p.m.
	Constant Output
MGS.2672	10 h.p. at 3,000 r.p.m.
MGS.2672A	7 1/2 h.p. at 1,500 r.p.m.
MGS.2672B	6 h.p. at 1,000 r.p.m.

MOTORIZED SPINDLES

For Surface Grinding

These spindles have circular Vee base, which allows for the clamping of the unit by means of a split ring. Mounting bases will be supplied to order.

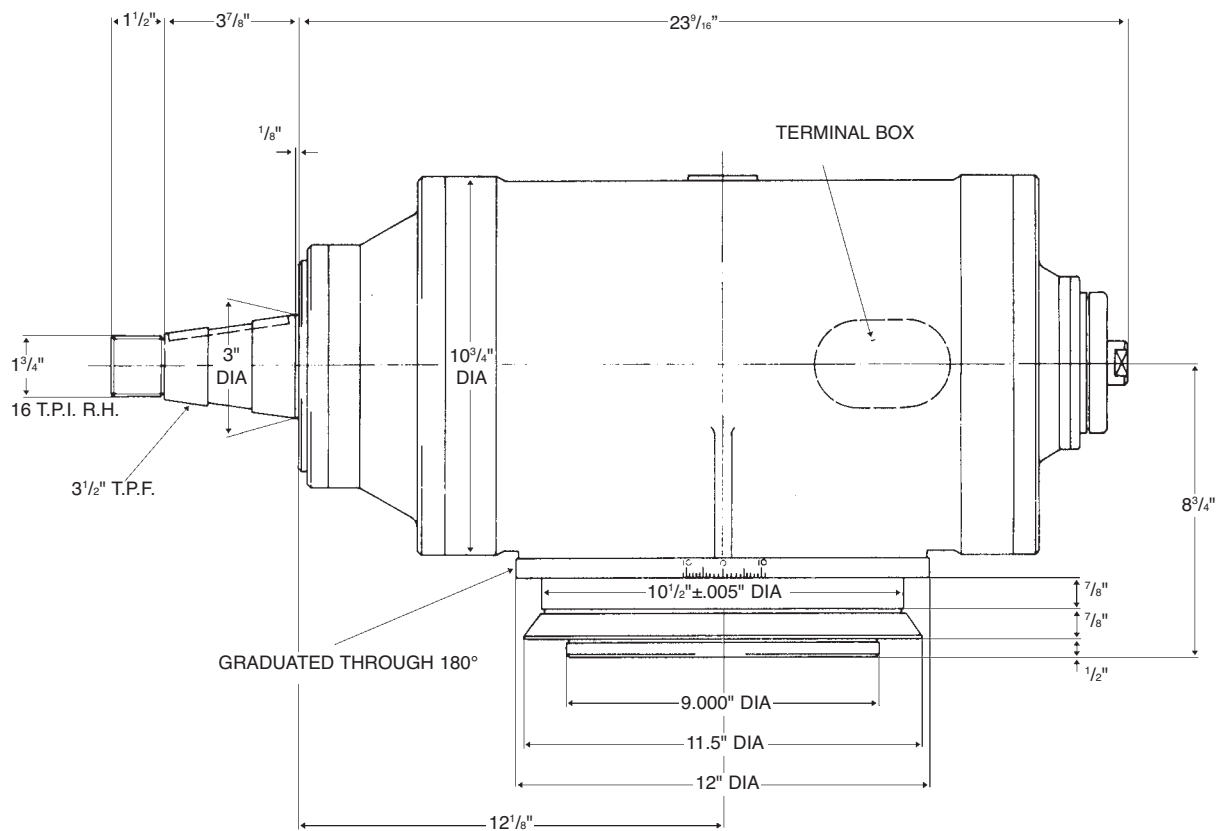
Voltages supplied to order.

Spindles have "Sealed" for life lubrication.

Grinding Wheel adaptors to suit cup wheels 6"-8" diameter for 3,000 r.p.m. spindles and 12"-14" diameter for 1,500 r.p.m. spindles will be supplied to order.

Rear end of spindle shaft is threaded to suit Rotary Coolant Union.

Standard rotation anti-clockwise viewing on grinding wheel end.



Ref	Dual Output
MGS.634A	5 h.p. at 3,000 r.p.m. and 5 h.p. at 1,500 r.p.m.
	Constant Output
MGS.2634	10 h.p. at 3,000 r.p.m.
MGS.2634B	7 1/2 h.p. at 1,500 r.p.m.

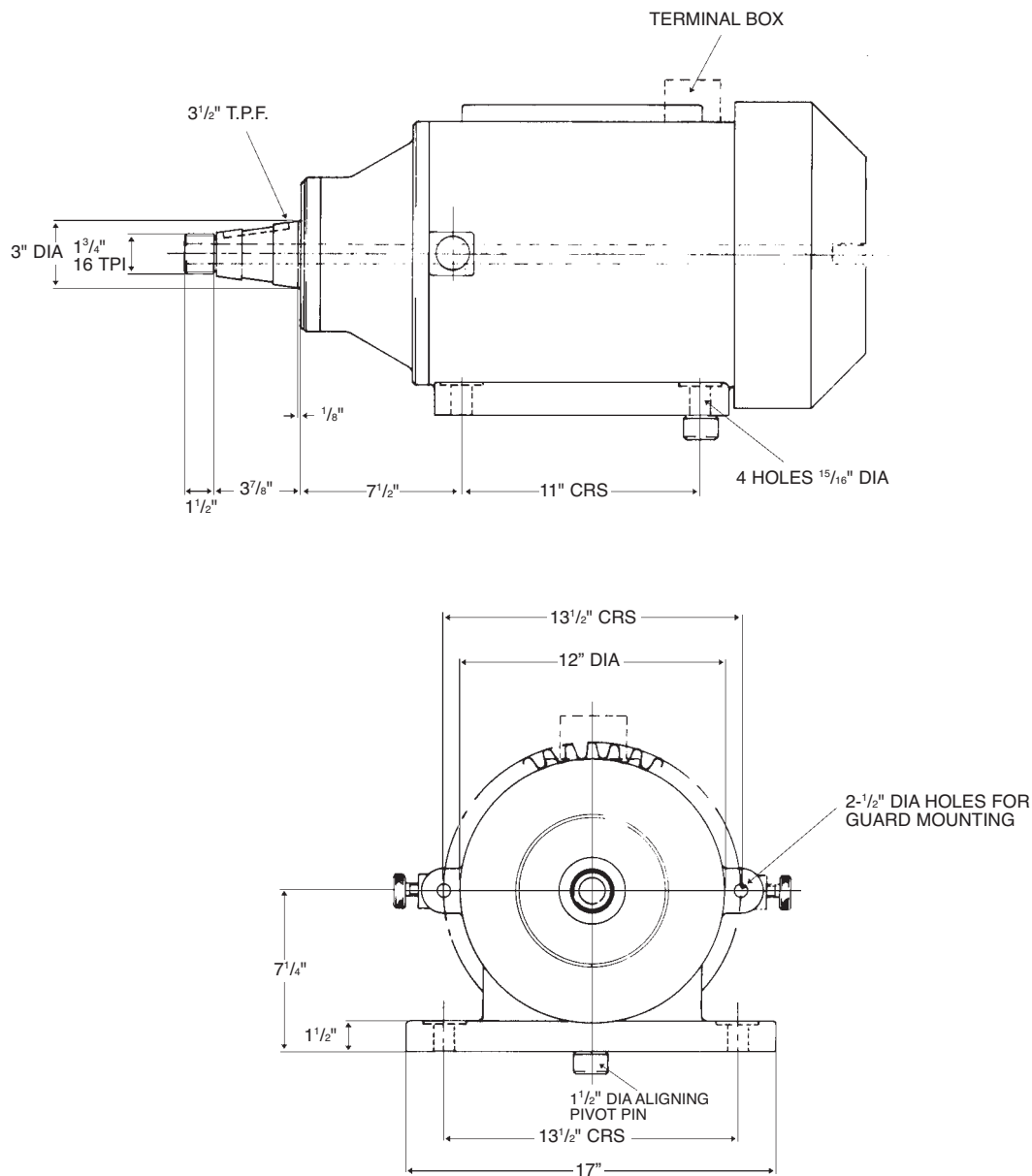
MOTORIZED SPINDLES

For Surface Grinding

Spindles are continuously rated with external fan cooling. Voltages supplied to order. Spindles have "Sealed" for life lubrication. Grinding Wheel adaptors to suit cupped wheels 6"-8" diameter for 3,000 r.p.m. spindles, 12"-14" diameter for 1,500 r.p.m. spindles and 16"-18" for 1,000 r.p.m. spindles.

Rear end of spindle shaft is threaded to suit Rotary Coolant Union.

Standard rotation anti-clockwise viewing on grinding wheel end.



Ref	Constant Output
MGS.918	15 h.p. at 3,000 r.p.m.
MGS.918A	12 1/2 h.p. at 1,500 r.p.m.
MGS.918B	10 h.p. at 1,000 r.p.m.

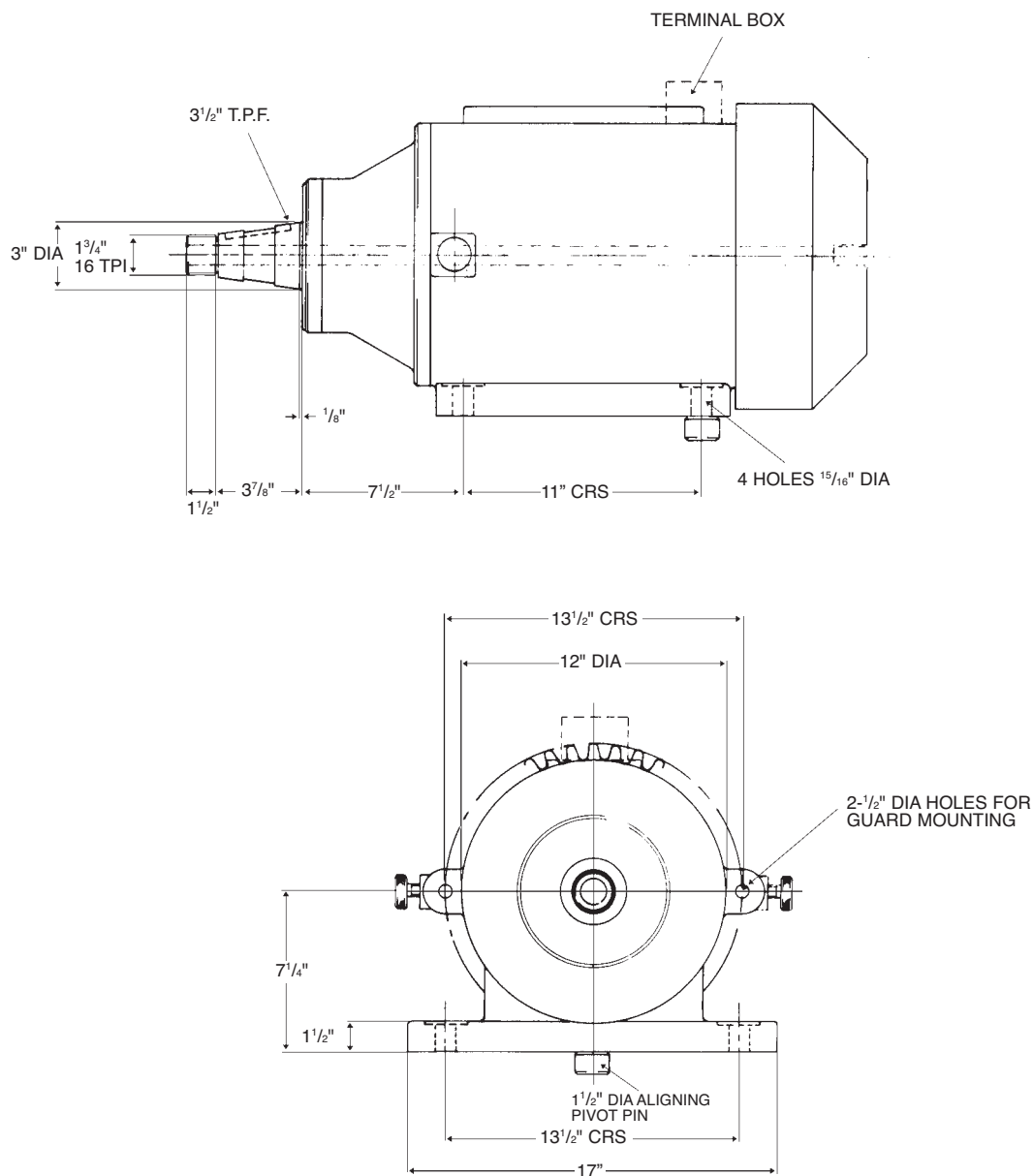
MOTORIZED SPINDLES

For Surface Grinding

Spindles are similar to those listed on pages 3.6 and 3.7 but heavier duty models. Spindles are continuously rated with external fan cooling. Voltages supplied to order. Spindles have "Sealed" for life lubrication. Grinding Wheel adaptors to suit cupped wheels 6"-8" diameter for 3,000 r.p.m. spindles, 12"-14" diameter for 1,500 r.p.m. spindles and 16"-18" for 1,000 r.p.m. spindles.

Rear end of spindle shaft is threaded to suit Rotary Coolant Union.

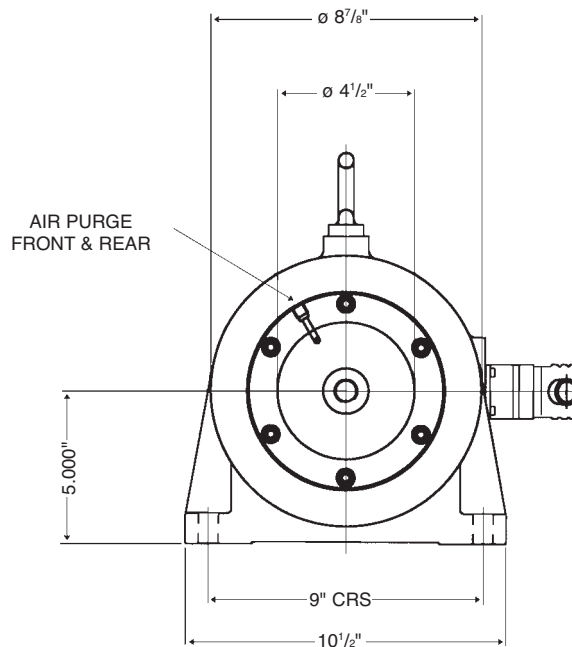
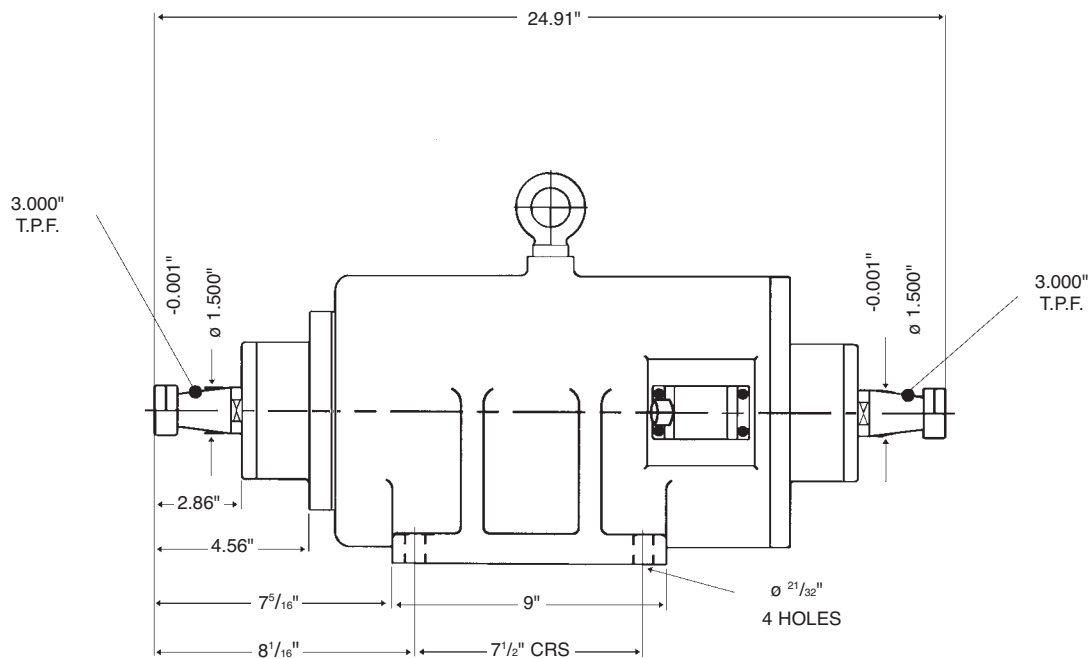
Standard rotation anti-clockwise viewing on grinding wheel end.



Ref	Constant Output
MGS.919	25 h.p. at 3,000 r.p.m.
MGS.919A	20 h.p. at 1,500 r.p.m.
MGS.919B	15 h.p. at 1,000 r.p.m.

MOTORISED SPINDLE

For Special Purpose Grinding Applications

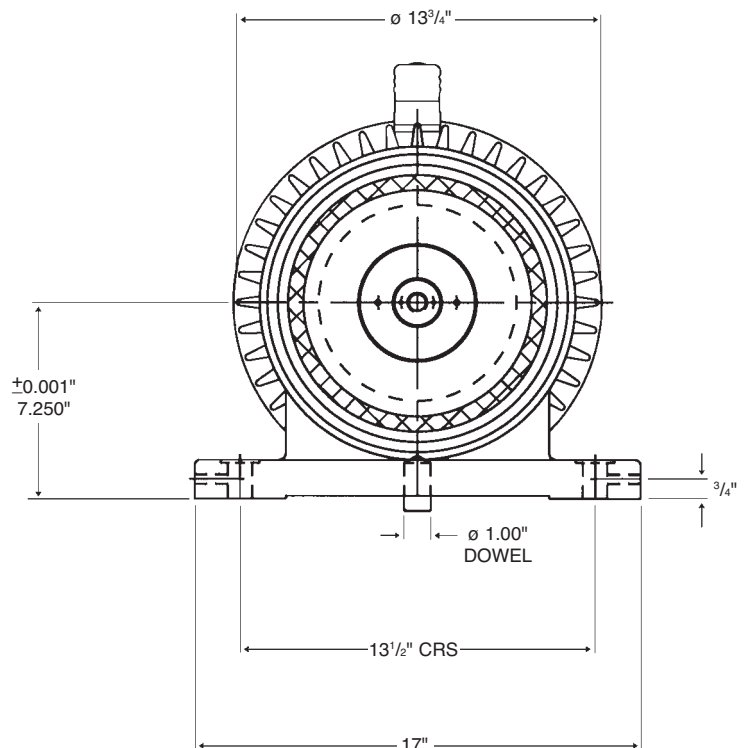
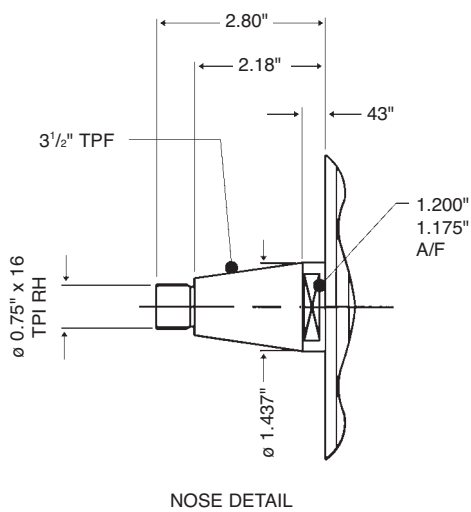
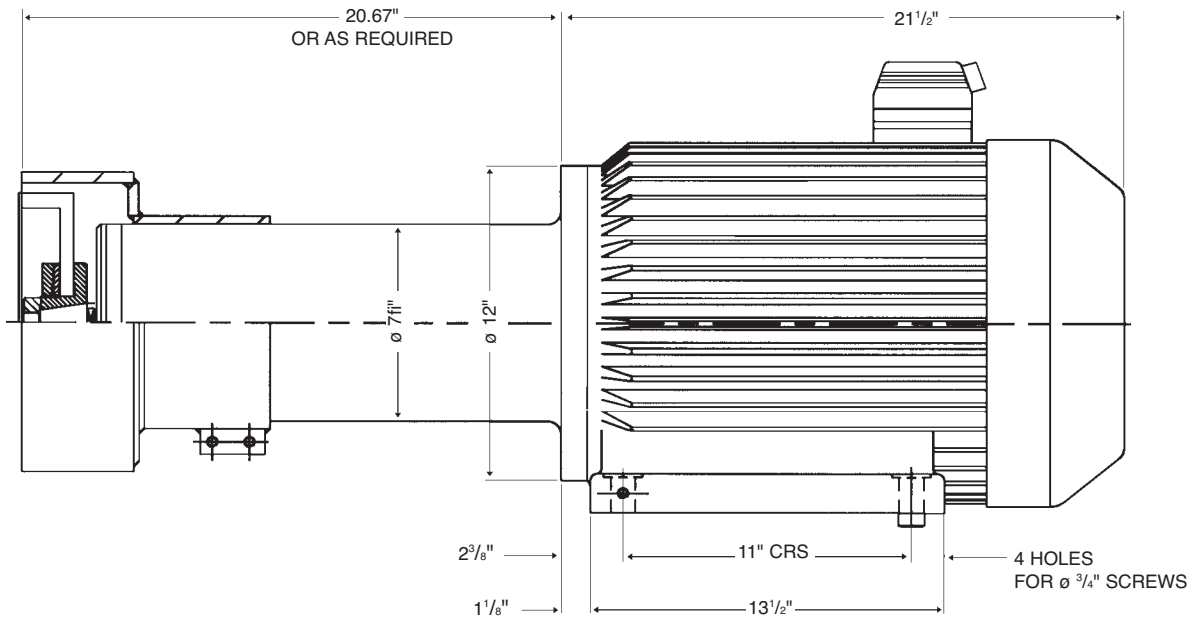


MGS 1160

Direction of rotation :- Dual
 Output :- 10 HP @ 3600 r.p.m. 60 Hz 3 Phase
 Sealed in lubrication
 Voltage to be specified by customer

MOTORISED SPINDLE

For Vertical Rotary Grinding Applications

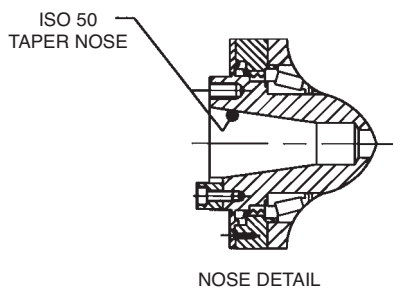
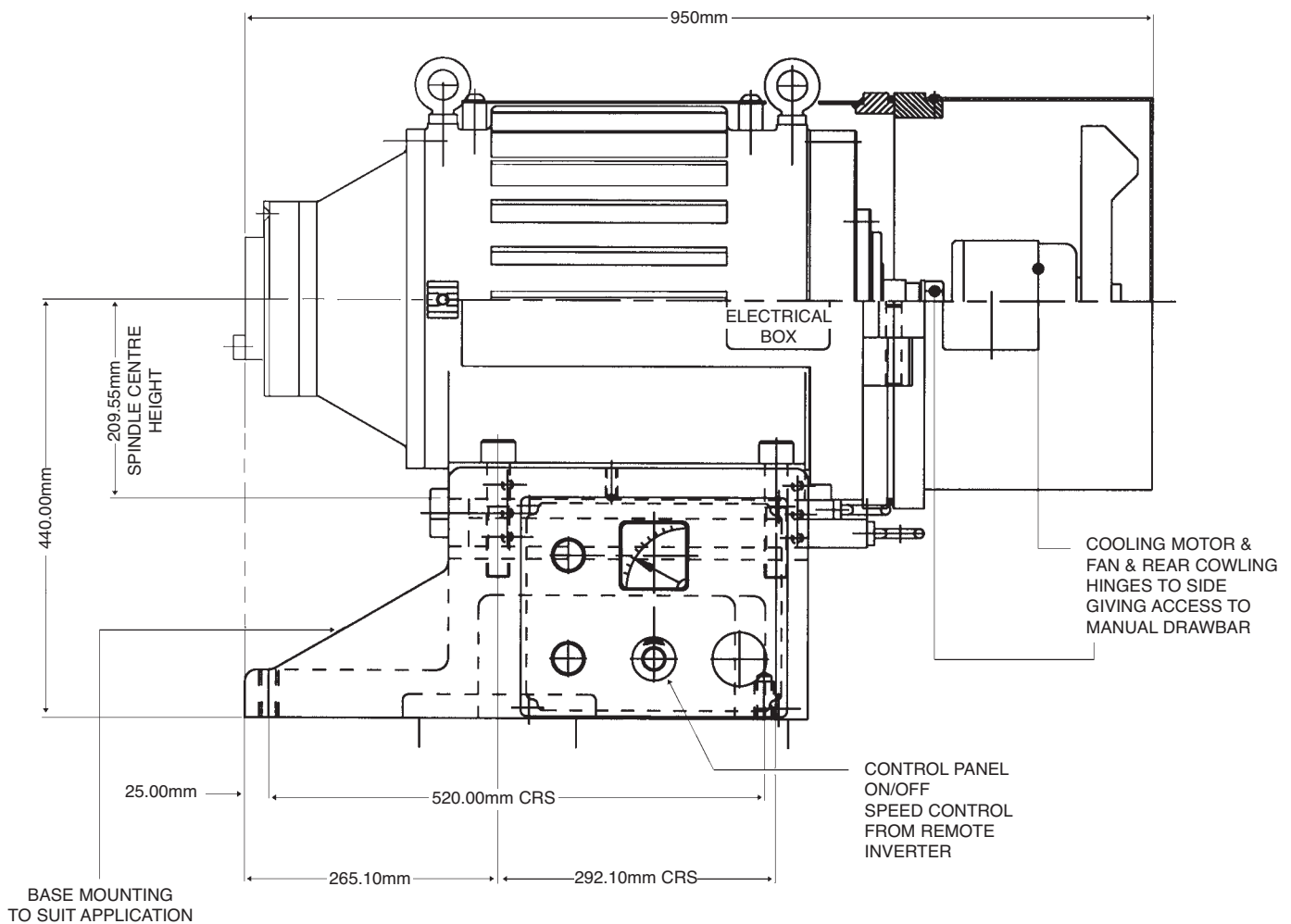


MGS 1132

Direction of rotation :- Anti-clockwise viewed on spindle nose.
 Operating Speed :- 1,500 to 3,500 rpm using speed inverter.
 215V 3 Phase 50Hz at 1440 rpm.
 380V 3 Phase 122Hz at 3,500 rpm.
 Other voltages and frequencies available

MOTORISED SPINDLE

For Heavy Duty Milling

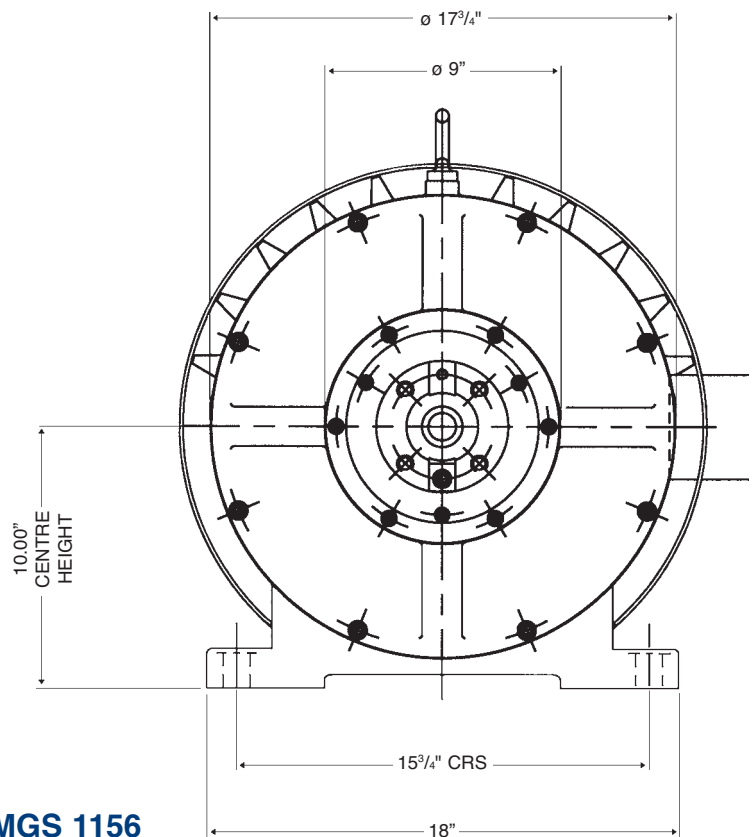
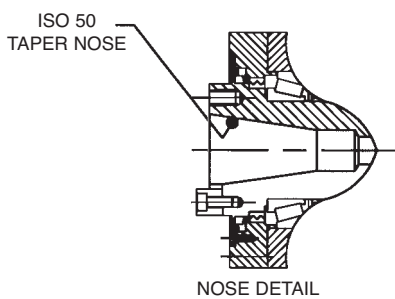
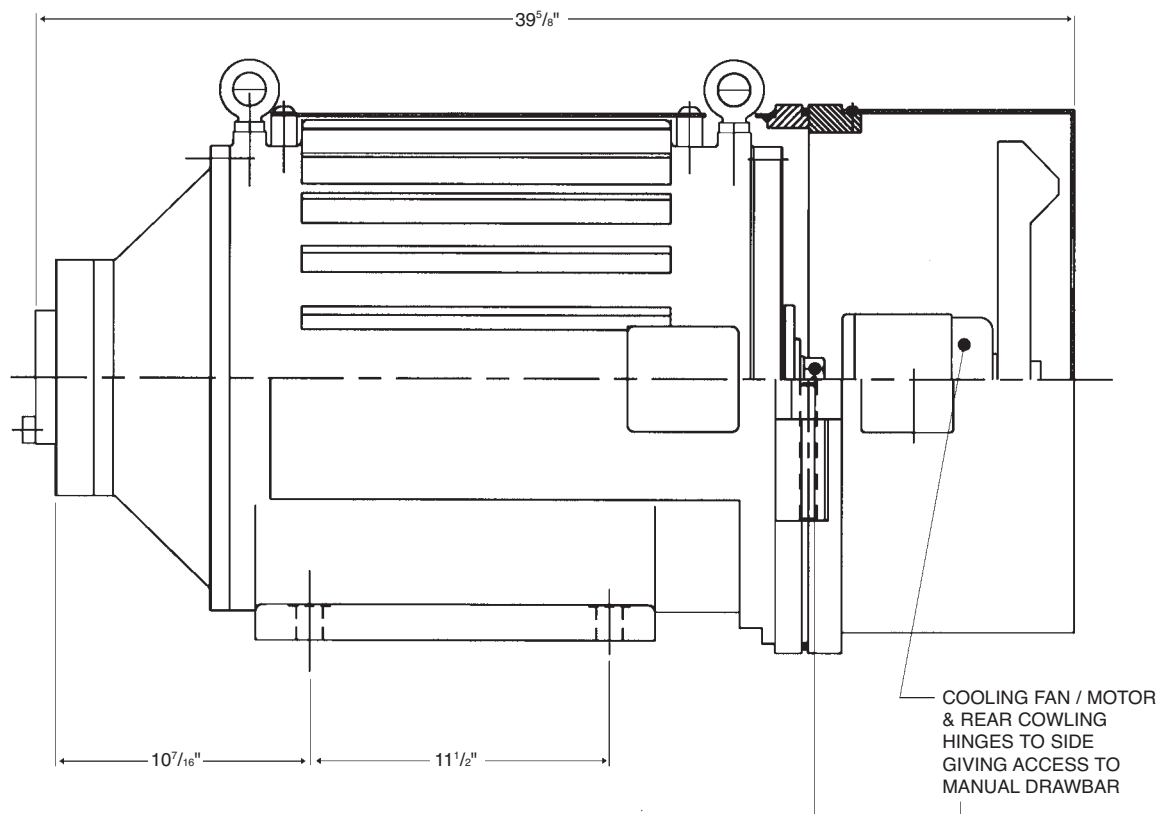


MG5 1146

Direction of rotation :- Anti-clockwise viewed on spindle nose
 Output :- 18.5kW at 1000 r.p.m. - 415V 3 Phase 50 Hz
 11.0kW at 600 r.p.m. - 249V 3 Phase 30 Hz
 7.5kW at 400 r.p.m. - 166V 3 Phase 20 Hz
 Speed controlled by an inverter CCD 1850.
 Other voltages and frequencies available.

MOTORISED SPINDLE

For Heavy Duty Milling



Direction of rotation :- Anti-clockwise
 viewed on spindle nose
 Output :- 37kW at 1000 r.p.m.
 Sealed in lubrication

MGS 1156

MOTORIZED SPINDLES

For Vertical Boring machines

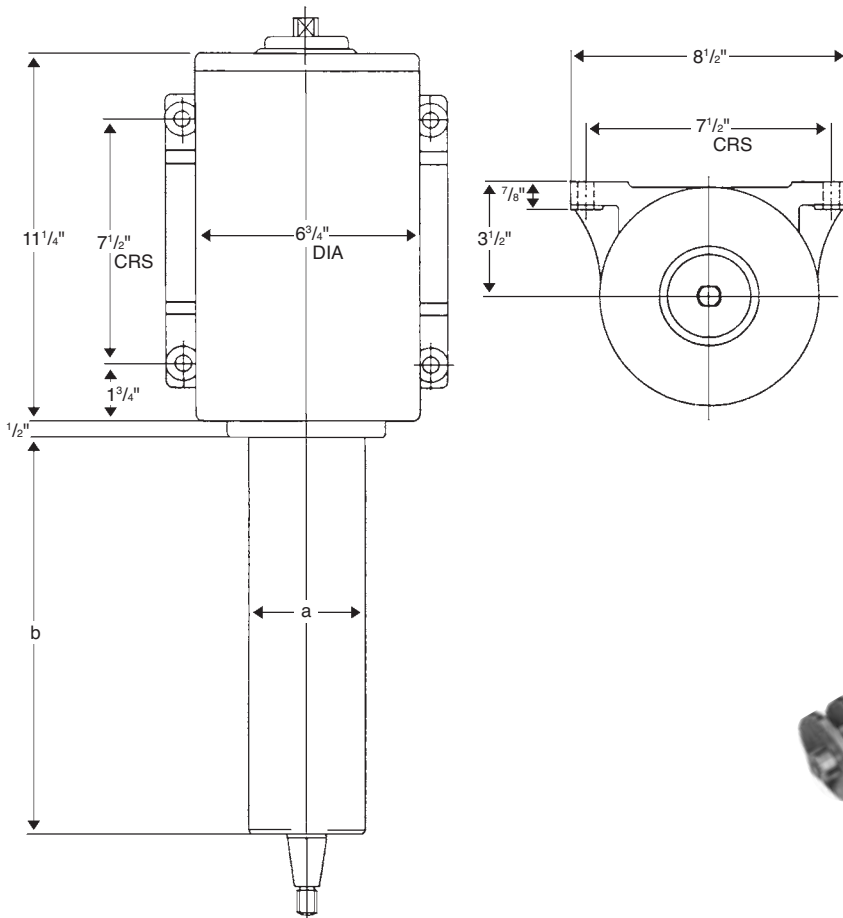
These grinding units can be used for a variety of applications, the motor housing having a flange on each side with bolt holes. A typical application is a vertical boring mill, the unit being fitted to the turret, enabling internal grinding to be carried out.

The length of the extension or nose can be varied to order.

Voltages to order.

Spindles have "Sealed" for life lubrication.

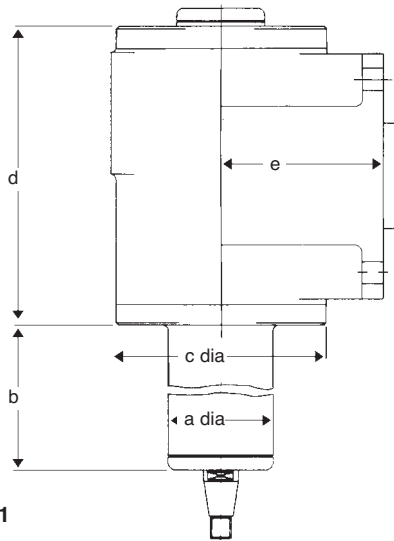
A.C. Speed Inverters can be used with these spindles to increase speeds.



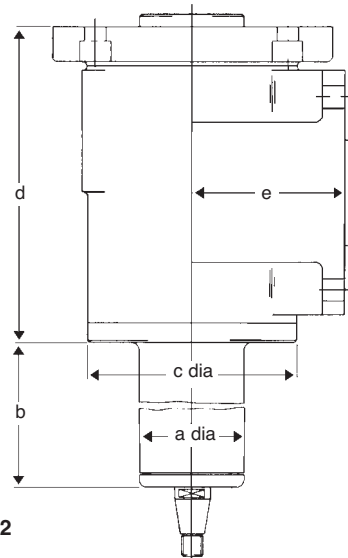
Ref.	Output	Ref.	Output	a	b
MGS.30C	1 1/2 h.p. at 1,500 r.p.m.	MGS.30V	2 h.p. at 3,000 r.p.m.	3 1/2"	4"
MGS.31C		MGS.31V		3 1/2"	6"
MGS.32C		MGS.32V		3 1/2"	9"
MGS.26C		MGS.26V		3 1/2"	12"
MGS.33C		MGS.33V		3 1/2"	16"
MGS.34C		MGS.34V		4"	20"
MGS.35C		MGS.35V		4"	24"

MOTORIZED SPINDLES

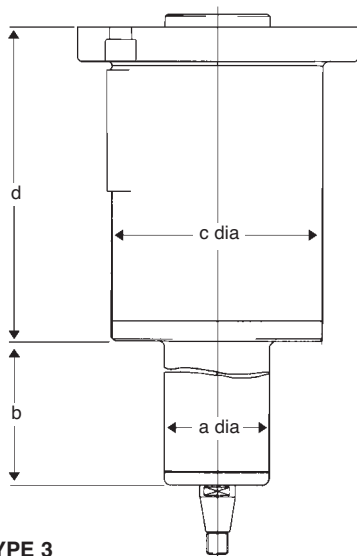
Vertical Boring Machine eg. Webster and Bennett machines



TYPE 1



TYPE 2



TYPE 3

TYPE 1

Spindle Ref	M/c Ref	a	b	c	d	e	Power Output	RPM
WBSH.1	36" Turret Mounting	3"	4" to 18"	6"	8 1/2"	4 3/8"	1 h.p. - .75 kW	3,000
WBSH.2	36" Turret Mounting	3 1/2"	4" to 18"	6 3/4"	10"	4 7/8"	2 h.p. - 1.5 kW	3,000
WBSH.3	48" and Above Turret Mounting	3 1/2"	4" to 18"	6 3/4"	10"	5 1/8"	2 h.p. - 1.5 kW	3,000
WBSH.4	48" and Above Turret Mounting	3 1/2"	4" to 18"	7 3/4"	13"	5 5/8"	3 h.p. - 2.2 kW or 2 h.p. - 1.5 kW	3,000 or 1,500

TYPE 2

Spindle Ref	M/c Ref	a	b	c	d	e	Power Output	RPM
WBSVH.1	36" Turret Mounting	3"	4" to 18"	6"	9"	4 3/8"	1 h.p. - .75 kW	3,000
WBSVH.2	36" Turret Mounting	3 1/2"	4" to 18"	6 3/4"	10 5/8"	4 7/8"	2 h.p. - 1.5 kW	3,000
WBSVH.3	48" and Above Turret Mounting	3 1/2"	4" to 18"	6 3/4"	10 5/8"	5 1/8"	2 h.p. - 1.5 kW	3,000
WBSVH.4	48" and Above Turret Mounting	3 1/2"	4" to 18"	7 3/4"	14 5/8"	5 5/8"	3 h.p. - 2.2 kW or 2 h.p. - 1.5 kW	3,000 or 1,500

TYPE 3

Spindle Ref	M/c Ref	a	b	c	d	Power Output	RPM
WBST.1	8" Square Ram Mounting	3"	4" to 18"	6"	9 1/2"	1 h.p. - .75 kW	3,000
WBST.2	8" Square Ram Mounting	3 1/2"	4" to 18"	6 3/4"	10 1/2"	2 h.p. - 1.5 kW	3,000
WBST.3	8" Square Ram Mounting	3 1/2"	4" to 18"	7 3/4"	15 3/8"	3 h.p. - 2.2 kW or 2 h.p. - 1.5 kW	3,000 or 1,500

Ordering Instructions. State spindle reference, sleeve length, "b" required and electrical supply spindle is to be operated on.

Wheel adaptors to suit grinding wheels will be supplied to order. Please give full wheel dimensions when ordering. Voltages supplied to order.

Spindles are fitted with synchronous speed, balanced electric motor and are suitable for rotation in either direction viewing on the spindle nose, they also have "Sealed" for life of bearings lubrication.

The spindles are supplied complete with reversing switch or plug and socket connector as required.

A.C. Speed Inverter can be used with these spindles to increase speeds.

MOTORISED PLANETARY SPINDLES

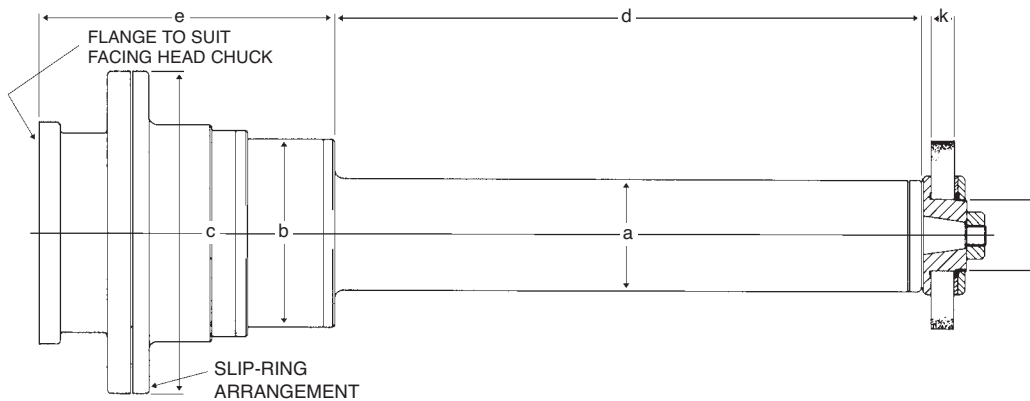
For Horizontal Boring Machines

These units are intended for mounting on the facing head of horizontal Boring Machines. The facing head provides the necessary planetary adjustment to suit the bore being ground. The length of the sleeve (dimension d) can be altered from the dimension shown. Each unit incorporates a balanced motor fed via a slip ring which remains stationary whilst the spindle is revolving with a planetary motion. The mounting flange is machined to suit your facing head.

Spindles can be supplied for use on various voltages and cycle supplies. Speeds greater than 4,000 r.p.m. are available. The spindles require either an AC speed inverter or high frequency drive.

Spindles are supplied with "Sealed" for life lubrication. Standard rotation is anti-clockwise viewing on the grinding wheel end, but can be supplied clockwise if desired.

Wheel Adaptors to suit various widths 'k' and bores 'j' can be supplied to order, also Wheel Adaptors with balancing facilities and balancing mandrels can be supplied.



Ref	Max Speed	a	d	b	c	e	h.p.
HFGS.604	4,500 r.p.m.	2 ¹ / ₄ "	12 ¹ / ₂ "	6 ³ / ₄ "	12"	10 ¹ / ₂ "	2
HFGS.661	4,500 r.p.m.	40mm	250mm	6 ³ / ₄ "	12"	10 ¹ / ₂ "	2
HFGS.668	4,500 r.p.m.	76mm	260mm	6 ³ / ₄ "	12"	10 ¹ / ₂ "	2
MGS.1102A	3,440 r.p.m.	4 ¹ / ₂ "	15 ¹ / ₄ "	-	14 ¹ / ₂ "	12 ³ / ₄ "	3
MGS.1103	3,440 r.p.m.	3"	15 ¹ / ₄ "	-	13 ³ / ₄ "	12 ³ / ₄ "	3
MGS.1107	3,440 r.p.m.	2 ¹ / ₄ "	10 ¹ / ₄ "	-	13 ³ / ₄ "	12 ³ / ₄ "	2
MGS.714	3,000 r.p.m.	4"	14 ¹ / ₂ "	6 ³ / ₄ "	12 ¹ / ₂ "	13"	2
GS.877	3,000 r.p.m.	4"	24 ¹ / ₂ "	6 ³ / ₄ "	12 ¹ / ₂ "	13"	2
GS.877B	3,000 r.p.m.	4"	36"	6 ³ / ₄ "	12 ¹ / ₂ "	13"	2
MGS.758	3,000 r.p.m.	80mm	400mm	6 ³ / ₄ "	12 ¹ / ₂ "	13"	2
MGS.624	3,000 r.p.m.	4 ³ / ₄ "	25"	8"	13 ³ / ₄ "	12 ¹ / ₂ "	3
MGS.759	3,000 r.p.m.	100mm	650mm	8"	13 ³ / ₄ "	12 ¹ / ₂ "	3
MGS.783	3,000 r.p.m.	100mm	750mm	8"	13 ³ / ₄ "	12 ¹ / ₂ "	3
MGS.625A	1,500 r.p.m.	5 ¹ / ₂ "	12"	9"	15 ¹ / ₂ "	16"	5
MGS.625	1,500 r.p.m.	5 ¹ / ₂ "	36"	9"	15 ¹ / ₂ "	16"	5
MGS.784	1,500 r.p.m.	140mm	700mm	9"	15 ¹ / ₂ "	16"	5

SPINDLES - BORING - OVERVIEW

Boring is a well established technique of machining where accuracy is required together with maximum constant production. Our boring spindles are capable, under ideal conditions, of finish machining components to limits of accuracy of 0.005mm on size, and 0.0025mm on parallelism and roundness according to the material being machined, diameter and length of the boring quill, the type and shape of the cutting tool, use of correct coolant and the characteristics of the machines or unit slides to which they are mounted. The quality of the spindle drive arrangements can also influence the results.

Jena Rotary Technology boring spindles are manufactured to the following standards of accuracy:

Flange outside diameter	runout =	0.0025mm T.I.R.	.0001" T.I.R.
Flange face	runout =	0.0025mm T.I.R.	.0001" T.I.R.
Location bore	runout =	0.0025mm T.I.R.	.0001" T.I.R.
Centre height	=	+0.012mm	.0005"
Datum side of body to spindle centre	=	+0.012mm	.0005"

The above tolerances apply to spindles equipped with super precision, preloaded, angular contact ball bearings. Tolerances on spindles equipped with taper roller bearings may vary slightly according to the class of bearings used. As ball bearings are the more versatile this type of spindle is regarded basically as standard, taper roller bearing spindles being employed in heavy duty or low speed applications or where maximum stiffness or rigidity is required.

We offer a wide range of boring spindles for use on all known makes of fine boring machines. They are also extensively used on in-line transfer, rotary and special purpose machines. All models are available with extended noses i.e. distance from the centre line of the front mounting holes to the spindle flange face and these are particularly useful for use on standard slide units for transfer machines and other useful special purpose machines.

The majority of spindles have a hollow shaft thus enabling facing heads, diaphragm chucks, power operated chucks, retractable quill units etc, to be mounted onto the spindle flange and actuated by a central draw bar from an air or hydraulic cylinder unit.

All spindles normally incorporate "sealed" for life lubrication and therefore require no further attention in this respect during the life of the bearings.

As standard these spindles are suitable for anticlockwise rotation when viewed on face of the flange.

We are able to supply special spindles in instances where none of the standards can be employed, also multi spindle cluster units with two or more spindles in a common housing.

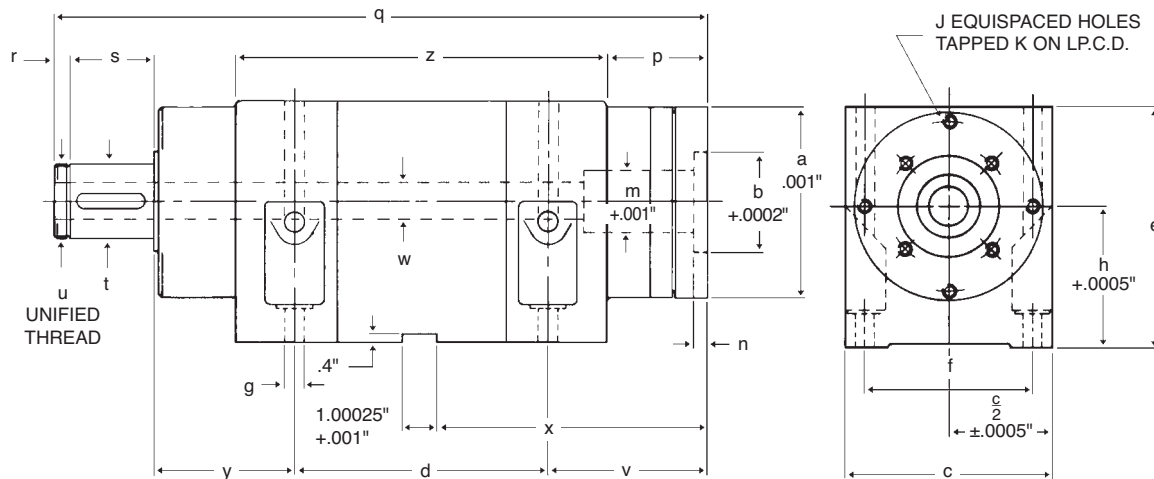
BORING SPINDLES

COMPATIBLE WITH PARKER MAJESTIC

Phosper bronze bush to suit bore m can be supplied to order, for support of drawbar where required. A recess with support bush can be fitted to rear of shaft if required.

Standard rotation: Anticlockwise viewing on spindle flange.

Lubrication: "Sealed" for life.



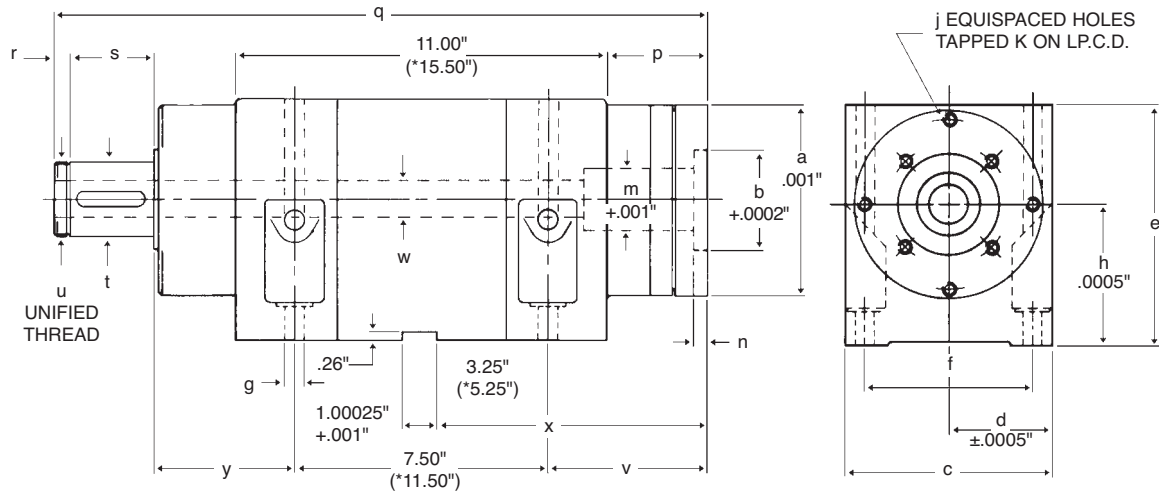
Spindle Ref	Max. Speed	a dia	b dia	c	d	e	f	g dia	h	j	k	l	Max hp
FB420	12,000 r.p.m.	3.000	1.000	3.000	5.50	3.50	2.25	¹³ / ₃₂	2.000	3	⁵ / ₁₆ - 18	2.250	1 1/2
FB421	9,000 r.p.m.	3.500	1.500	3.500	7.50	4.25	2.75	¹³ / ₃₂	2.500	3	³ / ₈ - 16	2.750	2
FB422	8,000 r.p.m.	3.937	1.500	4.000	7.50	4.88	3.00	¹⁷ / ₃₂	2.875	3	³ / ₈ - 16	3.250	3
FB423	7,000 r.p.m.	4.625	2.000	5.250	7.50	5.88	4.00	¹⁷ / ₃₂	3.375	3	³ / ₈ - 25	3.250	5
FB424	4,000 r.p.m.	5.625	3.000	5.750	7.50	6.75	4.62	¹⁷ / ₃₂	3.875	4	³ / ₈ - 24	3.625	7 1/2
										4	³ / ₈ - 24	5.000	
FB425	3,000 r.p.m.	6.625	3.000	6.750	9.50	7.75	5.25	²¹ / ₃₂	4.375	4	³ / ₈ - 24	5.000	10
										4	¹ / ₂ - 20	5.750	
FB426	2,500 r.p.m.	7.750	3.000	7.750	10.50	8.75	6.25	²¹ / ₃₂	4.875	4	¹ / ₂ - 13	6.000	15
FB427	2,500 r.p.m.	10.500	6.000	11.250	17.00	10.80	10.00	²¹ / ₃₂	5.800	6	⁵ / ₈ - 11	8.000	
FB428	2,000 r.p.m.	12.000	6.000	14.250	14.00	11.25	12.50	²⁵ / ₃₂	6.250	6	³ / ₄ - 16	10.500	

Spindle Ref	m dia	n	p	q	r	s	t	u	v	w Max	x	y	z
FB420	-	.75	2.13	13.00	.56	1.88	1.000	1-24 TPI	3.12	¹ / ₂	4.875	2.50	7.50
FB421	1.437	.50	4.00	18.75	.62	3.25	1.625	¹⁵ / ₈ -24 TPI	5.00	¹¹ / ₁₆	8.250	3.00	9.50
FB422	1.437	.50	4.00	19.00	.62	3.50	1.750	¹³ / ₄ -24 TPI	5.00	¹³ / ₁₆	8.250	3.00	9.50
FB423	1.750	.50	3.00	19.44	.87	3.00	2.000	2-24 TPI	4.75	¹³ / ₈	8.000	4.19	11.00
FB424	2.250	.50	4.00	20.94	.75	2.75	2.250	²¹ / ₄ -24 TPI	5.75	¹¹ / ₂	9.000	4.19	11.00
FB425	2.500	.62	4.75	24.87	.75	4.00	2.500	²¹ / ₂ -24 TPI	6.50	¹³ / ₄	10.750	4.87	13.00
FB426	2.750	.62	6.00	28.75	.75	4.25	2.500	²¹ / ₂ -24 TPI	8.25	¹³ / ₄	13.000	5.75	15.30
FB427	-	.75	4.13	29.50	-	4.00	3.000	-	5.50	-	9.000	3.00	20.50
FB428	4.000	1.00	7.00	32.13	-	4.00	4.000	-	9.00	²¹ / ₈	10.000	5.13	18.00

BORING SPINDLES

For Ex-Cell-O machines

Phosphor bronze bush to suit bore m can be supplied to order, for support of drawbar where required.
 Standard rotation: Anti-clockwise viewing on spindle flange.
 Lubrication: "Sealed" for life.



Spindle Ref	Max. Speed	a dia	b dia	c	d	e	f	g dia	h	j	k	l	Max hp
FB71	12,000 r.p.m.	3.219	1.000	3.625	1.812	3.81	2.81	¹⁵ / ₃₂	2.187	3	³ / ₈ UNF	2.500	3
FB72	12,000 r.p.m.	3.219	1.000	3.250	1.625	3.81	2.44	¹⁵ / ₃₂	2.187	3	³ / ₈ UNF	2.500	3
FB101	7,000 r.p.m.	3.937	2.250	4.500	2.250	6.44	3.59	⁹ / ₁₆	4.187	3	³ / ₈ UNF	3.250	5
FB102	7,000 r.p.m.	3.937	2.250	4.125	2.062	6.37	3.22	⁹ / ₁₆	4.187	3	³ / ₈ UNF	3.250	5
FB161	4,500 r.p.m.	5.625	3.000	6.125	3.062	7.19	5.00	⁹ / ₁₆	4.187	4	³ / ₈ UNC	3.625	10
										4	³ / ₈ UNC	5.000	
FB162	4,500 r.p.m.	5.625	3.000	5.875	2.937	8.06	4.62	⁹ / ₁₆	4.187	4	³ / ₈ UNC	3.625	10
										4	³ / ₈ UNC	5.000	
FB201	3,500 r.p.m.	8.000	3.000	8.875	4.437	8.31	7.62	¹¹ / ₁₆	4.187	4	³ / ₈ UNC	3.625	15
										4	³ / ₈ UNC	5.000	
										4	¹ / ₂ UNF	7.000	
*FB202	3,500 r.p.m.	8.000	3.000	8.875	4.437	9.31	7.62	¹¹ / ₁₆	5.187	4	³ / ₈ UNC	3.625	15
										4	³ / ₈ UNC	5.000	
										4	¹ / ₂ UNF	7.000	
*FB202E	3,500 r.p.m.	8.000	3.000	8.875	4.437	9.31	7.62	¹¹ / ₁₆	5.187	4	³ / ₈ UNC	3.625	15
										4	³ / ₈ UNC	5.000	
										4	¹ / ₂ UNF	7.000	
*FB261	3,000 r.p.m.	10.000	3.000	11.000	5.500	10.62	9.75	¹¹ / ₁₆	5.187	4	³ / ₈ UNC	3.625	25
										4	³ / ₈ UNC	5.000	
										4	¹ / ₂ UNF	7.000	
										4	¹ / ₂ UNF	9.000	
*FB261E	3,000 r.p.m.	10.000	3.000	11.000	5.500	10.62	9.75	¹¹ / ₁₆	5.187	4	³ / ₈ UNC	3.625	25
										4	³ / ₈ UNC	5.000	
										4	¹ / ₂ UNF	7.000	
										4	¹ / ₂ UNF	9.000	
*FB341	1,500 r.p.m.	13.500	2.000	21.250	10.62	13.38	15.75	¹³ / ₁₆	7.000	6	³ / ₄ UNF	11.500	

Spindle Ref	m dia	n	p	q	r	s	t	u	v	w Max	x	y
FB71	-	.62	3.00	18.87	-	2.50	1.250	-	4.75	-	8.000	4.12
FB72	-	.62	3.00	18.87	-	2.50	1.250	-	4.75	-	8.000	4.12
FB101	.937	.37	3.25	19.24	.37	2.25	1.500	1 ¹ / ₂ -24 TPI	5.00	²⁵ / ₃₂	8.250	4.12
FB102	.937	.37	3.25	19.24	.37	2.25	1.500	1 ¹ / ₂ -24 TPI	5.00	1 ³ / ₃₂	8.250	4.12
FB161	1.875	.37	3.00	19.81	.44	3.00	2.250	2 ¹ / ₄ -24 TPI	4.75	1 ³ / ₃₂	8.000	4.12
FB162	1.875	.37	3.00	19.81	.44	3.00	2.250	2 ¹ / ₄ -24 TPI	4.75	1 ³ / ₃₂	8.000	4.12
FB201	2.000	.37	3.00	19.81	.44	3.00	2.250	2 ¹ / ₄ -24 TPI	4.75	1 ³ / ₃₂	8.000	4.12
*FB202	2.000	.37	3.00	23.19	.44	3.00	2.250	2 ¹ / ₄ -24 TPI	5.00	1 ³ / ₃₂	10.250	3.25
*FB202E	2.000	.37	6.00	26.19	.44	3.00	2.250	2 ¹ / ₄ -24 TPI	8.00	1 ³ / ₃₂	13.250	3.25
*FB261	2.000	.37	3.00	24.86	.62	4.62	3.000	3-24 TPI	5.00	1 ⁹ / ₁₆	10.250	3.12
*FB261E	2.000	.37	6.00	22.86	.62	4.62	3.000	3-24 TPI	8.00	1 ⁹ / ₁₆	13.250	3.12
*FB341	-	.40	3.00	26.12	-	6.00	4.000	-	5.00	-	10.340	3.62

BELT DRIVEN SPINDLES - GRINDING - OVERVIEW

1. Always order a spindle with a maximum speed higher than the recommended grinding speed; for example, if the application recommends a grinding speed of 15,000 r.p.m, order a spindle with a maximum speed of 17,000 r.p.m.
2. For a large variety of work use Detachable Quill Type Spindle.
For maximum production on one size of bore use a Solid Quill Spindle.
For large diameter and long bores use a Sleeve Type Spindle.
See Spindle Options - page 97-98
3. Make sure that the spindle which you require is listed under the make of machine on the index page.
If not please provide full details.
4. Check rotation. Spindles are always supplied for Anti-Clockwise rotation **facing the grinding wheel** end unless otherwise stated. This is with exception to Surface Grinding and External Spindles which usually run in a clockwise direction.

(Note. - Practically all internal grinders are designed for this direction of rotation with few exceptions. This does not apply to surface grinding or external grinding spindles).

Special Spindles - Grinding

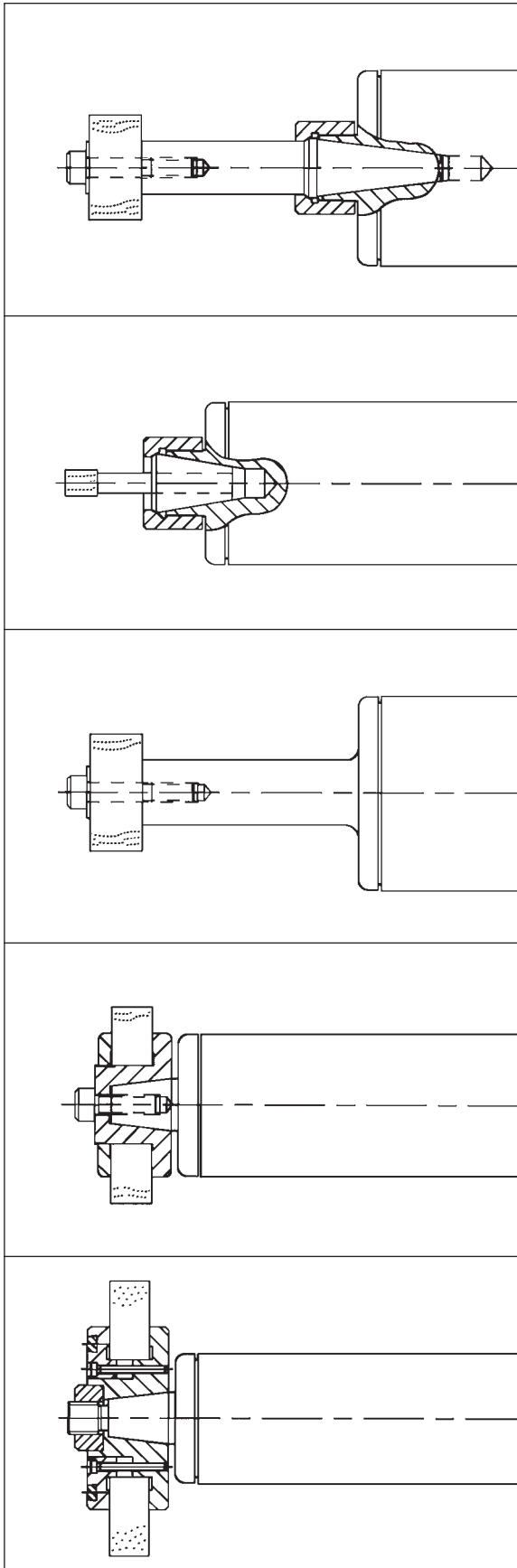
SHOULD A STANDARD SPINDLE NOT BE SUITABLE, PLEASE PROVIDE THE FOLLOWING INFORMATION:

1. Nature of work to be ground.
2. Make and model of grinding machine.
3. Production or Tool-Room work.
4. Diameter and speed of driving pulley.
5. Details of holding bracket, with sketch if possible.
6. Direction of rotation facing grinding wheel end.

Spindles are designed for operating in the horizontal position but can be modified for working vertically, etc. Where desired, if vertical operation is required state whether spindle is required with "Grinding Wheel Up" or "Grinding Wheel Down".

Spindles suitable for internal and external thread grinding, worm and spline grinding, etc, or for any high speed application, can usually be supplied upon receipt of full particulars.

SPINDLES - OPTIONS

**Detachable Quill Type**

With this type the quill is removable for grinding a large variety of bores. The quill is seated in an accurate taper and held by a separate lock nut. This method enables the quill to be removed without force and possible damage to the spindle. Full details of detachable quills is given on pages 9.56 to 9.58. This type will also accept collets as shown below without any modification to the grinding spindle.

Collet Type

This is the same as the detachable quill type spindle except that the collet is mounted in the taper bore. The collet is closed by the same lock nut which is used for holding the quill. This type is normally used for holding mounted wheels. Range of standard collets is given on pages 9.56 to 9.58 .

Solid Quill Type

With this type the quill or extension is solid and integral with the spindle resulting in maximum rigidity. It is recommended for one size of bore only or at least a very limited range of bores. It is also recommended for certain types of face grinding.

Sleeve Type

This type is normally used for large diameter and long bores. As the bearings are immediately behind the wheel maximum rigidity is obtained. The wheel is fitted to a separate adaptor and mounted on the taper nose.

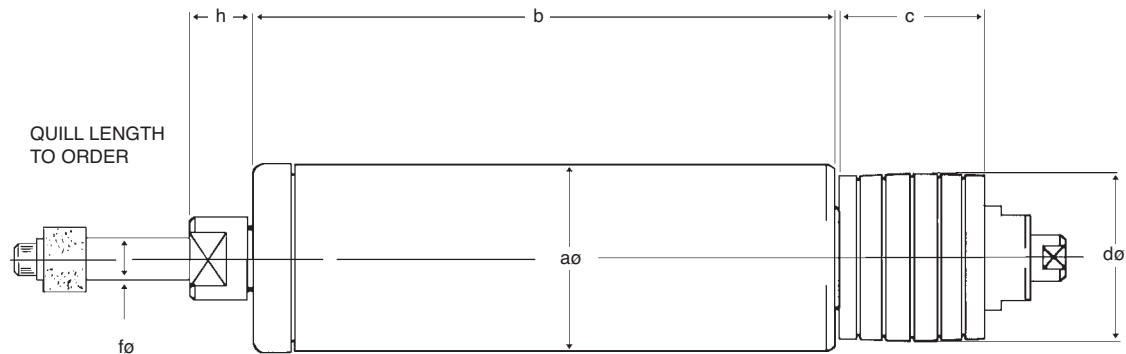
External Type

This type is used for outside diameter and surface grinding. The wheel is fitted to a separate adaptor and mounted on the taper nose. When large wheels are used the adaptor is fitted with balancing segments as illustrated.

BELT DRIVEN SPINDLES - INTERNAL GRINDING

STANDARD RANGE

METRIC



METRIC RANGE

Ref	Max Speed	a	b	c	d	Detachable 'f' ø Max	Solid 'f' ø Max	h
GS.1955	40.000 r.p.m.	25	105	30	40	5mm	6mm	13
GS.1764	30.000 r.p.m.	60	215	45	50	10mm	11mm	18
GS. 873	30.000 r.p.m.	45	170	30	50	10mm	11mm	18
GS.1766	28.000 r.p.m.	60	175	50	55	11mm	13mm	17
GS.1769	28.000 r.p.m.	70	215	50	55	11mm	13mm	17
GS.1770	28.000 r.p.m.	70	235	50	55	11mm	13mm	17
GS.1773	24.000 r.p.m.	60	215	50	55	14mm	16mm	18
GS.1776	24.000 r.p.m.	70	195	50	55	14mm	16mm	18
GS.1777	24.000 r.p.m.	70	280	50	55	14mm	16mm	18
GS.1778	24.000 r.p.m.	80	210	50	55	14mm	16mm	18
GS.1779	24.000 r.p.m.	80	285	50	55	14mm	16mm	18
GS.1781	20.000 r.p.m.	70	215	60	75	17mm	19mm	20
GS.1791	17.000 r.p.m.	90	280	60	65	22mm	25mm	25
GS.1792	17.000 r.p.m.	80	240	60	65	22mm	25mm	25
GS.1793	17.000 r.p.m.	80	220	60	65	22mm	25mm	25
GS.1797	15.000 r.p.m.	90	280	65	90	25mm	30mm	30
GS.1803	12.000 r.p.m.	100	330	65	95	30mm	35mm	35
GS.1807	12.000 r.p.m.	100	430	65	95	30mm	35mm	35

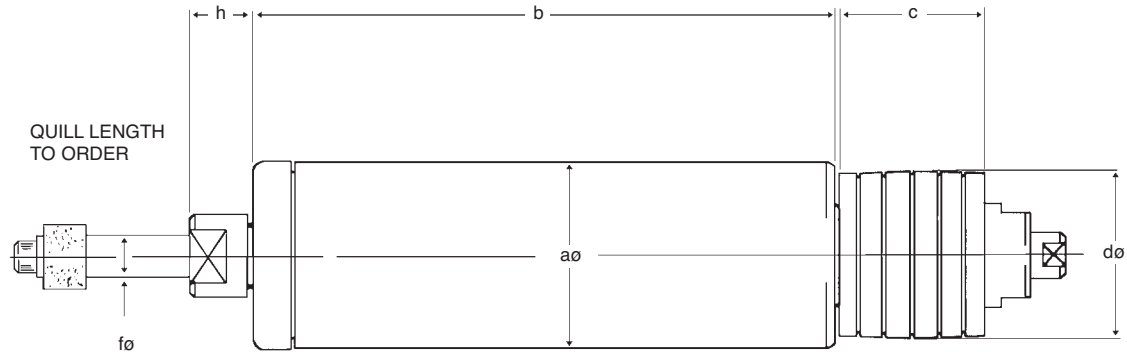
CONTINENTAL RANGE

Ref	Max Speed	øa	b					c	d	Detachable 'f' ø Max	Solid 'f' ø Max	h
GS.7220	40.000 r.p.m.	32	125	160	200			32	40	6.0mm	7.93mm	14
GS.7221	40.000 r.p.m.	36	125	160	250			32	40	6.0mm	7.93mm	14
GS.7222	38.000 r.p.m.	40	160	200	250			45	40	9.5mm	11.11mm	19
GS.7223	30.000 r.p.m.	45	160	250	315			45	40	11.0mm	12.70mm	18
GS.7224	30.000 r.p.m.	50	160	200	250	316		45	50	11.0mm	12.70mm	18
GS.7225	24.000 r.p.m.	60	160	250	315			57	55	17.0mm	19.05mm	21
GS.7226	20.000 r.p.m.	70	200	250	315			57	75	22.0mm	25.40mm	26
GS.7227	17.000 r.p.m.	80	200	250	315			63	65	25.0mm	31.75mm	31
GS.7228	12.000 r.p.m.	100	250	315	355	400	500	63	95	35.0mm	41.27mm	37
GS.7229	8.500 r.p.m.	120	630					63	95	44.5mm	50.80mm	41
GS.7230	7.500 r.p.m.	140	800	1000				63	95	44.5mm	50.80mm	41

BELT DRIVEN SPINDLES - INTERNAL GRINDING

STANDARD RANGE

INCH



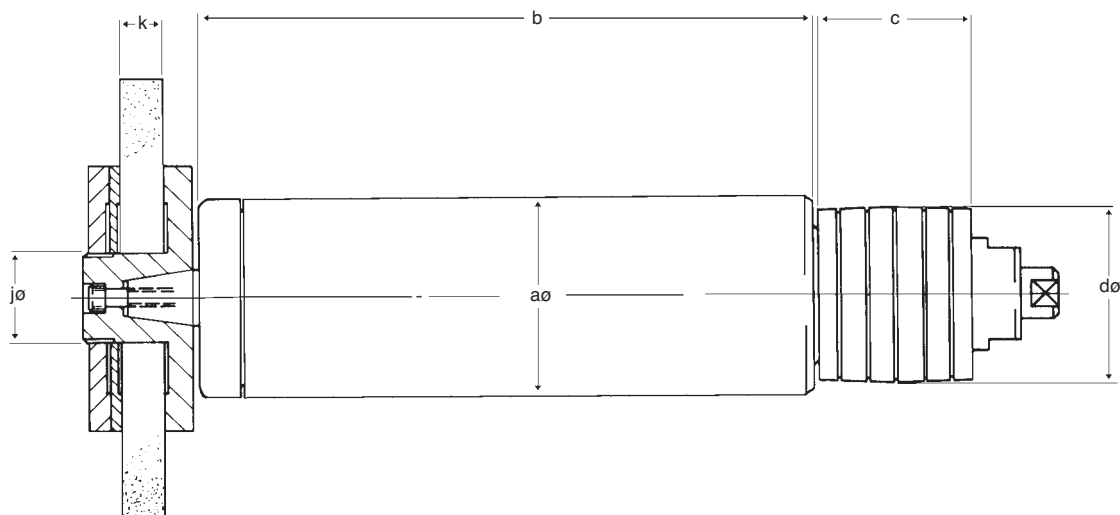
INCH RANGE

Ref	Max Speed	a	b	c	d	Detachable 'f' ø Max	Solid 'f' ø Max	h
GS.870A	38,000 r.p.m.	1 ¹ / ₄ "	6 ³ / ₁₆ "	1 ¹ / ₄ "	1 ¹ / ₂ "	1/4"	5/16"	1/2"
GS.882	38,000 r.p.m.	1 ¹ / ₂ "	5 ¹³ / ₁₆ "	1 ¹ / ₄ "	1 ¹ / ₂ "	1/4"	5/16"	1/2"
GS.1G	38,000 r.p.m.	1 ³ / ₄ "	5"	1 ¹ / ₄ "	1 ¹ / ₂ "	1/4"	5/16"	1/2"
GS.3	30,000 r.p.m.	2 ¹ / ₄ "	8 ³ / ₄ "	1 ³ / ₄ "	2"	3/8"	7/16"	1 ¹ / ₁₆ "
GS.4	28,000 r.p.m.	2 ¹ / ₄ "	7"	2"	2 ¹ / ₄ "	7/16"	1/2"	5/8"
GS.5	28,000 r.p.m.	2 ¹ / ₄ "	8 ³ / ₄ "	2"	2 ¹ / ₄ "	7/16"	1/2"	5/8"
GS.6	28,000 r.p.m.	2 ¹ / ₂ "	7"	2"	2 ¹ / ₄ "	7/16"	1/2"	5/8"
GS.142A	28,000 r.p.m.	2 ³ / ₄ "	9 ¹ / ₂ "	2"	2 ¹ / ₄ "	7/16"	1/2"	5/8"
GS.11	24,000 r.p.m.	2 ³ / ₄ "	8 ³ / ₄ "	2"	2 ¹ / ₄ "	9/16"	5/8"	1 ¹ / ₁₆ "
GS.129B	24,000 r.p.m.	3"	7 ³ / ₄ "	2"	2 ¹ / ₄ "	9/16"	5/8"	1 ¹ / ₁₆ "
GS.143B	24,000 r.p.m.	3"	10 ¹ / ₄ "	2"	2 ¹ / ₄ "	9/16"	5/8"	1 ¹ / ₁₆ "
GS.77	20,000 r.p.m.	2 ¹ / ₂ "	6 ⁵ / ₈ "	2 ¹ / ₄ "	3"	1 ¹ / ₁₆ "	3/4"	3/4"
GS.13	20,000 r.p.m.	2 ³ / ₄ "	8 ⁵ / ₈ "	2 ¹ / ₄ "	3"	1 ¹ / ₁₆ "	3/4"	3/4"
GS.14	20,000 r.p.m.	3"	6 ⁷ / ₈ "	2 ¹ / ₄ "	3"	1 ¹ / ₁₆ "	3/4"	3/4"
GS.15	20,000 r.p.m.	3"	8 ⁵ / ₈ "	2 ¹ / ₄ "	3"	1 ¹ / ₁₆ "	3/4"	3/4"
GS.85	20,000 r.p.m.	3 ¹ / ₈ "	7 ⁷ / ₈ "	2 ¹ / ₄ "	3"	1 ¹ / ₁₆ "	3/4"	3/4"
GS.144A	20,000 r.p.m.	3 ¹ / ₄ "	9 ⁷ / ₈ "	2 ¹ / ₄ "	3"	1 ¹ / ₁₆ "	3/4"	3/4"
GS.85A	20,000 r.p.m.	4"	17 ¹ / ₈ "	2 ¹ / ₄ "	3"	1 ¹ / ₁₆ "	3/4"	3/4"
GS.879	17,000 r.p.m.	3"	9 ¹ / ₄ "	2 ¹ / ₄ "	2 ³ / ₈ "	7/8"	1"	1"
GS.16	17,000 r.p.m.	3"	8"	2 ¹ / ₄ "	2 ⁵ / ₈ "	7/8"	1"	1"
GS.17	17,000 r.p.m.	3"	9 ³ / ₄ "	2 ¹ / ₄ "	2 ⁵ / ₈ "	7/8"	1"	1"
GS.86	17,000 r.p.m.	3 ¹ / ₈ "	7 ³ / ₄ "	2 ¹ / ₄ "	2 ⁵ / ₈ "	7/8"	1"	1"
GS.145A	17,000 r.p.m.	3 ¹ / ₄ "	10 ¹ / ₄ "	2 ¹ / ₄ "	2 ⁵ / ₈ "	7/8"	1"	1"
GS.120M	17,000 r.p.m.	3"	11 ¹ / ₄ "	2 ¹ / ₄ "	2 ⁵ / ₈ "	7/8"	1"	1"
GS.120	17,000 r.p.m.	3 ¹ / ₄ "	11 ¹ / ₄ "	2 ¹ / ₄ "	2 ⁵ / ₈ "	7/8"	1"	1"

BELT DRIVEN SPINDLES - EXTERNAL GRINDING

STANDARD RANGE

METRIC



METRIC RANGE

Ref	Max Speed	a	b	c	d	j	k
GS.1818	11.000 r.p.m.	38	140	30	50	20	15
GS.1819	11.000 r.p.m.	40	180	45	50	20	15
GS.1820	11.000 r.p.m.	60	220	45	50	20	15
GS.1822	11.000 r.p.m.	60	180	50	50	25	15
GS.1831	6.500 r.p.m.	80	380	60	90	30	25
GS.1832	6.500 r.p.m.	80	250	60	90	30	25
GS.1833	6.500 r.p.m.	80	300	60	90	30	25
GS.1834	5.000 r.p.m.	80	480	65	90	30	25
GS.1835	4.000 r.p.m.	90	180	65	90	30	25

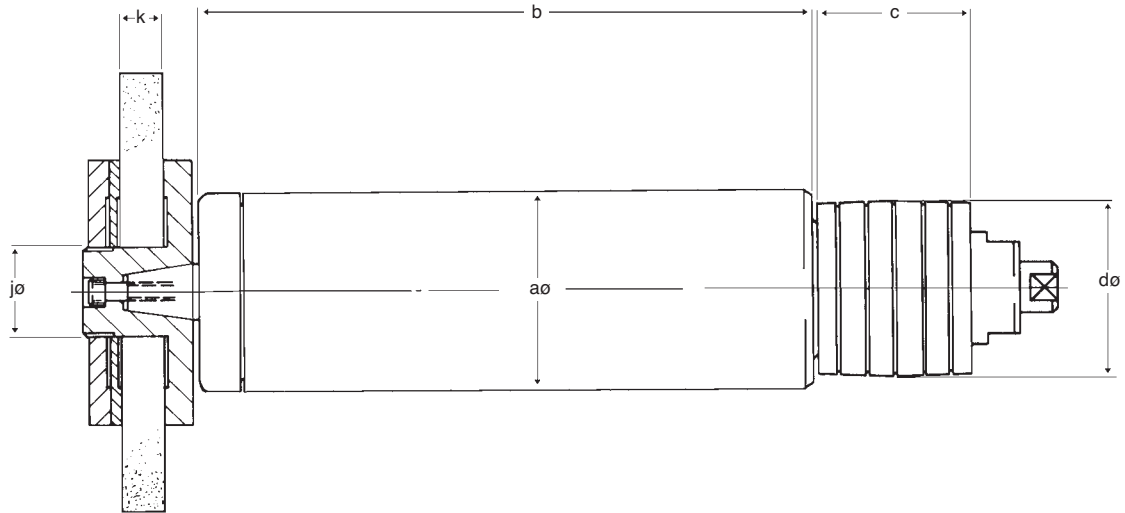
CONTINENTAL RANGE

Ref	Max Speed	a	b	c	d	j	k
GS.1960A	11.000 r.p.m.	25	250	30	40	10	5
GS.1817A	11.000 r.p.m.	32	280	30	50	15	15
GS.3231	11.000 r.p.m.	36	355	30	50	15	15
GS.1819A	11.000 r.p.m.	40	355	45	50	20	15
GS.3232	11.000 r.p.m.	45	400	45	50	15	15
GS.1820A	11.000 r.p.m.	60	500	45	50	20	15
GS.1844B	4.000 r.p.m.	120	500	75	To Order		

BELT DRIVEN SPINDLES - EXTERNAL GRINDING

STANDARD RANGE

INCH

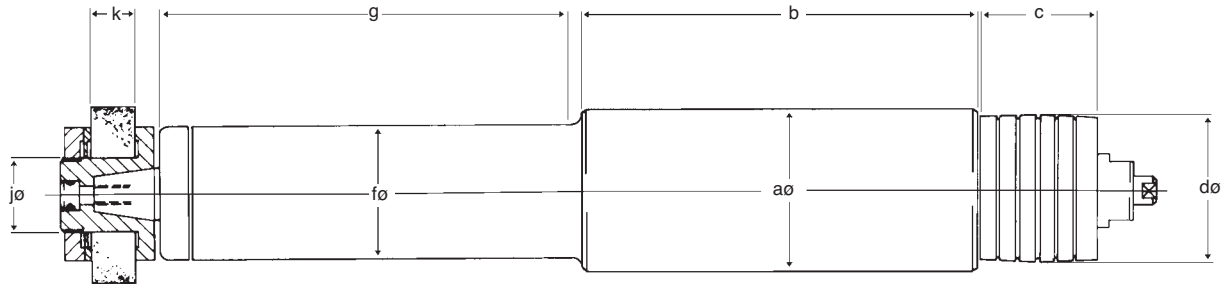


INCH RANGE

Ref	Max Speed	a	b	c	d	j	k
GS.1956	11,000 r.p.m.	1"	5 ³ / ₈ "	1 ¹ / ₄ "	1 ¹ / ₂ "	1 ¹ / ₂ "	1 ¹ / ₄ "
GS.870	11,000 r.p.m.	1 ¹ / ₄ "	6"	1 ¹ / ₄ "	2"	5 ⁵ / ₈ "	3 ³ / ₈ "
GS.881	11,000 r.p.m.	1 ¹ / ₂ "	5 ⁵ / ₈ "	1 ¹ / ₄ "	2"	3 ³ / ₄ "	1 ¹ / ₂ "
GS.1K	11,000 r.p.m.	1 ³ / ₄ "	7"	1 ³ / ₄ "	2"	7 ⁷ / ₈ "	1 ¹ / ₂ "
GS.3A	11,000 r.p.m.	2 ¹ / ₄ "	8 ³ / ₄ "	1 ³ / ₄ "	2"	7 ⁷ / ₈ "	1 ¹ / ₂ "
GS.897	11,000 r.p.m.	2"	13 ¹ / ₂ "	1 ³ / ₄ "	2"	1"	1 ¹ / ₂ "
GS.4B	11,000 r.p.m.	2 ¹ / ₄ "	7"	2"	2"	1"	1 ¹ / ₂ "
GS.6B	8,500 r.p.m.	2 ¹ / ₄ "	7"	2"	2"	1"	1 ¹ / ₂ "
GS.7C	8,500 r.p.m.	2 ¹ / ₂ "	8 ³ / ₄ "	2"	2"	1"	1 ¹ / ₂ "
GS.143E	8,500 r.p.m.	2 ¹ / ₂ "	10 ¹ / ₄ "	2"	2 ¹ / ₂ "	1"	3 ³ / ₄ "
GS.1231	8,500 r.p.m.	2 ³ / ₄ "	9 ¹ / ₂ "	2"	2 ¹ / ₂ "	1"	3 ³ / ₄ "
GS.21C	6,500 r.p.m.	3"	8 ³ / ₄ "	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	3 ³ / ₄ "
GS.14B	6,500 r.p.m.	3"	7"	2 ¹ / ₄ "	3 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.16B	6,500 r.p.m.	3"	8"	2 ¹ / ₄ "	3 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.21B	6,500 r.p.m.	3"	8"	2 ¹ / ₄ "	3 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.21H	6,500 r.p.m.	3"	10"	2 ¹ / ₂ "	3 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.185	6,500 r.p.m.	3 ¹ / ₄ "	11 ¹ / ₂ "	2 ¹ / ₄ "	3 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.1133	4,000 r.p.m.	3 ¹ / ₂ "	7"	2 ¹ / ₂ "	} To Order		
GS.6707	7,500 r.p.m.	3 ¹ / ₂ "	11 ¹ / ₂ "	2 ¹ / ₂ "			
GS.1124	4,000 r.p.m.	3 ¹ / ₂ "	14 ⁷ / ₈ "	2 ¹ / ₂ "			
GS.24B	4,000 r.p.m.	3 ³ / ₄ "	11 ¹ / ₄ "	2 ¹ / ₂ "			
GS.24C	4,000 r.p.m.	3 ³ / ₄ "	13 ¹ / ₄ "	2 ¹ / ₂ "			
GS.1220	4,000 r.p.m.	3 ¹⁵ / ₁₆ "	17 ¹ / ₄ "	2 ¹ / ₂ "			
GS.1148	4,000 r.p.m.	3 ¹⁵ / ₁₆ "	10 ³ / ₄ "	2 ¹ / ₂ "			
GS.24D	4,000 r.p.m.	4"	12 ³ / ₄ "	2 ¹ / ₂ "			
GS.2826	6,500 r.p.m.	4"	12 ³ / ₄ "				
GS.24H	4,000 r.p.m.	4 ¹ / ₂ "	18 ¹ / ₂ "	2 ¹ / ₂ "			
GS.25H	4,000 r.p.m.	4 ³ / ₄ "	5"	3"			
GS.6866	4,000 r.p.m.	4 ³ / ₄ "	15"				
GS.24F	4,000 r.p.m.	4 ³ / ₄ "	20"	3"			
GS.1319	4,000 r.p.m.	5"	20"	3"			
GS.1301	4,000 r.p.m.	5"	15 ¹ / ₄ "	3"			

BELT DRIVEN SPINDLES - SLEEVE TYPE

STANDARD RANGE - For large diameter and deep bores



INCH RANGE

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.508	11,500 r.p.m.	1 ¹ / ₄ "	9"	3 ¹ / ₄ "	12"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.509	11,500 r.p.m.	1 ¹ / ₄ "	10"	3 ¹ / ₄ "	12"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.510	11,500 r.p.m.	1 ¹ / ₄ "	12"	3 ¹ / ₄ "	12"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	1 ¹ / ₂ "
GS.511	11,500 r.p.m.	1 ¹ / ₂ "	9"	3 ¹ / ₄ "	12"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.512	11,500 r.p.m.	1 ¹ / ₂ "	11"	3 ¹ / ₄ "	12"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.513	11,500 r.p.m.	1 ¹ / ₂ "	12"	3 ¹ / ₄ "	12"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.514	11,000 r.p.m.	1 ³ / ₄ "	10"	3 ¹ / ₄ "	12"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.515	11,000 r.p.m.	1 ³ / ₄ "	11"	3 ¹ / ₄ "	12"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.516	11,000 r.p.m.	1 ³ / ₄ "	12"	3 ¹ / ₄ "	12"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.517	8,500 r.p.m.	2"	8"	3 ¹ / ₄ "	12"	2"	3 ¹ / ₄ "	1"	1"
GS.518	8,500 r.p.m.	2"	10"	3 ¹ / ₄ "	12"	2"	3 ¹ / ₄ "	1"	1"
GS.519	8,500 r.p.m.	2"	12"	3 ¹ / ₄ "	12"	2"	3 ¹ / ₄ "	1"	1"
GS.520	8,500 r.p.m.	2"	14"	3 ¹ / ₄ "	12"	2"	3 ¹ / ₄ "	1"	1"
GS.521	8,500 r.p.m.	2"	15"	3 ¹ / ₄ "	12"	2"	3 ¹ / ₄ "	1"	1"
GS.522	7,000 r.p.m.	2 ¹ / ₄ "	8"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.523	7,000 r.p.m.	2 ¹ / ₄ "	10"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.524	7,000 r.p.m.	2 ¹ / ₄ "	12"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.525	7,000 r.p.m.	2 ¹ / ₄ "	15"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.526	6,500 r.p.m.	2 ¹ / ₂ "	8"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.527	6,500 r.p.m.	2 ¹ / ₂ "	10"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.528	6,500 r.p.m.	2 ¹ / ₂ "	12"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "
GS.529	6,500 r.p.m.	2 ¹ / ₂ "	14"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.530	6,500 r.p.m.	2 ¹ / ₂ "	16"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.531	6,500 r.p.m.	2 ¹ / ₂ "	18"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.532	5,000 r.p.m.	3"	6"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.533	5,000 r.p.m.	3"	10"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.534	5,000 r.p.m.	3"	12"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.535	5,000 r.p.m.	3"	15"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.536	5,000 r.p.m.	3"	18"	3 ¹ / ₄ "	12"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"

METRIC RANGE

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.3234	11,000 r.p.m.	40	320	60	230	50.8	63	12.7	12.7
GS.3235	11,000 r.p.m.	40	380	60	230	50.8	63	12.7	12.7
GS.3236	11,000 r.p.m.	40	450	60	230	50.8	63	12.7	12.7
GS.3237	8,000 r.p.m.	50	420	70	230	50.8	80	22.2	19.05
GS.3238	8,000 r.p.m.	50	480	70	230	50.8	80	22.2	19.05
GS.3239	8,000 r.p.m.	50	530	70	230	50.8	80	22.2	19.05
GS.3240	7,000 r.p.m.	60	480	80	230	50.8	100	25.4	25.4
GS.3241	7,000 r.p.m.	60	530	80	230	50.8	100	25.4	25.4
GS.3242	7,000 r.p.m.	60	600	80	230	50.8	100	25.4	25.4
GS.3243	5,500 r.p.m.	80	590	100	230	63.5	125	31.75	25.4
GS.3244	5,500 r.p.m.	80	660	100	230	63.5	125	31.75	25.4
GS.3245	5,500 r.p.m.	80	740	100	230	63.5	125	31.75	25.4

SPINDLES - REPLACEMENT - OVERVIEW

In addition to all the manufacturers machine types listed (within this section) Jena-Tec is able to offer B&T replacement spindles for most other manufacturers machines.

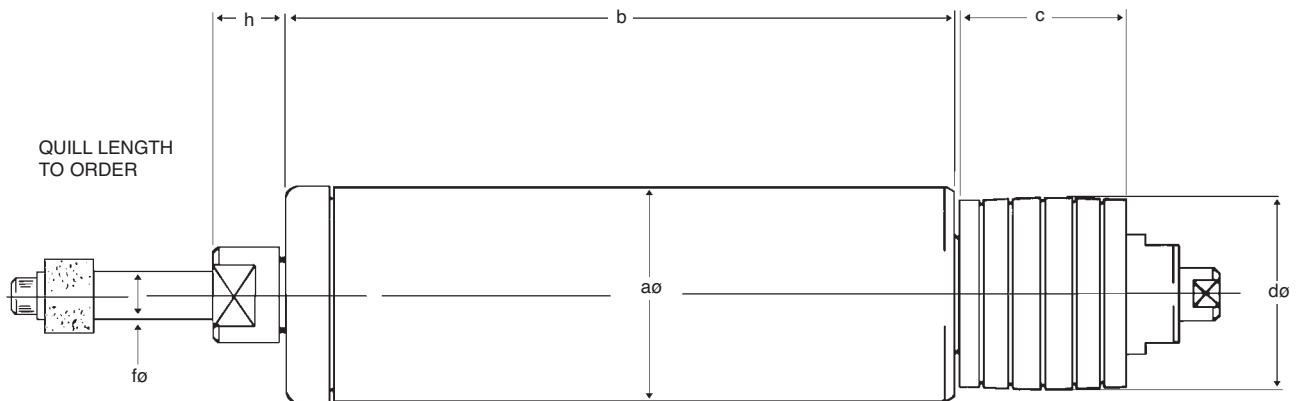
Replacement spindles may be customised, to suit special requirements.

Please discuss your requirements with a Jena-Tec rotary products technician.

BROWN AND SHARPE	page 36-38
BRYANT	page 39-45
CHURCHILL	page 46-56
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BROWN AND SHARPE

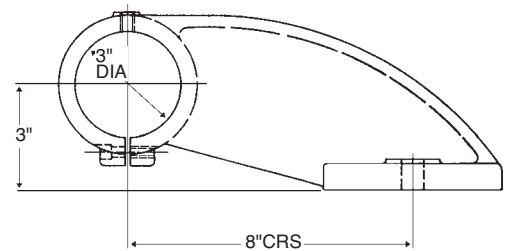
For Brown and Sharpe Nos.1 and 13 Universal Grinders (Sealed in Lubrication)



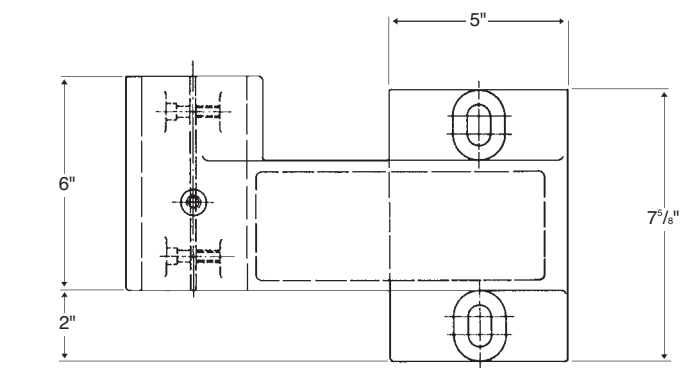
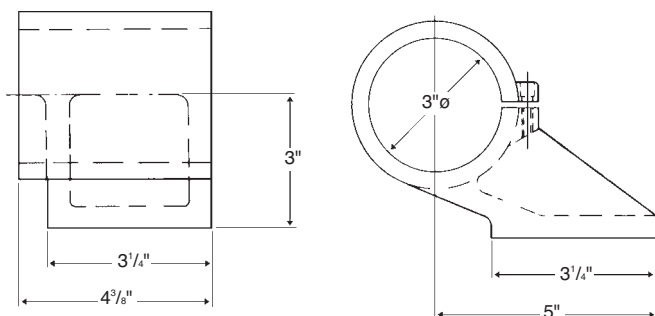
Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.76B	38,000	3"	6 ⁷ / ₈ "	1 ¹ / ₄ "	1"	"f" any dia. up to 1 ¹ / ₄ "	"f" any dia. up to 5 ⁵ / ₁₆ "	1 ¹ / ₂ "
GS.77B	30,000	3"	7"	1 ³ / ₄ "	1 ¹ / ₄ "	"f" any dia. up to 3 ³ / ₈ "	"f" any dia. up to 7 ⁷ / ₁₆ "	1 ¹¹ / ₁₆ "
GS.6F	28,000	3"	7"	2"	1 ³ / ₈ "	"f" any dia. up to 7 ⁷ / ₁₆ "	"f" any dia. up to 1 ¹ / ₂ "	5 ⁵ / ₈ "
GS.129B	24,000	3"	7 ³ / ₄ "	2"	1 ¹ / ₂ "	"f" any dia. up to 9 ⁹ / ₁₆ "	"f" any dia. up to 5 ⁵ / ₈ "	1 ¹¹ / ₁₆ "
GS.15	20,000	3"	8 ⁵ / ₈ "	2 ¹ / ₄ "	2"	"f" any dia. up to 1 ¹¹ / ₁₆ "	"f" any dia. up to 3 ³ / ₄ "	3 ³ / ₄ "
GS.17	17,000	3"	9 ³ / ₄ "	2 ¹ / ₄ "	2 ¹ / ₄ "	"f" any dia. up to 7 ⁷ / ₈ "	"f" any dia. up to 1"	1"

All the above spindles should be mounted in bracket B.1651 or B.1660.

Spindle GS.17 is recommended for general purpose work.



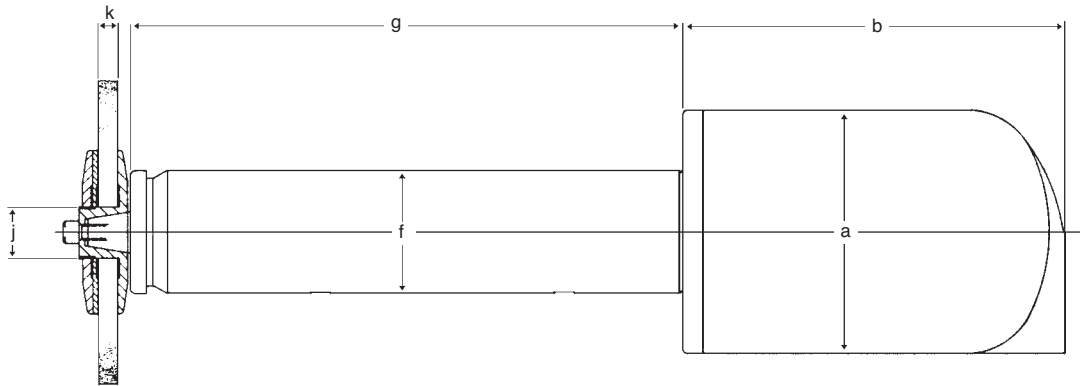
Bracket for mounting above spindles on Brown & Sharpe Nos. 1 and 13 Universal Grinders. Ref. B1651.



Brackets for mounting spindles on Brown & Sharpe Nos. 1 and 13 Universal Grinders. Bracket Ref. B.1660.

BROWN AND SHARPE

Motorised Self-contained Spindles for No. 2 Surface Grinder (Sealed in Lubrication)



Ref	a	b	f	g	j	k	Constant speed on 50 cycle supply	h.p.
MGS.16	6"	11 ³ / ₄ "	3"	11 ³ / ₄ "	1 ¹ / ₄ "	¹ / ₂ "	3,000 r.p.m.	1
MGS.590	6"	11 ³ / ₄ "	3"	12 ³ / ₄ "	1 ¹ / ₄ "	¹ / ₂ "	3,000 r.p.m.	1
MGS.591	6"	11 ³ / ₄ "	3 ¹ / ₄ "	12 ¹ / ₈ "	1 ¹ / ₄ "	¹ / ₂ "	3,000 r.p.m.	1
MGS.592	6"	11 ³ / ₄ "	3 ¹ / ₄ "	12 ³ / ₄ "	1 ¹ / ₄ "	¹ / ₂ "	3,000 r.p.m.	1

NOTE:-

For machines prior to serial number 9501 bore existing bracket 3" diameter and fit spindle MGS.16 or MGS.590. Machines after serial 9501 use spindles MGS.591 or MGS.592. Check dimensions carefully as there is only a small difference in length. Motorised Spindles are self-contained and eliminate the necessity of belts, idler pulleys, etc.

The same special pre-loaded precision bearings are used to remove all traces of radial or end play. This absence of end play enables better results to be obtained when grinding on the sides of the wheel, such as when grinding form tools and gap gauges, etc. Precision Ball Bearing Spindles can also be relied upon to give good results over long periods without attention.

The spindle is driven by a 1 horse power motor giving a constant speed of 3,000 r.p.m. on a 50-cycle supply. Motors are available for either 200/240 volt or 380/420 volt, A.C. supply. Spindles suitable for A.C. supply only.

The motor is mounted on the spindle direct, thus eliminating the necessity of couplings, etc., and the complete assembly is balanced to ensure smooth and vibrationless running.

When ordering, state current supply and spindle reference.

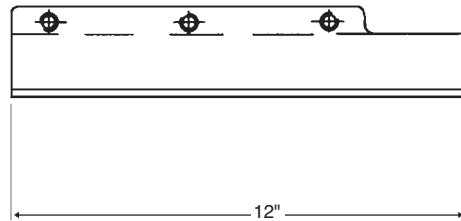
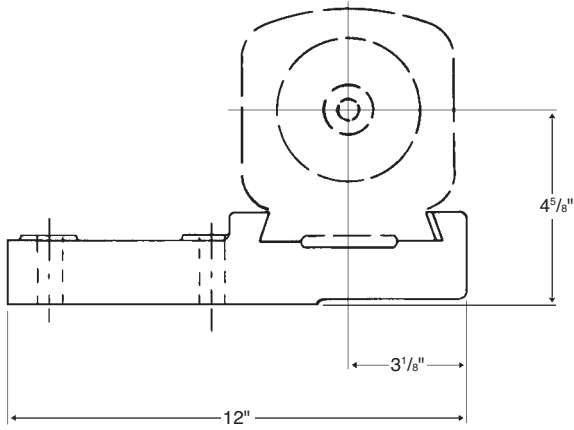
NOTE:-

Wheel Adaptors to suit alternative dimensions to those shown under j and k can be supplied. Also with facilities for balancing, this type being recommended for best results.

BROWN AND SHARPE

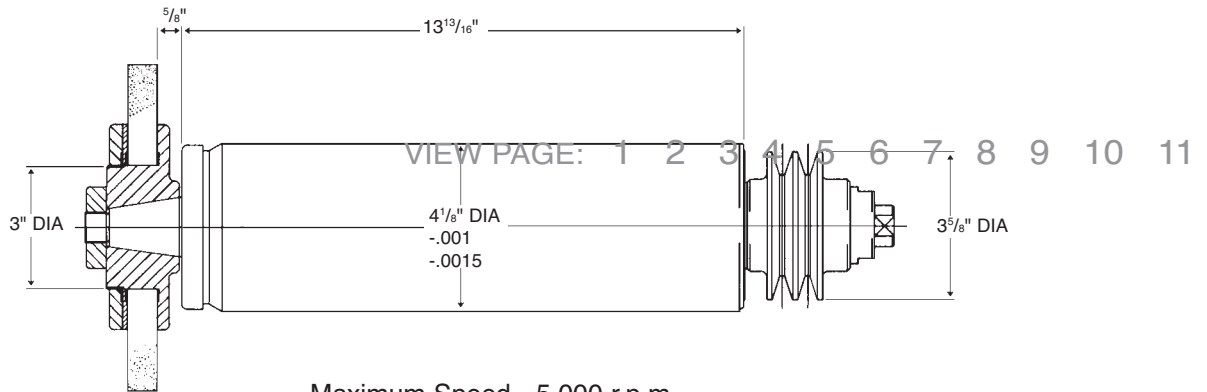
For Nos. 2, 3 and 4 Universal Grinders

The full range of Jena Rotary Technology Spindles normally for Heald Machines can be fitted to Brown & Sharpe Nos. 2, 3 and 4 Universal Grinders by using mounting bracket B.1658 (illustrated). The same spindle thus becomes interchangeable with Heald and Brown & Sharpe Machines which is an advantage where both types are operated. Spindle GS.147 is recommended for general work.



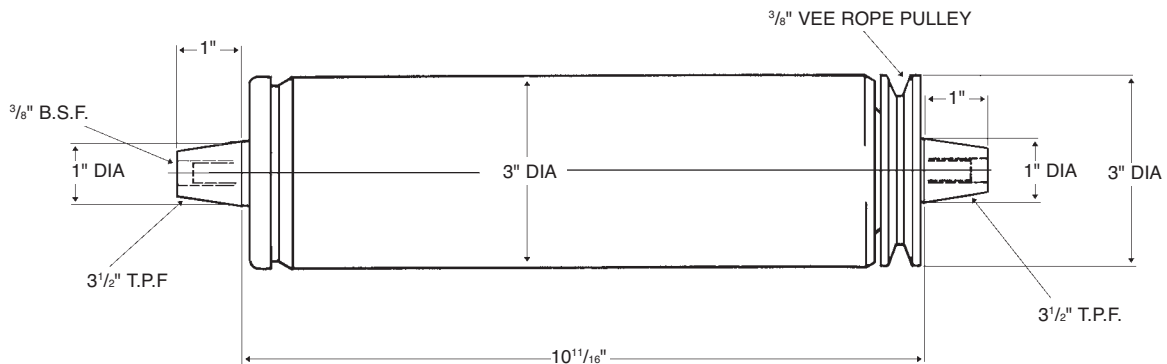
BRACKET ONLY
Ref. B.1658

Spindles suitable for No. 5 Surface Grinder (Sealed in lubrication)



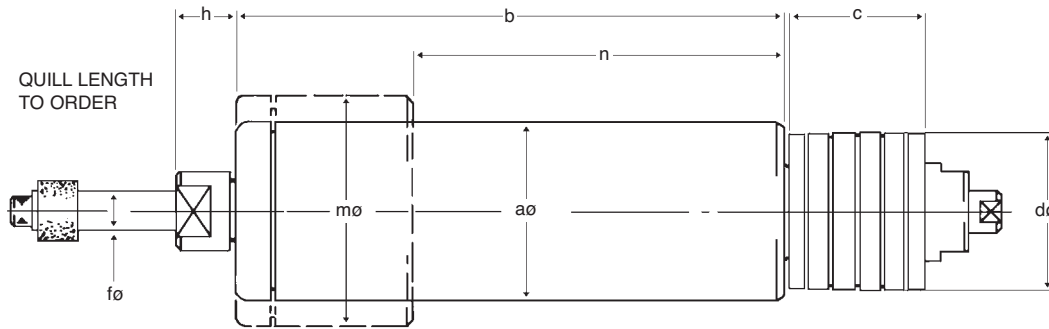
Maximum Speed - 5,000 r.p.m.
Ref. GS. 1533

Spindles suitable for No. 10 Cutter Grinder (Sealed in lubrication)



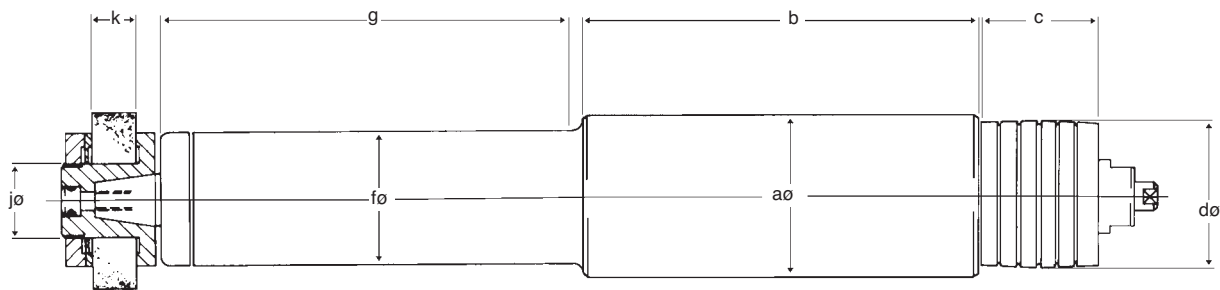
Maximum Speed - 5,000 r.p.m.
Ref. GS. 984

Production Spindles for No. 12 Internal Grinder (Sealed in lubrication)



Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.90	17,000 r.p.m.	3 1/8"	8 1/2"	2 1/4"	1 3/4"	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"		
GS.267	15,000 r.p.m.	3 1/8"	8 1/2"	2 1/4"	2 1/4"	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	1 3/16"		
GS.268	12,000 r.p.m.	3 1/8"	11 1/2"	2 1/4"	2 3/4"	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	1 3/8"	3 1/2"	8 1/2"
GS.269	10,000 r.p.m.	3 1/8"	12"	2 1/4"	3"	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	1 3/8"	4"	8 1/2"

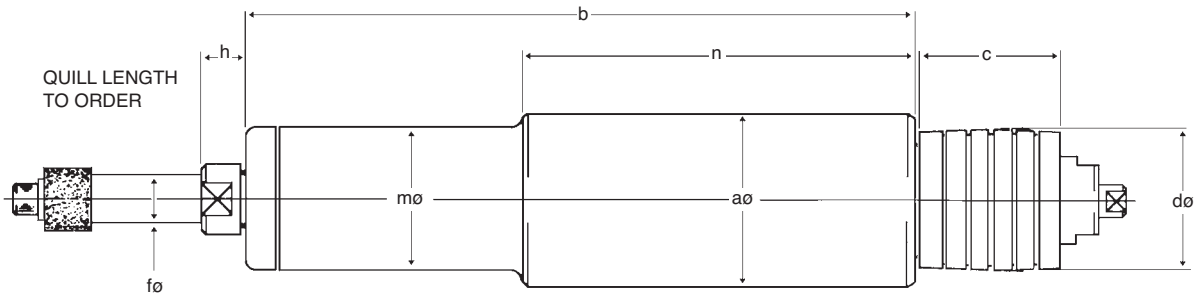


Sleeve Type

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.270	11,500 r.p.m.	1 1/4"	9"	3 1/8"	8 1/2"	2"	1 3/4"	1/2"	3/4"
GS.271	11,500 r.p.m.	1 1/4"	10"	3 1/8"	8 1/2"	2"	1 3/4"	1/2"	3/4"
GS.272	11,500 r.p.m.	1 1/4"	12"	3 1/8"	8 1/2"	2"	1 3/4"	1/2"	1 1/2"
GS.273	11,500 r.p.m.	1 1/2"	9"	3 1/8"	8 1/2"	2"	1 3/4"	3/4"	3/4"
GS.274	11,500 r.p.m.	1 1/2"	10"	3 1/8"	8 1/2"	2"	1 3/4"	3/4"	3/4"
GS.275	11,500 r.p.m.	1 1/2"	12"	3 1/8"	8 1/2"	2"	1 3/4"	3/4"	3/4"
GS.93	11,000 r.p.m.	1 3/4"	8"	3 1/8"	8 1/2"	2 1/4"	2"	7/8"	3/4"
GS.94	11,000 r.p.m.	1 3/4"	10"	3 1/8"	8 1/2"	2 1/4"	2"	7/8"	3/4"
GS.94A	11,000 r.p.m.	1 3/4"	12"	3 1/8"	8 1/2"	2 1/4"	2"	7/8"	3/4"
GS.95	8,500 r.p.m.	2"	6"	3 1/8"	8 1/2"	2 1/4"	2 1/4"	1"	1"
GS.96	8,500 r.p.m.	2"	8"	3 1/8"	8 1/2"	2 1/4"	2 1/4"	1"	1"
GS.97	8,500 r.p.m.	2"	10"	3 1/8"	8 1/2"	2 1/4"	2 1/4"	1"	1"
GS.97A	8,500 r.p.m.	2"	12"	3 1/8"	8 1/2"	2 1/4"	2 1/4"	1"	1"
GS.98	7,000 r.p.m.	2 1/4"	6"	3 1/8"	8 1/2"	2 1/4"	2 3/4"	1"	1"
GS.99	7,000 r.p.m.	2 1/4"	8"	3 1/8"	8 1/2"	2 1/4"	2 3/4"	1"	1"
GS.100	7,000 r.p.m.	2 1/4"	10"	3 1/8"	8 1/2"	2 1/4"	2 3/4"	1"	1"
GS.100A	7,000 r.p.m.	2 1/4"	12"	3 1/8"	8 1/2"	2 1/4"	2 3/4"	1"	1"
GS.102	6,500 r.p.m.	2 1/2"	6"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1"
GS.103	6,500 r.p.m.	2 1/2"	8"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1"
GS.104	6,500 r.p.m.	2 1/2"	10"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1"
GS.104A	6,500 r.p.m.	2 1/2"	12"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1"
GS.105	6,000 r.p.m.	3"	4"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1 1/2"
GS.106	6,000 r.p.m.	3"	6"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1 1/2"
GS.107	6,000 r.p.m.	3"	8"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1 1/2"
GS.108	6,000 r.p.m.	3"	10"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1"
GS.108A	6,000 r.p.m.	3"	12"	3 1/8"	8 1/2"	2 1/2"	3"	1 1/4"	1"

BRYANT

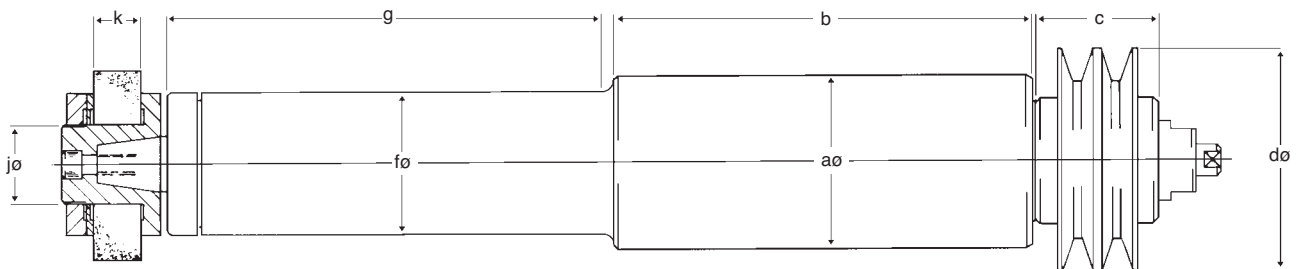
Production Spindles for Bryant 16 Internal Grinder (Sealed in Lubrication)



Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.276	24,000 r.p.m.	4"	17"	2 ¹ / ₄ "	2"	"f" any dia. up to ⁹ / ₁₆ "	"f" any dia. up to ⁵ / ₈ "	¹¹ / ₁₆ "	2 ¹ / ₄ "	10"
GS.85A	20,000 r.p.m.	4"	17"	2 ¹ / ₄ "	2 ¹ / ₄ "	"f" any dia. up to ¹¹ / ₁₆ "	"f" any dia. up to ³ / ₄ "	³ / ₄ "	2 ¹ / ₂ "	10"
GS.277	17,000 r.p.m.	4"	14 ³ / ₄ "	2 ¹ / ₂ "	2 ¹ / ₂ "	"f" any dia. up to ⁷ / ₈ "	"f" any dia. up to 1"	1"	3"	10"
GS.238	15,000 r.p.m.	4"	17"	2 ¹ / ₂ "	2 ³ / ₄ "	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ³ / ₁₆ "	3 ¹ / ₂ "	10"
GS.278	12,000 r.p.m.	4"	17 ³ / ₁₆ "	2 ¹ / ₂ "	3"	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ³ / ₈ "	1 ³ / ₈ "	4"	13 ¹ / ₂ "
GS.1058	10,000 r.p.m.	4"	17 ³ / ₁₆ "	2 ¹ / ₂ "	3 ¹ / ₂ "	"f" any dia. up to 1 ³ / ₈ "	"f" any dia. up to 1 ⁵ / ₈ "	1 ³ / ₈ "	4 ¹ / ₂ "	13 ³ / ₈ "
GS.279	7,500 r.p.m.	4"	14"	2 ¹ / ₂ "	4"	"f" any dia. up to 1 ³ / ₄ "	"f" any dia. up to 2"	1 ⁹ / ₁₆ "	5"	10 ¹ / ₄ "

Machines equipped with "V" belt pulleys should be changed to plain type for driving the above spindle with an endless silk belt.



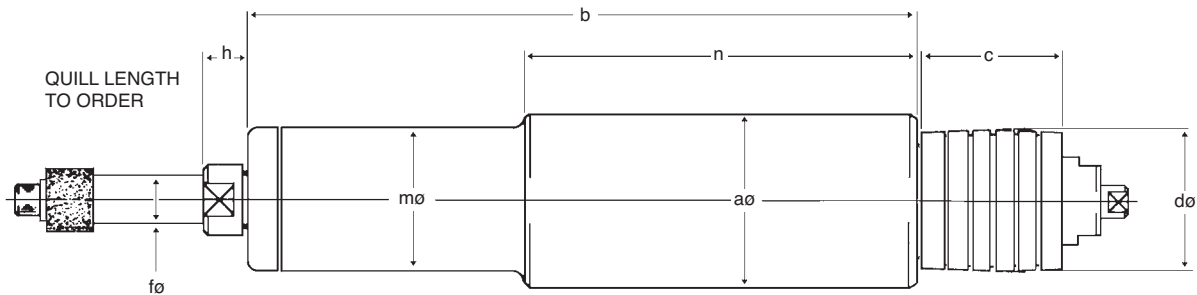
Sleeve Type

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.281	11,500 r.p.m.	1 ¹ / ₄ "	9"	4"	13"	2"	2 ⁷ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.282	11,500 r.p.m.	1 ¹ / ₄ "	10"	4"	13"	2"	2 ⁷ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.283	11,500 r.p.m.	1 ¹ / ₄ "	12"	4"	13"	2"	2 ⁷ / ₈ "	1 ¹ / ₂ "	1 ¹ / ₂ "
GS.284	11,500 r.p.m.	1 ¹ / ₂ "	11"	4"	13"	2"	3"	3 ³ / ₄ "	3 ³ / ₄ "
GS.285	11,500 r.p.m.	1 ¹ / ₂ "	12"	4"	13"	2"	3"	3 ³ / ₄ "	3 ³ / ₄ "
GS.976	11,000 r.p.m.	1 ³ / ₄ "	11"	4"	13"	2 ¹ / ₄ "	3"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.286	11,000 r.p.m.	1 ³ / ₄ "	12"	4"	13"	2 ¹ / ₄ "	3"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.287	8,500 r.p.m.	2"	8"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.288	8,500 r.p.m.	2"	10"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.289	8,500 r.p.m.	2"	12"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.290	7,000 r.p.m.	2 ¹ / ₄ "	8"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.98B	7,000 r.p.m.	2 ¹ / ₄ "	10"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.291	7,000 r.p.m.	2 ¹ / ₄ "	12"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.292	6,500 r.p.m.	2 ¹ / ₂ "	8"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.293	6,500 r.p.m.	2 ¹ / ₂ "	10"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.294	6,500 r.p.m.	2 ¹ / ₂ "	12"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.295	6,500 r.p.m.	2 ¹ / ₂ "	14"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.103B	6,000 r.p.m.	3"	6"	4"	13"	2 ¹ / ₂ "	4 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.296	6,000 r.p.m.	3"	10"	4"	13"	2 ¹ / ₂ "	4 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.297	6,000 r.p.m.	3"	12"	4"	13"	2 ¹ / ₂ "	4 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.298	6,000 r.p.m.	3"	14"	4"	13"	2 ¹ / ₂ "	4 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.103A	4,000 r.p.m.	3 ¹ / ₂ "	6"	4"	13"	2 ¹ / ₂ "	5 ¹ / ₄ "	2"	2"
GS.299	4,000 r.p.m.	3 ¹ / ₂ "	10"	4"	13"	2 ¹ / ₂ "	5 ¹ / ₄ "	2"	2"
GS.300	4,000 r.p.m.	3 ¹ / ₂ "	12"	4"	13"	2 ¹ / ₂ "	5 ¹ / ₄ "	2"	1"
GS.304	4,000 r.p.m.	3 ¹ / ₂ "	14"	4"	13"	2 ¹ / ₂ "	5 ¹ / ₄ "	2"	1"

All the Sleeve Type Spindles above are fitted with "V" belt pulleys unless otherwise specified. B&T Spindles are suitable for face grinding. Model GS.103A is particularly suitable for this purpose.

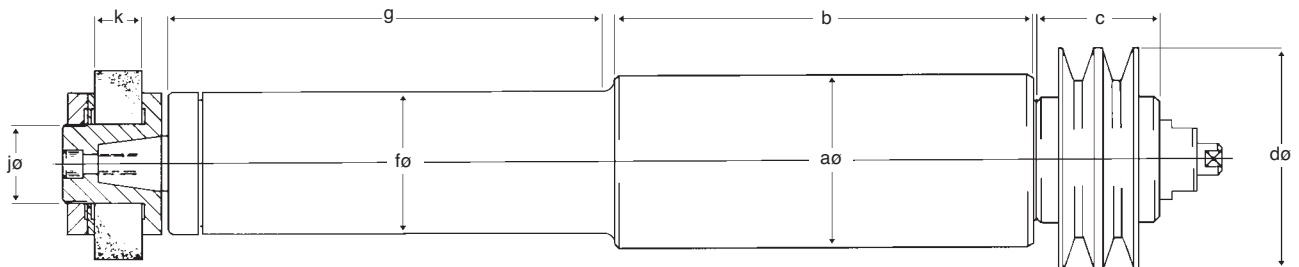
Production Spindles for Series 24 Internal Grinders (Sealed in lubrication)



Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.305	20,000 r.p.m.	5"	19"	2 1/4"	1 1/2"	"f" any dia. up to 1 1/16"	"f" any dia. up to 3/4"	3/4"	2 1/2"	15"
GS.306	17,000 r.p.m.	5"	19 1/8"	2 1/2"	1 3/4"	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"	3"	15"
GS.307C	15,000 r.p.m.	5"	19"	2 1/2"	2"	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	1 3/16"	3 1/2"	15"
GS.308	12,000 r.p.m.	5"	19"	2 1/2"	2 3/4"	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	1 3/8"	4"	15"
GS.105A	10,000 r.p.m.	5"	19"	2 1/2"	3 1/4"	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	1 3/8"	4 1/2"	15"
GS.309	7,500 r.p.m.	5"	18 3/4"	2 1/2"	4"	"f" any dia. up to 1 3/4"	"f" any dia. up to 2"	1 9/16"	5"	15"

Machines equipped with "V" belt pulleys should be changed to plain type pulley for driving the above spindles with endless silk belt.



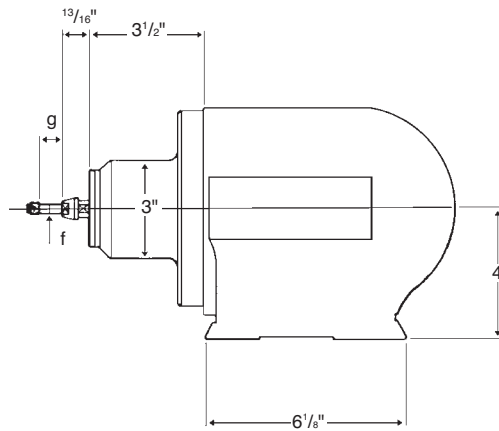
Sleeve Type Spindles

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.310	11,500 r.p.m.	1 1/4"	9"	5"	15"	2"	3"	1/2"	3/4"
GS.311	11,500 r.p.m.	1 1/4"	10"	5"	15"	2"	3"	1/2"	3/4"
GS.312	11,500 r.p.m.	1 1/4"	12"	5"	15"	2"	3"	1/2"	1 1/2"
GS.313	11,500 r.p.m.	1 1/2"	11"	5"	15"	2"	3"	3/4"	3/4"
GS.200B	11,500 r.p.m.	1 1/2"	12"	5"	15"	2"	3"	3/4"	3/4"
GS.314	11,000 r.p.m.	1 3/4"	11"	5"	15"	2 1/4"	3 1/4"	7/8"	3/4"
GS.315	11,000 r.p.m.	1 3/4"	12"	5"	15"	2 1/4"	3 1/4"	7/8"	3/4"
GS.316	8,500 r.p.m.	2"	8"	5"	15"	2 1/4"	3 1/2"	1"	1"
GS.317	8,500 r.p.m.	2"	10"	5"	15"	2 1/4"	3 1/2"	1"	1"
GS.318	8,500 r.p.m.	2"	12"	5"	15"	2 1/4"	3 1/2"	1"	1"
GS.319	8,500 r.p.m.	2"	14"	5"	15"	2 1/4"	3 1/2"	1"	1"
GS.320	7,000 r.p.m.	2 1/4"	8"	5"	15"	2 1/4"	3 1/2"	1"	1"
GS.321	7,000 r.p.m.	2 1/4"	10"	5"	15"	2 1/4"	3 1/2"	1"	1"

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.322	7,000 r.p.m.	2 1/4"	12"	5"	15"	2 1/4"	3 1/2"	1"	1"
GS.323	7,000 r.p.m.	2 1/4"	15"	5"	15"	2 1/4"	3 1/2"	1"	1"
GS.324	6,500 r.p.m.	2 1/2"	8"	5"	15"	2 1/2"	4 1/4"	1 1/4"	1"
GS.325	6,500 r.p.m.	2 1/2"	10"	5"	15"	2 1/2"	4 1/4"	1 1/4"	1"
GS.108A	6,500 r.p.m.	2 1/2"	12"	5"	15"	2 1/2"	4 1/4"	1 1/4"	1"
GS.326	6,500 r.p.m.	2 1/2"	15"	5"	15"	2 1/2"	4 1/4"	1 1/4"	1"
GS.327	6,000 r.p.m.	3"	6"	5"	15"	2 1/2"	4 3/4"	1 1/4"	1 1/2"
GS.328	6,000 r.p.m.	3"	10"	5"	15"	2 1/2"	4 3/4"	1 1/4"	1"
GS.108E	6,000 r.p.m.	3"	12"	5"	15"	2 1/2"	4 3/4"	1 1/4"	1"
GS.329	6,000 r.p.m.	3"	15"	5"	15"	2 1/2"	4 3/4"	1 1/4"	1"
GS.330	4,000 r.p.m.	3 1/2"	6"	5"	15"	2 1/2"	5 1/4"	2"	2"
GS.331	4,000 r.p.m.	3 1/2"	10"	5"	15"	2 1/2"	5 1/4"	2"	2"
GS.332	4,000 r.p.m.	3 1/2"	12"	5"	15"	2 1/2"	5 1/4"	2"	1"
GS.333	4,000 r.p.m.	3 1/2"	15"	5"	15"	2 1/2"	5 1/4"	2"	1"

Sleeve Type Spindles detailed above are fitted with "V" rope pulleys unless otherwise specified. Spindles are suitable for face grinding, Models GS.330 and GS.309 are particularly suitable for this purpose.

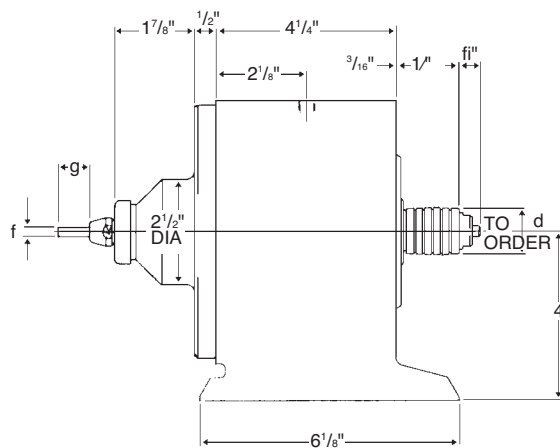
Spindles for or Internal Grinders types 1109, 1107, 1309, etc. High Frequency and Air-driven Types



Detachable and Solid Quill Types

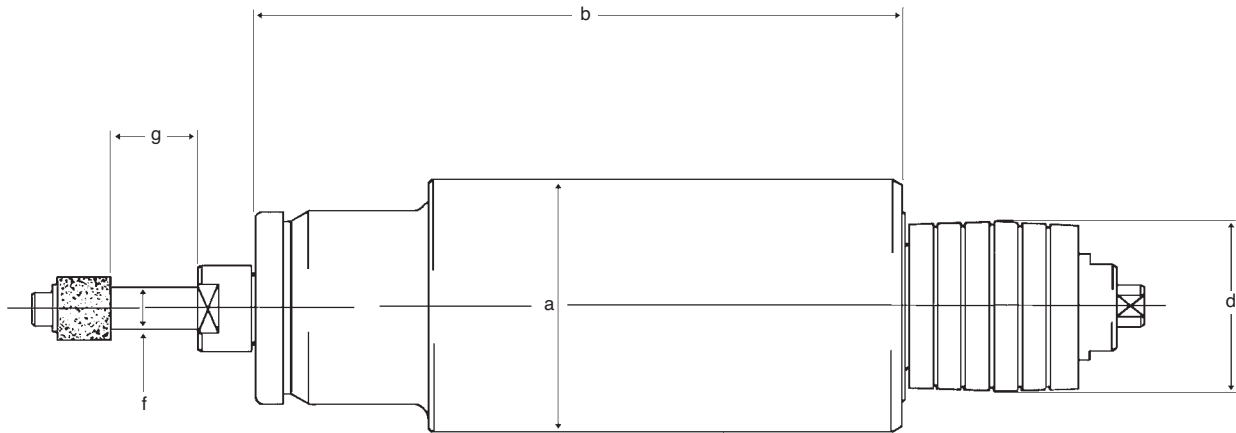
Ref	Max Speed	Detachable Quill Type	Solid Quill Type	
HFGS.76	60 to 80,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	High Frequency Type
HFGS.214	80 to 100,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	High Frequency Type
HFGS.75	30 to 40,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	High Frequency Type
HFGS.87	24,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	High Frequency Type
AGS.408	40 to 50,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	Air Driven Type
AGS.415	20,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	Air Driven Type
AGS.416	15,000 r.p.m.	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	Air Driven Type

Belt Driven. Solid and detachable Quill Types



Ref	Max Speed	Detachable Quill Type	Solid Quill Type	d
GS.1269C	38,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	1"
GS.1304	30,000 r.p.m.	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	1 1/8"
GS.1305	28,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	1 1/4"
GS.1306	24,000 r.p.m.	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	1 3/8"
GS.1307	20,000 r.p.m.	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	1 1/2"

Spindles for Series 112, 116, 112M, etc. (Sealed in lubrication)

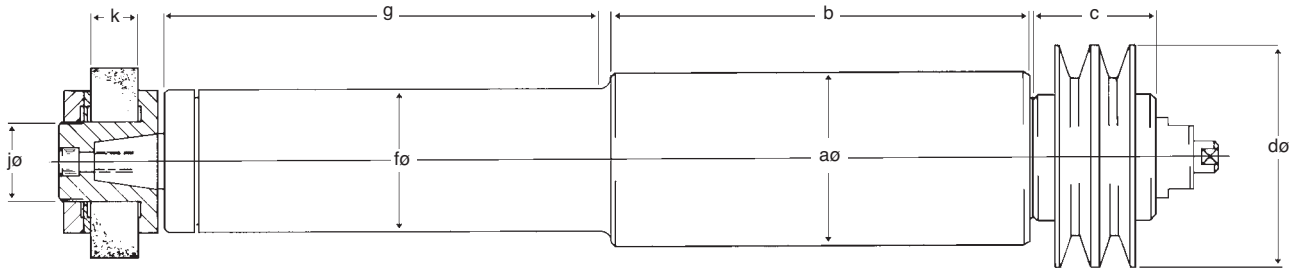


Detachable and Solid Quill Types

Ref	Max Speed	a	b	Detachable Quill Type	Solid Quill Type	d
GS.240	24,000 r.p.m.	4"	15"	"f" any dia. up to $\frac{9}{16}$ "	"f" any dia. up to $\frac{5}{8}$ "	$1\frac{3}{4}$ "
GS.240A	24,000 r.p.m.	4"	18"	"f" any dia. up to $\frac{9}{16}$ "	"f" any dia. up to $\frac{5}{8}$ "	$1\frac{3}{4}$ "
GS.241	20,000 r.p.m.	4"	15"	"f" any dia. up to $\frac{11}{16}$ "	"f" any dia. up to $\frac{3}{4}$ "	$1\frac{3}{4}$ "
GS.241A	20,000 r.p.m.	4"	18"	"f" any dia. up to $\frac{11}{16}$ "	"f" any dia. up to $\frac{3}{4}$ "	$1\frac{3}{4}$ "
GS.242	17,000 r.p.m.	4"	15"	"f" any dia. up to $\frac{7}{8}$ "	"f" any dia. up to 1"	2"
GS.242A	17,000 r.p.m.	4"	18"	"f" any dia. up to $\frac{7}{8}$ "	"f" any dia. up to 1"	2"
GS.243	15,000 r.p.m.	4"	15"	"f" any dia. up to 1"	"f" any dia. up to $1\frac{1}{4}$ "	$2\frac{1}{4}$ "
GS.243A	15,000 r.p.m.	4"	18"	"f" any dia. up to 1"	"f" any dia. up to $1\frac{1}{4}$ "	$2\frac{1}{4}$ "
GS.244	12,000 r.p.m.	4"	15"	"f" any dia. up to $1\frac{3}{16}$ "	"f" any dia. up to $1\frac{3}{8}$ "	$2\frac{1}{2}$ "
GS.244A	12,000 r.p.m.	4"	18"	"f" any dia. up to $1\frac{3}{16}$ "	"f" any dia. up to $1\frac{3}{8}$ "	$2\frac{1}{2}$ "
GS.245	10,000 r.p.m.	4"	$15\frac{1}{2}$ "	"f" any dia. up to $1\frac{3}{8}$ "	"f" any dia. up to $1\frac{5}{8}$ "	3"
GS.245A	10,000 r.p.m.	4"	$18\frac{1}{2}$ "	"f" any dia. up to $1\frac{3}{8}$ "	"f" any dia. up to $1\frac{5}{8}$ "	3"
GS.246	7,500 r.p.m.	4"	$15\frac{1}{2}$ "	"f" any dia. up to $1\frac{3}{4}$ "	"f" any dia. up to 2"	$3\frac{1}{2}$ "
GS.246A	7,500 r.p.m.	4"	$18\frac{1}{2}$ "	"f" any dia. up to $1\frac{3}{4}$ "	"f" any dia. up to 2"	$3\frac{1}{2}$ "

Spindles for 112,1116,112M, etc. Internal Grinders (Sealed in lubrication)

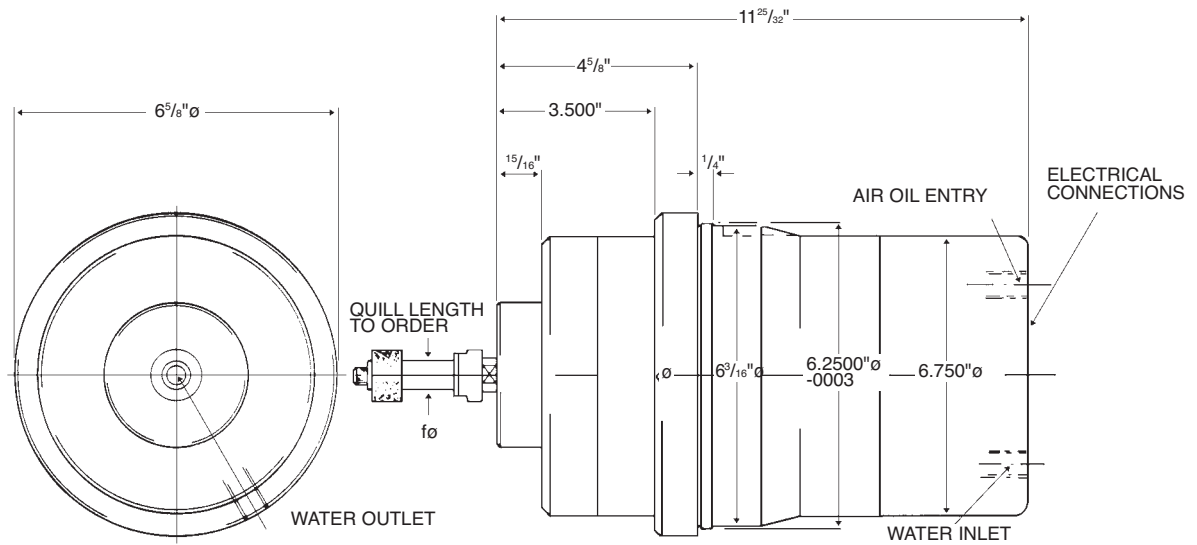
Sleeve Type for Large Diameters and Long Bores



Ref	Max Speed	f	g	a	b	c	d	j	k
GS.210	11,500 r.p.m.	1 ¹ / ₄ "	9"	4"	13"	2"	3"	1 ¹ / ₂ "	3 ³ / ₄ "
GS.211	11,500 r.p.m.	1 ¹ / ₄ "	10"	4"	13"	2"	3"	1 ¹ / ₂ "	3 ³ / ₄ "
GS.212	11,500 r.p.m.	1 ¹ / ₄ "	12"	4"	13"	2"	3"	1 ¹ / ₂ "	1 ¹ / ₂ "
GS.213	11,500 r.p.m.	1 ¹ / ₂ "	11"	4"	13"	2"	3"	3 ³ / ₄ "	3 ³ / ₄ "
GS.214	11,500 r.p.m.	1 ¹ / ₂ "	12"	4"	13"	2"	3"	3 ³ / ₄ "	3 ³ / ₄ "
GS.215	11,000 r.p.m.	1 ³ / ₄ "	11"	4"	13"	2 ¹ / ₄ "	3"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.216	11,000 r.p.m.	1 ³ / ₄ "	12"	4"	13"	2 ¹ / ₄ "	3"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.217	8,500 r.p.m.	2"	8"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.218	8,500 r.p.m.	2"	10"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.219	8,500 r.p.m.	2"	12"	4"	13"	2 ¹ / ₄ "	3 ¹ / ₂ "	1"	1"
GS.220	6,500 r.p.m.	2 ¹ / ₂ "	8"	4"	13"	2 ¹ / ₂ "	4"	1 ¹ / ₄ "	1"
GS.221	6,500 r.p.m.	2 ¹ / ₂ "	10"	4"	13"	2 ¹ / ₂ "	4"	1 ¹ / ₄ "	1"
GS.222	6,500 r.p.m.	2 ¹ / ₂ "	12"	4"	13"	2 ¹ / ₂ "	4"	1 ¹ / ₄ "	1"
GS.223	6,000 r.p.m.	3"	6"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.224	6,000 r.p.m.	3"	10"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.225	6,000 r.p.m.	3"	12"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.226	4,000 r.p.m.	3 ¹ / ₂ "	6"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₂ "	2"	2"
GS.227	4,000 r.p.m.	3 ¹ / ₂ "	10"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₂ "	2"	2"
GS.228	4,000 r.p.m.	3 ¹ / ₂ "	12"	4"	13"	2 ¹ / ₂ "	4 ¹ / ₂ "	2"	1"

All sleeve type spindles are suitable for face grinding and type GS.226 is particularly recommended for this purpose.

Spindles for Centalign Automatic Internal Grinder

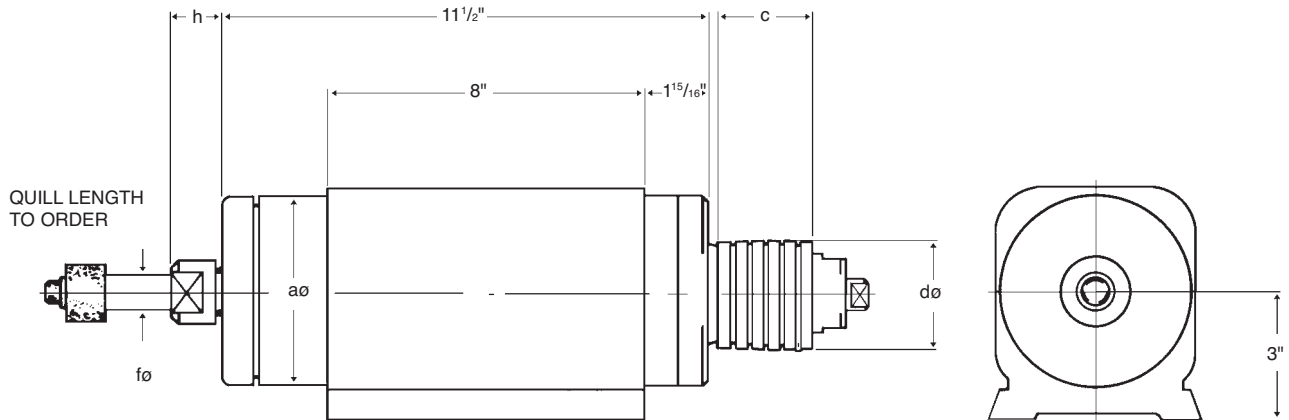


Ref	Speed Range	Detachable Quill Type	Solid Quill Type
HFGS.660	60,000 - 100,000 r.p.m.	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "
HFGS.648	30,000 - 50,000 r.p.m.	"f" any dia. up to $\frac{7}{16}$ "	"f" any dia. up to $\frac{1}{2}$ "
HFGS.679	24,000 r.p.m.	"f" any dia. up to $\frac{11}{16}$ "	"f" any dia. up to $\frac{3}{4}$ "

CHURCHILL

Spindles for Internal Grinders types HBA, HBM, HBY, etc. (Sealed in lubrication)

(Built after approximately 1960)



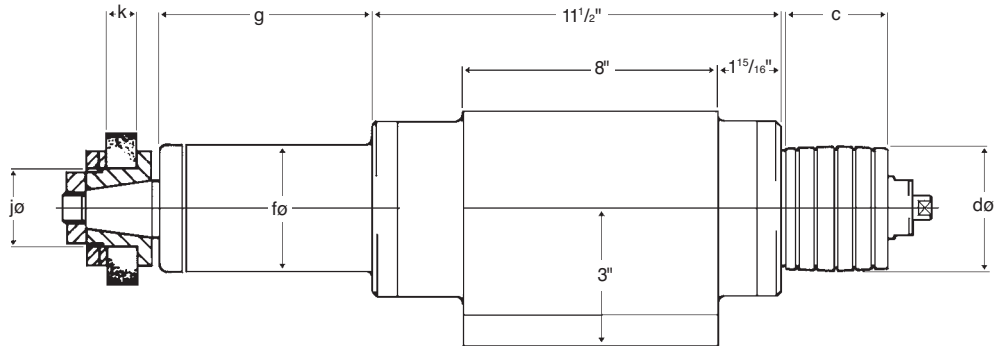
New Range Churchill H.B.Y. Dove Tail

Ref	Max Speed	a	c	d	Detachable Quill Type	Solid Quill Type	h
GS.6556	45,000 r.p.m.	2 ⁵ / ₁₆ "	1 ³ / ₄ "	7 ⁷ / ₈ "	"f" any dia. up to 3 ³ / ₈ "	"f" any dia. up to 7 ⁷ / ₁₆ "	9 ¹ / ₈ "
GS.6588	38,000 r.p.m.	2 ¹ / ₂ "	1 ³ / ₄ "	1"	"f" any dia. up to 7 ⁷ / ₁₆ "	"f" any dia. up to 1 ¹ / ₂ "	5 ⁵ / ₈ "
GS.6160	28,000 r.p.m.	2 ¹¹ / ₁₆ "	2"	1"	"f" any dia. up to 9 ⁹ / ₁₆ "	"f" any dia. up to 5 ⁵ / ₈ "	11 ¹ / ₈ "
GS.6161	24,000 r.p.m.	2 ⁷ / ₈ "	2 ¹ / ₄ "	1 ¹ / ₈ "	"f" any dia. up to 11 ¹ / ₁₆ "	"f" any dia. up to 3 ³ / ₄ "	3 ³ / ₄ "
GS.6162	20,000 r.p.m.	3 ¹ / ₄ "	2 ¹ / ₄ "	1 ¹ / ₄ "	"f" any dia. up to 7 ⁷ / ₈ "	"f" any dia. up to 1"	1"
GS.6163	17,000 r.p.m.	3 ¹ / ₂ "	2 ¹ / ₂ "	1 ³ / ₈ "	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ³ / ₁₆ "
GS.6164	15,000 r.p.m.	4"	2 ¹ / ₂ "	1 ¹ / ₂ "	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ³ / ₈ "	1 ³ / ₈ "
GS.6165	12,000 r.p.m.	4 ¹ / ₂ "	2 ¹ / ₂ "	2 ¹ / ₄ "	"f" any dia. up to 1 ³ / ₈ "	"f" any dia. up to 1 ⁵ / ₈ "	1 ³ / ₈ "
GS.6166	10,000 r.p.m.	4 ³ / ₄ "	2 ¹ / ₂ "	2 ³ / ₈ "	"f" any dia. up to 1 ⁹ / ₁₆ "	"f" any dia. up to 1 ¹³ / ₁₆ "	1 ⁹ / ₁₆ "
GS.6167	7,500 r.p.m.	5"	2 ¹ / ₂ "	3"	"f" any dia. up to 1 ³ / ₄ "	"f" any dia. up to 2"	1 ⁹ / ₁₆ "

Ref	Max Speed		Detachable Quill Type	Solid Quill Type
SGS.6461	50,000 r.p.m.	Super Speed Belt Driven Unit	1 ¹ / ₄ "	5 ⁵ / ₁₆ "
HFGS.683	30,000 to 40,000 r.p.m.	High Frequency Spindle	7 ⁷ / ₁₆ "	1 ¹ / ₂ "
HFGS.682A	60,000 to 80,000 r.p.m.	High Frequency Spindle	5 ⁵ / ₁₆ "	3 ³ / ₈ "
HFGS.682	80,000 to 100,000 r.p.m.	High Frequency Spindle	5 ⁵ / ₁₆ "	3 ³ / ₈ "

Spindles for Internal Grinders types HBA, HBM, HBY, etc. (Sealed in lubrication)

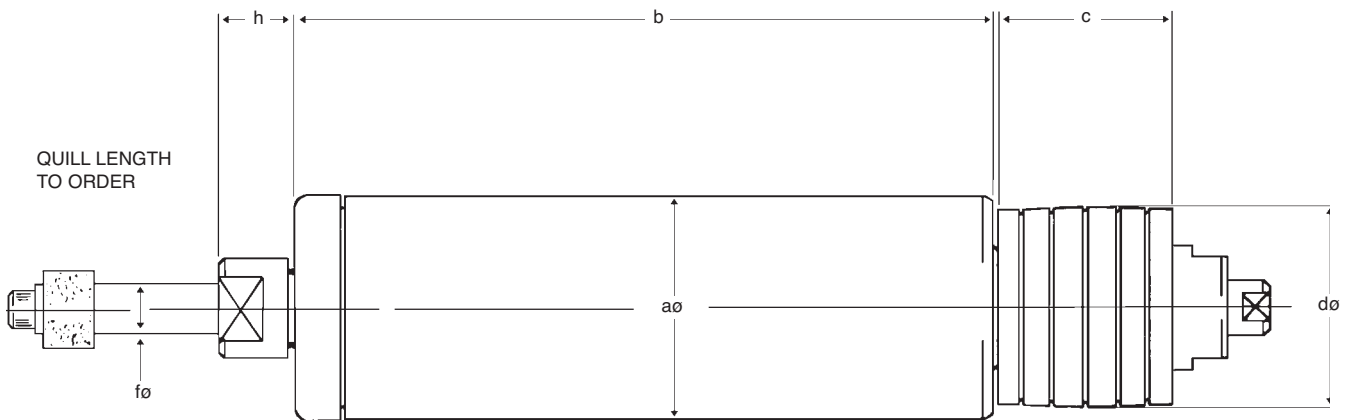
(Built after approximately 1960)



Sleeve Type for Large Diameter and Long Bores

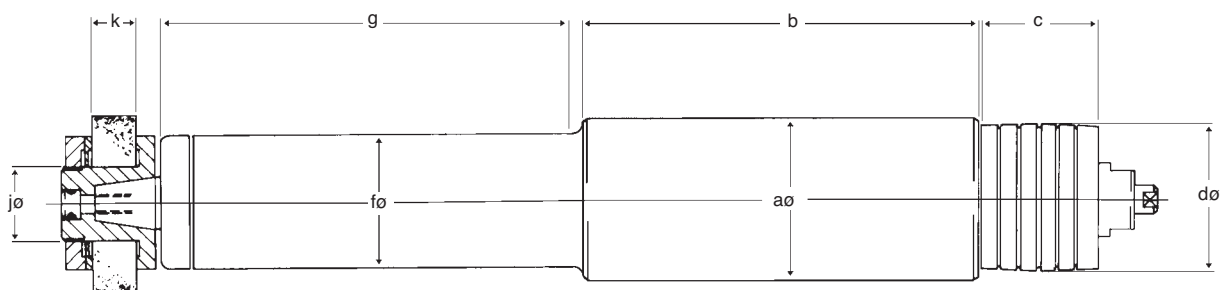
Ref	Max Speed	f	g	c	d	j	k
GS.6168	11,500 r.p.m.	1 1/4"	8"	2"	2"	5/8"	3/4"
GS.6169	11,500 r.p.m.	1 1/4"	10"	2"	2"	5/8"	3/4"
GS.6170	11,500 r.p.m.	1 1/4"	12"	2"	2"	5/8"	3/4"
GS.6171A	11,500 r.p.m.	1 1/2"	6"	2"	2"	3/4"	3/4"
GS.6171	11,500 r.p.m.	1 1/2"	8"	2"	2"	3/4"	3/4"
GS.6172	11,500 r.p.m.	1 1/2"	10"	2"	2"	3/4"	3/4"
GS.6173	11,500 r.p.m.	1 1/2"	12"	2"	2"	3/4"	3/4"
GS.6174	11,000 r.p.m.	1 3/4"	8"	2 1/4"	2"	7/8"	3/4"
GS.6175	11,000 r.p.m.	1 3/4"	10"	2 1/4"	2"	7/8"	3/4"
GS.6176	11,000 r.p.m.	1 3/4"	12"	2 1/4"	2"	7/8"	3/4"
GS.6177	8,500 r.p.m.	2 1/16"	8"	2 1/4"	2 1/2"	1"	1"
GS.6178	8,500 r.p.m.	2 1/16"	10"	2 1/4"	2 1/2"	1"	1"
GS.6179	8,500 r.p.m.	2 1/16"	12"	2 1/4"	2 1/2"	1"	1"
GS.6180	8,500 r.p.m.	2 1/16"	14"	2 1/4"	2 1/2"	1"	1"
GS.6181	8,500 r.p.m.	2 1/16"	16"	2 1/4"	2 1/2"	1"	1"
GS.6182	7,000 r.p.m.	2 1/4"	8"	2 1/4"	3"	1"	1"
GS.6183	7,000 r.p.m.	2 1/4"	10"	2 1/4"	3"	1"	1"
GS.6184	7,000 r.p.m.	2 1/4"	12"	2 1/4"	3"	1"	1"
GS.6185	7,000 r.p.m.	2 1/4"	14"	2 1/4"	3"	1"	1"
GS.6186	7,000 r.p.m.	2 1/4"	16"	2 1/4"	3"	1"	1"
GS.6187	6,500 r.p.m.	2 5/8"	8"	2 1/2"	3 1/4"	1 1/4"	1"
GS.6188	6,500 r.p.m.	2 5/8"	10"	2 1/2"	3 1/4"	1 1/4"	1"
GS.6189	6,500 r.p.m.	2 5/8"	12"	2 1/2"	3 1/4"	1 1/4"	1"
GS.6190	6,500 r.p.m.	2 5/8"	14"	2 1/2"	3 1/4"	1 1/4"	1"
GS.6191	6,500 r.p.m.	2 5/8"	16"	2 1/2"	3 1/4"	1 1/4"	1"
GS.6192	6,500 r.p.m.	2 5/8"	18"	2 1/2"	3 1/4"	1 1/4"	1"
GS.6193	5,000 r.p.m.	3"	6"	2 1/2"	4"	1 1/2"	1 1/2"
GS.6194	5,000 r.p.m.	3"	8"	2 1/2"	4"	1 1/2"	1 1/2"
GS.6195	5,000 r.p.m.	3"	10"	2 1/2"	4"	1 1/2"	1"
GS.6196	5,000 r.p.m.	3"	12"	2 1/2"	4"	1 1/2"	1"
GS.6197	5,000 r.p.m.	3"	14"	2 1/2"	4"	1 1/2"	1"
GS.6198	5,000 r.p.m.	3"	16"	2 1/2"	4"	1 1/2"	1"
GS.6199	5,000 r.p.m.	3"	18"	2 1/2"	4"	1 1/2"	1"
GS.6200	4,000 r.p.m.	3 1/2"	4"	2 1/2"	4 1/2"	2"	2"
GS.6201	4,000 r.p.m.	3 1/2"	8"	2 1/2"	4 1/2"	2"	2"
GS.6202	4,000 r.p.m.	3 1/2"	10"	2 1/2"	4 1/2"	2"	2"
GS.6203	4,000 r.p.m.	3 1/2"	12"	2 1/2"	4 1/2"	2"	1"
GS.6204	4,000 r.p.m.	3 1/2"	14"	2 1/2"	4 1/2"	2"	1"
GS.6205	4,000 r.p.m.	3 1/2"	16"	2 1/2"	4 1/2"	2"	1"
GS.6206	4,000 r.p.m.	3 1/2"	18"	2 1/2"	4 1/2"	2"	1"

**Spindles for Universal Grinders Model 'O' 8 in. x 16 in. 10 in. & 12 in. swing and
Cutter Grinders 'HO' PAW and PBW 8 in. x 16 in. 10 and 12 etc.
(Sealed in lubrication)**



Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.448	38,000 r.p.m.	2 1/2"	6 7/8"	1 1/4"	3/4"	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	1/2"
GS.449	30,000 r.p.m.	2 1/2"	6 3/4"	1 3/4"	1"	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	11/16"
GS.109	28,000 r.p.m.	2 1/2"	6 3/4"	2"	1 1/8"	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	5/8"
GS.110	24,000 r.p.m.	2 1/2"	6 3/4"	2"	1 1/4"	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	11/16"
GS.450	20,000 r.p.m.	2 1/2"	6 3/4"	2"	1 1/2"	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	3/4"
GS.451	17,000 r.p.m.	2 1/2"	8 1/2"	2"	1 3/4"	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"

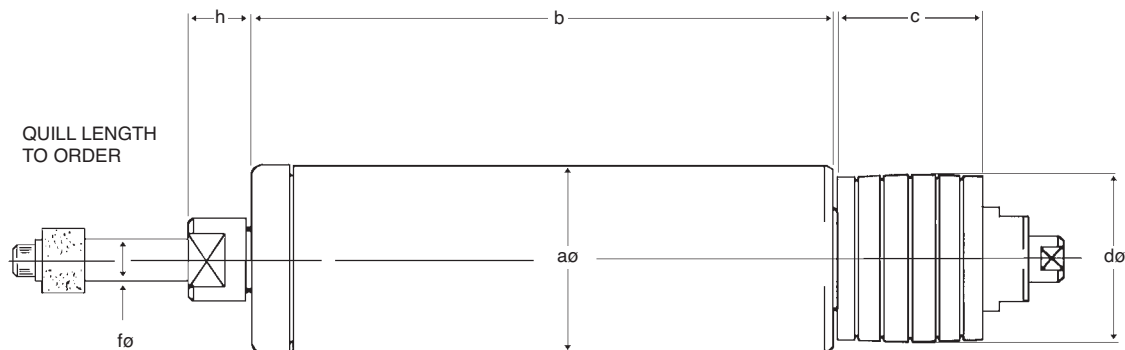


Sleeve Type Spindles for Large Dia. and Long Bores

Ref	Max Speed	f	g	a	d	j	k
GS.452	11,500 r.p.m.	1 1/4"	9"	2 1/2"	2"	1 1/2"	3/4"
GS.453	11,500 r.p.m.	1 1/4"	10"	2 1/2"	2"	1 1/2"	3/4"
GS.454	11,500 r.p.m.	1 1/4"	12"	2 1/2"	2"	1 1/2"	3/4"
GS.455	11,500 r.p.m.	1 1/2"	9"	2 1/2"	2"	3/4"	3/4"
GS.456	11,500 r.p.m.	1 1/2"	11"	2 1/2"	2"	3/4"	3/4"
GS.457	11,500 r.p.m.	1 1/2"	12"	2 1/2"	2"	3/4"	3/4"
GS.458	11,000 r.p.m.	1 3/4"	10"	2 1/2"	2"	7/8"	3/4"
GS.459	11,000 r.p.m.	1 3/4"	11"	2 1/2"	2"	7/8"	3/4"
GS.460	11,000 r.p.m.	1 3/4"	12"	2 1/2"	2"	7/8"	3/4"

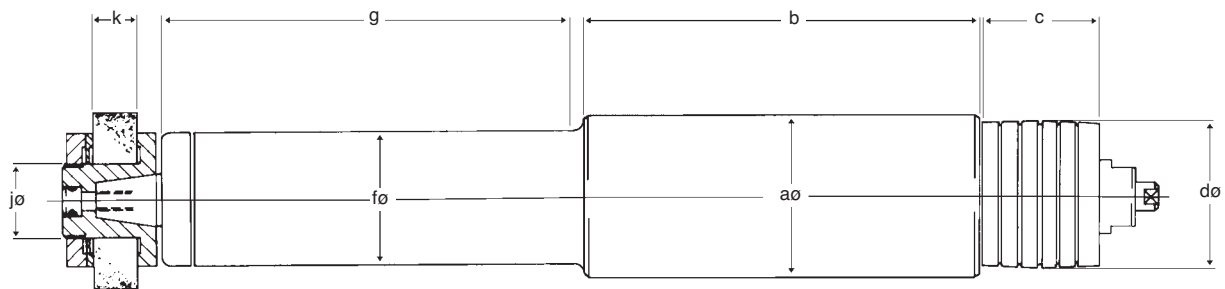
Ref	Max Speed	f	g	a	d	j	k
GS.461	8,500 r.p.m.	2"	8"	2 1/2"	2 3/4"	1"	1"
GS.462	8,500 r.p.m.	2"	10"	2 1/2"	2 3/4"	1"	1"
GS.463	8,500 r.p.m.	2"	12"	2 1/2"	2 3/4"	1"	1"
GS.464	7,000 r.p.m.	2 1/4"	8"	2 1/2"	3 1/4"	1"	1"
GS.465	7,000 r.p.m.	2 1/4"	10"	2 1/2"	3 1/4"	1"	1"
GS.466	7,000 r.p.m.	2 1/4"	12"	2 1/2"	3 1/4"	1"	1"
GS.467	6,500 r.p.m.	2 1/2"	8"	2 1/2"	3 1/2"	1 1/4"	1"
GS.468	6,500 r.p.m.	2 1/2"	10"	2 1/2"	3 1/2"	1 1/4"	1"
GS.469	6,500 r.p.m.	2 1/2"	12"	2 1/2"	3 1/2"	1 1/4"	1"

Spindles for Universal Grinders Models PBW PAW PCH etc. (Sealed in lubrication)



Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.470	30,000 r.p.m.	3 1/4"	10"	1 3/4"	1"	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	11/16"
GS.471	28,000 r.p.m.	3 1/4"	10"	2"	1"	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	5/8"
GS.472	24,000 r.p.m.	3 1/4"	10"	2"	1 1/4"	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	11/16"
GS.473	20,000 r.p.m.	3 1/4"	9 7/8"	2 1/4"	1 1/2"	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	3/4"
GS.17E	17,000 r.p.m.	3 1/4"	9 3/4"	2 1/4"	1 3/4"	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"
GS.474	15,000 r.p.m.	3 1/4"	10 1/4"	2 1/2"	1 1/8"	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	1 3/16"
GS.475	12,000 r.p.m.	3 1/4"	10 1/8"	2 1/2"	2 3/8"	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	1 3/8"
GS.476	10,000 r.p.m.	3 1/4"	10 1/8"	2 1/2"	3"	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	1 3/8"



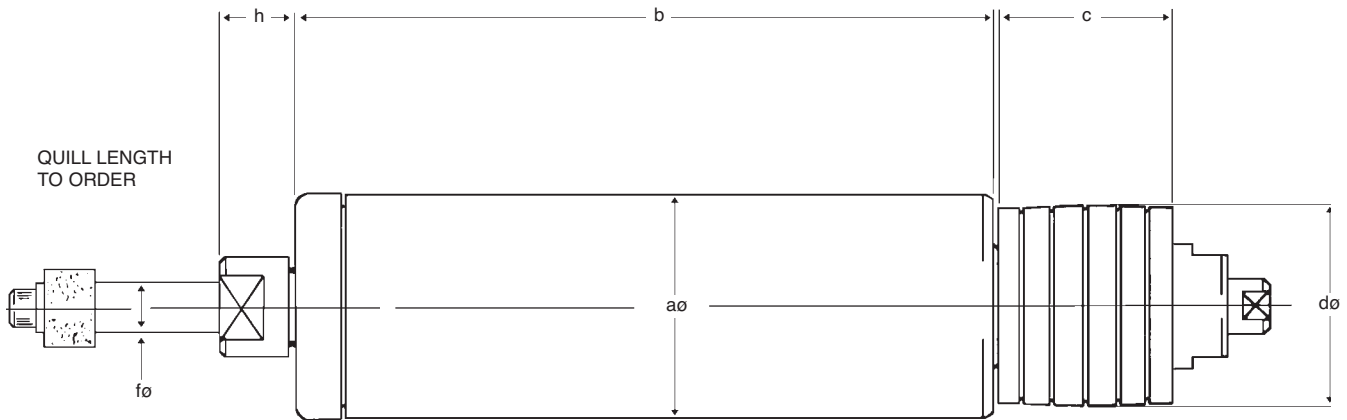
Sleeve Type Spindles for Large Dia. and Deep Bores

Ref	Max Speed	f	g	a	c	d	j	k
GS.477	11,500 r.p.m.	1 1/4"	9"	3 1/4"	2"	2 1/2"	1 1/2"	3/4"
GS.478	11,500 r.p.m.	1 1/4"	10"	3 1/4"	2"	2 1/2"	1 1/2"	1 1/2"
GS.479	11,500 r.p.m.	1 1/4"	12"	3 1/4"	2"	2 1/2"	1 1/2"	1 1/2"
GS.480	11,500 r.p.m.	1 1/2"	9"	3 1/4"	2"	2 1/2"	3/4"	3/4"
GS.481	11,500 r.p.m.	1 1/2"	11"	3 1/4"	2"	2 1/2"	3/4"	3/4"
GS.482	11,500 r.p.m.	1 1/2"	12"	3 1/4"	2"	2 1/2"	3/4"	3/4"
GS.483	11,000 r.p.m.	1 3/4"	10"	3 1/4"	2"	2 1/2"	7/8"	3/4"
GS.484	11,000 r.p.m.	1 3/4"	11"	3 1/4"	2"	2 1/2"	7/8"	3/4"
GS.485	11,000 r.p.m.	1 3/4"	12"	3 1/4"	2"	2 1/2"	7/8"	3/4"
GS.486	8,500 r.p.m.	2"	8"	3 1/4"	2"	3 1/4"	1"	1"
GS.487	8,500 r.p.m.	2"	10"	3 1/4"	2"	3 1/4"	1"	1"
GS.488	8,500 r.p.m.	2"	12"	3 1/4"	2"	3 1/4"	1"	1"
GS.489	8,500 r.p.m.	2"	14"	3 1/4"	2"	3 1/4"	1"	1"
GS.490	8,500 r.p.m.	2"	15"	3 1/4"	2"	3 1/4"	1"	1"

Ref	Max Speed	f	g	a	c	d	j	k
GS.491	7,000 r.p.m.	2 1/4"	8"	3 1/4"	2 1/4"	3 3/4"	1"	1"
GS.492	7,000 r.p.m.	2 1/4"	10"	3 1/4"	2 1/4"	3 3/4"	1"	1"
GS.493	7,000 r.p.m.	2 1/4"	12"	3 1/4"	2 1/4"	3 3/4"	1"	1"
GS.494	7,000 r.p.m.	2 1/4"	15"	3 1/4"	2 1/4"	3 3/4"	1"	1"
GS.495	6,500 r.p.m.	2 1/2"	8"	3 1/4"	2 1/2"	4 1/2"	1 1/4"	1"
GS.496	6,500 r.p.m.	2 1/2"	10"	3 1/4"	2 1/2"	4 1/2"	1 1/4"	1"
GS.497	6,500 r.p.m.	2 1/2"	12"	3 1/4"	2 1/2"	4 1/2"	1 1/4"	1"
GS.498	6,500 r.p.m.	2 1/2"	14"	3 1/4"	2 1/2"	4 1/2"	1 1/4"	1"
GS.499	6,500 r.p.m.	2 1/2"	16"	3 1/4"	2 1/2"	4 1/2"	1 1/4"	1"
GS.500	6,500 r.p.m.	2 1/2"	18"	3 1/4"	2 1/2"	4 1/2"	1 1/4"	1"
GS.501	5,000 r.p.m.	3"	6"	3 1/4"	2 1/2"	5 3/4"	1 1/4"	1 1/2"
GS.502	5,000 r.p.m.	3"	10"	3 1/4"	2 1/2"	5 1/4"	1 1/4"	1"
GS.503	5,000 r.p.m.	3"	12"	3 1/4"	2 1/2"	5 3/4"	1 1/4"	1"
GS.504	5,000 r.p.m.	3"	15"	3 1/4"	2 1/2"	5 3/4"	1 1/4"	1"
GS.505	5,000 r.p.m.	3"	18"	3 1/4"	2 1/2"	5 1/4"	1 1/4"	1"

CHURCHILL

Spindles for Internal Grinders. All types including models HBB, HBA, HCA, HDA, HCB, HDB, HMD, HBY, HCY, HDY (Sealed in lubrication)



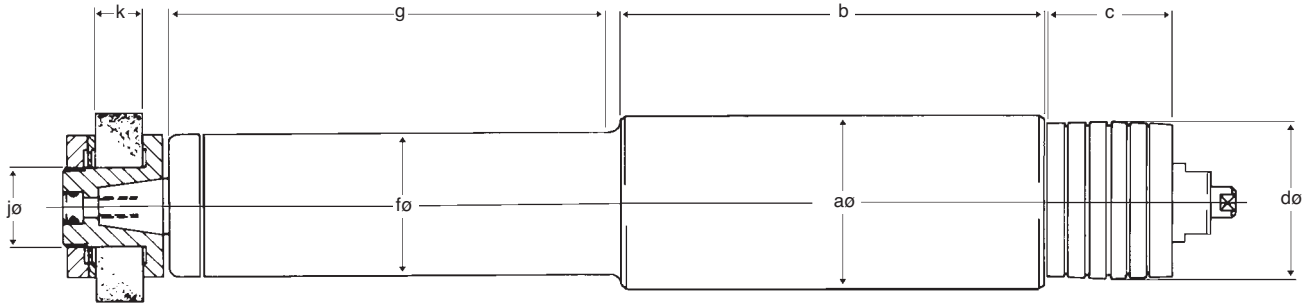
Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.910	30,000 r.p.m.	3 ¹ / ₄ "	12"	1 ³ / ₄ "	1"	"f" any dia. up to 3 ³ / ₈ "	"f" any dia. up to 7 ¹ / ₁₆ "	1 ¹¹ / ₁₆ "
GS.117	28,000 r.p.m.	3 ¹ / ₄ "	12"	2"	1"	"f" any dia. up to 7 ¹ / ₁₆ "	"f" any dia. up to 1 ¹ / ₂ "	5 ⁵ / ₈ "
GS.118	24,000 r.p.m.	3 ¹ / ₄ "	12"	2"	1 ¹ / ₄ "	"f" any dia. up to 9 ⁹ / ₁₆ "	"f" any dia. up to 5 ⁵ / ₈ "	1 ¹¹ / ₁₆ "
GS.119	20,000 r.p.m.	3 ¹ / ₄ "	11 ⁷ / ₈ "	2 ¹ / ₄ "	1 ³ / ₈ "	"f" any dia. up to 1 ¹¹ / ₁₆ "	"f" any dia. up to 3 ³ / ₄ "	3 ³ / ₄ "
GS.120	17,000 r.p.m.	3 ¹ / ₄ "	11 ³ / ₄ "	2 ¹ / ₂ "	1 ³ / ₈ "	"f" any dia. up to 7 ⁷ / ₈ "	"f" any dia. up to 1"	1"
GS.121	15,000 r.p.m.	3 ¹ / ₄ "	11 ³ / ₄ "	2 ¹ / ₂ "	2"	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ³ / ₁₆ "
GS.506	12,000 r.p.m.	3 ¹ / ₄ "	12 ⁵ / ₈ "	2 ¹ / ₂ "	2 ¹ / ₄ "	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ³ / ₈ "	1 ³ / ₈ "
GS.507	10,000 r.p.m.	3 ¹ / ₄ "	12 ⁵ / ₈ "	2 ¹ / ₂ "	2 ³ / ₄ "	"f" any dia. up to 1 ³ / ₈ "	"f" any dia. up to 1 ⁵ / ₈ "	1 ³ / ₈ "

Note:- The above spindles are interchangeable with Churchill spindles type 4B and 5B and fit into the existing split bracket.

CHURCHILL

Spindles for Internal Grinders. All types including models HBB, HBA, HCA, HDA, HMD, HBY, HCY, HDY, etc. (Sealed in lubrication)

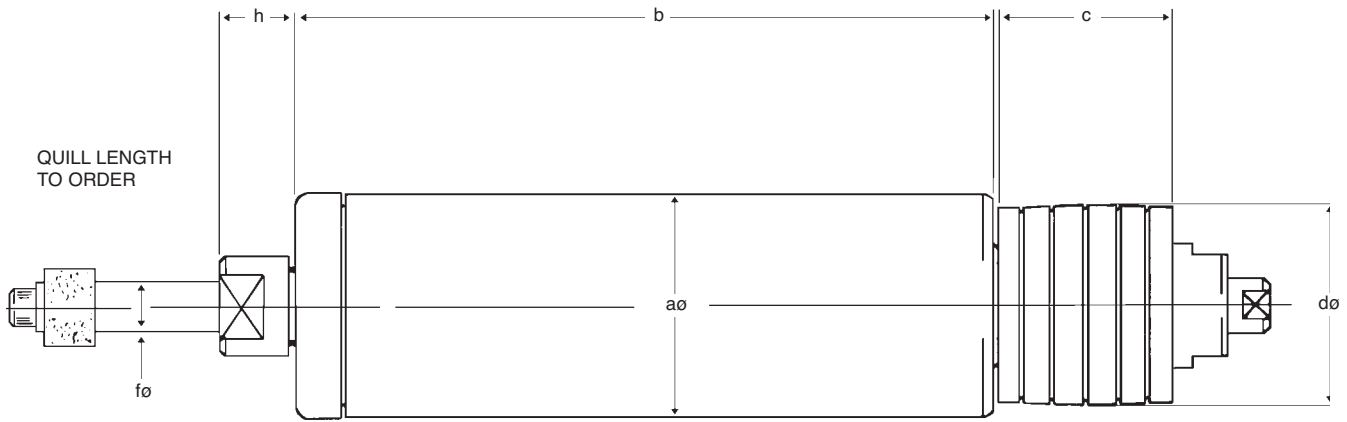


Sleeve Type Spindles suitable for Large Diameter and Deep Bores

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.508	11,500 r.p.m.	1 1/4"	9"	3 1/4"	12"	2"	2 5/8"	1/2"	3/4"
GS.509	11,500 r.p.m.	1 1/4"	10"	3 1/4"	12"	2"	2 5/8"	1/2"	3/4"
GS.510	11,500 r.p.m.	1 1/4"	12"	3 1/4"	12"	2"	2 5/8"	1/2"	1/2"
GS.511	11,500 r.p.m.	1 1/2"	9"	3 1/4"	12"	2"	2 3/4"	3/4"	3/4"
GS.512	11,500 r.p.m.	1 1/2"	11"	3 1/4"	12"	2"	2 3/4"	3/4"	3/4"
GS.513	11,500 r.p.m.	1 1/2"	12"	3 1/4"	12"	2"	2 3/4"	3/4"	3/4"
GS.514	11,000 r.p.m.	1 3/4"	10"	3 1/4"	12"	2"	2 7/8"	7/8"	3/4"
GS.515	11,000 r.p.m.	1 3/4"	11"	3 1/4"	12"	2"	2 7/8"	7/8"	3/4"
GS.516	11,000 r.p.m.	1 3/4"	12"	3 1/4"	12"	2"	2 7/8"	7/8"	3/4"
GS.517	8,500 r.p.m.	2"	8"	3 1/4"	12"	2"	3 1/4"	1"	1"
GS.518	8,500 r.p.m.	2"	10"	3 1/4"	12"	2"	3 1/4"	1"	1"
GS.519	8,500 r.p.m.	2"	12"	3 1/4"	12"	2"	3 1/4"	1"	1"
GS.520	8,500 r.p.m.	2"	14"	3 1/4"	12"	2"	3 1/4"	1"	1"
GS.521	8,500 r.p.m.	2"	15"	3 1/4"	12"	2"	3 1/4"	1"	1"
GS.522	7,000 r.p.m.	2 1/4"	8"	3 1/4"	12"	2 1/4"	3 3/4"	1"	1"
GS.523	7,000 r.p.m.	2 1/4"	10"	3 1/4"	12"	2 1/4"	3 3/4"	1"	1"
GS.524	7,000 r.p.m.	2 1/4"	12"	3 1/4"	12"	2 1/4"	3 3/4"	1"	1"
GS.525	7,000 r.p.m.	2 1/4"	15"	3 1/4"	12"	2 1/4"	3 3/4"	1"	1"
GS.526	6,500 r.p.m.	2 1/2"	8"	3 1/4"	12"	2 1/4"	4 1/2"	1 1/4"	1"
GS.527	6,500 r.p.m.	2 1/2"	10"	3 1/4"	12"	2 1/4"	4 1/2"	1 1/4"	1"
GS.528	6,500 r.p.m.	2 1/2"	12"	3 1/4"	12"	2 1/4"	4 1/2"	1 1/4"	1"
GS.529	6,500 r.p.m.	2 1/2"	14"	3 1/4"	12"	2 1/4"	4 1/2"	1 1/4"	1"
GS.530	6,500 r.p.m.	2 1/2"	16"	3 1/4"	12"	2 1/4"	4 1/2"	1 1/4"	1"
GS.531	6,500 r.p.m.	2 1/2"	18"	3 1/4"	12"	2 1/4"	4 1/2"	1 1/4"	1"
GS.532	5,000 r.p.m.	3"	6"	3 1/4"	12"	2 1/4"	5 3/4"	1 1/4"	1 1/2"
GS.533	5,000 r.p.m.	3"	10"	3 1/4"	12"	2 1/4"	5 3/4"	1 1/4"	1"
GS.534	5,000 r.p.m.	3"	12"	3 1/4"	12"	2 1/4"	5 3/4"	1 1/4"	1"
GS.535	5,000 r.p.m.	3"	15"	3 1/4"	12"	2 1/4"	5 3/4"	1 1/4"	1"
GS.536	5,000 r.p.m.	3"	18"	3 1/4"	12"	2 1/4"	5 3/4"	1 1/4"	1"

All Spindles are suitable for face grinding, type GS.532 is particularly recommended for this purpose.

Spindles for Type HF Internal Grinder (Sealed in Lubrication)

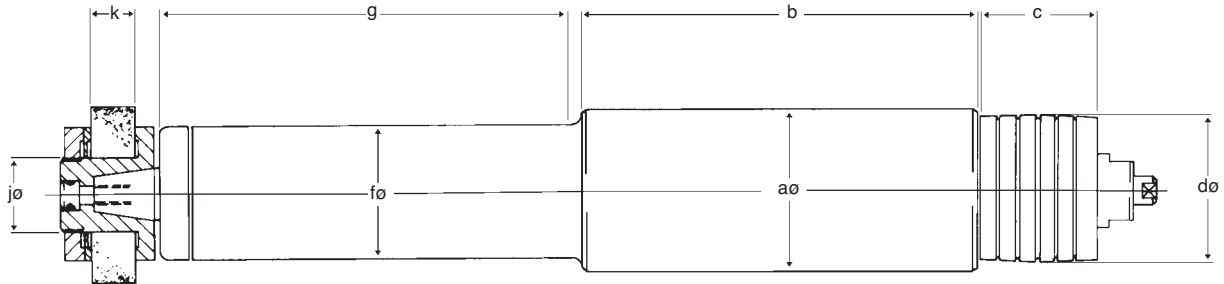


Detachable and Solid Quill Type Spindles

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.924	15,000 r.p.m.	5"	23 ¹ / ₄ "	2 ¹ / ₂ "	2 ¹ / ₂ "	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ³ / ₁₆ "
GS.925	12,000 r.p.m.	5"	23 ¹ / ₈ "	3"	3"	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ³ / ₈ "	1 ³ / ₈ "
GS.926	10,000 r.p.m.	5"	23 ¹ / ₈ "	3"	3 ¹ / ₂ "	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ⁵ / ₈ "	1 ³ / ₈ "
GS.927	7,500 r.p.m.	5"	23 ¹ / ₈ "	3"	4"	"f" any dia. up to 1 ³ / ₄ "	"f" any dia. up to 2"	1 ⁹ / ₁₆ "

Jena Rotary Technology Spindles are individually built, not only to suit the machine but also to suit the job which they are intended to handle. These two factors ensure maximum production of accurate work over long periods. Illustration right shows various types of Internal Grinding Spindles.

Spindles for Type HF Internal Grinder (Sealed in lubrication)



Sleeve Type Spindles for Large Diameter and Long Bores

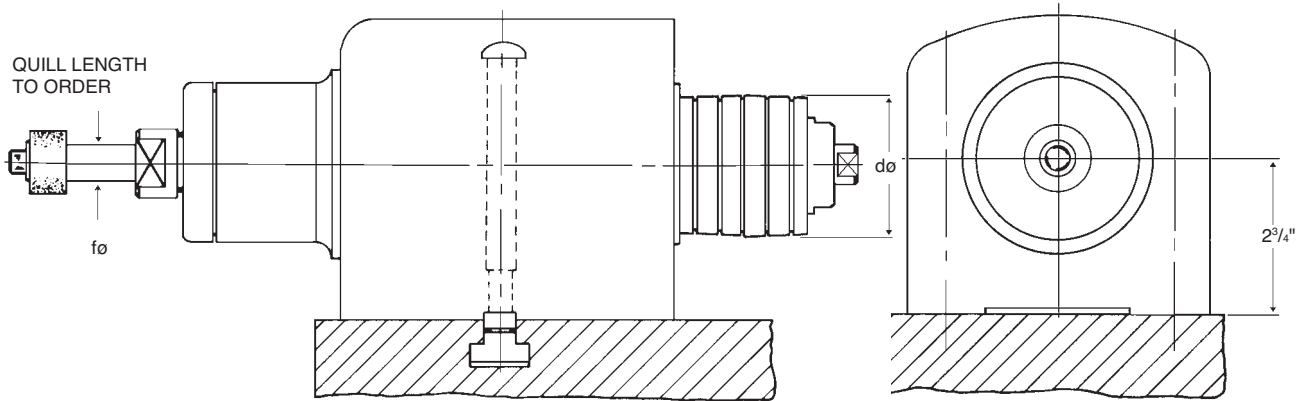
Ref	Max Speed	f	g	a	b	c	d	j	k
GS.928	11,500 r.p.m.	1 1/4"	9"	5"	19"	2"	2 3/4"	1 1/2"	3/4"
GS.929	11,500 r.p.m.	1 1/4"	10"	5"	19"	2"	2 3/4"	1 1/2"	3/4"
GS.930	11,500 r.p.m.	1 1/4"	12"	5"	19"	2"	2 3/4"	1 1/2"	1/2"
GS.931	11,500 r.p.m.	1 1/2"	9"	5"	19"	2"	2 3/4"	3/4"	3/4"
GS.932	11,500 r.p.m.	1 1/2"	11"	5"	19"	2"	2 3/4"	3/4"	3/4"
GS.933	11,500 r.p.m.	1 1/2"	12"	5"	19"	2"	2 3/4"	3/4"	3/4"
GS.934	11,000 r.p.m.	1 3/4"	10"	5"	19"	2"	2 3/4"	7/8"	3/4"
GS.935	11,000 r.p.m.	1 3/4"	11"	5"	19"	2"	2 3/4"	7/8"	3/4"
GS.936	11,000 r.p.m.	1 3/4"	12"	5"	19"	2"	2 3/4"	7/8"	3/4"
GS.937	8,500 r.p.m.	2"	8"	5"	19"	2 1/4"	3"	1"	1"
GS.938	8,500 r.p.m.	2"	10"	5"	19"	2 1/4"	3"	1"	1"
GS.939	8,500 r.p.m.	2"	12"	5"	19"	2 1/4"	3"	1"	1"
GS.940	8,500 r.p.m.	2"	14"	5"	19"	2 1/4"	3"	1"	1"
GS.941	8,500 r.p.m.	2"	15"	5"	19"	2 1/4"	3"	1"	1"
GS.942	7,000 r.p.m.	2 1/4"	8"	5"	19"	2 1/4"	3 1/4"	1"	1"
GS.943	7,000 r.p.m.	2 1/4"	10"	5"	19"	2 1/4"	3 1/4"	1"	1"
GS.944	7,000 r.p.m.	2 1/4"	12"	5"	19"	2 1/4"	3 1/4"	1"	1"
GS.945	7,000 r.p.m.	2 1/4"	15"	5"	19"	2 1/4"	3 1/4"	1"	1"
GS.946	6,500 r.p.m.	2 1/2"	8"	5"	19"	2 1/4"	3 1/4"	1 1/4"	1"
GS.947	6,500 r.p.m.	2 1/2"	10"	5"	19"	2 1/4"	3 1/4"	1 1/4"	1"
GS.948	6,500 r.p.m.	2 1/2"	12"	5"	19"	2 1/4"	3 1/4"	1 1/4"	1"
GS.949	6,500 r.p.m.	2 1/2"	14"	5"	19"	2 1/4"	3 1/4"	1 1/4"	1"
GS.950	6,500 r.p.m.	2 1/2"	16"	5"	19"	2 1/4"	3 1/4"	1 1/4"	1"
GS.951	6,500 r.p.m.	2 1/2"	18"	5"	19"	2 1/4"	3 1/4"	1 1/4"	1"

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.952	5,000 r.p.m.	3"	6"	5"	19"	2 1/2"	3 1/2"	1 1/4"	1"
GS.953	5,000 r.p.m.	3"	10"	5"	19"	2 1/2"	3 1/2"	1 1/4"	1"
GS.954	5,000 r.p.m.	3"	12"	5"	19"	2 1/2"	3 1/2"	1 1/4"	1"
GS.955	5,000 r.p.m.	3"	15"	5"	19"	2 1/2"	3 1/2"	1 1/4"	1"
GS.956	5,000 r.p.m.	3"	18"	5"	19"	2 1/2"	3 1/2"	1 1/4"	1"
GS.957	5,000 r.p.m.	3"	24"	5"	19"	2 1/2"	3 1/2"	1 1/4"	1"
GS.958	4,000 r.p.m.	3 1/2"	4"	5"	19"	2 1/2"	3 3/4"	2"	2"
GS.959	4,000 r.p.m.	3 1/2"	10"	5"	19"	2 1/2"	3 3/4"	2"	2"
GS.960	4,000 r.p.m.	3 1/2"	12"	5"	19"	2 1/2"	3 3/4"	2"	1"
GS.961	4,000 r.p.m.	3 1/2"	14"	5"	19"	2 1/2"	3 3/4"	2"	1"
GS.962	4,000 r.p.m.	3 1/2"	16"	5"	19"	2 1/2"	3 3/4"	2"	1"
GS.963	4,000 r.p.m.	3 1/2"	18"	5"	19"	2 1/2"	3 3/4"	2"	1"
GS.964	4,000 r.p.m.	3 1/2"	24"	5"	19"	2 1/2"	3 3/4"	2"	1"
GS.965	3,500 r.p.m.	4"	4"	5"	19"	3"	4 1/2"	2 1/2"	2"
GS.966	3,500 r.p.m.	4"	10"	5"	19"	3"	4 1/2"	2 1/2"	2"
GS.967	3,500 r.p.m.	4"	15"	5"	19"	3"	4 1/2"	2 1/2"	1 1/2"
GS.968	3,500 r.p.m.	4"	24"	5"	19"	3"	4 1/2"	2 1/2"	1"
GS.969	3,500 r.p.m.	4"	36"	5"	19"	3"	4 1/2"	2 1/2"	1"
GS.970	3,500 r.p.m.	4 1/2"	6"	5"	19"	3"	5"	2 1/2"	2"
GS.971	3,500 r.p.m.	4 1/2"	12"	5"	19"	3"	5"	2 1/2"	2"
GS.972	3,500 r.p.m.	4 1/2"	15"	5"	19"	3"	5"	2 1/2"	1 1/2"
GS.973	3,500 r.p.m.	4 1/2"	24"	5"	19"	3"	5"	2 1/2"	1"
GS.974	3,500 r.p.m.	4 1/2"	36"	5"	19"	3"	5"	2 1/2"	1"
GS.975	3,500 r.p.m.	4 1/2"	40"	5"	19"	3"	5"	2 1/2"	1"

Spindles are suitable for face grinding and types GS.970, GS.965 are particularly recommended for this purpose.

CHURCHILL

For models HBB, HBA, HCA, HDA, HCB, HMD, AC, HBY, HCY, HDY, HAY, HBM, etc.



Ref	Max Speed	Detachable Quill Type	Solid Quill Type	
AGS.402	40 to 50,000 r.p.m.	"f" any dia. up to 1/4" Air Driven	"f" any dia. up to 5/16"	} Self-contained Spindles. External motor drive not required.
HFGS.64	60 to 80,000 r.p.m.	"f" any dia. up to 1/4" High Frequency Electrically Driven	"f" any dia. up to 5/16"	
HFGS.216	80 to 100,000 r.p.m.	"f" any dia. up to 1/4" High Frequency Electrically Driven	"f" any dia. up to 5/16"	
HFGS.62	24,000 r.p.m.	"f" any dia. up to 7/16" High Frequency Electrically Driven	"f" any dia. up to 1/2"	
HFGS.225	18,000 r.p.m.	"f" any dia. up to 11/16" High Frequency Electrically Driven	"f" any dia. up to 3/4"	
HFGS.66	12,000 r.p.m.	"f" any dia. up to 1" High Frequency Electrically Driven	"f" any dia. up to 13/16"	

Ref	Max Speed	Detachable Quill Type	Solid Quill Type	d	
GS.72G	28,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	1"	} Belt driven Spindles
GS.72F	24,000 r.p.m.	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	1 1/8"	
GS.72E	20,000 r.p.m.	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	1 1/4"	
GS.72D	17,000 r.p.m.	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1 1/4"	
GS.72C	15,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	1 1/2"	
GS.72B	12,000 r.p.m.	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	2 1/4"	
GS.72A	10,000 r.p.m.	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	2 3/8"	
GS.72M	7,500 r.p.m.	"f" any dia. up to 1 3/4"	"f" any dia. up to 2"	3"	

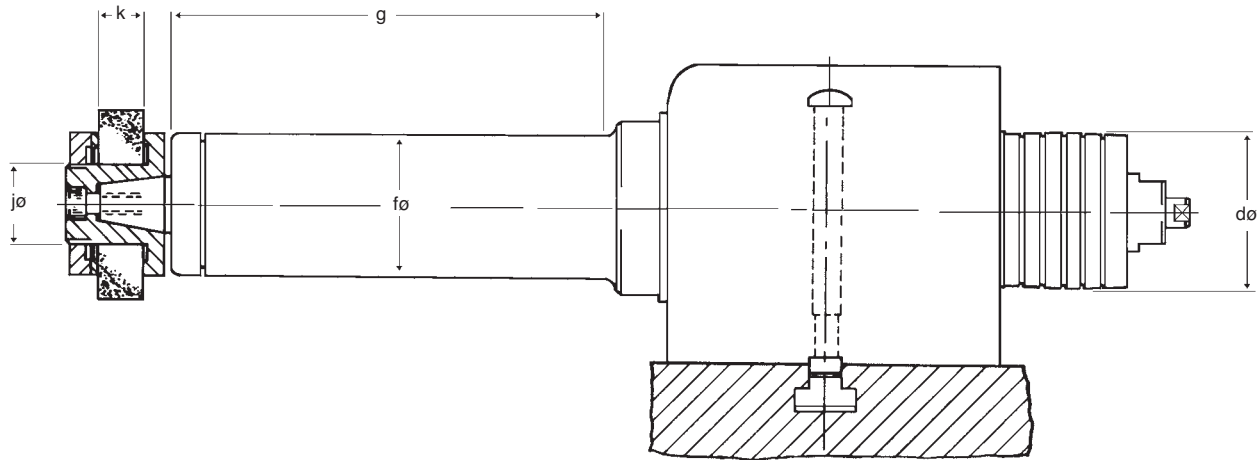
Type GS.72B spindle is recommended for general purpose work on all machines except model HAY for which spindle GS.72D is recommended.

Standard centre height is 2 3/4" but bracket can be supplied with centre height of 3 3/4" when desired.

NOTE:- These spindles are mounted complete in bracket ready for fitting to the machine. The steel spindle housing is heat treated, ground all over, and fitted into the bracket by means of a taper, which eliminates the possibility of distorting the spindle and bearings. Super precision bearings are used pre-loaded to remove all traces of radial or end thrust. The internal taper is guaranteed to run true within .00005" total indicator reading. The above spindles replace the Churchill "1000" series of spindles and are also recommended in place of spindles held by a split bracket fitted to earlier machines.

IMPORTANT:- Standard centre height is 2 3/4" but 3 3/4" centre height can be supplied when specified.

For Internal Grinders (Sealed in lubrication)



Sleeve Type Spindles suitable for Large Diameter and Deep Bores

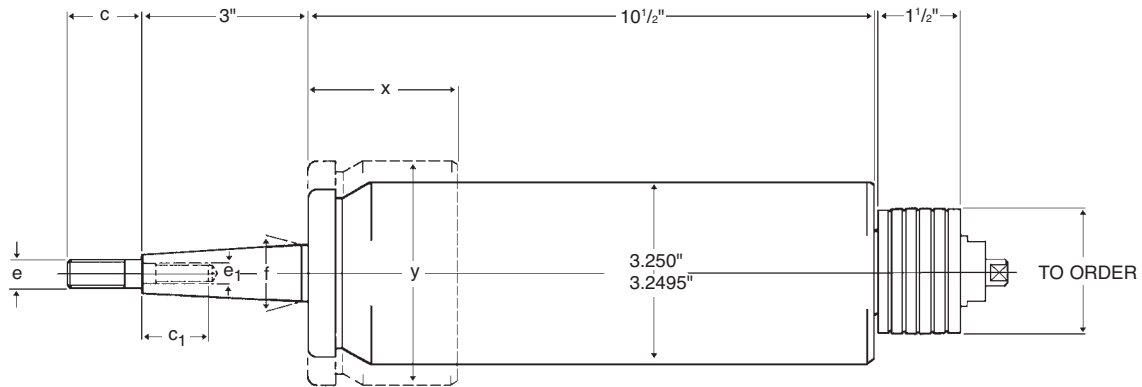
Ref	Max Speed	f	g	d	j	k
GS.537	11,500 r.p.m.	1 ¹ / ₄ "	9"	2"	1 ¹ / ₂ "	3 ³ / ₄ "
GS.538	11,500 r.p.m.	1 ¹ / ₄ "	10"	2"	1 ¹ / ₂ "	3 ³ / ₄ "
GS.539	11,500 r.p.m.	1 ¹ / ₄ "	12"	2"	1 ¹ / ₂ "	1 ¹ / ₂ "
GS.540	11,500 r.p.m.	1 ¹ / ₂ "	9"	2"	3 ³ / ₄ "	3 ³ / ₄ "
GS.541	11,500 r.p.m.	1 ¹ / ₂ "	11"	2"	3 ³ / ₄ "	3 ³ / ₄ "
GS.542	11,500 r.p.m.	1 ¹ / ₂ "	12"	2"	3 ³ / ₄ "	3 ³ / ₄ "
GS.543	11,000 r.p.m.	1 ³ / ₄ "	10"	2"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.544	11,000 r.p.m.	1 ³ / ₄ "	11"	2"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.545	11,000 r.p.m.	1 ³ / ₄ "	12"	2"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.546	8,500 r.p.m.	2"	8"	2 ¹ / ₂ "	1"	1"
GS.547	8,500 r.p.m.	2"	10"	2 ¹ / ₂ "	1"	1"
GS.548	8,500 r.p.m.	2"	12"	2 ¹ / ₂ "	1"	1"
GS.549	8,500 r.p.m.	2"	14"	2 ¹ / ₂ "	1"	1"
GS.550	8,500 r.p.m.	2"	15"	2 ¹ / ₂ "	1"	1"
GS.551	7,000 r.p.m.	2 ¹ / ₄ "	8"	3"	1"	1"
GS.552	7,000 r.p.m.	2 ¹ / ₄ "	10"	3"	1"	1"
GS.553	7,000 r.p.m.	2 ¹ / ₄ "	12"	3"	1"	1"
GS.554	7,000 r.p.m.	2 ¹ / ₄ "	14"	3"	1"	1"

Ref	Max Speed	f	g	d	j	k
GS.555	6,500 r.p.m.	2 ¹ / ₂ "	8"	3 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.556	6,500 r.p.m.	2 ¹ / ₂ "	10"	3 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.557	6,500 r.p.m.	2 ¹ / ₂ "	12"	3 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.558	6,500 r.p.m.	2 ¹ / ₂ "	14"	3 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.559	6,500 r.p.m.	2 ¹ / ₂ "	16"	3 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.560	6,500 r.p.m.	2 ¹ / ₂ "	18"	3 ¹ / ₄ "	1 ¹ / ₄ "	1"
GS.561	5,000 r.p.m.	3"	6"	4"	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.562	5,000 r.p.m.	3"	10"	4"	1 ¹ / ₄ "	1"
GS.563	5,000 r.p.m.	3"	12"	4"	1 ¹ / ₄ "	1"
GS.564	5,000 r.p.m.	3"	15"	4"	1 ¹ / ₄ "	1"
GS.565	5,000 r.p.m.	3"	18"	4"	1 ¹ / ₄ "	1"
GS.566	4,000 r.p.m.	3 ¹ / ₂ "	4"	4 ¹ / ₂ "	2"	2"
GS.567	4,000 r.p.m.	3 ¹ / ₂ "	10"	4 ¹ / ₂ "	2"	2"
GS.568	4,000 r.p.m.	3 ¹ / ₂ "	12"	4 ¹ / ₂ "	2"	1"
GS.569	4,000 r.p.m.	3 ¹ / ₂ "	14"	4 ¹ / ₂ "	2"	1"
GS.570	4,000 r.p.m.	3 ¹ / ₂ "	16"	4 ¹ / ₂ "	2"	1"
GS.571	4,000 r.p.m.	3 ¹ / ₂ "	18"	4 ¹ / ₂ "	2"	1"

All the above spindles are mounted in a bracket by means of a taper thus eliminating distortion, etc. These units replace the old split bracket mounting and are strongly recommended. Certain Churchill grinders may require raising blocks to obtain the correct centre height. Spindles can be supplied for any type of Churchill grinders, upon receipt of details.

Above are supplied with a centre height of 2³/₄" unless otherwise specified, but spindles can be supplied with centre height of 3³/₄" when required.

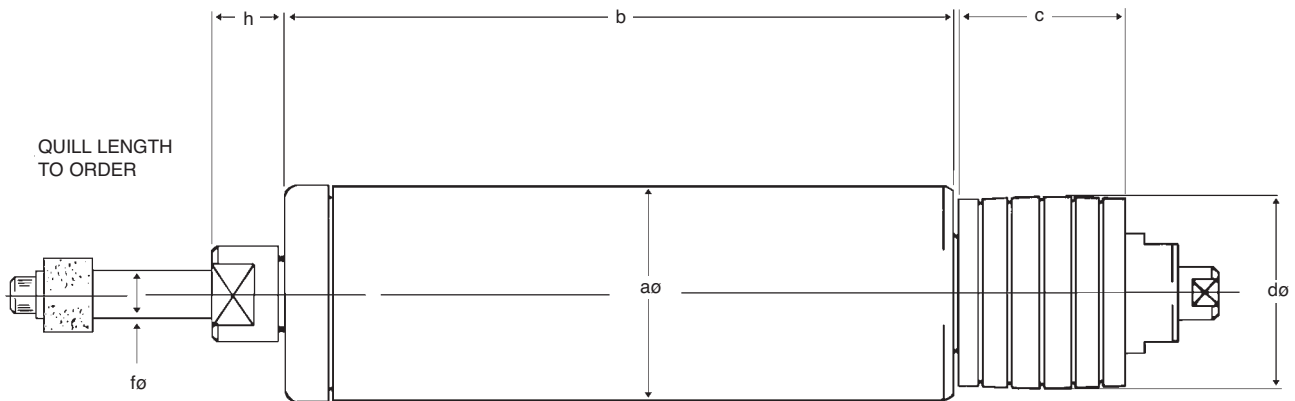
For Broach Sharpening Machines. (Sealed in Lubrication)



Ref	Max Speed	"f" dia. Max.	Thread Sizes	x	y
GS.5961	7,500 r.p.m.	1 ⁵ / ₈ "	e ⁵ / ₈ " whit. l.h. c 1 ³ / ₈ "	3 ¹ / ₄ "	4 ¹ / ₂ "
GS.5962	10,000 r.p.m.	1 ⁷ / ₁₆ "	e ¹ / ₂ " whit. l.h. c 1 ³ / ₈ "	2 ³ / ₄ "	4"
GS.5963	15,000 r.p.m.	1 ¹ / ₄ "	e ¹ / ₂ " whit. l.h. c 1 ³ / ₈ "	2 ¹ / ₂ "	3 ¹ / ₂ "
GS.5964	17,000 r.p.m.	1"	e ₁ ³ / ₈ " whit. l.h. c ₁ 1 ¹ / ₄ "	—	—
GS.5965	20,000 r.p.m.	1 ³ / ₁₆ "	e ₁ ¹ / ₄ " whit. l.h. c ₁ 1"	—	—

NOTE: GS.5964 and GS.5965 do not have male thread.

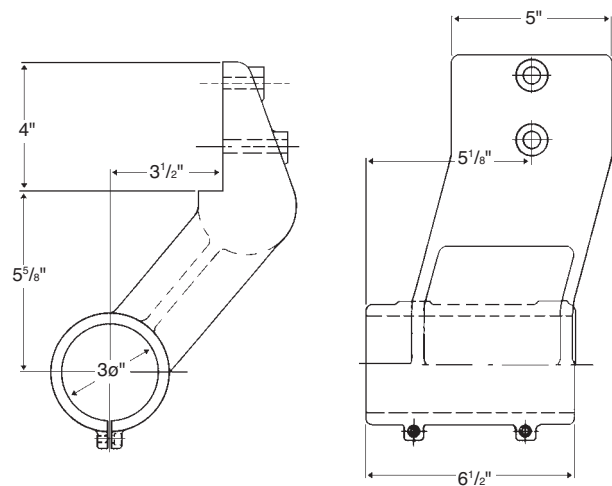
Spindles for No. 2 Cutter Grinder



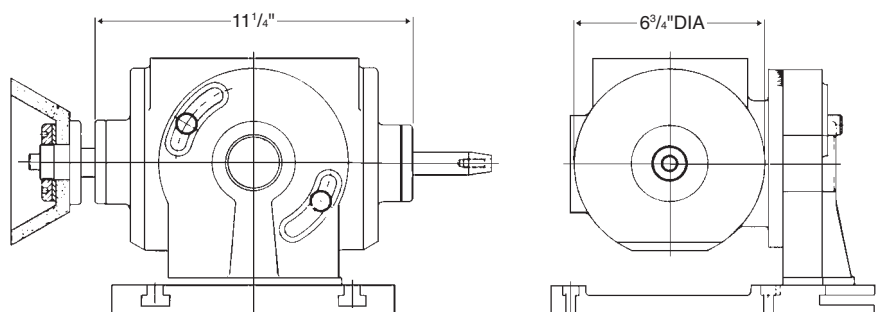
Detachable and Solid Quill Type Spindles

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.438	38,000	3"	8 1/8"	1 1/4"	3/4"	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	1 1/2"
GS.439	30,000	3"	8"	1 3/4"	1"	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	1 1/16"
GS.440	28,000	3"	8"	2"	1"	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	5/8"
GS.441	24,000	3"	8"	2"	1 1/4"	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	1 1/16"
GS.442	20,000	3"	7 7/8"	2 1/4"	1 1/2"	"f" any dia. up to 1 1/16"	"f" any dia. up to 3/4"	3/4"
GS.443	17,000	3"	7 3/4"	2 1/4"	1 3/4"	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"

All the above spindles should be mounted in bracket **B.1161**.

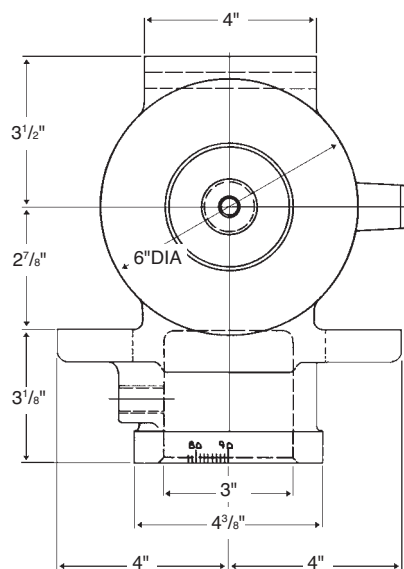
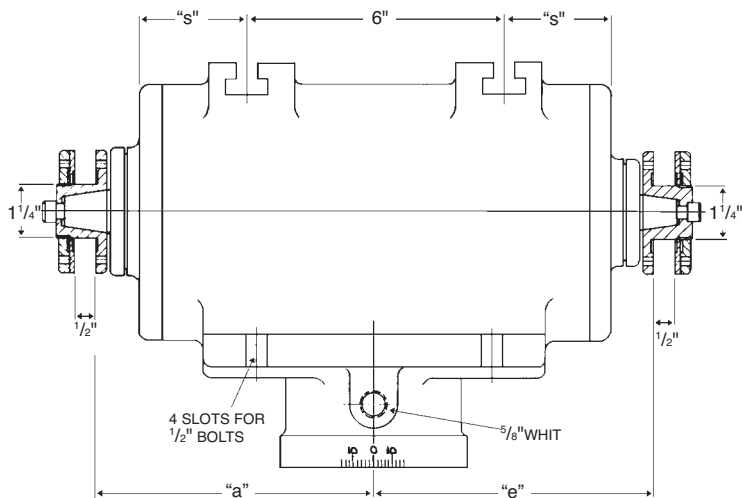


Tilting Head Motorised Spindle suitable Cincinnati No. 2 Cutter Grinder (Sealed in lubrication)



MOTOR 1 H.P. AT 2880 r.p.m. 50 Cycle 3 Phase 380-420v. REF. MGS.627

Motorised Spindles for No. 1 and 1 7/2 Tool and Cutter Grinders. (Sealed in lubrication)

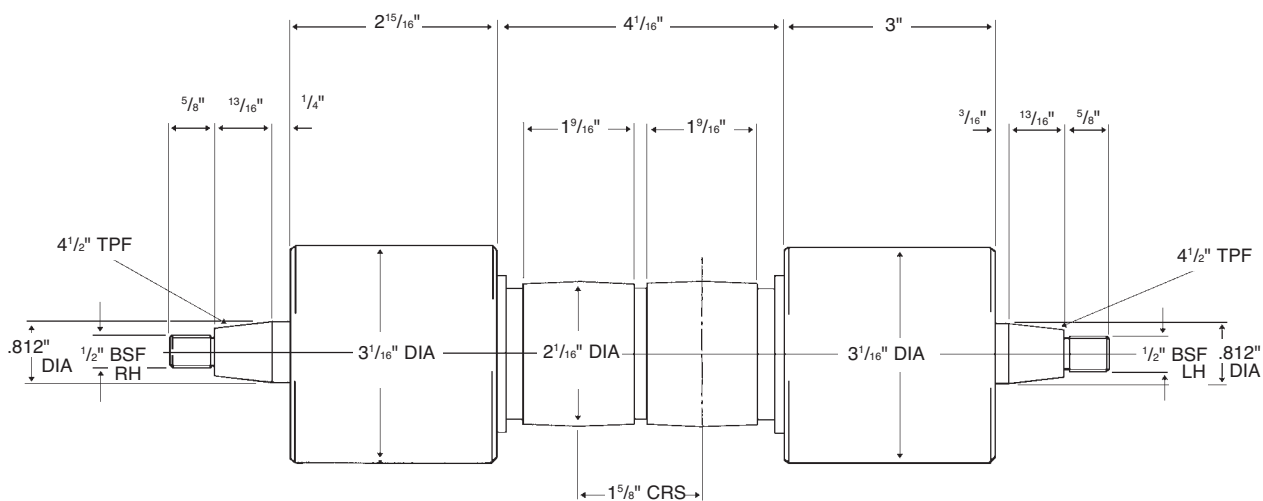


Suitable for 380/420 volts, 50 cycle, 3-phase supply.

Ref	Constant Speed	h.p.	a	e	s
MGS.42	3,000 r.p.m.	1"	6 1/16"	6 1/16"	1 1/2"
MGS.43	3,000 r.p.m.	1"	6 1/2"	6 1/2"	1 15/16"

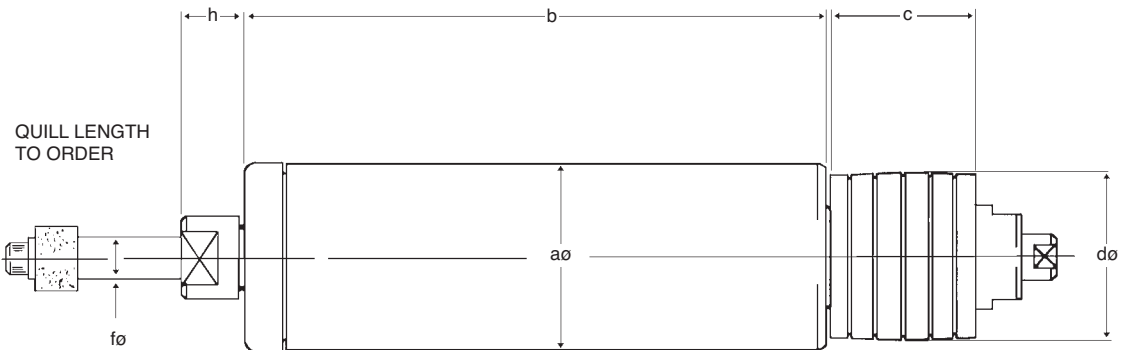
Ref	Constant Speed	h.p.	a	e	s
MGS.40	3,000 r.p.m.	1"	7 11/16"	6 1/16"	1 1/2"
MGS.41	3,000 r.p.m.	1"	8 1/8"	6 1/2"	1 15/16"

Spindle for Cutter Grinder (Sealed in lubrication)



MAXIMUM SPEED 5,000 R.P.M. REF. GS.1272.

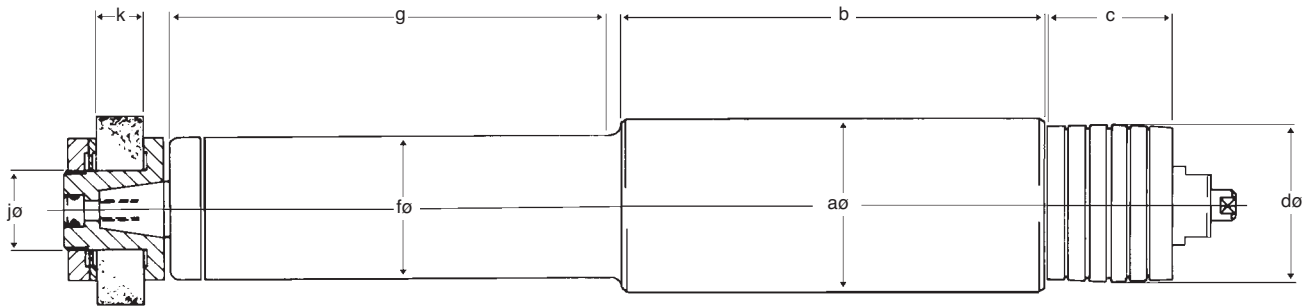
Spindles for Universal Grinders. (Sealed in lubrication)



Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.402	30,000 r.p.m.	3 ¹ / ₈ "	12"	1 ³ / ₄ "	1 ¹ / ₈ "	"f" any dia. up to 3 ³ / ₈ "	"f" any dia. up to 7 ⁷ / ₁₆ "	1 ¹¹ / ₁₆ "
GS.403	28,000 r.p.m.	3 ¹ / ₈ "	12"	2"	1 ¹ / ₈ "	"f" any dia. up to 7 ⁷ / ₁₆ "	"f" any dia. up to 1 ¹ / ₂ "	5 ⁵ / ₈ "
GS.404	24,000 r.p.m.	3 ¹ / ₈ "	12"	2"	1 ¹ / ₄ "	"f" any dia. up to 9 ⁹ / ₁₆ "	"f" any dia. up to 5 ⁵ / ₈ "	1 ¹¹ / ₁₆ "
GS.405	20,000 r.p.m.	3 ¹ / ₈ "	11 ⁷ / ₈ "	2 ¹ / ₄ "	1 ³ / ₈ "	"f" any dia. up to 1 ¹¹ / ₁₆ "	"f" any dia. up to 3 ³ / ₄ "	3 ³ / ₄ "
GS.406	17,000 r.p.m.	3 ¹ / ₈ "	11 ³ / ₄ "	2 ¹ / ₄ "	1 ⁵ / ₈ "	"f" any dia. up to 7 ⁷ / ₈ "	"f" any dia. up to 1"	1"
GS.406A	15,000 r.p.m.	3 ¹ / ₈ "	11 ³ / ₄ "	2 ¹ / ₄ "	2"	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ⁹ / ₁₆ "
GS.407	12,000 r.p.m.	3 ¹ / ₈ "	12 ⁵ / ₈ "	2 ¹ / ₂ "	2 ¹ / ₄ "	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ³ / ₈ "	1 ³ / ₈ "
GS.408	10,000 r.p.m.	3 ¹ / ₈ "	12 ⁵ / ₈ "	2 ¹ / ₂ "	2 ³ / ₄ "	"f" any dia. up to 1 ³ / ₈ "	"f" any dia. up to 1 ⁵ / ₈ "	1 ³ / ₈ "

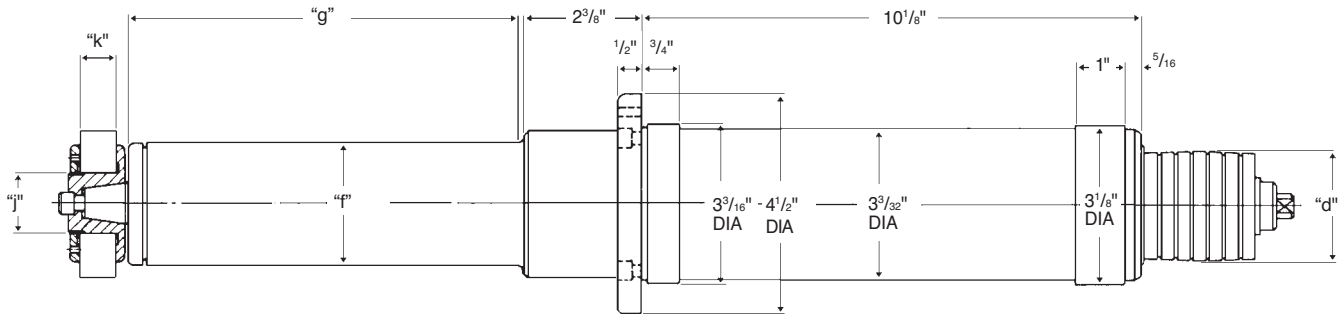
Spindles for Universal Grinders. (Sealed in lubrication)



Ref	Max Speed	f	g	a	b	c	d	j	k
GS.409	11,500 r.p.m.	1 ¹ / ₄ "	9"	3 ¹ / ₈ "	10"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.410	11,500 r.p.m.	1 ¹ / ₄ "	10"	3 ¹ / ₈ "	10"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.411	11,500 r.p.m.	1 ¹ / ₄ "	12"	3 ¹ / ₈ "	10"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	1 ¹ / ₂ "
GS.412	11,500 r.p.m.	1 ¹ / ₂ "	9"	3 ¹ / ₈ "	10"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.413	11,500 r.p.m.	1 ¹ / ₂ "	11"	3 ¹ / ₈ "	10"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.414	11,500 r.p.m.	1 ¹ / ₂ "	12"	3 ¹ / ₈ "	10"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.415	11,000 r.p.m.	1 ³ / ₄ "	10"	3 ¹ / ₈ "	10"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.416	11,000 r.p.m.	1 ³ / ₄ "	11"	3 ¹ / ₈ "	10"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.417	11,000 r.p.m.	1 ³ / ₄ "	12"	3 ¹ / ₈ "	10"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.418	8,500 r.p.m.	2"	8"	3 ¹ / ₈ "	10"	2"	3 ¹ / ₄ "	1"	1"
GS.419	8,500 r.p.m.	2"	10"	3 ¹ / ₈ "	10"	2"	3 ¹ / ₄ "	1"	1"
GS.420	8,500 r.p.m.	2"	12"	3 ¹ / ₈ "	10"	2"	3 ¹ / ₄ "	1"	1"
GS.421	8,500 r.p.m.	2"	14"	3 ¹ / ₈ "	10"	2"	3 ¹ / ₄ "	1"	1"
GS.422	8,500 r.p.m.	2"	15"	3 ¹ / ₈ "	10"	2"	3 ¹ / ₄ "	1"	1"
GS.423	7,000 r.p.m.	2 ¹ / ₄ "	8"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.424	7,000 r.p.m.	2 ¹ / ₄ "	10"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.425	7,000 r.p.m.	2 ¹ / ₄ "	12"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.426	7,000 r.p.m.	2 ¹ / ₄ "	15"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.427	6,500 r.p.m.	2 ¹ / ₂ "	8"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.428	6,500 r.p.m.	2 ¹ / ₂ "	10"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.429	6,500 r.p.m.	2 ¹ / ₂ "	12"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.430	6,500 r.p.m.	2 ¹ / ₂ "	14"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.431	6,500 r.p.m.	2 ¹ / ₂ "	16"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.432	6,500 r.p.m.	2 ¹ / ₂ "	18"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.433	5,000 r.p.m.	3"	6"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.434	5,000 r.p.m.	3"	10"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.435	5,000 r.p.m.	3"	12"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.436	5,000 r.p.m.	3"	15"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"
GS.437	5,000 r.p.m.	3"	18"	3 ¹ / ₈ "	10"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1"

Sleeve Type Spindles are suitable for face grinding, type GS.433 is particularly recommended for this purpose.

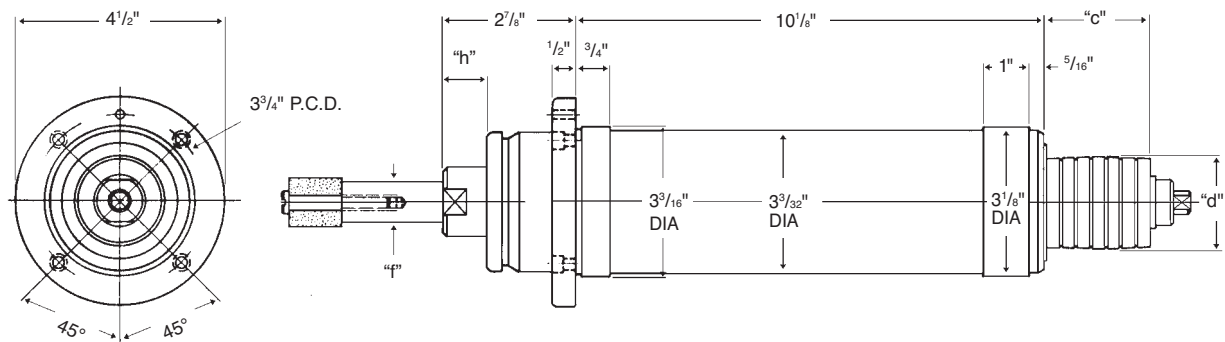
Spindles for No. 10 Universal Grinder. (Sealed in lubrication)



Sleeve Type for Large Diameter and Deep Bores

Ref	Max Speed	d	f	g	j	k
GS.1068A	11,500 r.p.m.	2 ¹ / ₄ "	1 ¹ / ₄ "	9"	1 ¹ / ₂ "	3 ³ / ₄ "
GS.1069A	11,500 r.p.m.	2 ¹ / ₄ "	1 ¹ / ₄ "	10"	1 ¹ / ₂ "	3 ³ / ₄ "
GS.1070A	11,500 r.p.m.	2 ¹ / ₄ "	1 ¹ / ₄ "	12"	1 ¹ / ₂ "	3 ³ / ₄ "
GS.1071A	11,500 r.p.m.	2 ¹ / ₄ "	1 ¹ / ₂ "	9"	3 ³ / ₄ "	3 ³ / ₄ "
GS.1072A	11,500 r.p.m.	2 ¹ / ₄ "	1 ¹ / ₂ "	11"	3 ³ / ₄ "	3 ³ / ₄ "
GS.1073A	11,500 r.p.m.	2 ¹ / ₄ "	1 ¹ / ₂ "	12"	3 ³ / ₄ "	3 ³ / ₄ "
GS.1074A	11,000 r.p.m.	2 ¹ / ₄ "	1 ³ / ₄ "	10"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.1075A	11,000 r.p.m.	2 ¹ / ₄ "	1 ³ / ₄ "	11"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.1076A	11,000 r.p.m.	2 ¹ / ₄ "	1 ³ / ₄ "	12"	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.1077A	8,500 r.p.m.	2 ³ / ₄ "	2"	8"	1"	1"
GS.1078A	8,500 r.p.m.	2 ³ / ₄ "	2"	10"	1"	1"
GS.1079A	8,500 r.p.m.	2 ³ / ₄ "	2"	12"	1"	1"
GS.1080A	8,500 r.p.m.	2 ³ / ₄ "	2"	14"	1"	1"
GS.1081A	8,500 r.p.m.	2 ³ / ₄ "	2"	15"	1"	1"
GS.1082A	7,000 r.p.m.	3"	2 ¹ / ₄ "	8"	1"	1"
GS.1083A	7,000 r.p.m.	3"	2 ¹ / ₄ "	10"	1"	1"
GS.1084A	7,000 r.p.m.	3"	2 ¹ / ₄ "	12"	1"	1"
GS.1085A	7,000 r.p.m.	3"	2 ¹ / ₄ "	15"	1"	1"
GS.1086A	6,500 r.p.m.	3 ¹ / ₄ "	2 ¹ / ₂ "	8"	1 ¹ / ₄ "	1"
GS.1087A	6,500 r.p.m.	3 ¹ / ₄ "	2 ¹ / ₂ "	10"	1 ¹ / ₄ "	1"
GS.1088A	6,500 r.p.m.	3 ¹ / ₄ "	2 ¹ / ₂ "	12"	1 ¹ / ₄ "	1"
GS.1089A	6,500 r.p.m.	3 ¹ / ₄ "	2 ¹ / ₂ "	14"	1 ¹ / ₄ "	1"
GS.1090A	6,500 r.p.m.	3 ¹ / ₄ "	2 ¹ / ₂ "	16"	1 ¹ / ₄ "	1"
GS.1091A	6,500 r.p.m.	3 ¹ / ₄ "	2 ¹ / ₂ "	18"	1 ¹ / ₄ "	1"
GS.1092A	5,000 r.p.m.	3 ¹ / ₂ "	6"	3"	2"	1"
GS.1093A	5,000 r.p.m.	3 ¹ / ₂ "	3"	10"	2"	1"
GS.1094A	5,000 r.p.m.	3 ¹ / ₂ "	3"	12"	2"	1"
GS.1095A	5,000 r.p.m.	3 ¹ / ₂ "	3"	15"	2"	1"
GS.1096A	5,000 r.p.m.	3 ¹ / ₂ "	3"	18"	2"	1"

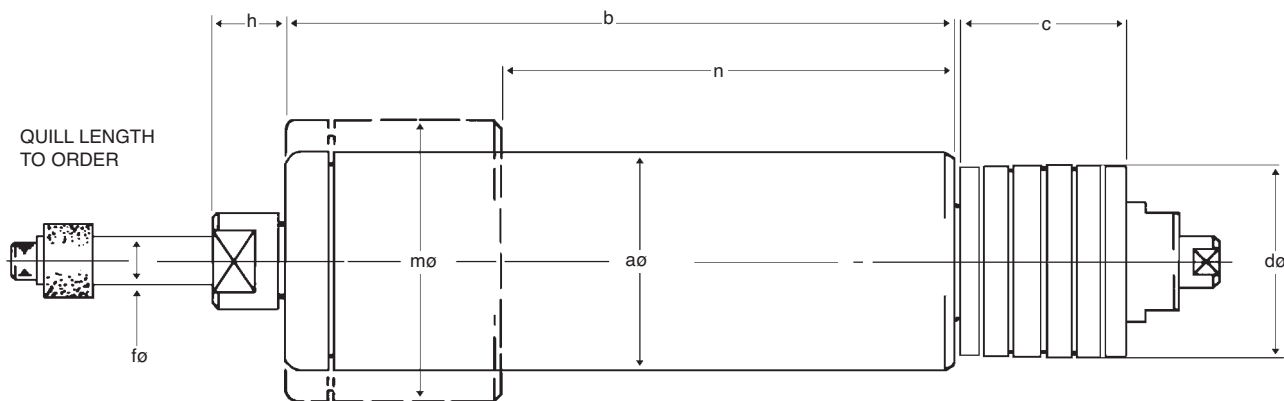
Spindles for Universal Grinder. (Sealed in lubrication)



Detachable and Solid Quill Types

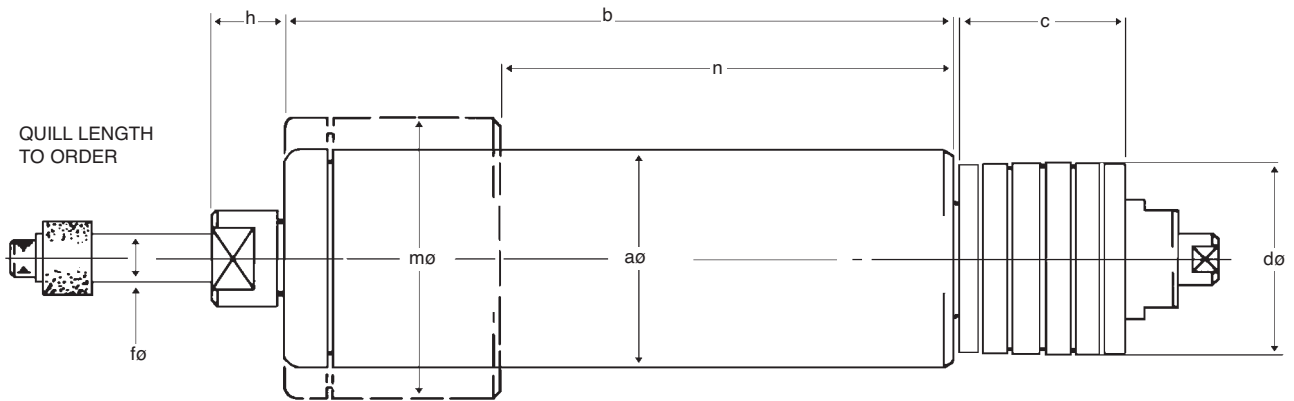
Ref	Max Speed	Detachable Quill Type	Solid Quill Type	c	d	h
GS.1060A	30,000 r.p.m.	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	1 3/4"	1"	1 1/16"
GS.1061A	28,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	2"	1 1/8"	5/8"
GS.1062A	24,000 r.p.m.	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	2 1/4"	1 5/16"	1 1/16"
GS.1063A	20,000 r.p.m.	"f" any dia. up to 1 1/16"	"f" any dia. up to 3/4"	2 1/4"	1 5/8"	3/4"
GS.1064A	17,000 r.p.m.	"f" any dia. up to 7/8"	"f" any dia. up to 1"	2 1/2"	1 13/16"	1"
GS.1065A	15,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	2 1/2"	2 1/4"	1 3/16"
GS.1066A	12,000 r.p.m.	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	2 1/2"	2 3/4"	1 3/8"
GS.1067A	10,000 r.p.m.	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	2 1/2"	3"	1 3/8"

Spindles for MSO Type R75 m/cs. (Sealed in lubrication)



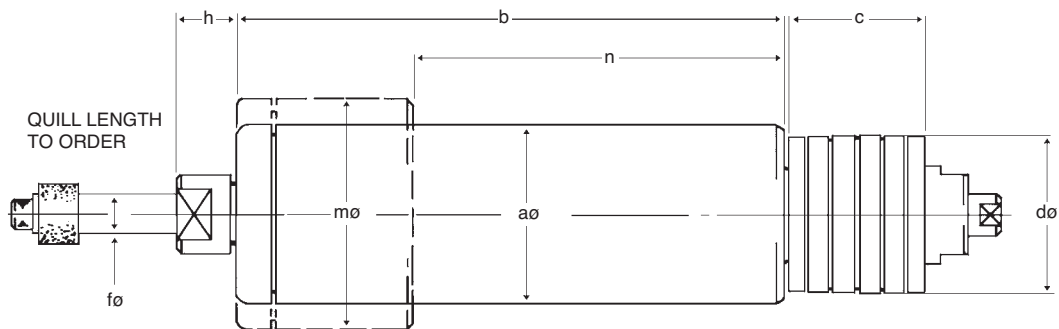
Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.6380	30,000 r.p.m.	60mm	180mm	60mm	18.5mm	"f" any dia. up to 11mm	"f" any dia. up to 13mm	16mm		
GS.6381	28,000 r.p.m.	60mm	180mm	60mm	19mm	"f" any dia. up to 14mm	"f" any dia. up to 16mm	17mm		
GS.6382	24,000 r.p.m.	60mm	180mm	60mm	23mm	"f" any dia. up to 17mm	"f" any dia. up to 19mm	20mm		
GS.6383	20,000 r.p.m.	60mm	220mm	60mm	27mm	"f" any dia. up to 22mm	"f" any dia. up to 25mm	25mm	70mm	140mm
GS.6384	17,000 r.p.m.	60mm	225mm	60mm	32mm	"f" any dia. up to 25mm	"f" any dia. up to 30mm	30mm	76mm	140mm
GS.6385	15,000 r.p.m.	60mm	225mm	60mm	37mm	"f" any dia. up to 30mm	"f" any dia. up to 35mm	35mm	86mm	140mm
GS.6386	12,000 r.p.m.	60mm	230mm	60mm	47mm	"f" any dia. up to 35mm	"f" any dia. up to 40mm	35mm	95mm	140mm

Spindles for MSO - M/C Types R.108, R.204, R.206 & R.207 M/C's



Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.6470	30,000 r.p.m.	60mm	240mm	60mm	18.5mm	"f" any dia. up to 11mm	"f" any dia. up to 13mm	16mm		
GS.6471	28,000 r.p.m.	60mm	240mm	60mm	19mm	"f" any dia. up to 14mm	"f" any dia. up to 17mm	17mm		
GS.6472	24,000 r.p.m.	60mm	230mm	60mm	23mm	"f" any dia. up to 17mm	"f" any dia. up to 20mm	20mm		
GS.6473	20,000 r.p.m.	60mm	280mm	60mm	27mm	"f" any dia. up to 22mm	"f" any dia. up to 25mm	25mm	70mm	200mm
GS.6474	17,000 r.p.m.	60mm	285mm	60mm	32mm	"f" any dia. up to 25mm	"f" any dia. up to 30mm	30mm	76mm	200mm
GS.6475	15,000 r.p.m.	60mm	285mm	60mm	37mm	"f" any dia. up to 30mm	"f" any dia. up to 35mm	35mm	85mm	200mm
GS.6476	12,000 r.p.m.	60mm	290mm	60mm	47mm	"f" any dia. up to 35mm	"f" any dia. up to 40mm	35mm	95mm	200mm

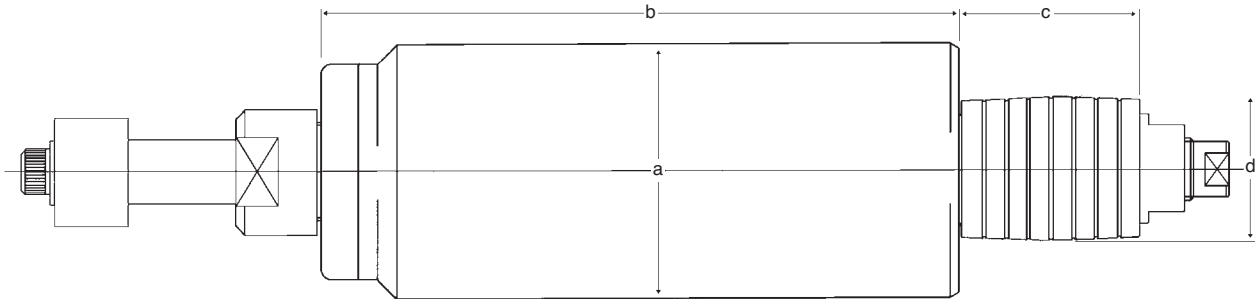
**Spindles for MSO Type R208 FH300 FH300DL
(Sealed in lubrication)**



Detachable and Solid Quill Type Spindles

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.6480	30,000 r.p.m.	80mm	220mm	80mm	18.5mm	"f" any dia. up to 11mm	"f" any dia. up to 13mm	16mm		
GS.6481	28,000 r.p.m.	80mm	220mm	80mm	19mm	"f" any dia. up to 14mm	"f" any dia. up to 16mm	17mm		
GS.6482	24,000 r.p.m.	80mm	210mm	80mm	23mm	"f" any dia. up to 17mm	"f" any dia. up to 19mm	20mm		
GS.6483	20,000 r.p.m.	80mm	260mm	80mm	27mm	"f" any dia. up to 22mm	"f" any dia. up to 25mm	25mm		
GS.6484	17,000 r.p.m.	80mm	265mm	80mm	32mm	"f" any dia. up to 25mm	"f" any dia. up to 30mm	30mm		
GS.6485	15,000 r.p.m.	80mm	265mm	80mm	37mm	"f" any dia. up to 30mm	"f" any dia. up to 35mm	35mm	86mm	180mm
GS.6486	12,000 r.p.m.	80mm	270mm	80mm	47mm	"f" any dia. up to 35mm	"f" any dia. up to 40mm	35mm	95mm	180mm

Spindles for Internal Grinding Machines

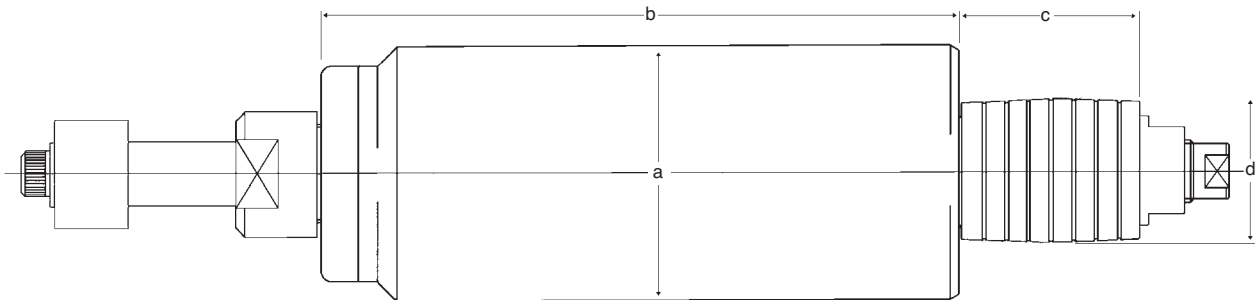


Ref	Max Speed	a	b	c	d	Detachable Quill Type
GS.7020	30,000 r.p.m.	60mm	295mm	50mm	22mm	"f" any dia. up to 11mm
GS.7021	28,000 r.p.m.	60mm	295mm	50mm	24mm	"f" any dia. up to 14mm
GS.7022	24,000 r.p.m.	60mm	295mm	57mm	28mm	"f" any dia. up to 17mm
GS.7023	20,000 r.p.m.	60mm	295mm	57mm	35mm	"f" any dia. up to 22mm
GS.7024	17,000 r.p.m.	60mm	295mm	57mm	42mm	"f" any dia. up to 25mm
GS.7025	15,000 r.p.m.	60mm	295mm	57mm	50mm	"f" any dia. up to 30mm
GS.7026	12,000 r.p.m.	60mm	295mm	57mm	64mm	"f" any dia. up to 35mm

Ref	Max Speed	a	b	c	d	Detachable Quill Type
GS.7020A	30,000 r.p.m.	60mm	335mm	50mm	22mm	"f" any dia. up to 11mm
GS.7021A	28,000 r.p.m.	60mm	335mm	50mm	24mm	"f" any dia. up to 14mm
GS.7022A	24,000 r.p.m.	60mm	335mm	57mm	28mm	"f" any dia. up to 17mm
GS.7023A	20,000 r.p.m.	60mm	335mm	57mm	35mm	"f" any dia. up to 22mm
GS.7024A	17,000 r.p.m.	60mm	335mm	57mm	42mm	"f" any dia. up to 25mm
GS.7025A	15,000 r.p.m.	60mm	335mm	57mm	50mm	"f" any dia. up to 30mm
GS.7026A	12,000 r.p.m.	60mm	335mm	57mm	64mm	"f" any dia. up to 35mm

Ref	Max Speed	a	b	c	d	Detachable Quill Type
GS.6920A	30,000 r.p.m.	80mm	275mm	50mm	28mm	"f" any dia. up to 11mm
GS.6921A	28,000 r.p.m.	80mm	275mm	57mm	32mm	"f" any dia. up to 14mm
GS.6922A	24,000 r.p.m.	80mm	275mm	57mm	38mm	"f" any dia. up to 17mm
GS.6923A	20,000 r.p.m.	80mm	275mm	57mm	45mm	"f" any dia. up to 22mm
GS.6924A	17,000 r.p.m.	80mm	275mm	64mm	50mm	"f" any dia. up to 25mm
GS.6925A	15,000 r.p.m.	80mm	275mm	64mm	64mm	"f" any dia. up to 30mm
GS.6926A	12,000 r.p.m.	80mm	275mm	75mm	75mm	"f" any dia. up to 35mm
GS.6927A	10,000 r.p.m.	80mm	275mm	75mm	100mm	"f" any dia. up to 40mm
GS.6928A	7,500 r.p.m.	80mm	275mm	75mm	116mm	"f" any dia. up to 44.5mm

Spindles for Internal Grinding Machines

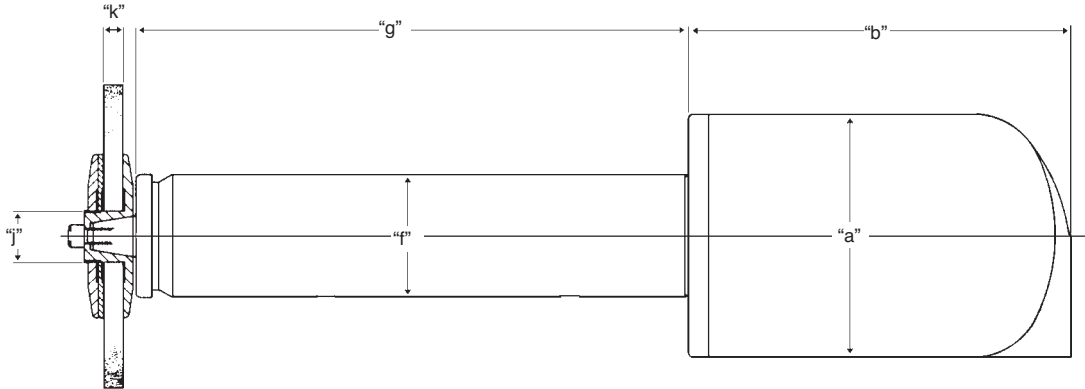


Ref	Max Speed	a	b	c	d	Detachable Quill Type
GS.7010	30,000 r.p.m.	90mm	225mm	50mm	28mm	"f" any dia. up to 11mm
GS.7011	28,000 r.p.m.	90mm	225mm	57mm	32mm	"f" any dia. up to 14mm
GS.7012	24,000 r.p.m.	90mm	225mm	57mm	38mm	"f" any dia. up to 17mm
GS.7013	20,000 r.p.m.	90mm	225mm	57mm	45mm	"f" any dia. up to 22mm
GS.7014	17,000 r.p.m.	90mm	225mm	64mm	50mm	"f" any dia. up to 25mm
GS.7015	15,000 r.p.m.	90mm	225mm	64mm	64mm	"f" any dia. up to 30mm

Ref	Max Speed	a	b	c	d	Detachable Quill Type
GS.6920	30,000 r.p.m.	90mm	275mm	50mm	28mm	"f" any dia. up to 11mm
GS.6921	28,000 r.p.m.	90mm	275mm	57mm	32mm	"f" any dia. up to 14mm
GS.6922	24,000 r.p.m.	90mm	275mm	57mm	38mm	"f" any dia. up to 17mm
GS.6923	20,000 r.p.m.	90mm	275mm	57mm	45mm	"f" any dia. up to 22mm
GS.6924	17,000 r.p.m.	90mm	275mm	64mm	50mm	"f" any dia. up to 25mm
GS.6925	15,000 r.p.m.	90mm	275mm	64mm	64mm	"f" any dia. up to 30mm
GS.6926	12,000 r.p.m.	90mm	275mm	75mm	75mm	"f" any dia. up to 35mm
GS.6927	10,000 r.p.m.	90mm	275mm	75mm	100mm	"f" any dia. up to 40mm
GS.6928	7,500 r.p.m.	90mm	275mm	75mm	116mm	"f" any dia. up to 44.5mm

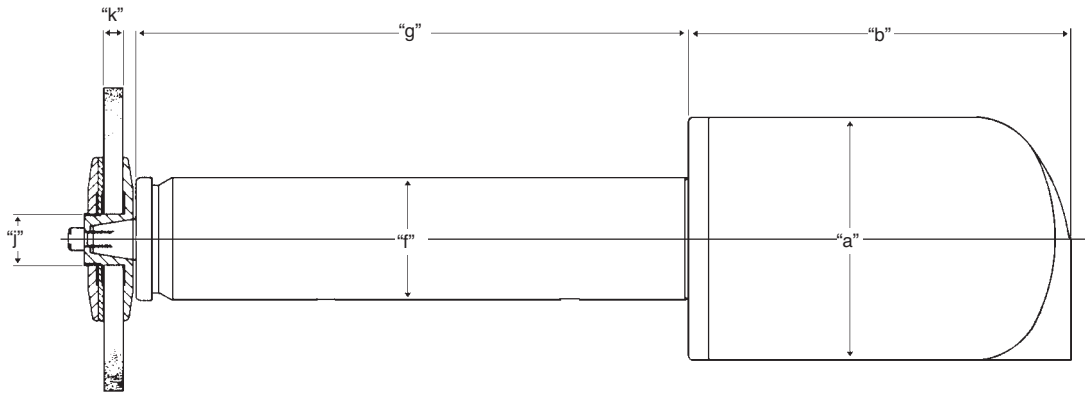
HAMMOND

Motorised Self-contained Spindle for No. 2 Surface Grinder. (Sealed in lubrication)



Ref	a	b	f	g	j	k	Constant Speed on 50-cycle supply	h.p.
MGS.16A	6"	9 ¹ / ₂ "	3	13 ¹ / ₂ "	1 ¹ / ₄ "	1 ¹ / ₂ "	3,000 r.p.m.	1

Motorised Spindle for 6" x 18" Surface Grinder. (Sealed in lubrication)

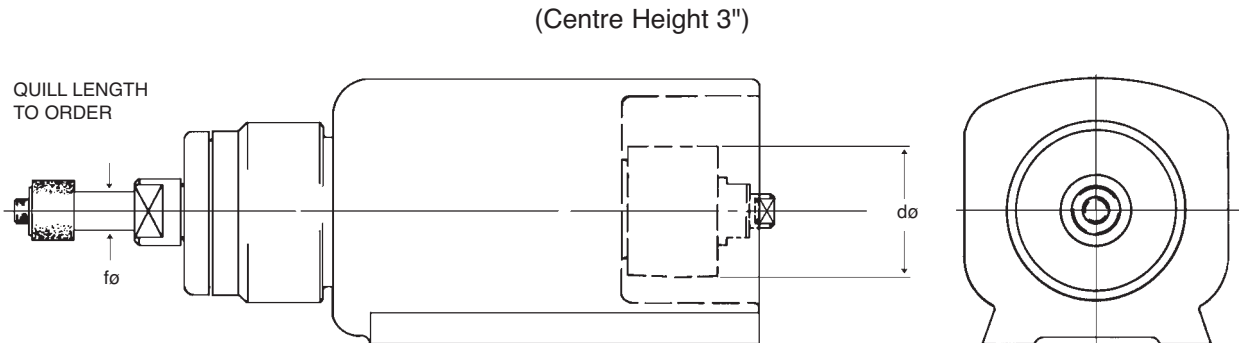


Ref	a	b	f	g	j	k	Constant Speed on 50-cycle supply	h.p.
MGS.588	6"	9 1/2"	3"	13"	1 1/4"	1/2"	3,000 r.p.m.	1

The above spindle is fitted with special precision pre-loaded ball bearings with all traces of radial and end clearances removed. The spindle is equally suitable for grinding either on the periphery or on the sides of the wheel. The motor is mounted direct on the shaft and the complete unit balanced for smooth running.

HEALD

Spindles for Models 70, 70a, 72, 72a, 72a3, 72a5, 75, 75a, 172, etc. (Sealed in lubrication)



Belt Driven Type

Ref	Max Speed	Detachable Quill Type	Solid Quill Type	d
GS.142	28,000 r.p.m.	"f" any dia. up to $\frac{7}{16}$ "	"f" any dia. up to $\frac{1}{2}$ "	$1\frac{1}{4}$ "
GS.143	24,000 r.p.m.	"f" any dia. up to $\frac{9}{16}$ "	"f" any dia. up to $\frac{5}{8}$ "	$1\frac{1}{4}$ "
GS.144	20,000 r.p.m.	"f" any dia. up to $\frac{11}{16}$ "	"f" any dia. up to $\frac{3}{4}$ "	$1\frac{3}{8}$ "
GS.145	17,000 r.p.m.	"f" any dia. up to $\frac{7}{8}$ "	"f" any dia. up to 1"	$1\frac{1}{2}$ "
GS.146	15,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to $1\frac{1}{4}$ "	$1\frac{3}{4}$ "
GS.147	12,000 r.p.m.	"f" any dia. up to $1\frac{3}{16}$ "	"f" any dia. up to $1\frac{3}{8}$ "	$2\frac{1}{4}$ "
GS.148	10,000 r.p.m.	"f" any dia. up to $1\frac{3}{8}$ "	"f" any dia. up to $1\frac{5}{8}$ "	$2\frac{3}{4}$ "
GS.148A	7,500 r.p.m.	"f" any dia. up to $1\frac{3}{4}$ "	"f" any dia. up to 2"	$3\frac{1}{2}$ "

GS.148 recommended for general purpose work.

Self-Contained Motorised High Frequency Electrically Driven Spindles

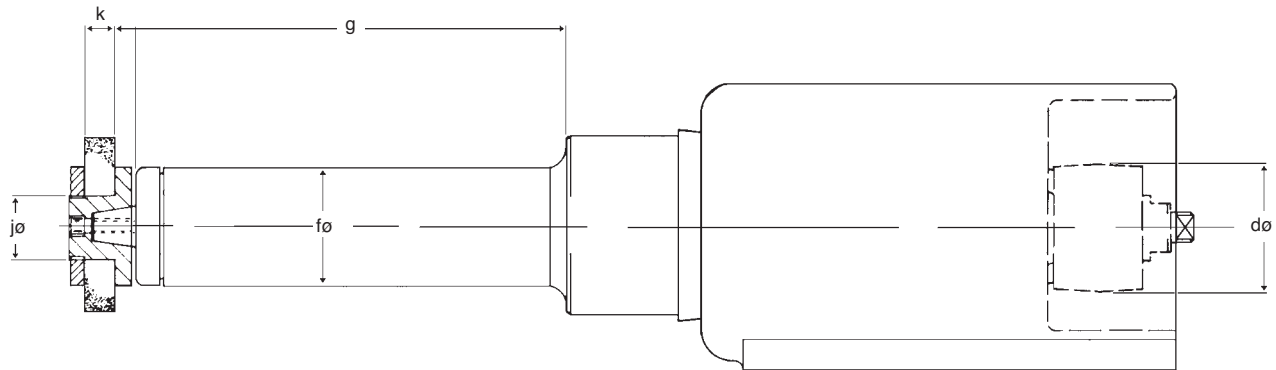
Ref	Max Speed	Detachable Quill Type	Solid Quill Type
HFGS.217	80 to 100,000 r.p.m.	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "
HFGS.81	60 to 80,000 r.p.m.	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "
HFGS.84	30 to 40,000 r.p.m.	"f" any dia. up to $\frac{7}{16}$ "	"f" any dia. up to $\frac{1}{2}$ "
HFGS.68	24,000 r.p.m.	"f" any dia. up to $\frac{7}{16}$ "	"f" any dia. up to $\frac{1}{2}$ "
HFGS.226	18,000 r.p.m.	"f" any dia. up to $\frac{11}{16}$ "	"f" any dia. up to $\frac{3}{4}$ "
HFGS.67	12,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to $1\frac{1}{4}$ "

Air Driven Type

Ref	Max Speed	Detachable Quill Type	Solid Quill Type
AGS.410	40 to 50,000 r.p.m.	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "

HEALD

Spindles for Models 70, 70a, 72, 72a3, 72a5, etc. (Centre height 3"). (Sealed in lubrication)



Sleeve Type

Ref	Max Speed	f	g	d	j	k
GS.157A	11,500 r.p.m.	1 1/4"	9"	2 3/4"	1/2"	3/4"
GS.157B	11,500 r.p.m.	1 1/4"	10"	2 3/4"	1/2"	1/2"
GS.157C	11,500 r.p.m.	1 1/4"	12"	2 3/4"	1/2"	1/2"
GS.307	11,500 r.p.m.	1 1/2"	9"	2 3/4"	3/4"	1/2"
GS.307A	11,500 r.p.m.	1 1/2"	11"	2 3/4"	3/4"	1/2"
GS.307B	11,500 r.p.m.	1 1/2"	12"	2 3/4"	3/4"	1/2"
GS.157	11,000 r.p.m.	1 3/4"	10"	2 3/4"	7/8"	3/4"
GS.158A	11,000 r.p.m.	1 3/4"	11"	2 3/4"	7/8"	3/4"
GS.158B	11,000 r.p.m.	1 3/4"	12"	2 3/4"	7/8"	3/4"
GS.159	8,500 r.p.m.	2"	8"	3"	1"	1"
GS.160	8,500 r.p.m.	2"	10"	3"	1"	1"
GS.160A	8,500 r.p.m.	2"	12"	3"	1"	1"
GS.160B	8,500 r.p.m.	2"	14"	3"	1"	1"
GS.160C	8,500 r.p.m.	2"	15"	3"	1"	1"
GS.162	7,000 r.p.m.	2 1/4"	8"	3 1/4"	1"	1"
GS.163	7,000 r.p.m.	2 1/4"	10"	3 1/4"	1"	1"
GS.163A	7,000 r.p.m.	2 1/4"	12"	3 1/4"	1"	1"
GS.163B	7,000 r.p.m.	2 1/4"	14"	3 1/4"	1"	1"

Ref	Max Speed	f	g	d	j	k
GS.166	6,500 r.p.m.	2 1/2"	8"	3 1/4"	1 1/4"	1"
GS.167	6,500 r.p.m.	2 1/2"	10"	3 1/4"	1 1/4"	1"
GS.167A	6,500 r.p.m.	2 1/2"	12"	3 1/4"	1 1/4"	1"
GS.167B	6,500 r.p.m.	2 1/2"	14"	3 1/4"	1 1/4"	1"
GS.167C	6,500 r.p.m.	2 1/2"	16"	3 1/4"	1 1/4"	1"
GS.167D	6,500 r.p.m.	2 1/2"	18"	3 1/4"	1 1/4"	1"
GS.169	5,000 r.p.m.	3"	6"	3 1/4"	1 1/4"	1 1/2"
GS.171	5,000 r.p.m.	3"	10"	3 1/4"	1 1/4"	1"
GS.171A	5,000 r.p.m.	3"	12"	3 1/4"	1 1/4"	1"
GS.171B	5,000 r.p.m.	3"	15"	3 1/4"	1 1/4"	1"
GS.171C	5,000 r.p.m.	3"	18"	3 1/4"	1 1/4"	1"
GS.172	4,000 r.p.m.	3 1/2"	4"	3 1/2"	2"	2"
GS.175	4,000 r.p.m.	3 1/2"	10"	3 1/2"	2"	2"
GS.176	4,000 r.p.m.	3 1/2"	12"	3 1/2"	2"	1"
GS.176A	4,000 r.p.m.	3 1/2"	14"	3 1/2"	2"	1"
GS.176B	4,000 r.p.m.	3 1/2"	16"	3 1/2"	2"	1"
GS.176C	4,000 r.p.m.	3 1/2"	18"	3 1/2"	2"	1"

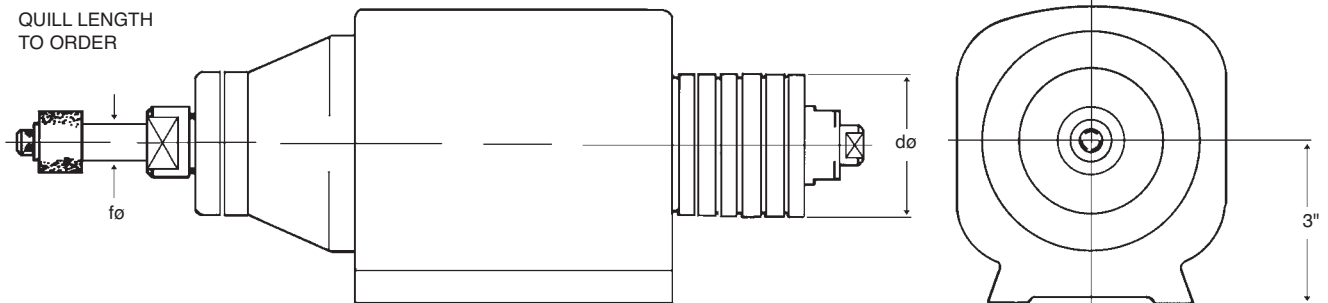
Spindle GS.172 is particularly suitable for face grinding.

Special long spindles for grinding aero landing legs can be quoted for upon receipt of drawings.

HEALD

Spindles for Heald No.81 Internal Grinder

(Centre Height 3")



Detachable and Solid Quill Type Spindles

Belt Driven Spindles

Ref	Max Speed	Detachable Quill Type	Solid Quill Type	d
GS.127A	38,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	1"
GS.127	30,000 r.p.m.	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	1 1/16"
GS.128	28,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	1 1/4"
GS.129	24,000 r.p.m.	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	1 1/2"
GS.130	20,000 r.p.m.	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	1 7/8"
GS.131	17,000 r.p.m.	"f" any dia. up to 7/8"	"f" any dia. up to 1"	2 1/8"
GS.132	15,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	2 3/8"
GS.133	12,000 r.p.m.	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	2 7/8"
GS.133A	10,000 r.p.m.	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	3 1/4"

GS.131 recommended for general purpose work.

Self-Contained Motorised High Frequency Electrically Driven Spindles

Ref	Speed	Detachable Quill Type	Solid Quill Type
HFGS.219	80 to 100,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"
HFGS.69	60 to 80,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"
HFGS.77	30 to 40,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"
HFGS.73	24,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"

Ref. **SGS127** 30 to 65,000 r.p.m. Super Speed Belt Driven Spindle

Self-Contained Air Driven Spindle

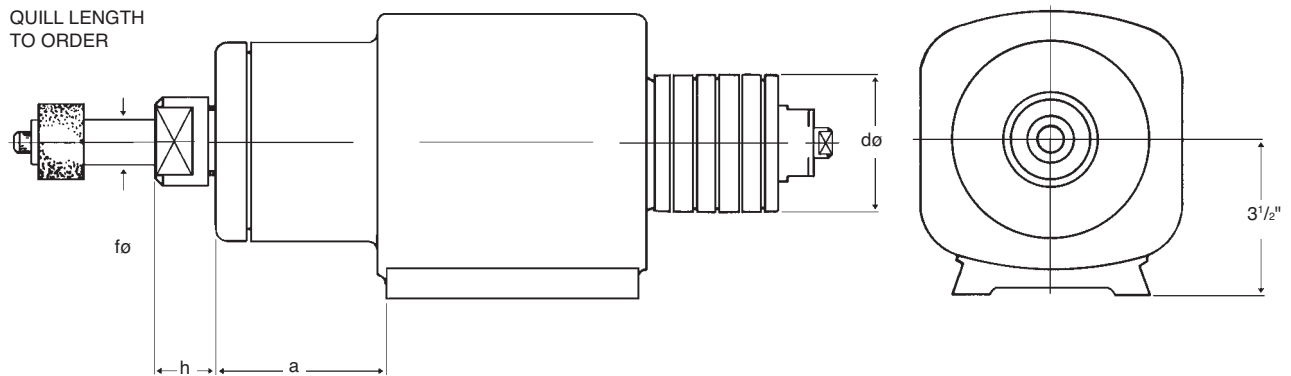
Ref	Max Speed	Detachable Quill Type	Solid Quill Type
AGS.403	40 to 50,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"

NOTE:-Spindles for Heald machines are supplied complete in bracket ready for fitting to machine. The Spindle is held in the bracket by a taper thus eliminating all possibility of distortion.

HEALD

Spindles for Internal Grinders Models 170, 171, 171a, 180 and 190, etc.

(Centre Height 3 1/2")



Belt Driven Type

Ref. 'A' 3 1/2"	Ref. 'A' 6"	Ref. 'A' 7 1/4"	Max Speed	Detachable Quill Type	Solid Quill Type	d	h
GS.1886	GS.1887	GS.1888	38,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	1 1/8"	3/8"
GS.1889	GS.1890	GS.1891	30,000 r.p.m.	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	1 1/8"	1/2"
GS.1892	GS.1893	GS.1894	28,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	1 1/4"	1/2"
GS.1895	GS.1896	GS.1897	24,000 r.p.m.	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	1 1/2"	1/2"
GS.1898	GS.1899	GS.1900	20,000 r.p.m.	"f" any dia. up to 1 1/16"	"f" any dia. up to 3/4"	2"	5/8"
GS.1901	GS.1902	GS.1903	17,000 r.p.m.	"f" any dia. up to 7/8"	"f" any dia. up to 1"	2 1/8"	3/4"
GS.1904	GS.1905	GS.1906	15,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	2 3/8"	3/4"
GS.1907	GS.1908	GS.1909	12,000 r.p.m.	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	2 7/8"	7/8"
GS.1910	GS.1911	GS.1912	10,000 r.p.m.	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	3 1/4"	7/8"
GS.1913	GS.1914	GS.1915	7,500 r.p.m.	"f" any dia. up to 3/4"	"f" any dia. up to 2"	3 1/2"	7/8"

Self-Contained Motorised High Frequency Electrically Driven Spindles

Ref. 'A' 3 1/2"	Ref. 'A' 6"	Ref. 'A' 7 1/4"	h	Max Speed	Detachable Quill Type	Solid Quill Type
HFGS.239	HFGS.240	HFGS.241	5/8"	80 to 100,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"
HFGS.242	HFGS.243	HFGS.244	5/8"	60 to 80,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"
HFGS.245	HFGS.246	HFGS.247	3/4"	30 to 40,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"

Super Speed Belt Driven Type

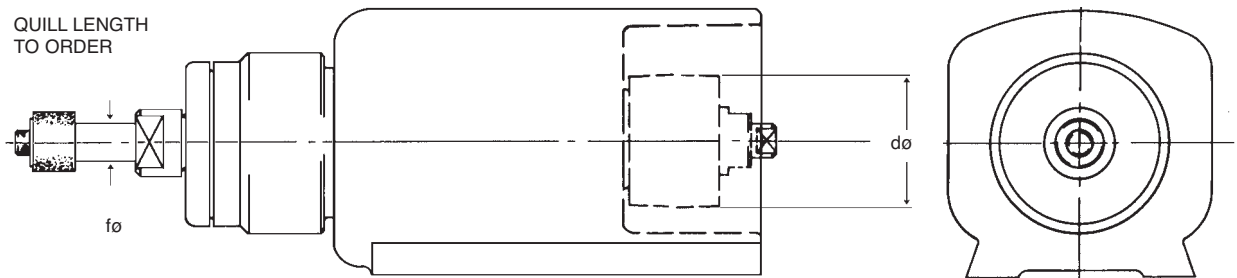
Max Speed	Detachable Quill Type	Solid Quill Type
30 to 65,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"

Air Driven Type

Ref	Max Speed	Detachable Quill Type	Solid Quill Type
A.G.S. 409	40 to 50,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"

HEALD

Spindles for Models 174, 74, 73 (Centre height 4"). (Sealed in Lubrication)

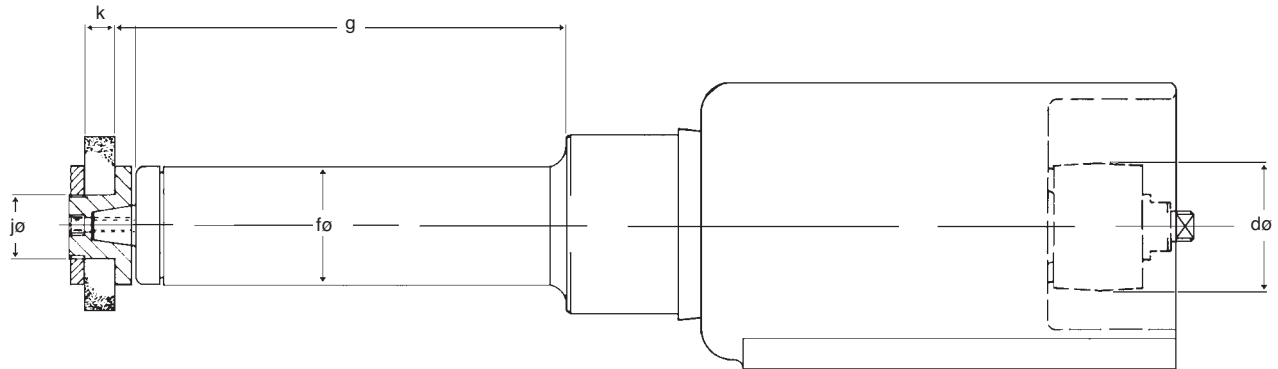


Detachable and Solid Quill Types

Ref	Max Speed	Detachable Quill Type	Solid Quill Type	d
GS.977	20,000 r.p.m.	"f" any dia. up to $1\frac{1}{16}$ "	"f" any dia. up to $\frac{3}{4}$ "	$1\frac{3}{4}$ "
GS.978	17,000 r.p.m.	"f" any dia. up to $\frac{7}{8}$ "	"f" any dia. up to 1"	2"
GS.979	15,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to $1\frac{1}{4}$ "	$2\frac{1}{4}$ "
GS.980	12,000 r.p.m.	"f" any dia. up to $1\frac{3}{16}$ "	"f" any dia. up to $1\frac{3}{8}$ "	$2\frac{1}{2}$ "
GS.981	10,000 r.p.m.	"f" any dia. up to $1\frac{3}{8}$ "	"f" any dia. up to $1\frac{5}{8}$ "	$2\frac{3}{4}$ "
GS.982	7,500 r.p.m.	"f" any dia. up to $1\frac{3}{4}$ "	"f" any dia. up to 2"	3"

HEALD

Spindles for Models 174, 74, 73 (Centre height 4"). (Sealed in lubrication)



Sleeve Type

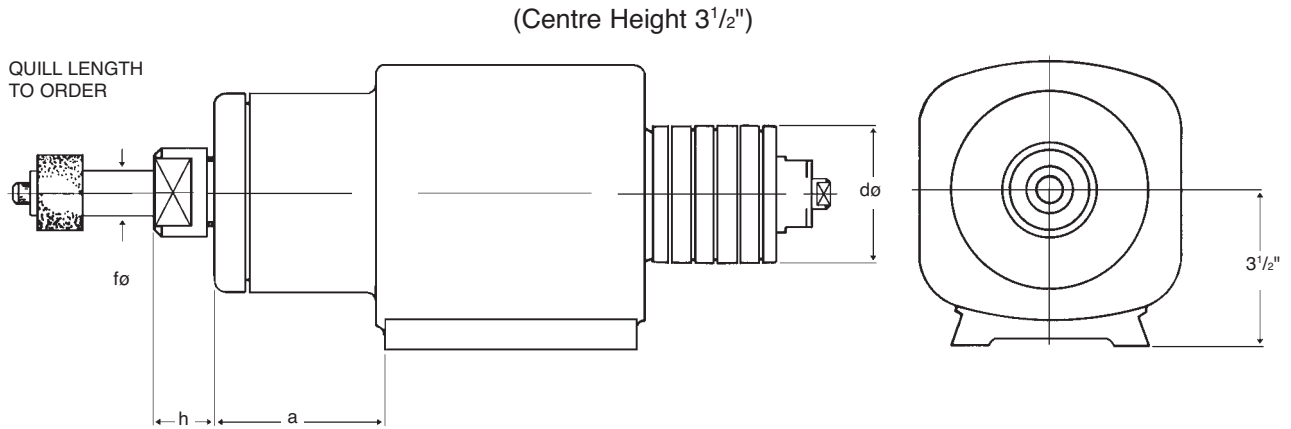
Ref	Max Speed	f	g	d	j	k
GS.1007	11,500 r.p.m.	1 1/4"	9"	2 3/4"	1 1/2"	3/4"
GS.1008	11,500 r.p.m.	1 1/4"	10"	2 3/4"	1 1/2"	1 1/2"
GS.1009	11,500 r.p.m.	1 1/4"	12"	2 3/4"	1 1/2"	1 1/2"
GS.1010	11,500 r.p.m.	1 1/2"	9"	2 3/4"	3/4"	1 1/2"
GS.1011	11,500 r.p.m.	1 1/2"	11"	2 3/4"	3/4"	1 1/2"
GS.1012	11,500 r.p.m.	1 1/2"	12"	2 3/4"	3/4"	1 1/2"
GS.1013	11,000 r.p.m.	1 3/4"	10"	2 3/4"	7/8"	3/4"
GS.1014	11,000 r.p.m.	1 3/4"	11"	2 3/4"	7/8"	3/4"
GS.1015	11,000 r.p.m.	1 3/4"	12"	2 3/4"	7/8"	3/4"
GS.1016	8,500 r.p.m.	2"	8"	3"	1"	1"
GS.1017	8,500 r.p.m.	2"	10"	3"	1"	1"
GS.1018	8,500 r.p.m.	2"	12"	3"	1"	1"
GS.1019	8,500 r.p.m.	2"	14"	3"	1"	1"
GS.1020	8,500 r.p.m.	2"	15"	3"	1"	1"
GS.1021	7,000 r.p.m.	2 1/4"	8"	3 1/4"	1"	1"
GS.1022	7,000 r.p.m.	2 1/4"	10"	3 1/4"	1"	1"
GS.1023	7,000 r.p.m.	2 1/4"	12"	3 1/4"	1"	1"
GS.1024	7,000 r.p.m.	2 1/4"	14"	3 1/4"	1"	1"
GS.1025	6,500 r.p.m.	2 1/2"	8"	3 1/4"	1 1/4"	1"
GS.1026	6,500 r.p.m.	2 1/2"	10"	3 1/4"	1 1/4"	1"
GS.1027	6,500 r.p.m.	2 1/2"	12"	3 1/4"	1 1/4"	1"

Ref	Max Speed	f	g	d	j	k
GS.1028	6,500 r.p.m.	2 1/2"	14"	3 1/4"	1 1/4"	1"
GS.1029	6,500 r.p.m.	2 1/2"	16"	3 1/4"	1 1/4"	1"
GS.1030	6,500 r.p.m.	2 1/2"	18"	3 1/4"	1 1/4"	1"
GS.1031	5,000 r.p.m.	3"	6"	3 1/4"	1 1/4"	1 1/2"
GS.1032	5,000 r.p.m.	3"	10"	3 1/4"	1 1/4"	1"
GS.1033	5,000 r.p.m.	3"	12"	3 1/4"	1 1/4"	1"
GS.1034	5,000 r.p.m.	3"	15"	3 1/4"	1 1/4"	1"
GS.1035	5,000 r.p.m.	3"	18"	3 1/4"	1 1/4"	1"
GS.1036	4,000 r.p.m.	3 1/2"	4"	3 1/2"	2"	2"
GS.1037	4,000 r.p.m.	3 1/2"	10"	3 1/2"	2"	2"
GS.1038	4,000 r.p.m.	3 1/2"	12"	3 1/2"	2"	1"
GS.1039	4,000 r.p.m.	3 1/2"	14"	3 1/2"	2"	1"
GS.1040	4,000 r.p.m.	3 1/2"	16"	3 1/2"	2"	1"
GS.1041	4,000 r.p.m.	3 1/2"	18"	3 1/2"	2"	1"
GS.1042	4,000 r.p.m.	3 1/2"	24"	3 1/2"	2"	1"
GS.1043	4,000 r.p.m.	4"	6"	4 3/4"	2"	2"
GS.1044	4,000 r.p.m.	4"	12"	4 3/4"	2"	2"
GS.1045	4,000 r.p.m.	4"	18"	4 3/4"	2"	1 1/2"
GS.1046	4,000 r.p.m.	4"	24"	4 3/4"	2"	1 1/2"
GS.1047	4,000 r.p.m.	4"	30"	4 3/4"	2"	1 1/2"
GS.1048	4,000 r.p.m.	4"	36"	4 3/4"	2"	1 1/2"

All Sleeve Type Spindles are suitable for face grinding, and types GS.1036 and GS.1043 are particularly recommended for this purpose.

HEALD

Spindles for Internal Grinders Models 271, 272, 273a, 274, 275, 276, 281, 291, 170a, 180a, 190a, 290a. (Sealed in lubrication)



Belt Driven Type

Ref. 'A' 4 1/4"	Ref. 'A' 5 1/2"	Ref. 'A' 7"	Max Speed	Detachable Quill Type	Solid Quill Type	d	h
GS.1856	GS.1857	GS.1858	38,000 r.p.m.	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	1 1/8"	1/2"
GS.1859	GS.1860	GS.1861	30,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	1 1/8"	11/16"
GS.1862	GS.1863	GS.1864	28,000 r.p.m.	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	1 1/4"	5/8"
GS.1865	GS.1866	GS.1867	24,000 r.p.m.	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	1 1/2"	11/16"
GS.1868	GS.1869	GS.1870	20,000 r.p.m.	"f" any dia. up to 7/8"	"f" any dia. up to 1"	2"	3/4"
GS.1871	GS.1872	GS.1873	17,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	2 1/8"	1"
GS.1874	GS.1875	GS.1876	15,000 r.p.m.	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	2 3/8"	1 3/16"
GS.1877	GS.1878	GS.1879	12,000 r.p.m.	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	2 7/8"	1 3/8"
GS.1880	GS.1881	GS.1882	10,000 r.p.m.	"f" any dia. up to 1 9/16"	"f" any dia. up to 1 13/16"	3 1/4"	1 3/8"
GS.1883	GS.1884	GS.1885	7,500 r.p.m.	"f" any dia. up to 1 3/4"	"f" any dia. up to 2"	3 1/2"	1 9/16"

Self-Contained Motorised High Frequency Electrically Driven Spindles

Ref. 'A' 4 1/4"	Ref. 'A' 5 1/2"	Ref. 'A' 7"	Max Speed	Detachable Quill Type	Solid Quill Type	h
HFGS.230	HFGS.231	HFGS.232	80 to 100,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	5/8"
HFGS.233	HFGS.234	HFGS.235	60 to 80,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	5/8"
HFGS.236	HFGS.237	HFGS.238	30 to 40,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	3/4"

Super Speed Belt Driven Type

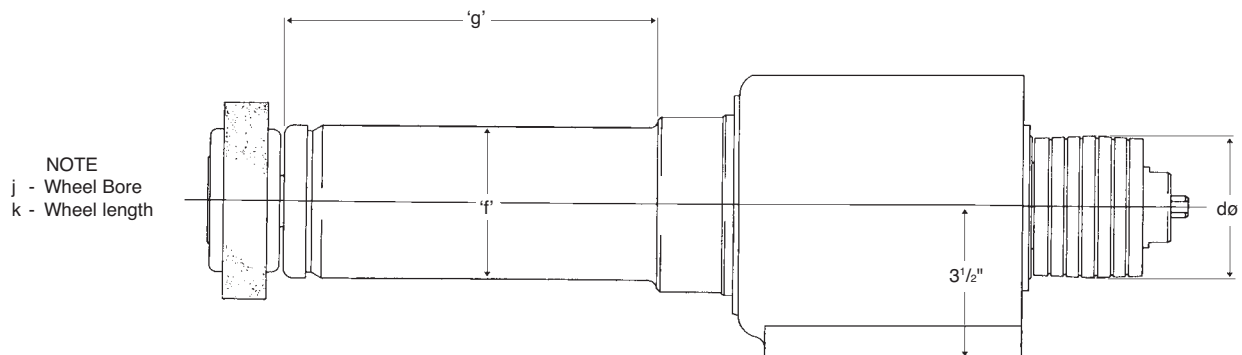
Max Speed	Detachable Quill Type	Solid Quill Type
30 to 65,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"

Air Driven Type

Ref	Max Speed	Detachable Quill Type	Solid Quill Type
A.G.S. 409	40 to 50,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"

HEALD

Spindles for Internal Grinders Type 271, 272, 371, etc. (Centre height 3fi). (Sealed in lubrication)



Sleeve Type for Large Diameter and Long Bores

Ref	Max Speed	f	g	d	j	k
GS.1406	11,500 r.p.m.	1 1/4"	9"	2 3/4"	1/2"	3/4"
GS.1407	11,500 r.p.m.	1 1/4"	10"	2 3/4"	1/2"	1/2"
GS.1408	11,500 r.p.m.	1 1/4"	12"	2 3/4"	1/2"	1/2"
GS.1409	11,500 r.p.m.	1 1/2"	9"	2 3/4"	3/4"	3/4"
GS.1410	11,500 r.p.m.	1 1/2"	11"	2 3/4"	3/4"	1/2"
GS.1411	11,500 r.p.m.	1 1/2"	12"	2 3/4"	3/4"	1/2"
GS.1412	11,000 r.p.m.	1 3/4"	10"	2 3/4"	7/8"	3/4"
GS.1413	11,000 r.p.m.	1 3/4"	11"	2 3/4"	7/8"	3/4"
GS.1414	11,000 r.p.m.	1 3/4"	12"	2 3/4"	7/8"	3/4"
GS.1415	8,500 r.p.m.	2"	8"	3"	1"	1"
GS.1416	8,500 r.p.m.	2"	10"	3"	1"	1"
GS.1417	8,500 r.p.m.	2"	12"	3"	1"	1"
GS.1418	8,500 r.p.m.	2"	14"	3"	1"	1"
GS.1419	8,500 r.p.m.	2"	15"	3"	1"	1"
GS.1420	7,000 r.p.m.	2 1/4"	8"	3 1/4"	1"	1"
GS.1421	7,000 r.p.m.	2 1/4"	10"	3 1/4"	1"	1"
GS.1422	7,000 r.p.m.	2 1/4"	12"	3 1/4"	1"	1"
GS.1423	7,000 r.p.m.	2 1/4"	14"	3 1/4"	1"	1"

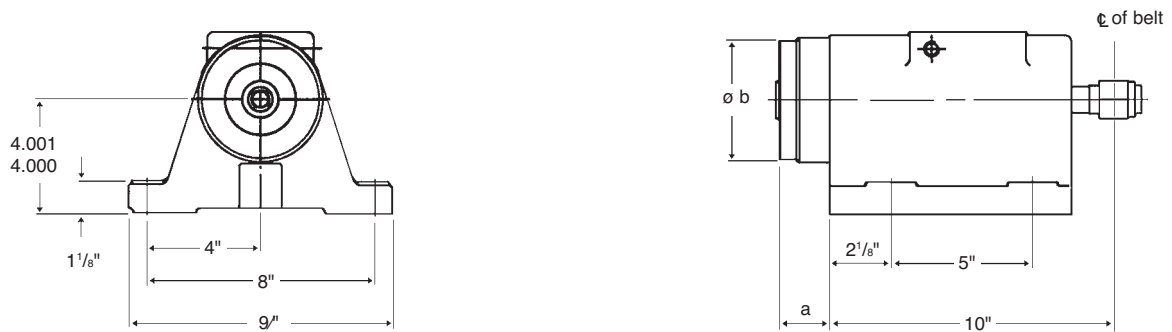
Ref	Max Speed	f	g	d	j	k
GS.1424	6,500 r.p.m.	2 1/2"	8"	3 1/4"	1 1/4"	1"
GS.1425	6,500 r.p.m.	2 1/2"	10"	3 1/4"	1 1/4"	1"
GS.1426	6,500 r.p.m.	2 1/2"	12"	3 1/4"	1 1/4"	1"
GS.1427	6,500 r.p.m.	2 1/2"	14"	3 1/4"	1 1/4"	1"
GS.1428	6,500 r.p.m.	2 1/2"	16"	3 1/4"	1 1/4"	1"
GS.1429	6,500 r.p.m.	2 1/2"	18"	3 1/4"	1 1/4"	1"
GS.1430	5,000 r.p.m.	3"	6"	3 1/2"	1 1/4"	1 1/2"
GS.1431	5,000 r.p.m.	3"	10"	3 1/2"	1 1/4"	1"
GS.1432	5,000 r.p.m.	3"	12"	3 1/2"	1 1/4"	1"
GS.1433	5,000 r.p.m.	3"	15"	3 1/2"	1 1/4"	1"
GS.1434	5,000 r.p.m.	3"	18"	3 1/2"	1 1/4"	1"
GS.1435	4,000 r.p.m.	3 1/2"	4"	3 1/2"	2"	2"
GS.1436	4,000 r.p.m.	3 1/2"	10"	3 1/2"	2"	2"
GS.1437	4,000 r.p.m.	3 1/2"	12"	3 1/2"	2"	1"
GS.1438	4,000 r.p.m.	3 1/2"	14"	3 1/2"	2"	1"
GS.1439	4,000 r.p.m.	3 1/2"	16"	3 1/2"	2"	1"
GS.1440	4,000 r.p.m.	3 1/2"	18"	3 1/2"	2"	1"

All the above spindles are capable of accepting thrust for combined bore and face grinding, but for face grinding only type GS.1435 is particularly recommended.

HEALD

'A' frame spindles for machines 1CF70, 1CF71, 1CF80, 1CF81, 1CF90, 1CF91, 2CF90, 2CF91

Group 5

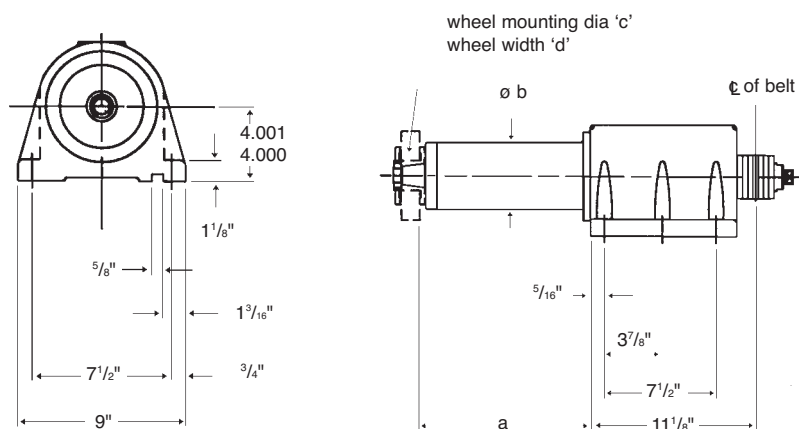


Ref	Equivalent to Heald	a	øb	Max. r.p.m.
GS.3534	401-250500	1.75	3.500	50,000
GS.3535	405-250500	1.75	3.625	35,000
GS.3499	407-250500	1.75	4.375	28,000/35,000
GS.3536	409-250500	1.75	4.750	22,000
GS.3537	411-250500	1.75	5.375	18,000
GS.3538	413-250500	1.75	6.250	12,000
GS.3553	415-250500	1.75	6.750	10,000

Ref	Equivalent to Heald	a	øb	Max. r.p.m.
GS.3554	405-254500	4.5	3.625	25,000
GS.3555	407-254500	4.5	4.375	17,000
GS.3556	409-254500	4.5	4.750	14,000
GS.3557	411-254500	4.5	5.375	11,000

Spindles for machines 291, 2911, 292, 2912

Group 7

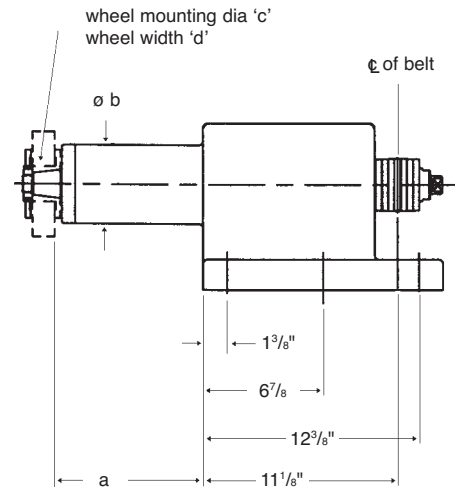
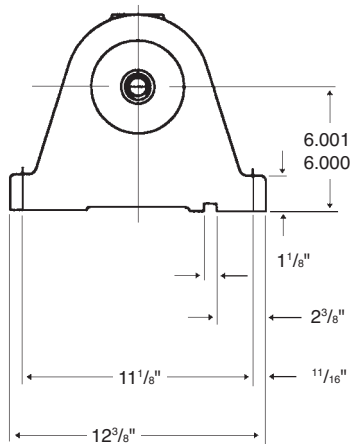


Ref	Equivalent to Heald	a	øb	c	d	Max. r.p.m.
GS.3544	405-290711	11	3.37	1.50	1.00	8,500
GS.3545	407-290711	11	4.12	2.50	1.25	7,500
GS.3546	409-290711	11	4.50	2.50	1.25	6,500
GS.3547	409-290711	11	5.12	2.75	1.25	5,500
GS.3548	411-290711	11	6.00	3.00	1.50	5,500

HEALD

'A' frame spindles for machines 3CF80, 3CF90, 472, 476

Group 9
Group 6

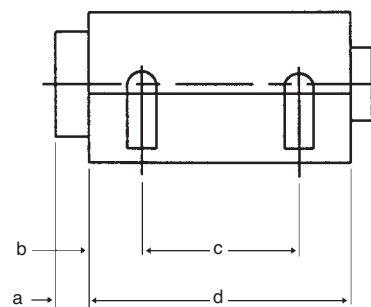
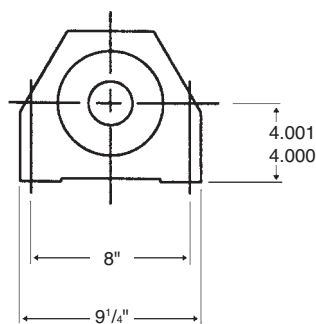


Ref	Equivalent to Heald	a	ϕb	c	d	Max. r.p.m.
GS.3539	405-290612	12	3.37	1.50	1.00	7,000
GS.3540	407-290614	14	4.12	2.50	1.25	4,500
GS.3381	409-290608	8	4.50	2.50	1.25	8,500
GS.3541	409-290616	16	4.50	2.50	1.25	4,000
GS.3542	411-290618	18	5.12	2.75	1.25	3,800
GS.3543	413-290620	20	6.00	3.00	1.50	3,500

Ref	Equivalent to Heald	a	ϕb	c	d	Max. r.p.m.
GS.3558	405-290914	14	3.37	1.50	1.00	6,500
GS.3559	407-290916	16	3.75	2.50	1.25	7,500
GS.3560	409-290918	18	4.50	2.50	1.25	6,500
GS.3561	409-290920	20	5.12	2.75	1.25	5,500
GS.3562	411-290922	22	6.00	3.00	1.50	4,500
GS.3563	413-290924	24	6.75	3.50	2.00	3,500

Spindles for machines OCF70, OCF71, OCF80, OCF81, OCF90, OCF91, ICF70, ICF71, ICF80, ICF81, ICF90, ICF91, 2CF90, 2CF91

Group 8

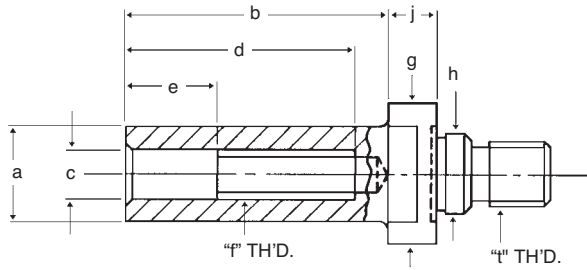


Ref	Equivalent to Heald	a	b	c	d	Max. r.p.m.
HF.828	544-9000-A	3.69	1.87	5	8.06	100,000
HF.829	542-9000	3.69	1.87	5	8.06	60,000
HF.830	501-250800-B	2.75	1.87	5	8.06	50,000
HF.831	505-250800	2.94	.875	5	7.00	25,000
HF.832	509-250800	2.94	.875	5	7.00	18,000

HEALD MOUNTING DETAILS

Table of Location Details.

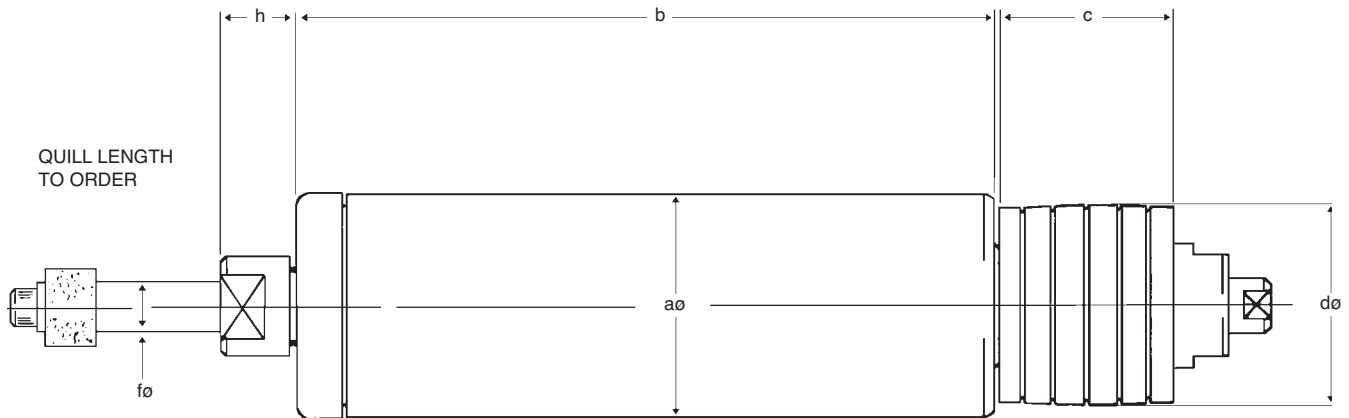
Straight Shank



Heald Spindle Prefix Ref.	g	h	j	t
405-505	1 $\frac{1}{16}$ "	.624	$\frac{3}{8}$ "	$\frac{1}{2}$ "-20
407	1 $\frac{1}{2}$ "	.874	$\frac{7}{16}$ "	$\frac{5}{8}$ "-18
409-509	2"	1.124	$\frac{7}{16}$ "	$\frac{3}{4}$ "-16
411	2 $\frac{3}{8}$ "	1.374	$\frac{7}{16}$ "	$\frac{7}{8}$ "-14
413	2 $\frac{3}{4}$ "	1.624	$\frac{7}{16}$ "	1"-14
501	$\frac{7}{8}$ "	.437	$\frac{5}{16}$ "	$\frac{7}{16}$ "-20

Spindles can be supplied with Heald Taper Shank Mounting or Boneham Mounting.

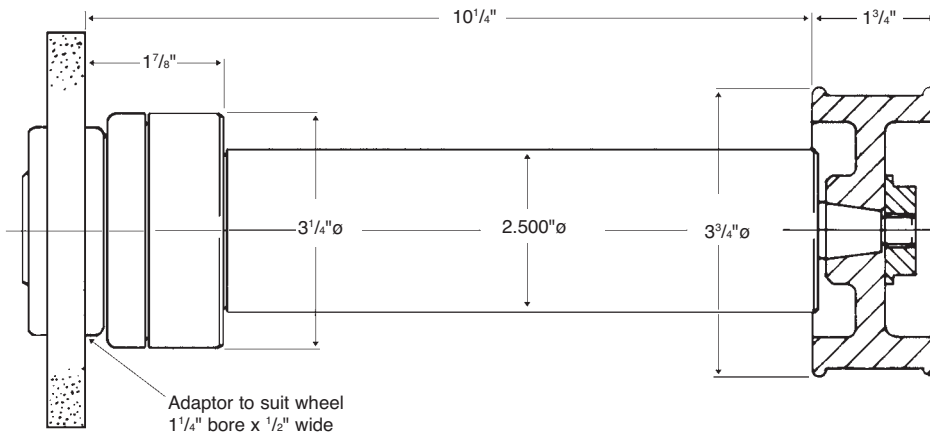
Spindles for Grinding Machines. (Sealed in lubrication)



Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.6579	30,000 r.p.m	2 ³ / ₄ "	7"	1 ³ / ₄ "	1 ¹ / ₄ "	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	5/8"
GS.6580	28,000 r.p.m.	2 ³ / ₄ "	7"	2"	1 ³ / ₈ "	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	11/16"
GS.6581	24,000 r.p.m.	2 ³ / ₄ "	7"	2"	1 ¹ / ₂ "	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	3/4"
GS.6582	20,000 r.p.m.	2 ³ / ₄ "	7"	2 ¹ / ₄ "	1 ³ / ₄ "	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"
GS.6583	28,000 r.p.m.	3 ¹ / ₄ "	8"	2"	1 ³ / ₈ "	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	11/16"
GS.6584	24,000 r.p.m.	3 ¹ / ₄ "	8"	2"	1 ¹ / ₂ "	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	3/4"
GS.6585	20,000 r.p.m.	3 ¹ / ₄ "	8"	2 ¹ / ₄ "	1 ³ / ₄ "	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"
GS.6586	17,000 r.p.m.	3 ¹ / ₄ "	8"	2 ¹ / ₄ "	2"	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ³ / ₁₆ "
GS.6579A	40 to 60,000 r.p.m.	1 ¹ / ₄ "	4 ¹ / ₂ "	5/8"	1/2"-3/4"	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	1/2"

The above spindles are supplied in a shock-proof box with spanners and provision for two quills.

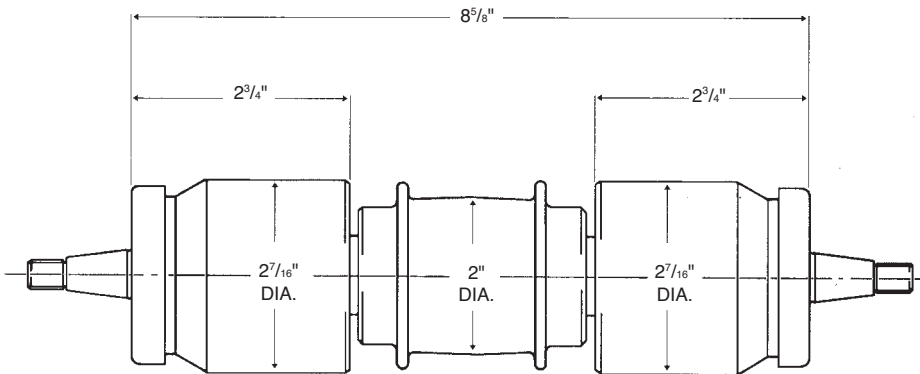
Spindle for 540 Surface Grinder



Ref. G.S.587

Maximum Speed 5,000 r.p.m.
Rotation: Clockwise
Viewing on arrow
"Sealed in" lubrication.

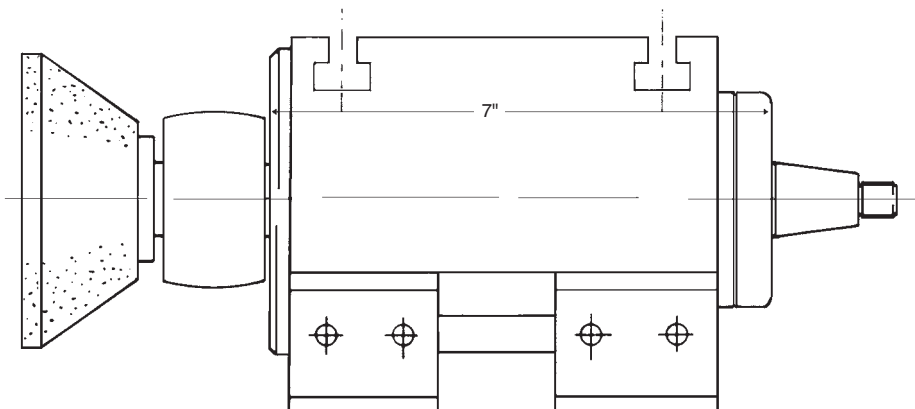
Precision Spindle for Tool & Cutter Grinder 310



Ref. G.S.1221

Maximum Speed 5,000 r.p.m.
Rotation: Clockwise
Viewing on arrow
"Sealed in" lubrication.

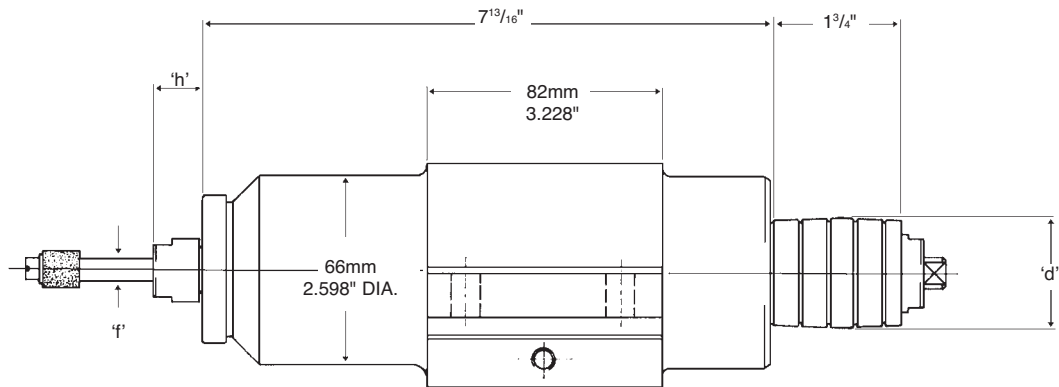
Precision Spindle for Universal Toolroom Grinder Model 1314



Ref. G.S.6350

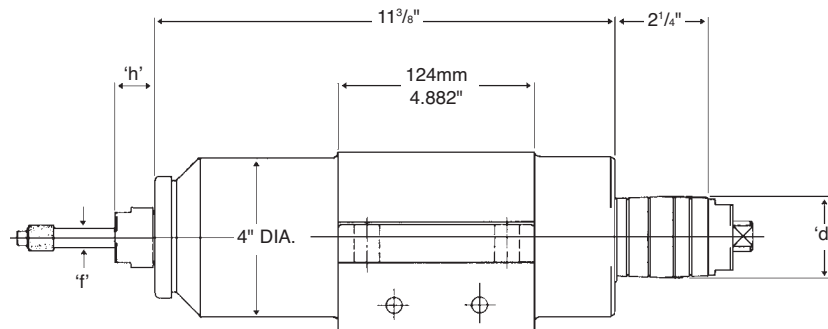
Maximum Speed 5,000 r.p.m.
Rotation: Anti-clockwise
Viewing on arrow
"Sealed in" lubrication.

Spindles for Models D7, C8, CM8 Internal Grinders



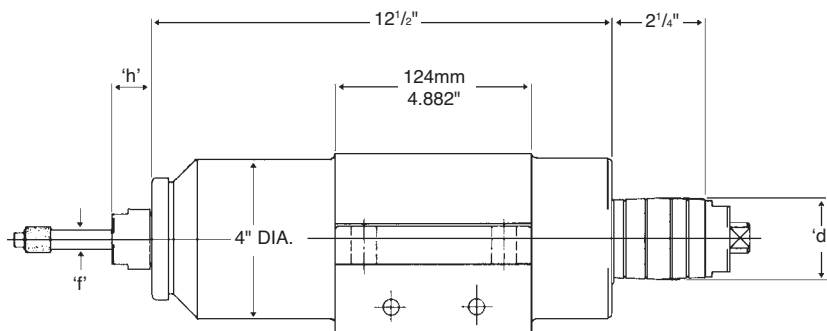
Ref	Max Speed	d	Detachable Quill Type	Solid Quill Type	h
GS.1648	38,000 r.p.m.	$\frac{3}{4}$ "	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "	$\frac{1}{2}$ "
GS.1649	30,000 r.p.m.	1"	"f" any dia. up to $\frac{3}{8}$ "	"f" any dia. up to $\frac{7}{16}$ "	$\frac{11}{16}$ "
GS.1650	28,000 r.p.m.	$1\frac{1}{4}$ "	"f" any dia. up to $\frac{7}{16}$ "	"f" any dia. up to $\frac{1}{2}$ "	$\frac{5}{8}$ "
GS.1651	24,000 r.p.m.	$1\frac{3}{8}$ "	"f" any dia. up to $\frac{9}{16}$ "	"f" any dia. up to $\frac{5}{8}$ "	$\frac{11}{16}$ "
GS.1652	20,000 r.p.m.	$1\frac{3}{4}$ "	"f" any dia. up to $\frac{11}{16}$ "	"f" any dia. up to $\frac{3}{4}$ "	$\frac{3}{4}$ "
AGS.439	40 to 50,000 r.p.m.	Air Driven	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "	
HFGS.112	60 to 80,000 r.p.m.	Elect. Driven	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "	
HFGS.220	80 to 100,000 r.p.m.	Elect. Driven	"f" any dia. up to $\frac{1}{4}$ "	"f" any dia. up to $\frac{5}{16}$ "	

Spindles for Models D14 and D22 Internal Grinders



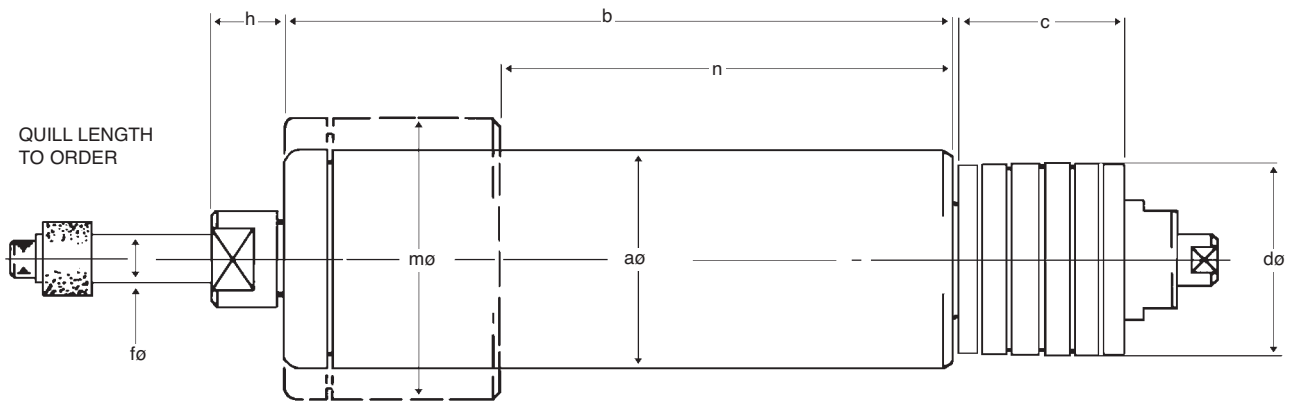
Ref	Max Speed	d	Detachable Quill Type	Solid Quill Type	h
GS.1930	38,000 r.p.m.	3/4"	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	1/2"
GS.1931	30,000 r.p.m.	1"	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	11/16"
GS.1932	28,000 r.p.m.	1 1/4"	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	5/8"
GS.1934	24,000 r.p.m.	1 1/2"	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	11/16"
GS.1936	20,000 r.p.m.	1 3/4"	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	3/4"
GS.1937	17,000 r.p.m.	2"	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"
GS.1938	15,000 r.p.m.	2 1/4"	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	1 3/16"
GS.1939	12,000 r.p.m.	2 1/2"	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	1 3/8"

Production spindles for Models C30 Internal Grinders



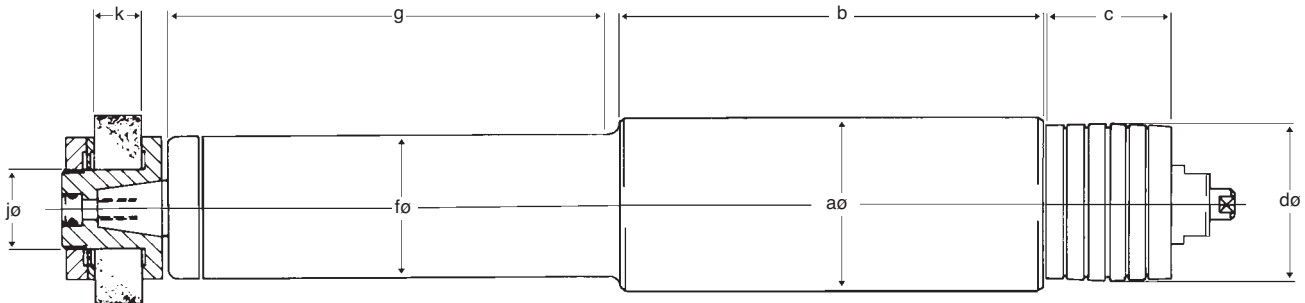
Ref	Max Speed	d	Detachable Quill Type	Solid Quill Type	h
GS.1940	28,000 r.p.m.	1 1/4"	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	5/8"
GS.1941	24,000 r.p.m.	1 1/2"	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	11/16"
GS.1942	20,000 r.p.m.	1 3/4"	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	3/4"
GS.1943	17,000 r.p.m.	2"	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"
GS.1944	15,000 r.p.m.	2 1/4"	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	1 3/16"
GS.1945	12,000 r.p.m.	2 1/2"	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	1 3/8"

Spindles for Universal Grinders. (Sealed in lubrication)



Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.604	30,000 r.p.m.	3"	11"	1 ³ / ₄ "	1 ¹ / ₈ "	"f" any dia. up to ³ / ₈ "	"f" any dia. up to ⁷ / ₁₆ "	1 ¹ / ₁₆ "		
GS.605	28,000 r.p.m.	3"	11"	2"	1 ¹ / ₈ "	"f" any dia. up to ⁷ / ₁₆ "	"f" any dia. up to ¹ / ₂ "	⁵ / ₈ "		
GS.606	24,000 r.p.m.	3"	12"	2"	1 ¹ / ₄ "	"f" any dia. up to ⁹ / ₁₆ "	"f" any dia. up to ⁵ / ₈ "	1 ¹ / ₁₆ "		
GS.607	20,000 r.p.m.	3"	11"	2 ¹ / ₄ "	1 ³ / ₈ "	"f" any dia. up to ¹¹ / ₁₆ "	"f" any dia. up to ³ / ₄ "	³ / ₄ "		
GS.608	17,000 r.p.m.	3"	10 ³ / ₄ "	2 ¹ / ₄ "	1 ⁵ / ₈ "	"f" any dia. up to ⁷ / ₈ "	"f" any dia. up to 1"	1"		
GS.609	15,000 r.p.m.	3"	11 ¹ / ₂ "	2 ¹ / ₄ "	2"	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ³ / ₁₆ "	3 ¹ / ₂ "	9 ¹ / ₄ "
GS.610	12,000 r.p.m.	3"	12"	2 ¹ / ₄ "	2 ¹ / ₄ "	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ³ / ₈ "	1 ³ / ₈ "	4"	8 ⁵ / ₈ "
GS.611	10,000 r.p.m.	3"	12 ¹ / ₂ "	2 ¹ / ₄ "	2 ³ / ₄ "	"f" any dia. up to 1 ³ / ₈ "	"f" any dia. up to 1 ⁵ / ₈ "	1 ³ / ₈ "	4 ¹ / ₂ "	9 ⁵ / ₈ "

Spindles for Universal Grinders. (Sealed in lubrication)



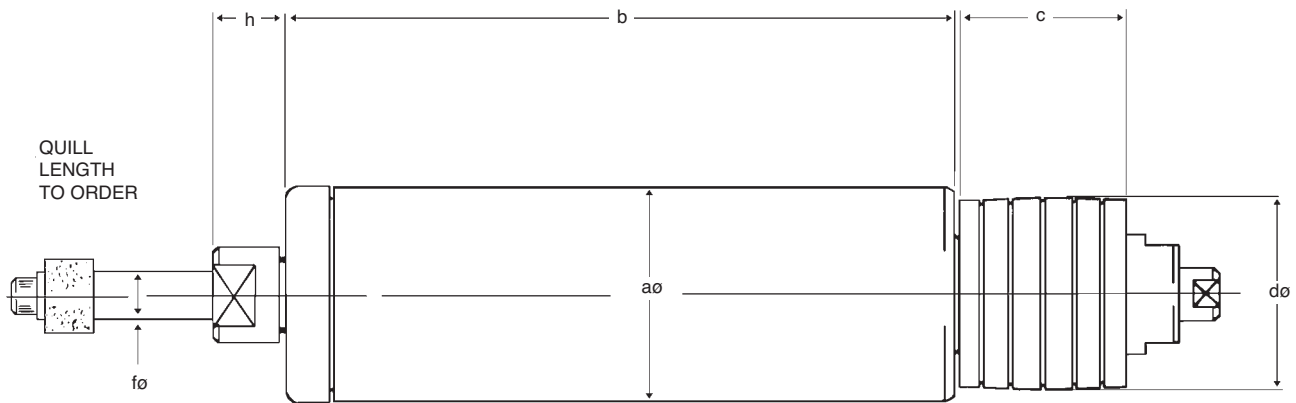
Sleeve Type for Large Diameter and Long Bores

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.612	11,500 r.p.m.	1 ¹ / ₄ "	9"	3"	9"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.613	11,500 r.p.m.	1 ¹ / ₄ "	10"	3"	9"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.614	11,500 r.p.m.	1 ¹ / ₄ "	12"	3"	9"	2"	2 ⁵ / ₈ "	1 ¹ / ₂ "	1 ¹ / ₂ "
GS.615	11,500 r.p.m.	1 ¹ / ₂ "	9"	3"	9"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.616	11,500 r.p.m.	1 ¹ / ₂ "	11"	3"	9"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.617	11,500 r.p.m.	1 ¹ / ₂ "	12"	3"	9"	2"	2 ³ / ₄ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.618	11,000 r.p.m.	1 ³ / ₄ "	10"	3"	9"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.619	11,000 r.p.m.	1 ³ / ₄ "	11"	3"	9"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.620	11,000 r.p.m.	1 ³ / ₄ "	12"	3"	9"	2"	2 ⁷ / ₈ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.621	8,500 r.p.m.	2"	8"	3"	9"	2"	3 ¹ / ₄ "	1"	1"
GS.622	8,500 r.p.m.	2"	10"	3"	9"	2"	3 ¹ / ₄ "	1"	1"
GS.623	8,500 r.p.m.	2"	12"	3"	9"	2"	3 ¹ / ₄ "	1"	1"
GS.624	8,500 r.p.m.	2"	14"	3"	9"	2"	3 ¹ / ₄ "	1"	1"
GS.625	8,500 r.p.m.	2"	15"	3"	9"	2"	3 ¹ / ₄ "	1"	1"
GS.626	7,000 r.p.m.	2 ¹ / ₄ "	8"	3"	9"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.627	7,000 r.p.m.	2 ¹ / ₄ "	10"	3"	9"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.628	7,000 r.p.m.	2 ¹ / ₄ "	12"	3"	9"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.629	7,000 r.p.m.	2 ¹ / ₄ "	15"	3"	9"	2 ¹ / ₄ "	3 ³ / ₄ "	1"	1"
GS.630	6,500 r.p.m.	2 ¹ / ₂ "	8"	3"	9"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.631	6,500 r.p.m.	2 ¹ / ₂ "	10"	3"	9"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.632	6,500 r.p.m.	2 ¹ / ₂ "	12"	3"	9"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.633	6,500 r.p.m.	2 ¹ / ₂ "	14"	3"	9"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.634	6,500 r.p.m.	2 ¹ / ₂ "	16"	3"	9"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.635	6,500 r.p.m.	2 ¹ / ₂ "	18"	3"	9"	2 ¹ / ₄ "	4 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.636	5,000 r.p.m.	3"	6"	3"	9"	2 ¹ / ₄ "	5 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.637	5,000 r.p.m.	3"	10"	3"	9"	2 ¹ / ₂ "	5 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.638	5,000 r.p.m.	3"	12"	3"	9"	2 ¹ / ₂ "	5 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.639	5,000 r.p.m.	3"	15"	3"	9"	2 ¹ / ₂ "	5 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.640	5,000 r.p.m.	3"	18"	3"	9"	2 ¹ / ₂ "	5 ³ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₂ "

Spindles are suitable for face grinding, type GS.636 is particularly recommended for this purpose.

MATRIX

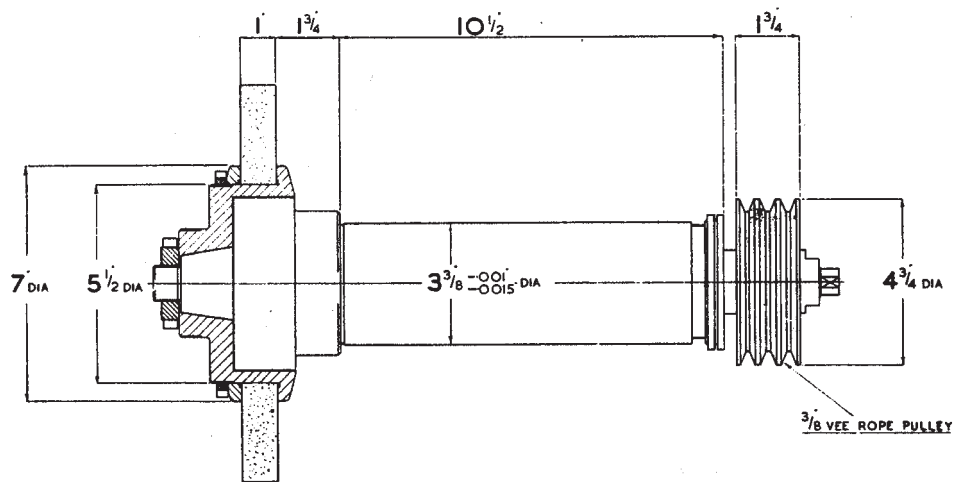
Universal Grinder. Model 1a. (Sealed in lubrication)



Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.643	38,000 r.p.m.	2 ¹ / ₂ "	6	1 ¹ / ₄ "	³ / ₄ "	"f" any dia. up to ¹ / ₄ "	"f" any dia. up to ⁵ / ₁₆ "	¹ / ₂ "
GS.644	30,000 r.p.m.	2 ¹ / ₂ "	6 ¹ / ₂ "	1 ³ / ₄ "	1	"f" any dia. up to ³ / ₈ "	"f" any dia. up to ⁷ / ₁₆ "	¹¹ / ₁₆ "
GS.645	28,000 r.p.m.	2 ¹ / ₂ "	7	2	1 ¹ / ₄ "	1"f" any dia. up to ⁷ / ₁₆ "	"f" any dia. up to ¹ / ₂ "	⁵ / ₈ "
GS.646	24,000 r.p.m.	2 ¹ / ₂ "	7	2	1 ³ / ₈ "	"f" any dia. up to ⁹ / ₁₆ "	"f" any dia. up to ⁵ / ₈ "	¹¹ / ₁₆ "
GS.647	20,000 r.p.m.	2 ¹ / ₂ "	6 ⁷ / ₈ "	2	1 ¹ / ₂ "	"f" any dia. up to ¹¹ / ₁₆ "	"f" any dia. up to ³ / ₄ "	³ / ₄ "

MATRIX

External Spindle. Suitable for Thread Grinder (Sealed in lubrication)

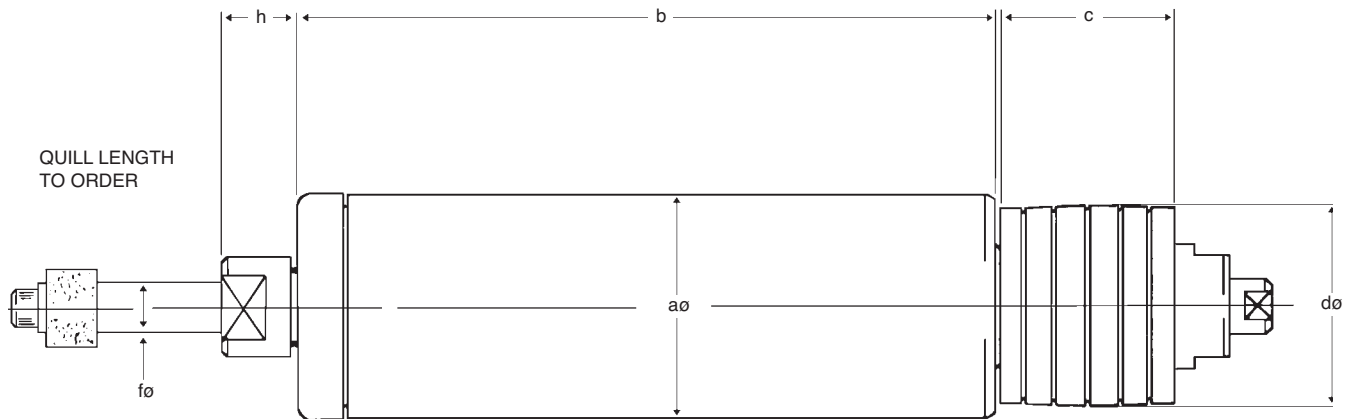


Maximum Speed 10,000 r.p.m. **Ref. GS.850**

The above spindle takes the place of the existing plain bearing unit without the necessity of any modifications to the housing.

Special pre-loaded ball bearings are used giving accurate results coupled with maximum production.

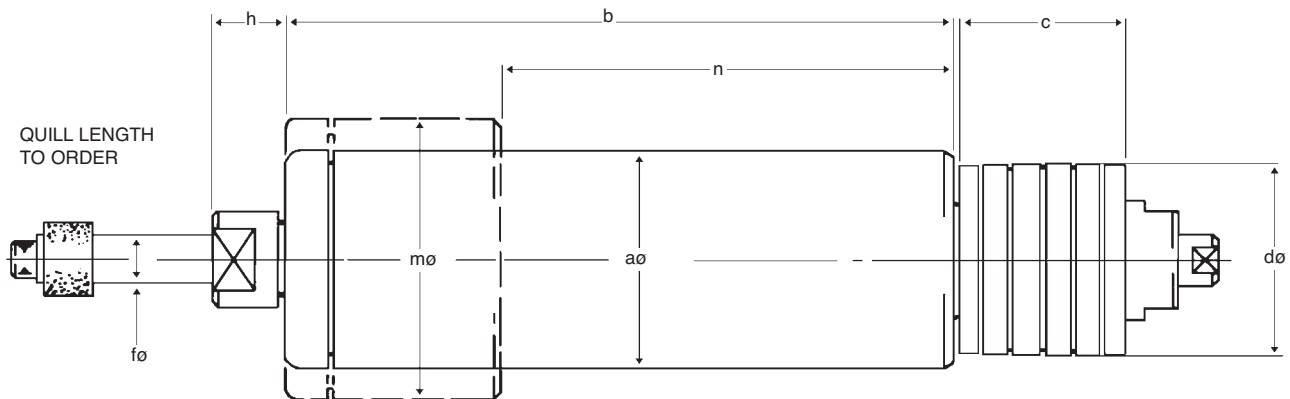
Spindles for Internal Grinding Machines. (Sealed in lubrication)



Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.6579	30,000 r.p.m	2 ³ / ₄ "	7"	1 ³ / ₄ "	1 ¹ / ₄ "	"f" any dia. up to ⁷ / ₁₆ "	"f" any dia. up to ¹ / ₂ "	⁵ / ₈ "
GS.6580	28,000 r.p.m.	2 ³ / ₄ "	7"	2"	1 ³ / ₈ "	"f" any dia. up to ⁹ / ₁₆ "	"f" any dia. up to ⁵ / ₈ "	¹¹ / ₁₆ "
GS.6581	24,000 r.p.m.	2 ³ / ₄ "	7"	2"	1 ¹ / ₂ "	"f" any dia. up to ¹¹ / ₁₆ "	"f" any dia. up to ³ / ₄ "	³ / ₄ "
GS.6582	20,000 r.p.m.	2 ³ / ₄ "	7"	2 ¹ / ₄ "	1 ³ / ₄ "	"f" any dia. up to ⁷ / ₈ "	"f" any dia. up to 1"	1"

The above spindles are supplied in a shock-proof box with spanners and provision for two quills.

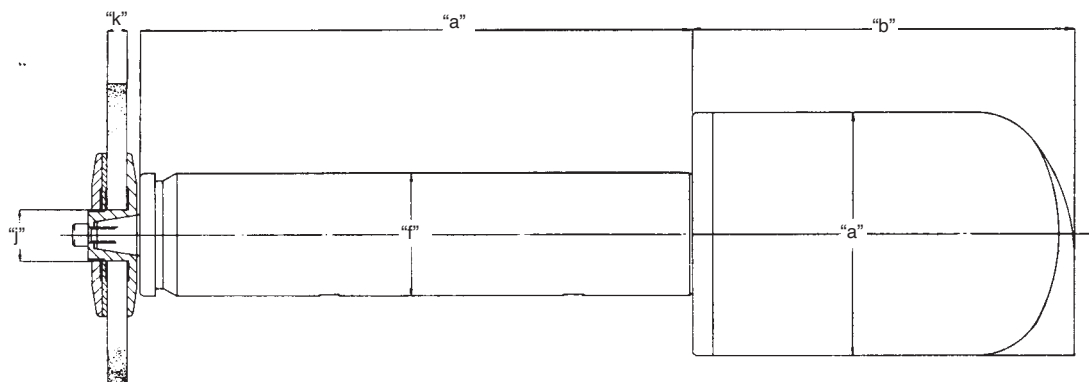
Spindles for Machines U14, 14" x 18" Universal Grinders. (Sealed in lubrication)



Detachable and Solid Quill Types

Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h	m	n
GS.2100	30,000 r.p.m.	3 ¹ / ₈ "	12"	1 ³ / ₄ "	1 ¹ / ₈ "	"f" any dia. up to 3 ³ / ₈ "	"f" any dia. up to 7 ⁷ / ₁₆ "	1 ¹¹ / ₁₆ "		
GS.2101	28,000 r.p.m.	3 ¹ / ₈ "	12"	2"	1 ¹ / ₈ "	"f" any dia. up to 7 ⁷ / ₁₆ "	"f" any dia. up to 1 ¹ / ₂ "	5 ⁵ / ₈ "		
GS.2102	24,000 r.p.m.	3 ¹ / ₈ "	12"	2 ¹ / ₄ "	1 ¹ / ₄ "	"f" any dia. up to 9 ⁹ / ₁₆ "	"f" any dia. up to 5 ⁵ / ₈ "	1 ¹¹ / ₁₆ "		
GS.2103	20,000 r.p.m.	3 ¹ / ₈ "	12"	2 ¹ / ₄ "	1 ³ / ₈ "	"f" any dia. up to 1 ¹¹ / ₁₆ "	"f" any dia. up to 3 ³ / ₄ "	3 ³ / ₄ "		
GS.2104	17,000 r.p.m.	3 ¹ / ₈ "	12"	2 ¹ / ₄ "	1 ⁵ / ₈ "	"f" any dia. up to 7 ⁷ / ₈ "	"f" any dia. up to 1"	1"		
GS.2105	15,000 r.p.m.	3 ¹ / ₈ "	12 ³ / ₄ "	2 ¹ / ₄ "	2"	"f" any dia. up to 1"	"f" any dia. up to 1 ¹ / ₄ "	1 ³ / ₁₆ "	3 ¹ / ₂ "	10 ⁵ / ₁₆ "
GS.2106	12,000 r.p.m.	3 ¹ / ₈ "	12 ⁷ / ₈ "	2 ¹ / ₄ "	2 ¹ / ₄ "	"f" any dia. up to 1 ³ / ₁₆ "	"f" any dia. up to 1 ³ / ₈ "	1 ³ / ₈ "	4"	10 ⁵ / ₁₆ "
GS.2107	10,000 r.p.m.	3 ¹ / ₈ "	13 ³ / ₁₆ "	2 ¹ / ₄ "	2 ³ / ₄ "	"f" any dia. up to 1 ³ / ₈ "	"f" any dia. up to 1 ⁵ / ₈ "	1 ³ / ₈ "	4 ¹ / ₂ "	10 ⁵ / ₁₆ "
GS.2107A	7,500 r.p.m.	3 ¹ / ₈ "	14 ¹ / ₄ "	2 ¹ / ₄ "	3"	"f" any dia. up to 1 ³ / ₄ "	"f" any dia. up to 2"	1 ⁹ / ₁₆ "	5"	10 ⁵ / ₁₆ "

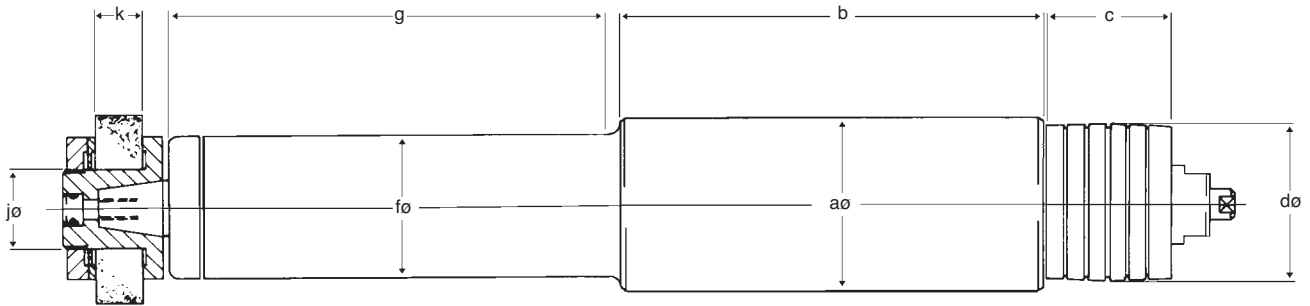
Motorised spindle for 6" x 18" surface grinders



Ref	a	b	f	g	j	k	Speed r.p.m.
MGS.17	6 ³ / ₄ "	11 ³ / ₄ "	3 ¹ / ₂ "	12 ¹ / ₂ "	1 ¹ / ₄ "	1 ¹ / ₂ "	3,000 r.p.m.

380/420 voltage 50 cycle A.C. only 3 phase

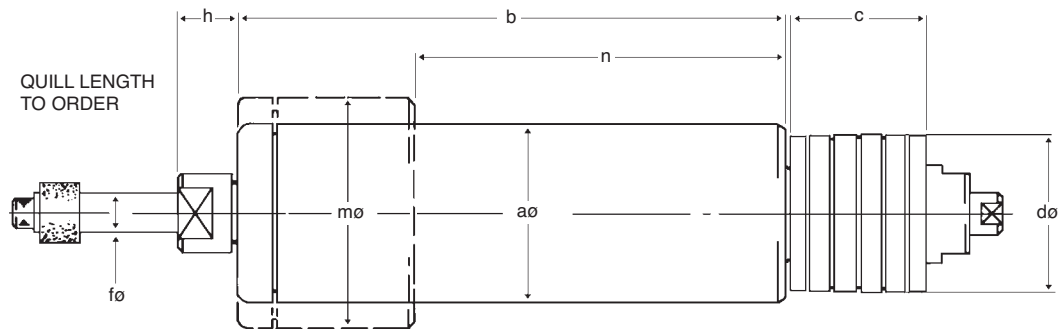
Spindles for Machines U14, 14" x 18" Universal Grinder. (Sealed in lubrication)



Sleeve Type Spindles for Large Diameter and Long Bores

Ref	Max Speed	a	d	g	f	j	k
GS.2108	11,500 r.p.m.	3 ¹ / ₈ "	2 ⁵ / ₈ "	9"	1 ¹ / ₄ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.2109	11,500 r.p.m.	3 ¹ / ₈ "	2 ⁵ / ₈ "	10"	1 ¹ / ₄ "	1 ¹ / ₂ "	3 ³ / ₄ "
GS.2110	11,500 r.p.m.	3 ¹ / ₈ "	2 ⁵ / ₈ "	12"	1 ¹ / ₄ "	1 ¹ / ₂ "	1 ¹ / ₂ "
GS.2111	11,500 r.p.m.	3 ¹ / ₈ "	2 ³ / ₄ "	9"	1 ¹ / ₂ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.2112	11,500 r.p.m.	3 ¹ / ₈ "	2 ³ / ₄ "	11"	1 ¹ / ₂ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.2113	11,500 r.p.m.	3 ¹ / ₈ "	2 ³ / ₄ "	12"	1 ¹ / ₂ "	3 ³ / ₄ "	3 ³ / ₄ "
GS.2114	11,000 r.p.m.	3 ¹ / ₈ "	2 ⁷ / ₈ "	10"	1 ³ / ₄ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.2115	11,000 r.p.m.	3 ¹ / ₈ "	2 ⁷ / ₈ "	11"	1 ³ / ₄ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.2116	11,000 r.p.m.	3 ¹ / ₈ "	2 ⁷ / ₈ "	12"	1 ³ / ₄ "	7 ⁷ / ₈ "	3 ³ / ₄ "
GS.2117	8,500 r.p.m.	3 ¹ / ₈ "	3 ¹ / ₄ "	8"	2"	1"	1"
GS.2118	8,500 r.p.m.	3 ¹ / ₈ "	3 ¹ / ₄ "	10"	2"	1"	1"
GS.2119	8,500 r.p.m.	3 ¹ / ₈ "	3 ¹ / ₄ "	12"	2"	1"	1"
GS.2120	8,500 r.p.m.	3 ¹ / ₈ "	3 ¹ / ₄ "	14"	2"	1"	1"
GS.2121	8,500 r.p.m.	3 ¹ / ₈ "	3 ¹ / ₄ "	15"	2"	1"	1"
GS.2122	7,000 r.p.m.	3 ¹ / ₈ "	3 ³ / ₄ "	8"	2 ¹ / ₄ "	1"	1"
GS.2123	7,000 r.p.m.	3 ¹ / ₈ "	3 ³ / ₄ "	10"	2 ¹ / ₄ "	1"	1"
GS.2124	7,000 r.p.m.	3 ¹ / ₈ "	3 ³ / ₄ "	12"	2 ¹ / ₄ "	1"	1"
GS.2125	7,000 r.p.m.	3 ¹ / ₈ "	3 ³ / ₄ "	15"	2 ¹ / ₄ "	1"	1"
GS.2126	6,500 r.p.m.	3 ¹ / ₈ "	4 ¹ / ₂ "	8"	2 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.2127	6,500 r.p.m.	3 ¹ / ₈ "	4 ¹ / ₂ "	10"	2 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.2128	6,500 r.p.m.	3 ¹ / ₈ "	4 ¹ / ₂ "	12"	2 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.2129	6,500 r.p.m.	3 ¹ / ₈ "	4 ¹ / ₂ "	14"	2 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.2130	6,500 r.p.m.	3 ¹ / ₈ "	4 ¹ / ₂ "	16"	2 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.2131	6,500 r.p.m.	3 ¹ / ₈ "	4 ¹ / ₂ "	18"	2 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.2132	5,000 r.p.m.	3 ¹ / ₈ "	5 ³ / ₄ "	6"	3"	1 ¹ / ₄ "	1 ¹ / ₂ "
GS.2133	5,000 r.p.m.	3 ¹ / ₈ "	5 ³ / ₄ "	10"	3"	1 ¹ / ₄ "	1"
GS.2134	5,000 r.p.m.	3 ¹ / ₈ "	5 ³ / ₄ "	12"	3"	1 ¹ / ₄ "	1"
GS.2135	5,000 r.p.m.	3 ¹ / ₈ "	5 ³ / ₄ "	15"	3"	1 ¹ / ₄ "	1"
GS.2136	5,000 r.p.m.	3 ¹ / ₈ "	5 ³ / ₄ "	18"	3"	1 ¹ / ₄ "	1"

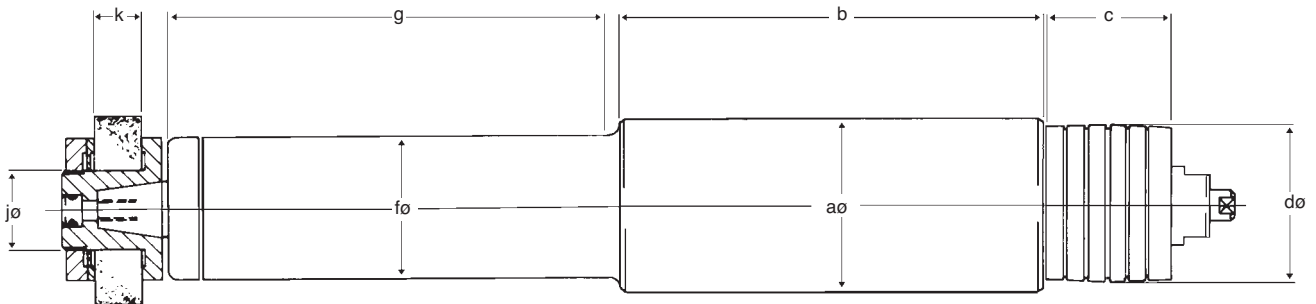
Spindles for Internal Grinders Type SJD. M/c. (Sealed in lubrication)



NOTE: Please state rotation required on order.

Ref	Max Speed	a	b	c	Detachable Quill Type	Solid Quill Type	h	m	n
GS.2038	28,000 r.p.m.	80mm	14 ^{3/8} "	2"	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	5/8"		
GS.2055	24,000 r.p.m.	80mm	14 ^{3/8} "	2 ^{1/4} "	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	11/16"		
GS.2056	20,000 r.p.m.	80mm	14 ^{3/8} "	2 ^{1/4} "	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	3/4"		
GS.2057	17,000 r.p.m.	80mm	14 ^{3/8} "	2 ^{1/4} "	"f" any dia. up to 7/8"	"f" any dia. up to 1"	1"		
GS.2058	15,000 r.p.m.	80mm	15"	2 ^{1/2} "	"f" any dia. up to 1"	"f" any dia. up to 1 ^{1/4} "	1 ^{3/16} "	3 ^{1/2} "	12"
GS.2059	12,000 r.p.m.	80mm	15"	2 ^{1/2} "	"f" any dia. up to 1 ^{3/16} "	"f" any dia. up to 1 ^{3/8} "	1 ^{3/8} "	4"	12"
GS.2060	10,000 r.p.m.	80mm	15"	2 ^{1/2} "	"f" any dia. up to 1 ^{3/8} "	"f" any dia. up to 1 ^{5/8} "	1 ^{3/8} "	4 ^{1/2} "	12"

Spindles for Vertical Internal Grinders. (Sealed in lubrication)

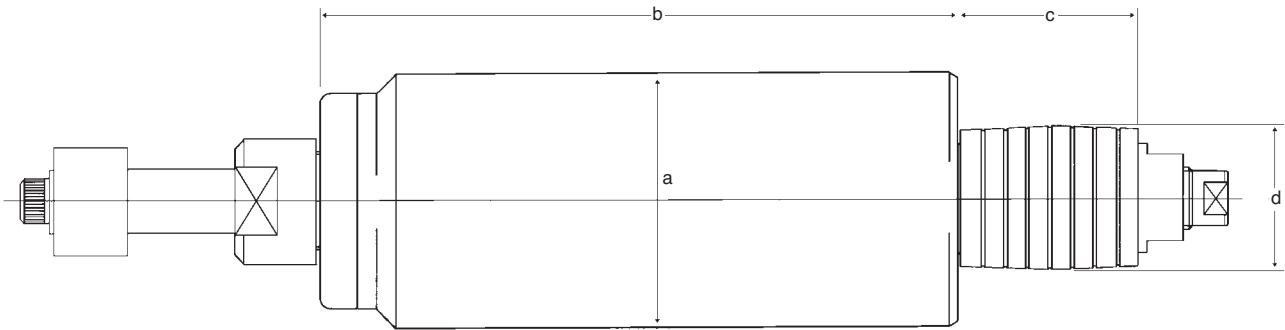


Sleeve Type Spindles

Ref	Max Speed	f	g	a	b	c	d	j	k
GS.6490	6,500 r.p.m.	2 ⁵ / ₈ "	8"	16 ¹ / ₂ "	4 ¹ / ₂ "	2 ¹ / ₄ "	2 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.6491	6,500 r.p.m.	2 ⁵ / ₈ "	12"	13"	4 ¹ / ₂ "	2 ¹ / ₄ "	3 ¹ / ₂ "	1 ¹ / ₄ "	1"
GS.6492	5,000 r.p.m.	3"	8"	16 ¹ / ₂ "	4 ¹ / ₂ "	2 ¹ / ₄ "	3"	1 ¹ / ₂ "	1"
GS.6493	5,000 r.p.m.	3"	12"	13"	4 ¹ / ₂ "	2 ¹ / ₄ "	3"	1 ¹ / ₂ "	1"
GS.6494	4,000 r.p.m.	3 ¹ / ₂ "	8"	16 ¹ / ₂ "	4 ¹ / ₂ "	2 ¹ / ₂ "	3 ¹ / ₂ "	2 ¹ / ₂ "	1"
GS.6495	4,000 r.p.m.	3 ¹ / ₂ "	12"	12 ¹ / ₂ "	4 ¹ / ₂ "	2 ¹ / ₂ "	3 ¹ / ₂ "	2 ¹ / ₂ "	1"
GS.6496	4,000 r.p.m.	4"	8"	16 ¹ / ₂ "	4 ¹ / ₂ "	2 ¹ / ₂ "	3 ³ / ₄ "	2 ¹ / ₂ "	1"
GS.6497	4,000 r.p.m.	4"	12"	13"	4 ¹ / ₂ "	2 ¹ / ₂ "	3 ³ / ₄ "	2 ¹ / ₂ "	1"
GS.6498	4,000 r.p.m.	4"	16"	9"	4 ¹ / ₂ "	2 ¹ / ₂ "	3 ³ / ₄ "	2 ¹ / ₂ "	1"
GS.6499	3,500 r.p.m.	4 ¹ / ₂ "	12"	13"	4 ¹ / ₂ "	2 ¹ / ₂ "	4 ¹ / ₈ "	2 ¹ / ₂ "	1"
GS.6500	3,500 r.p.m.	4 ¹ / ₂ "	14"	16 ¹ / ₂ "	4 ¹ / ₂ "	2 ¹ / ₂ "	4 ¹ / ₈ "	2 ¹ / ₂ "	1"

Vertical Operation - Nose down rotation to be stated on order.

Spindles for Internal Grinding Machines. (Sealed in lubrication)



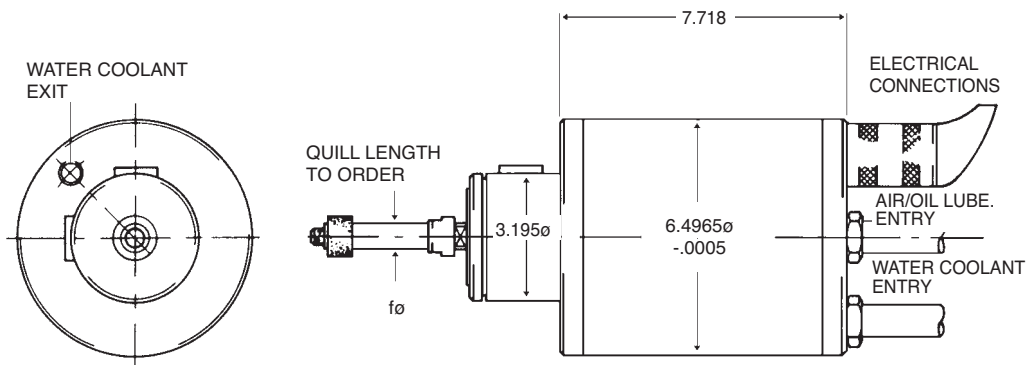
Ref	Max Speed	a	b	c	d	Detachable Quill Type
GS.7573	30,000 r.p.m.	100mm	315mm	50mm	28mm	"f" any dia. up to 11mm
GS.7574	28,000 r.p.m.	100mm	315mm	57mm	32mm	"f" any dia. up to 14mm
GS.7575	24,000 r.p.m.	100mm	315mm	57mm	38mm	"f" any dia. up to 17mm
GS.7576	20,000 r.p.m.	100mm	315mm	57mm	45mm	"f" any dia. up to 22mm
GS.7577	17,000 r.p.m.	100mm	315mm	64mm	50mm	"f" any dia. up to 25mm
GS.7578	15,000 r.p.m.	100mm	315mm	64mm	64mm	"f" any dia. up to 30mm
GS.7579	12,000 r.p.m.	100mm	315mm	75mm	75mm	"f" any dia. up to 35mm
GS.7580	10,000 r.p.m.	100mm	315mm	75mm	100mm	"f" any dia. up to 40mm

b length can be supplied to order requirements

Ref	Max Speed	a	b	c	d	Detachable Quill Type
GS.7581	30,000 r.p.m.	100mm	355mm	50mm	28mm	"f" any dia. up to 11mm
GS.7582	28,000 r.p.m.	100mm	355mm	57mm	32mm	"f" any dia. up to 14mm
GS.7583	24,000 r.p.m.	100mm	355mm	57mm	38mm	"f" any dia. up to 17mm
GS.7584	20,000 r.p.m.	100mm	355mm	57mm	45mm	"f" any dia. up to 22mm
GS.7585	17,000 r.p.m.	100mm	355mm	64mm	50mm	"f" any dia. up to 25mm
GS.7586	15,000 r.p.m.	100mm	355mm	64mm	64mm	"f" any dia. up to 30mm
GS.7587	12,000 r.p.m.	100mm	355mm	75mm	75mm	"f" any dia. up to 35mm
GS.7588	10,000 r.p.m.	100mm	355mm	75mm	100mm	"f" any dia. up to 40mm

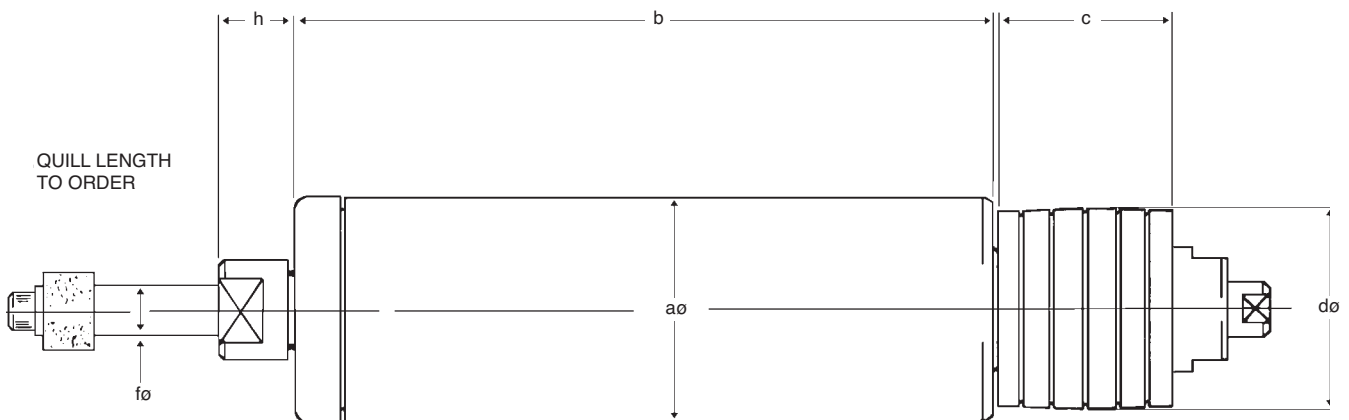
b length can be supplied to order requirements

Spindles for Internal Grinder Type 3ACE



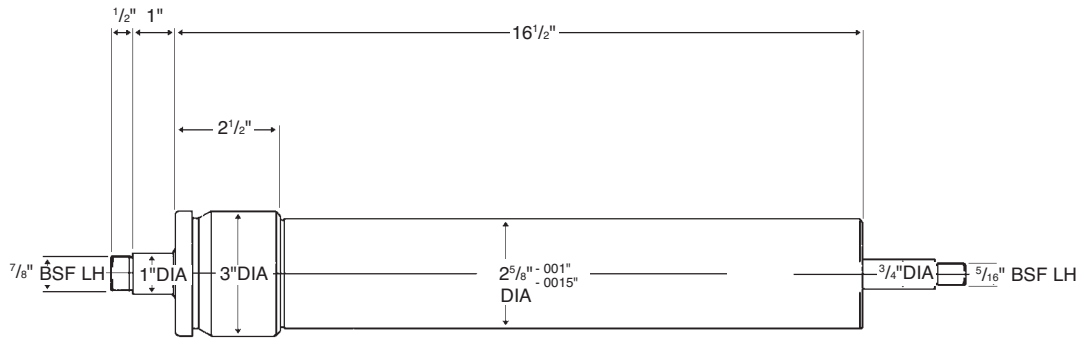
Ref	Speed Range	Detachable Quill Type
HFGS.680	60,000 - 100,000 r.p.m.	"f" any dia. up to 1/4"
HFGS.654	30,000 - 45,000 r.p.m.	"f" any dia. up to 9/16"
HFGS.681	24,000 r.p.m.	"f" any dia. up to 7/8"

Spindles for Internal Grinder Types 3, 5, 6 & 52



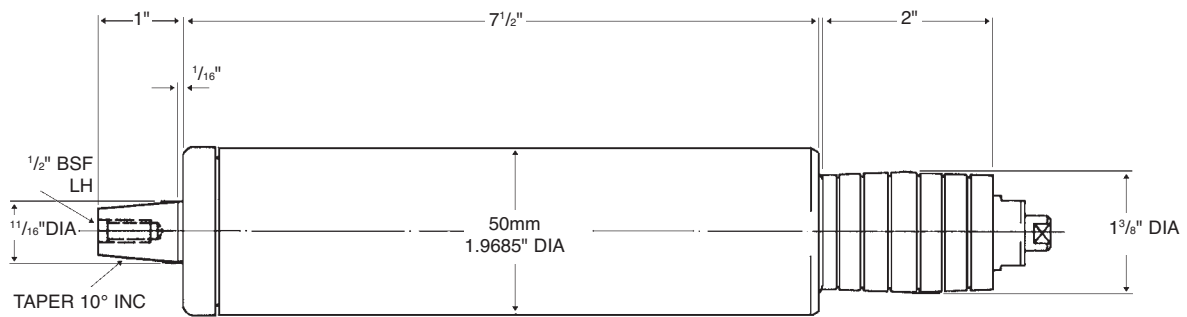
Ref	Max Speed	a	b	c	d	Detachable Quill Type	Solid Quill Type	h
GS.6614	40,000 r.p.m.	70mm	280mm	45mm	35mm	"f" any dia. up to 9.5mm	"f" any dia. up to 11mm	18mm
GS.6613	28,000 r.p.m.	70mm	280mm	50mm	42mm	"f" any dia. up to 17mm	"f" any dia. up to 19mm	20mm
GS.6612	24,000 r.p.m.	70mm	280mm	57mm	54mm	"f" any dia. up to 22mm	"f" any dia. up to 25mm	25mm
GS.6611	20,000 r.p.m.	70mm	280mm	57mm	66mm	"f" any dia. up to 25mm	"f" any dia. up to 30mm	30mm
GS.6615	5,000 r.p.m.	70mm	280mm	57mm	To order	"f" any dia. up to 35mm	"f" any dia. up to 40mm	30mm
GS.6518	40,000 r.p.m.	90mm	280mm	32mm	35mm	"f" any dia. up to 9.5mm	"f" any dia. up to 11mm	18mm
GS.6519	28,000 r.p.m.	90mm	280mm	50mm	42mm	"f" any dia. up to 17mm	"f" any dia. up to 19mm	20mm
GS.6520	24,000 r.p.m.	90mm	280mm	57mm	54mm	"f" any dia. up to 22mm	"f" any dia. up to 25mm	25mm
GS.6521	20,000 r.p.m.	90mm	280mm	57mm	66mm	"f" any dia. up to 25mm	"f" any dia. up to 30mm	30mm
GS.6523	12,000 r.p.m.	90mm	280mm	65mm	100mm	"f" any dia. up to 40mm	"f" any dia. up to 44mm	35mm
GS.6522	20,000 r.p.m.	120mm	345mm	65mm	To order	"f" any dia. up to 25mm	"f" any dia. up to 30mm	30mm
GS.6524	12,000 r.p.m.	120mm	350mm	65mm	To order	"f" any dia. up to 40mm	"f" any dia. up to 44mm	38mm
GS.6525	10,000 r.p.m.	120mm	385mm	65mm	To order	"f" any dia. up to 45mm	"f" any dia. up to 50mm	40mm

Spindle for Thread Grinder. (Sealed in lubrication)



Maximum Speed 6,000 r.p.m. **Ref. GS.1200**

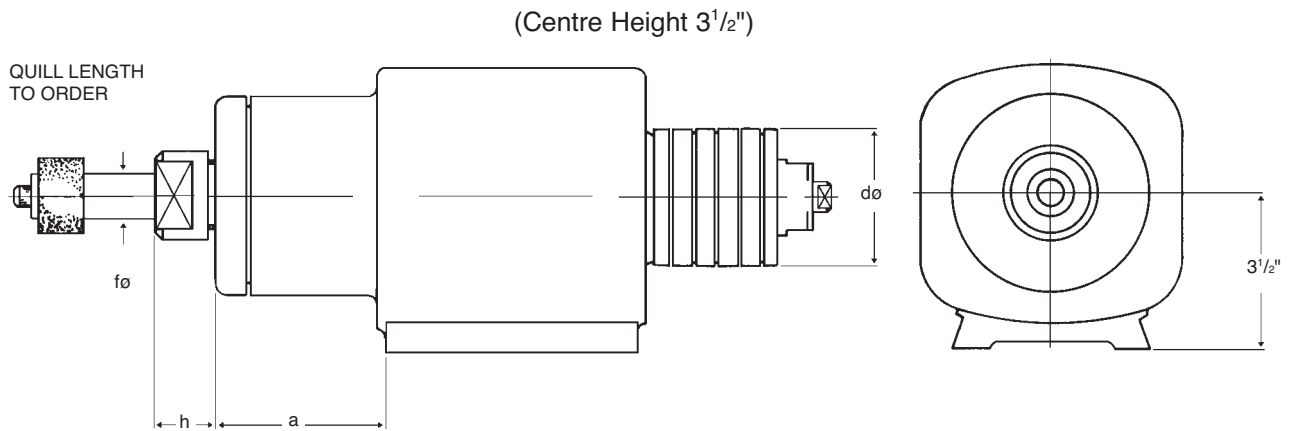
Spindle for Profile Machine (Sealed in lubrication)



Maximum Speed 10,000 r.p.m. **Ref. GS.6041**

WICKMAN SCRIVENER

Spindles for Internal Grinders. (Sealed in lubrication)



Belt Driven Type

Ref. 'A' 4"	Max Speed	Detachable Quill Type	Solid Quill Type	d	h
GS.1856	38,000 r.p.m.	"f" any dia. up to 3/8"	"f" any dia. up to 7/16"	1 1/8"	1/2"
GS.1859	30,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	1 1/8"	11/16"
GS.1862	28,000 r.p.m.	"f" any dia. up to 9/16"	"f" any dia. up to 5/8"	1 1/4"	5/8"
GS.1865	24,000 r.p.m.	"f" any dia. up to 11/16"	"f" any dia. up to 3/4"	1 1/2"	11/16"
GS.1868	20,000 r.p.m.	"f" any dia. up to 7/8"	"f" any dia. up to 1"	2"	3/4"
GS.1871	17,000 r.p.m.	"f" any dia. up to 1"	"f" any dia. up to 1 1/4"	2 1/8"	1"
GS.1874	15,000 r.p.m.	"f" any dia. up to 1 3/16"	"f" any dia. up to 1 3/8"	2 3/8"	1 3/16"
GS.1877	12,000 r.p.m.	"f" any dia. up to 1 3/8"	"f" any dia. up to 1 5/8"	2 7/8"	1 3/8"
GS.1880	10,000 r.p.m.	"f" any dia. up to 1 9/16"	"f" any dia. up to 1 13/16"	3 1/4"	1 3/8"
GS.1883	7,500 r.p.m.	"f" any dia. up to 1 3/4"	"f" any dia. up to 2"	3 1/2"	1 9/16"

Self-Contained Motorised High Frequency Electrically Driven Spindles

Ref. 'A' 4"	Max Speed	Detachable Quill Type	Solid Quill Type	h
HFGS.230	80 to 100,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	5/8"
HFGS.233	60 to 80,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"	5/8"
HFGS.236	30 to 40,000 r.p.m.	"f" any dia. up to 7/16"	"f" any dia. up to 1/2"	3/4"

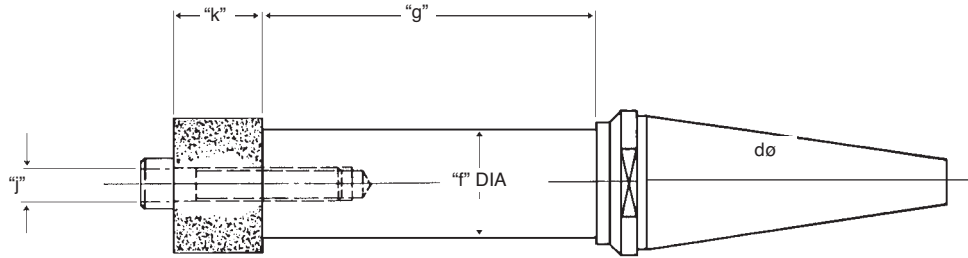
Super Speed Belt Driven Type

Max Speed	Detachable Quill Type	Solid Quill Type
30 to 65,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"

Air Driven Type

Ref	Max Speed	Detachable Quill Type	Solid Quill Type
A.G.S. 409	40 to 50,000 r.p.m.	"f" any dia. up to 1/4"	"f" any dia. up to 5/16"

QUILLS



Detachable Quills

Suitable for Spindles with a maximum Quill Diameter 1/4" 6mm

f	g	j	k	f	g	j	k
3/16"	1/2" 5/8" 3/4" 7/8" 1" 1 1/4"	1/16"	1/4"	1/4"	1/2" 3/4" 1" 1 1/4" 1 1/2" 1 3/4" 2"	1/8"	1/4" or 3/8"

Collets 1/8" 3/16" 3mm 4mm

Suitable for Spindles with a maximum Quill Diameter 5/16"

f	g	j	k	f	g	j	k
3/16"	1/2" 3/4" 1" 1 1/4"	3/32"	1/4" or 3/8"	5/16"	3/4" 1" 1 1/4" 1 1/2" 1 3/4" 2" 2 1/4"	1/8"	3/8" or 1/2"
1/4"	1/2" 3/4" 1" 1 1/4" 1 1/2" 1 3/4" 2"	1/8"	1/4" or 3/8"				

Collets 1/8" 3/16" 3mm 4mm

Suitable for Spindles with a maximum Quill Diameter 3/8" 9.5mm 10mm

f	g	j	k	f	g	j	k
3/16"	1/2" 3/4" 1" 1 1/4"	3/32"	1/4"	5/16"	3/4" 1" 1 1/4" 1 1/2" 1 3/4" 2" 2 1/4"	1/8"	3/8" or 1/2"
1/4"	1/2" 3/4" 1" 1 1/4" 1 1/2" 1 3/4" 2"	1/8"	1/4" or 3/8"	3/8"	3/4" 1" 1 1/4" 1 3/4" 2" 2 1/4" 2 1/2" 2 3/4"	3/16"	3/8" or 1/2"

Collets 1/8" 3/16" 1/4" 3mm 4mm 5mm

Suitable for Spindles with a maximum Quill Diameter 7/16" 11mm

f	g	j	k	f	g	j	k
3/16"	1/2" 3/4" 1" 1 1/4"	3/32"	1/4"	3/8"	3/4" 1" 1 1/2" 2" 2 1/2"	1/8"	3/8" or 1/2"
1/4"	1/2" 3/4" 1" 1 1/2" 2"	1/8"	1/4" or 3/8"	7/16"	3/4" 1" 1 1/2" 2" 2 1/2"	3/16"	1/2" or 3/4"

Collets 1/8" 3/16" 1/4" 5/16" 4mm 5mm 6mm 8mm

Suitable for Spindles with a maximum Quill Diameter 9/16" 14mm

f	g	j	k	f	g	j	k
3/16"	1/2" 3/4" 1" 1 1/4"	3/32"	1/4"	1/2"	1" 1 1/2" 2" 2 1/2" 3"	1/4"	3/4"
1/4"	1/2" 1" 1 1/2" 2"	1/8"	1/4" or 3/8"	9/16"	1" 1 1/2" 2" 2 1/2" 3"	1/4"	3/4"
3/8"	1" 1 1/2" 2" 2 3/4"	3/16"	3/8" or 1/2"				

Collets 1/8" 3/16" 1/4" 5/16" 3/8" 4mm 5mm 6mm 8mm 10mm

Suitable for Spindles with a maximum Quill Diameter 1 1/16" 17mm

f	g	j	k	f	g	j	k
1/2"	1" 1 1/2" 2"	1/8"	1/4" or 3/8"	5/8"	1" 1 1/2" 2" 2 1/2" 3" 3 1/2" 4"	1/4"	3/4" or 1"
3/8"	1" 1 1/2" 2" 2 1/2"	3/16"	3/8" or 1/2"	1 1/16"	1" 1 1/2" 2" 2 1/2" 3" 3 1/2" 4"	1/4"	3/4" or 1"
1/2"	1" 1 1/2" 2" 2 1/2" 3"	1/4"	3/4"				

Collets 1/8" 3/16" 1/4" 5/16" 3/8" 4mm 5mm 6mm 8mm 10mm

QUILLS

Suitable for Spindles with a maximum Quill Diameter $\frac{7}{8}$ " 22mm

f	g	j	k
$\frac{3}{8}$ "	$\frac{3}{4}$ " 1" 1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ "	$\frac{3}{16}$ "	$\frac{3}{8}$ " or $\frac{1}{2}$ "
$\frac{1}{2}$ "	1" 1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3"	$\frac{1}{4}$ "	$\frac{3}{4}$ "
$\frac{5}{8}$ "	1" 1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{3}{4}$ " or 1"

f	g	j	k
$\frac{3}{4}$ "	1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ "	$\frac{3}{8}$ "	$\frac{3}{4}$ " or 1"
$\frac{7}{8}$ "	1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6"	$\frac{3}{8}$ "	$\frac{3}{4}$ " or 1"

Collets $\frac{1}{4}$ " $\frac{5}{16}$ " $\frac{3}{8}$ " $\frac{1}{2}$ " 6mm 8mm 10mm 12mm

Suitable for Spindles with a maximum Quill Diameter 1" 25mm

f	g	j	k
$\frac{1}{2}$ "	1" 1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3"	$\frac{1}{4}$ "	$\frac{3}{4}$ "
$\frac{5}{8}$ "	1" 1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4"	$\frac{1}{4}$ "	$\frac{3}{4}$ " or 1"
$\frac{3}{4}$ "	1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{4}$ " 5"	$\frac{1}{4}$ "	$\frac{3}{4}$ " or 1"

f	g	j	k
$\frac{7}{8}$ "	1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6"	$\frac{3}{8}$ "	1"
1"	2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 6 $\frac{1}{2}$ "	$\frac{3}{8}$ "	1"

Collets $\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $\frac{3}{4}$ " 10mm 12mm 16mmSuitable for Spindles with a maximum Quill Diameter 1 $\frac{3}{16}$ " 30mm

f	g	j	k
$\frac{5}{8}$ "	1" 1 $\frac{1}{2}$ " 2" 2 $\frac{1}{4}$ " 2 $\frac{1}{2}$ " 2 $\frac{3}{4}$ " 3" 3 $\frac{1}{4}$ " 3 $\frac{1}{2}$ " 4"	$\frac{1}{4}$ "	$\frac{3}{4}$ " or 1"
$\frac{3}{4}$ "	1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5"	$\frac{3}{8}$ "	$\frac{3}{8}$ " or 1"
$\frac{7}{8}$ "	1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6"	$\frac{3}{8}$ "	1"
1	2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6"	$\frac{3}{8}$ "	1"

f	g	j	k
$\frac{1}{8}$ "	2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7"	$\frac{1}{2}$ "	1"
$\frac{1}{4}$ "	2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8"	$\frac{1}{2}$ "	1"

Collets $\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $\frac{3}{4}$ " 10mm 12mm 16mmSuitable for Spindles with a maximum Quill Diameter 1 $\frac{3}{8}$ " 35mm

f	g	j	k
$\frac{3}{4}$ "	2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5"	$\frac{3}{8}$ "	$\frac{3}{4}$ " or 1"
$\frac{7}{8}$ "	1 $\frac{1}{2}$ " 2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 6"	$\frac{3}{8}$ "	1"
1"	2" 2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 6" 6 $\frac{1}{2}$ "	$\frac{3}{8}$ "	1"

f	g	j	k
$\frac{1}{8}$ "	2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8"	$\frac{1}{2}$ "	1"
$\frac{1}{4}$ "	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8"	$\frac{1}{2}$ "	1"
$\frac{3}{8}$ "	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8" 9"	$\frac{1}{2}$ "	$\frac{1}{4}$ "

Collets $\frac{1}{2}$ " $\frac{5}{8}$ " $\frac{3}{4}$ " $\frac{7}{8}$ " 12mm 16mm 20mmSuitable for Spindles with a maximum Quill Diameter 1 $\frac{9}{16}$ " 40mm

f	g	j	k
$\frac{1}{8}$ "	2 $\frac{1}{2}$ " 3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8"	$\frac{1}{2}$ "	1"
$\frac{1}{4}$ "	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8"	$\frac{1}{2}$ "	1"
$\frac{3}{8}$ "	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8" 9"	$\frac{1}{2}$ "	1 $\frac{1}{4}$ "

f	g	j	k
$\frac{1}{2}$ "	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8" 9" 10"	$\frac{1}{2}$ "	1 $\frac{1}{4}$ " or 1 $\frac{1}{2}$ "
$\frac{9}{16}$ "	3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8" 9" 10"	$\frac{1}{2}$ "	1 $\frac{1}{4}$ " or 1 $\frac{1}{2}$ "

Suitable for Spindles with a maximum Quill Diameter 1 $\frac{3}{4}$ " 44.5mm

f	g	j	k
1"	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6"	$\frac{3}{8}$ "	1"
$\frac{1}{8}$ "	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8"	$\frac{1}{2}$ "	1"
$\frac{1}{4}$ "	3" 3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8"	$\frac{1}{2}$ "	1" or 1 $\frac{1}{4}$ "

f	g	j	k
$\frac{3}{8}$ "	3" 3 $\frac{1}{2}$ " 4" 5" 5 $\frac{1}{2}$ " 6" 7" 8" 9"	$\frac{1}{2}$ "	1 $\frac{1}{4}$ "
$\frac{1}{2}$ "	3 $\frac{1}{2}$ " 4" 4 $\frac{1}{2}$ " 5" 5 $\frac{1}{2}$ " 6" 7" 8" 9" 10"	$\frac{1}{2}$ "	1 $\frac{1}{4}$ " or 1 $\frac{1}{2}$ "
$\frac{3}{4}$ "	4" 5" 6" 7" 8" 9" 10" 12"	$\frac{3}{4}$ "	1 $\frac{1}{4}$ " or 1 $\frac{1}{2}$ "

Ordering Instructions. When ordering state the maximum speed of your spindle type and serial number. Quote diameter "f" and length "g". Should you require quills for clockwise rotating spindles state this clearly on your order otherwise quills with right-hand threads for anti-clockwise rotating spindles (facing the grinding wheel end) will always be supplied. Use the correct diameter and shortest length quill possible.

SPECIAL QUILLS CAN BE SUPPLIED TO ORDER.

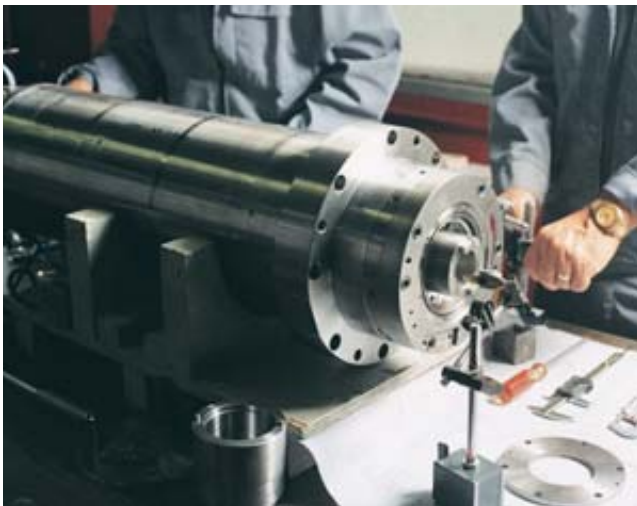
SPINDLES REPAIR

Dedicated workshop for the repair and upgrade of spindles.

Jena-Tec offer a high quality, economic service for the repair and upgrade of spindles.

All work is carried out by skilled specialist technicians, familiar with the specifications and functions of precision machine tool spindles.

- All rotating parts are dynamically balanced.
- Spindles are assembled in a cleanroom to ensure trouble-free performance.
- On final test running accuracy and vibration levels are monitored and recorded to give assurance of a quality re-build.



DETERMINING SPINDLE - INFORMATION REQUIRED

When enquiring for a Jena-Tec spindle please provide as much of the following information as possible.

Spindle Type and Application

Type of spindle housing:-

- (a) Block Type
- (b) Foot Mounted
- (c) Cartridge Type, with or without mounting bracket or flange

Space limitations:- specify centre height, length and total height

Operating position – horizontal, vertical nose up, vertical nose down, inclined.

Direction of rotation

If motorised, specify HP speed, volts, phases and cycles.

If belt driven, specify spindle speed, HP and RPM of drive motor, type and centre distance of belt drive.

Operating Details and Conditions

Type of Operation or process i.e. grinding, milling, drilling, boring, routing or other.

Grinding Spindles:- specify wheel diameter, face width, hole size and type of wheel.

For internal grinding specify smallest diameter and depth of hole to be ground.

Boring Spindles:- specify range of hole diameters and depths, type of boring bar and mounting.

Routing Spindles:- specify cutter details and type of mounting.

Milling Spindles:- specify cutter material, size, type and number of teeth, material to be machined and stock removal rate.

Is Coolant used? If so, specify coolant method, flood or drip

Operating conditions:- specify any high radial or axial loads, high temperatures or any chemically active gasses or fluids.

IN ADDITION TO ABOVE PLEASE SUPPLY DRAWING WHERE POSSIBLE