



# Centre Hole Grinder **ZSU**

**Linear grinding and  
plunge grinding**  
for centre holes.

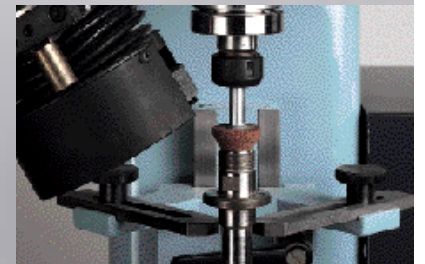
## **Linear grinding**



For centres from  
1mm to 150 mm dia.

**Accuracy**  
Concentricity **1 $\mu$ m**

## **Plunge grinding**



Centre holes from  
1mm up to 120 mm dia.

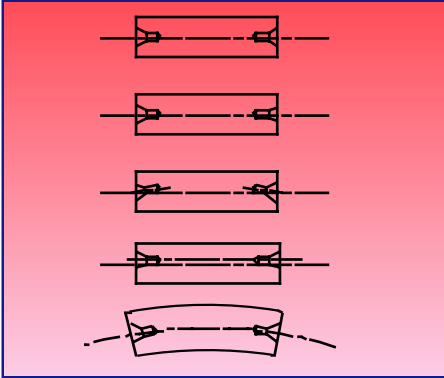
**Accuracy**  
Roundness as measured  
at the centre hole is  
**1 $\mu$ m ( 0,5  $\mu$ m)**

**klein**

## »The roundness of a workpiece depends on the roundness of its centre holes«

Meister Ortlieb

### Defect and Function of centre hole

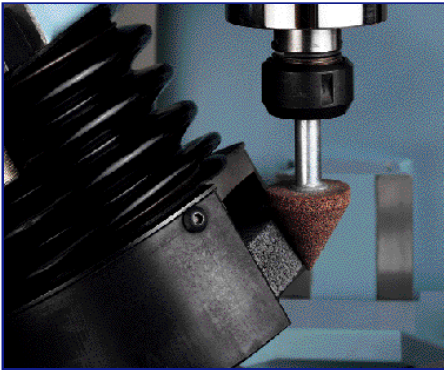


Together with the dead centre point of the external grinder the centre hole forms a plain bearing. For optimum results the taper of the centre hole must be round and co-axial with the centre hole at the other end of the workpiece. After hardening the workpiece, its centre holes are neither round nor oval, are out of alignment, covered with scale and too rough. To obtain good results rapidly in circular grinding -essential for productivity-

the centre holes must be ground before they are mounted on the external grinder. A prerequisite to optimum results in centre hole grinding is a grinding point of true geometric shape, which must meet the following requirements:

- True correct taper form (in terms of taper angle and geometry)
- Absolutely sharp points of grinding pin (*important for small centre holes*).
- Fine surface finish.

### Dressing with a dressing wheel



The major problem encountered in dressing the tapered grinding point is the diminishing circumferential speed towards the tip. At the tip itself the speed is zero.

With a driven dressing wheel, constant conditions for dressing exist all the way down to the tip. 0,2 mm tip radii can be obtained, to grind *small centre holes*.

The surface quality of the centre hole is determined by the speed at which

the dressing wheel oscillates over the grinding tool.

The dressing spindle stays always in his dressing position.

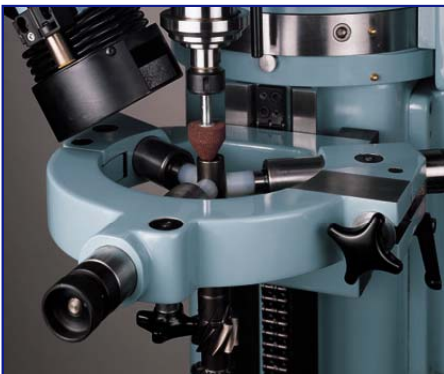
The dressing infeed is effected by means of the approaching gear.

Moreover, this dressing device reduces non-productive dressing time and grinding cone wear to a minimum.

The distance between grinding wheel and centre hole is kept constant.

## The workpieces can be divided into two categories:

### Linear grinding



Workpieces are, ground, turned, hardened, or smooth.

Workpieces, are ground by linear grinding method if the centrehole must be concentric with the outer dia. The centres are ground co-axial, concentric, and round.

The workpiece is driven by the tailstock and is guided in a steady rest. The grinding point makes a linear contact on the centrehole.

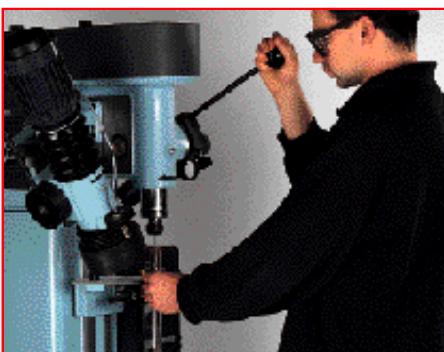
#### Accuracy

The concentricity to the outside diameter is with in **1µm**.

#### Grinding capacity:

Centres from 1 to 150 mm dia

### Plunge grinding ( special equipment)



Workpieces can be rough, turned, hardened, or smooth. The centre hole need not to be concentric with the outer diameter. The centre holes do not leave their position. The workpiece is held by hand during the plunge grinding process. This is uncomplicated and very quick.

The grinding point plunges into the centre hole and laps it round and coaxial. The grinding contact pres-

sure can be adjusted by a spring.

This ensures smooth and sensitive grinding of the smallest centre holes.

#### Grinding accuracy:

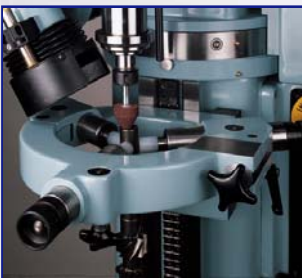
roundness measured at the centre hole is **1µm** or better. ( 0,5µm)

**Grinding capacity:** 1-120mm dia (width of chamfer 2mm).

## Centre grinding ensures good results quickly in circular grinding



Swivelling device for easier better loading and unloading of heavy workpieces



Concentric grinding with the steady rest

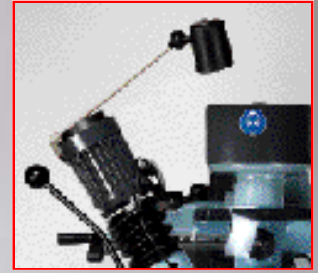


Workpiece drive with two speeds  $25 \text{ min}^{-1}$  /  $50 \text{ min}^{-1}$

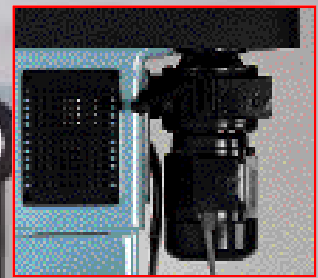


Tailstock motorlift with two speeds

Standard equipment



Spot light for a bright working area



For plunge grinding: Stepless variable grinding spindle speed for centers upto  $120 \text{ mm}$  dia



Pneumatic swivelling device for the grinding head. For easier loading and unloading of heavy workpieces



Three jaw chuck, on request high precision spindle.

Special accessories

## Special accessories



Dust collector with 3-phase  
400 V or single phase 230 V

## ZSU I



## ZSU I



## Technical Data

		ZSU I	ZSU II	ZSU III	ZSU VI
Distance between centers	ca. mm	1000	1500	2000	2500
Height of centre	mm	160	160	160	160
Max. work	mm dia	320	320	320	320
Max. centre hole	mm dia	150	150	150	150
Min. centre hole	mm dia	1	1	1	1
Centre hole taper angle		60° - 90°	60° - 90°	60° - 90°	60° - 90°
<b>Grinding spindle</b>					
Drive motor speed	1 / min	7500-20000	7500-20000	7500-20000	7500-20000
<b>Plunge grinding</b>					
Drive motor speed	1 / min	440 - 9.500	440 - 9.500	440 - 9.500	440 - 9.500
Stepless variable speed	1 / min	50 - 6.500	50 - 6.500	50 - 6.500	50 - 6.500
Drive motor rating	kW	0,45	0,45	0,45	0,45
Travel	mm	ca.60	ca.60	ca.60	ca.60
Collet chucks	mm	4-10	4-10	4-10	4-10
<b>Tail stock</b>					
Morse taper	MK	4	4	4	4
Max. workpiece weight	kg	160	160	160	160
<b>Dressing spindle</b>					
Dressing wheel	mm dia	120	120	120	120
Weight net / gross	kg	540 / 640	570 / 670	600 / 700	650 / 750
Measur. 70x80 x Height	cm	190	240	290	340
Packing 120x 90 x Length	cm	215	260	310	360

Specifications are subject to change without notice

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