



Centre Hole  
Grinder

**ZSS**

**Plunge grinding**  
for centre holes.

**Plunge grinding**

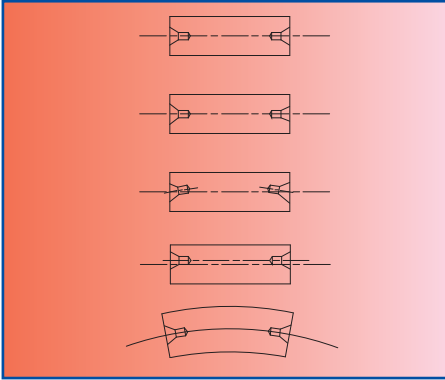


Centre holes from  
1mm up to 120 mm dia.  
**Accuracy**  
Grinding accuracy as  
measured at the centre hole  
is **1 $\mu$ m**

**klein**

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

### Defect and Function of centre hole

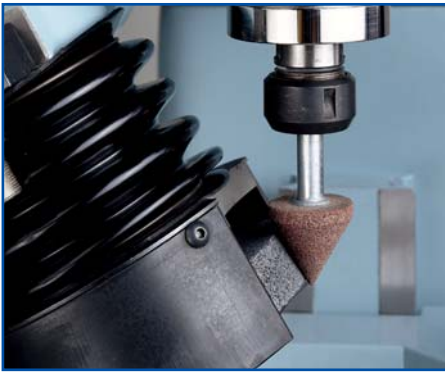


Together with the dead centre point of the external grinder the centre hole forms a plain bearing. For optimum results the taper of the centre hole must be round and co-axial with the centre hole at the other end of the workpiece. After hardening the workpiece, its centre holes are neither round nor 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.

## Plunge grinding



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 work-piece 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 pressure can be adjusted by a spring. This ensures smooth and sensitive grinding of the smallest centre holes.

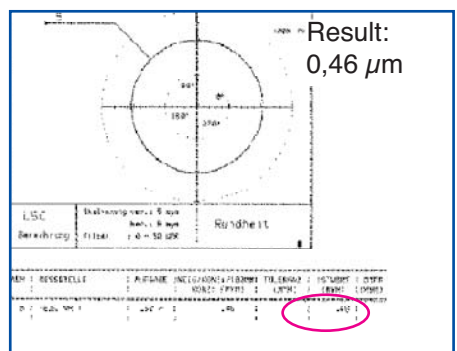
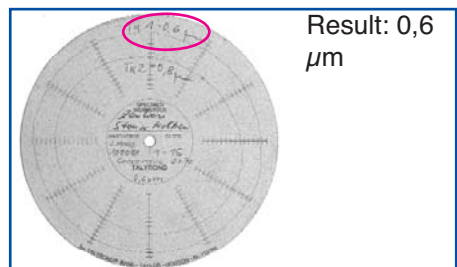
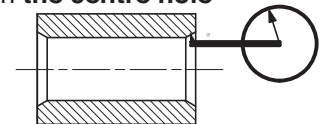
#### Grinding accuracy:

roundness measured at the centre hole is **1µm** or better.

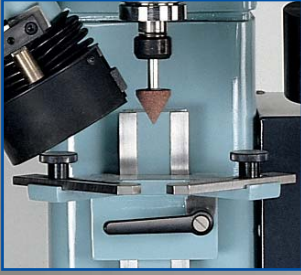
**Grinding capacity:** 1-120mm dia (width of chamfer 2mm).

If the centre hole must be concentric with the outer dia, or must be offset. then they are ground to the linear grinding method on the **klein** machines ZSU

### Take roundness measurements only in the centre hole



# Centre grinding ensures good results quickly in circular grinding



The workpiece stop is employed for prelocating the workpieces and as a hand support during grinding.



Plunge grinding:  
The centre hole is laped in full contact.



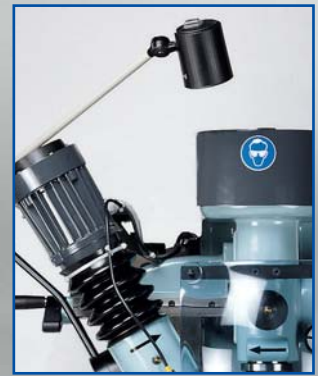
Dressing device with dressing wheel.



Stepless variable grinding spindle speed for centres upto 120 mm dia



Dust collector with 3-phase 400 V

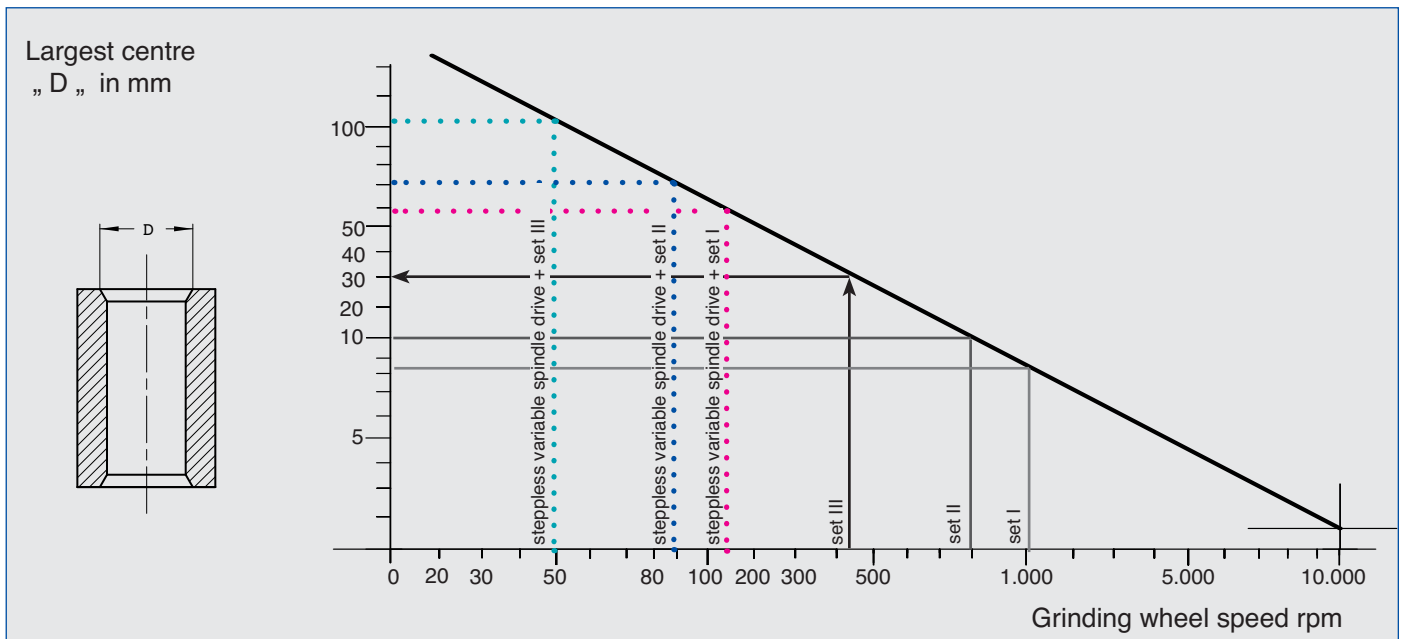


Spot light for a bright working area



Standard  
Special

## Selection of cone pulley sets



## Technical Data

		ZSS I	ZSS II
Distance between centres	mm	1000	1500
Height of centre	mm	165	165
Max. work	mm dia	325	325
Max. centre hole	mm dia	ca. 30	ca. 30
Stepless variable spindle drive	mm	ca.120	ca.120
Min. centre hole	mm dia	1	1
Centre hole taper angle		60° - 90°	60° - 90°
<b>Grinding spindle</b>			
Drive motor speed	rpm	440 - 9.500	440 - 9.500
Stepless variable spindle drive	rpm	50 - 6.500	50 - 6.500
Drive motor rating	kW	0,45	0,45
Travel	mm	ca.60	ca.60
Collet chucks	mm	4-10	4-10
<b>Tail stock</b>			
Morse taper	MT	2	2
Max. workpiece weight	kg	80	80
<b>Dressing spindle</b>			
Dressing wheel	mm dia	120	120
	kg	240 / 330	280 / 380
Weight net / gross	cm	170 x 70 x 80	230 x 70 x 80
Measurements H x L x W	cm	120 x 190 x 90	120 x 240 x 90



## Special equipment

- Stepless variable grinding spindle speed for centers upto 120 mm dia
- Set of cone pulleys
- Grinding wheels
- Collet chucks
- Dust collector 3-phase 400 V

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