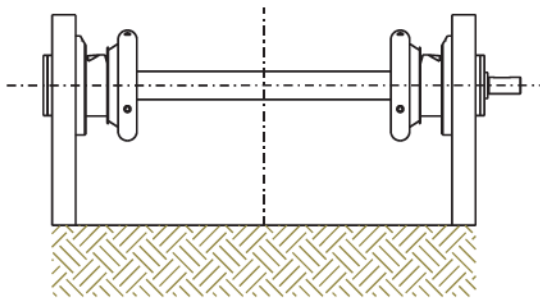
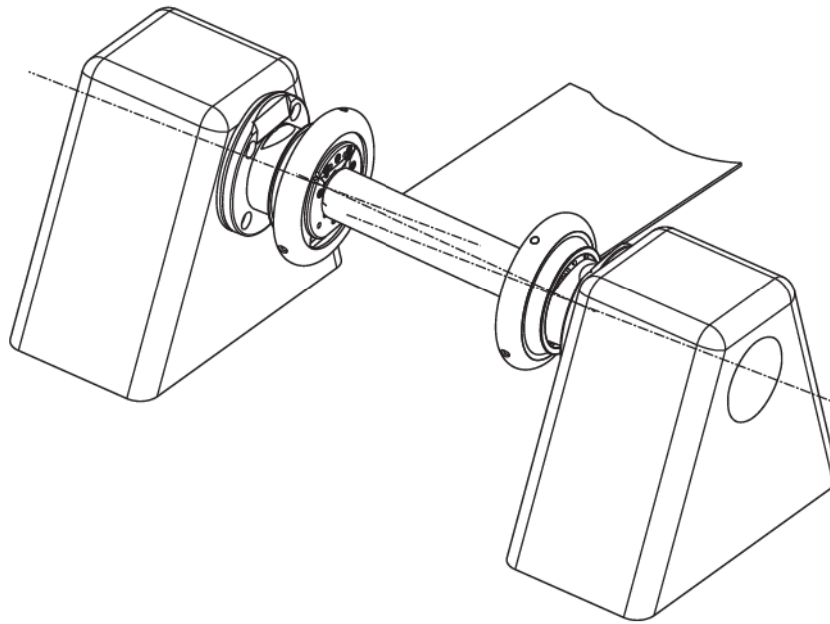
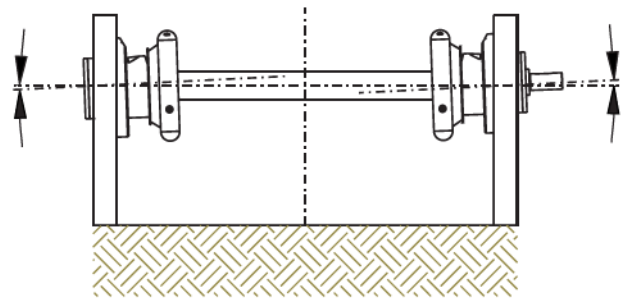


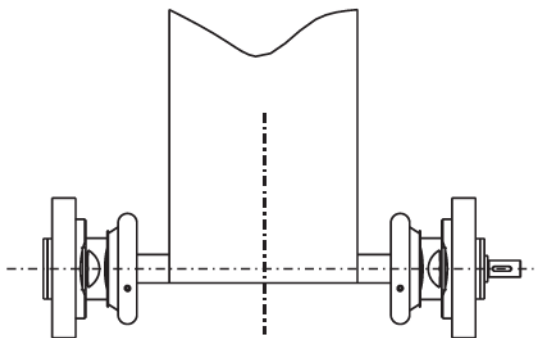
## 5.00 Assembly Instruction



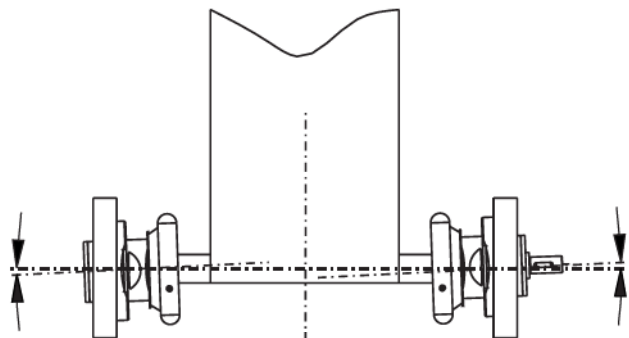
right



wrong



right



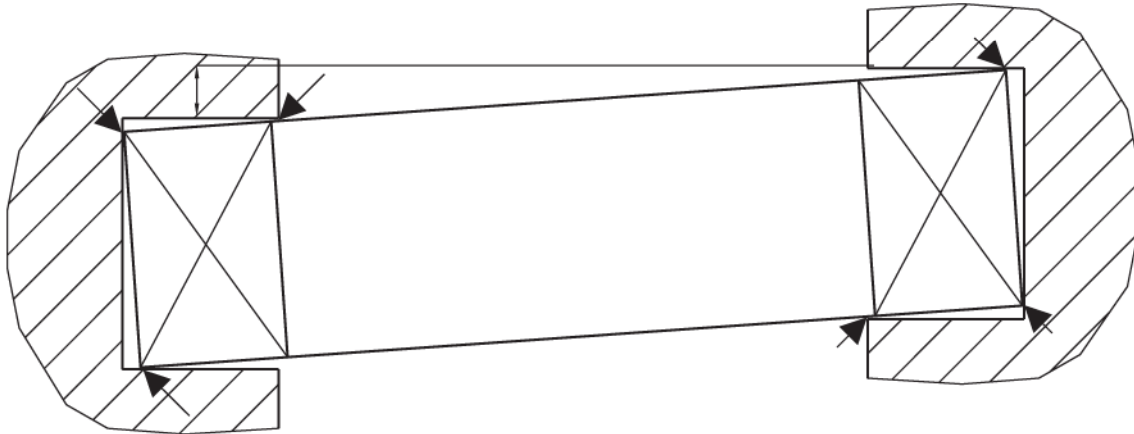
wrong

- Boschert Chucks have to be mounted in an alignment
- please make sure that the winding shafts are mounted in the same height and same distance
- No more then  $0.3^\circ$  misalignment.

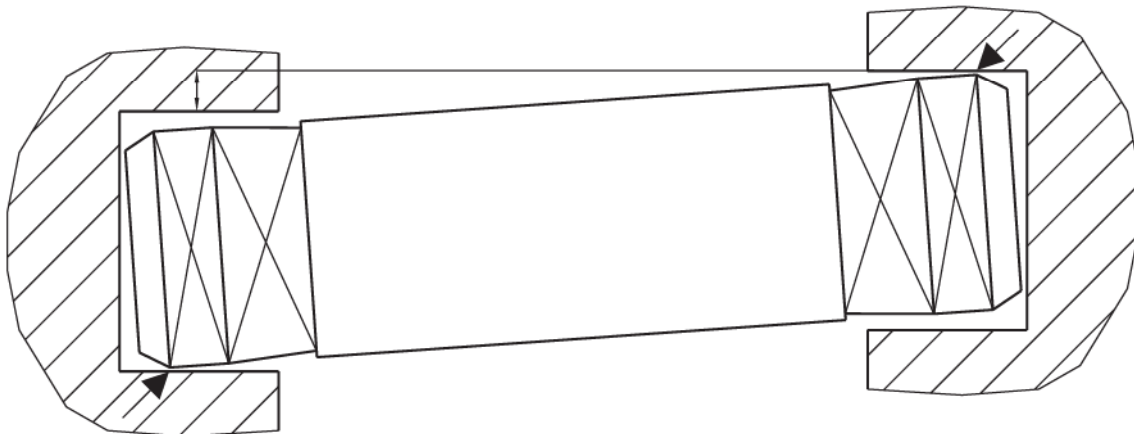
- is the winding shaft installed correct and in alignment
  - there are cases where the winding shaft is installed correct and in alignment, but the Boschert Chucks are mounted incorrectly (no alignment), you have to expect that the square pocket of the Boschert Chuck will wear very fast.
- The result are vibrations of the stand or the machine.

Precise alignment of the Chucks protects against increased wear. Any misalignment will affect the life of both the Safety Chucks and the shaft ends.

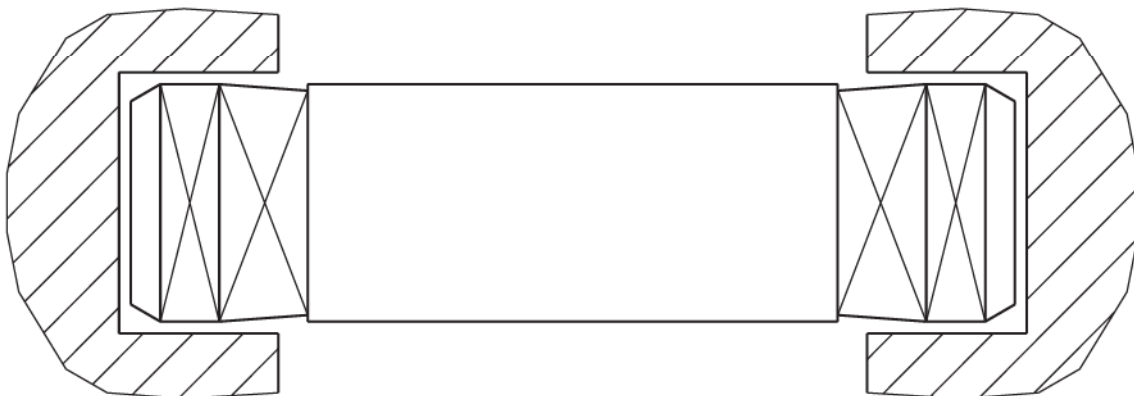
**The factory cannot provide any warranty if the chucks are not mounted as we recommend.**



wrong alignment



wrong alignment



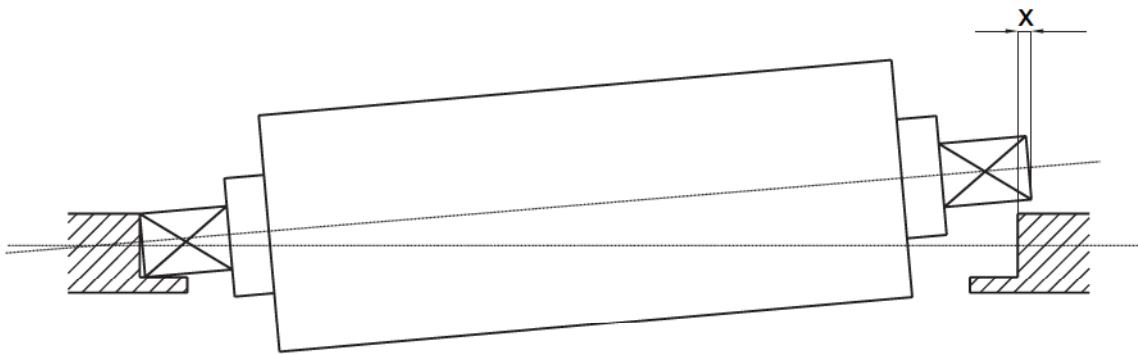
correct alignment

## Advantages of close tolerances - Selection of the winding bar

Here especially measure "x" see page 5.10.

Only slight axial space between safety chuck and winding bar results in troublefree winding. On the other hand, there has to be enough space to put the winding bar in. Since the space differs from application to application, we here show the main influences on examples.

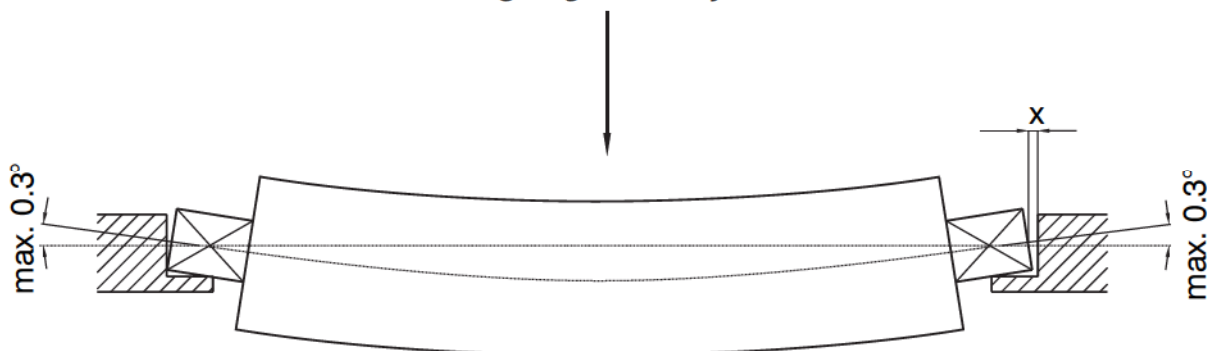
### Winding shaft cannot be inserted in alignment with the shaft



**More space necessary !**

### Wrong choice of winding shafts deflection.

max. bending angle at the journals  $0.3^\circ$

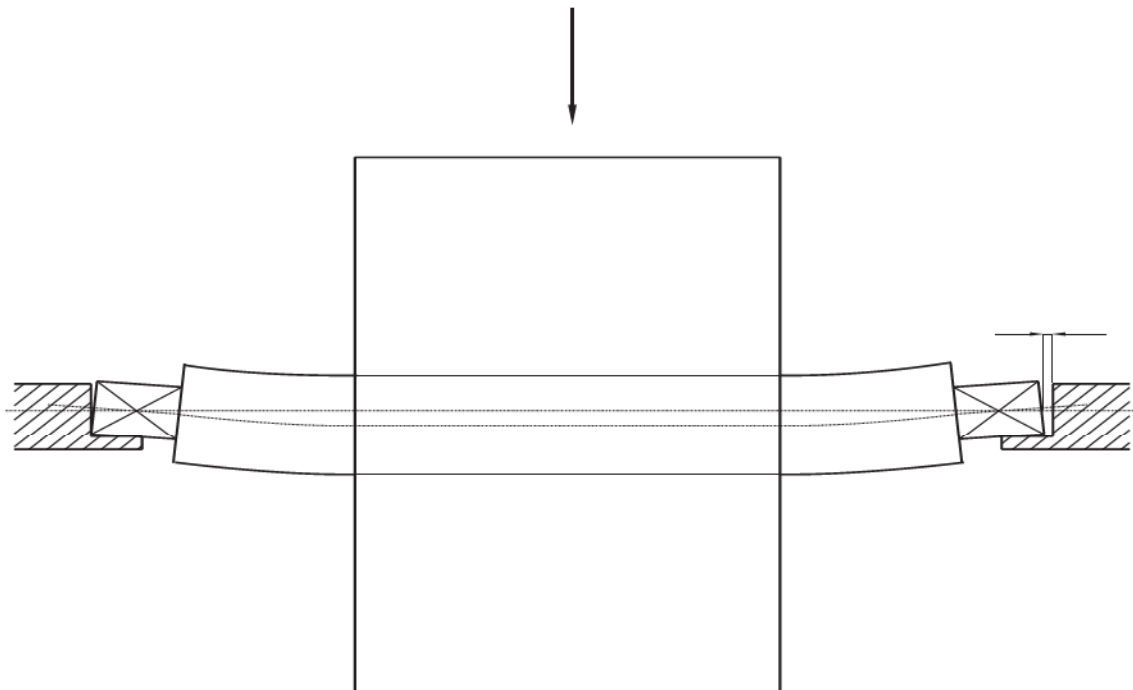
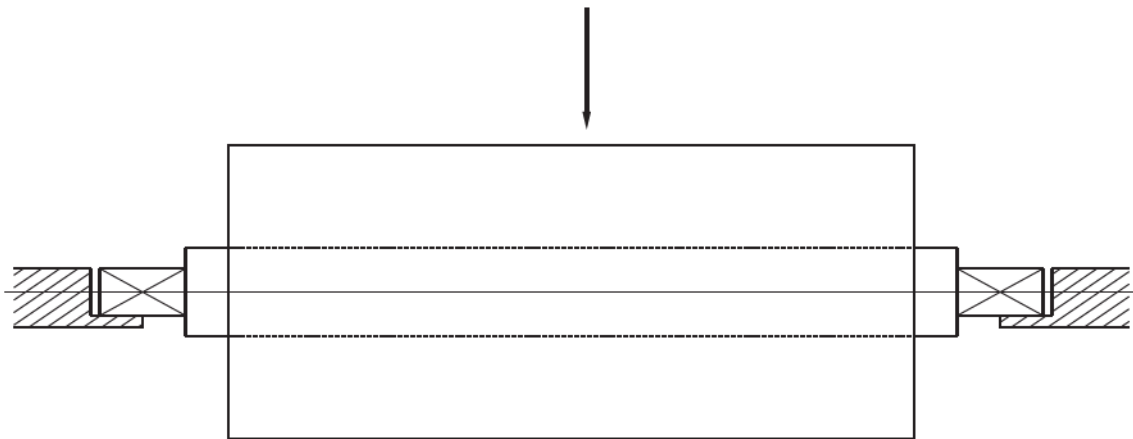


**Space becomes larger !**

**Important: please see page 5.10**

## Different roll widths on the same winding shaft

The width of a roll affects the deflection of the roll shaft. A narrow width roll on a long roll shaft is more likely to cause deflection than a roll which is nearly the same width as the length of the roll body.



## Effect of narrow width roll on roll shaft

## 1. Manufacturer

Boschert GmbH & Co. KG  
Mattenstrasse 1  
D-79541 Lörrach-Hauingen  
phone-no.: 07621/95930  
Fax-no.: 07621/55184

## 2. Range of application

Boschert Safety Chucks are used to wind and unwind all different web materials. It is possible to work with Boschert Safety Chucks in temperatures between - 30 degrees and +100 degrees Celsius. For temperatures which are not in this range, you need a special permission from the manufacturer.

### 2.1 General view

Boschert Safety Chucks consist of two assembly groups:

Housing, shaft + handwheel

With help of the tilting handwheel the roll shaft can be inserted very fast.

To guarantee a safe supporting of the winding shaft, the Boschert Safety Chucks are provided with three safety-systems.

- a) The spring-ball lock in the handwheel holds the handwheel in a safe and closed condition during operation.
- b) The housing of the chuck has a slope which prevents the handwheel opening in a wrong position and means the handwheel closes automatically when the machine starts.
- c) A finger-guard which is fixed on the handwheel makes access to the pinch point of the behind the hand wheel impossible.

### 2.2 Position of operator

During operation of the machine, the operator should stay clear of the winding shaft.

### 2.3 Noises

During operation, the Boschert Safety Chuck does not produce any noises.

### 2.4 Emissions

The Safety Chuck doesn't emit radiation, gas, exhaust or dust.

### 2.5 Electrical device

You don't need any electrical equipment to work with the chuck.

## 3. Transport

For transport a rust protection has to be applied. The chucks have to be protect against mechanical damage.

## 4. Putting into operation

### 4.1 Installation

Please fix the Boschert Safety Chucks with help of the bolt holes provided.  
Please be sure that the alignment is correct. No more than 0.3° misalignment.

### 4.2 Foundations

There are no special demands for the foundation.

### 4.3 Space

Please be sure that there is a good accessibility to the handwheel.

### 4.4 It is not allowed to work with the chucks in:

- bad surroundings (corundum abrasive dust)
- acid air
- acid steam
- temperatures less than - 30 degr. / more than 100 degr. Celsius

### 4.5 Safety measure

User has to make sure, that the finger-guard is glued to the handwheel.

## 5. Working with the chuck

### 5.1 Function

The only part to adjust on the Boschert Safety Chuck is the handwheel. Move the handwheel back for changing the winding shaft. The handwheel has to be closed before starting the machine.

### 5.2 Equipment, modification

After modification and changing the machine, please check the function of the slope of the housing and of the spring and ball detent system.

### 5.3 Risks

A dangerous situation occurs when the material have to be changed, the chuck is not fully opened and the winding shaft is lifted up one sided. The result is a load which can destroy the Boschert Safety Chuck.

## 6. Servicing

To guarantee a safe work environment, following chucks have to be made weekly:

- a) Is finger-guard still fixed on the handwheel
- b) Does the ball-spring-locking device keep the handwheel closed
- c) Does the handwheel close itself after a 180 degrees revolution

If one of the above described points doesn't work, the chuck has to be taken out of operation and repaired.

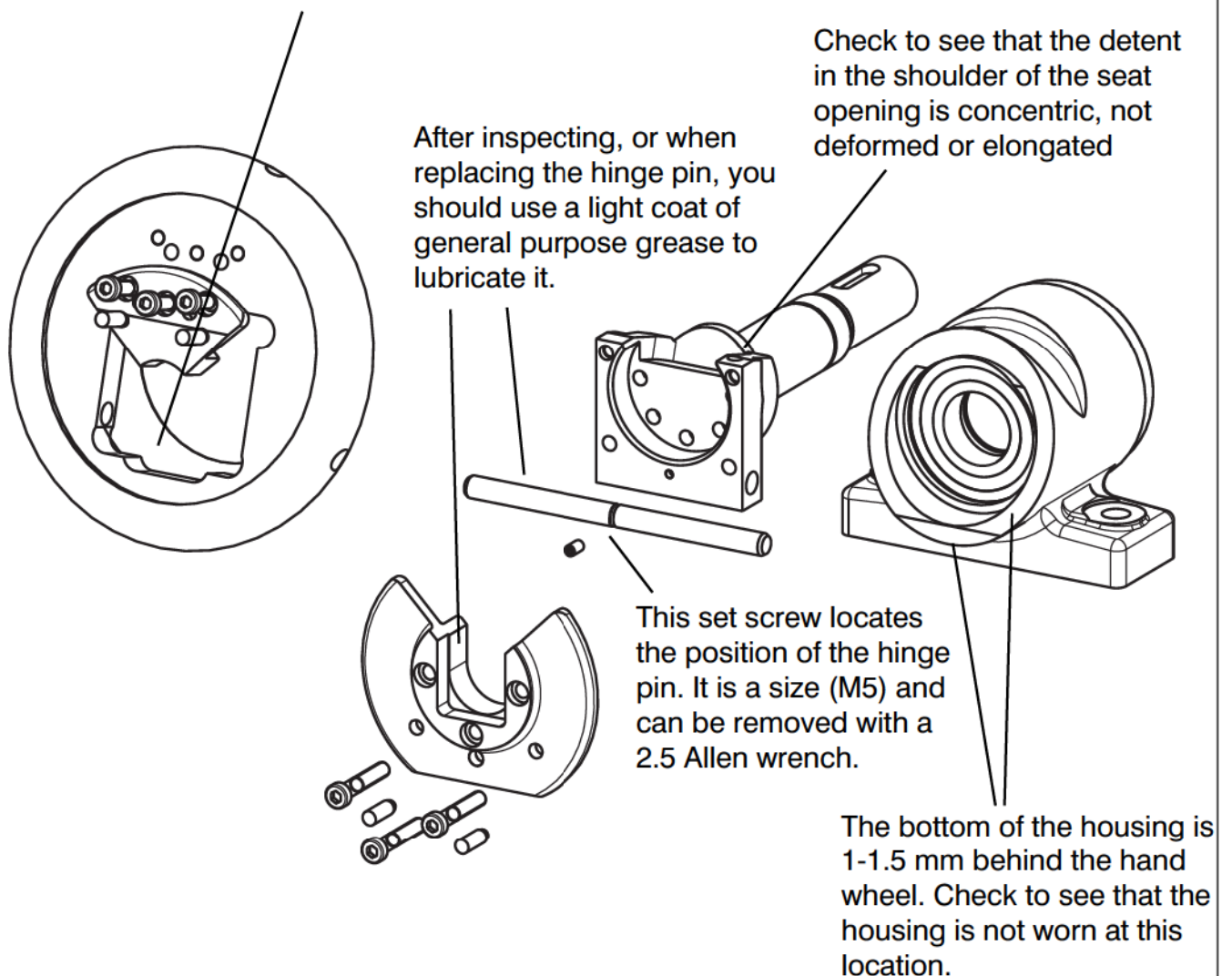
## 7. Disassembling

If it is necessary to disassemble the chucks, please take care that each shaft and its handwheel are a set and you should not assemble incorrectly, to assemble parts that don't belong together. Changes cause an incorrect movement and stresses the chucks.

## 8. Spare parts

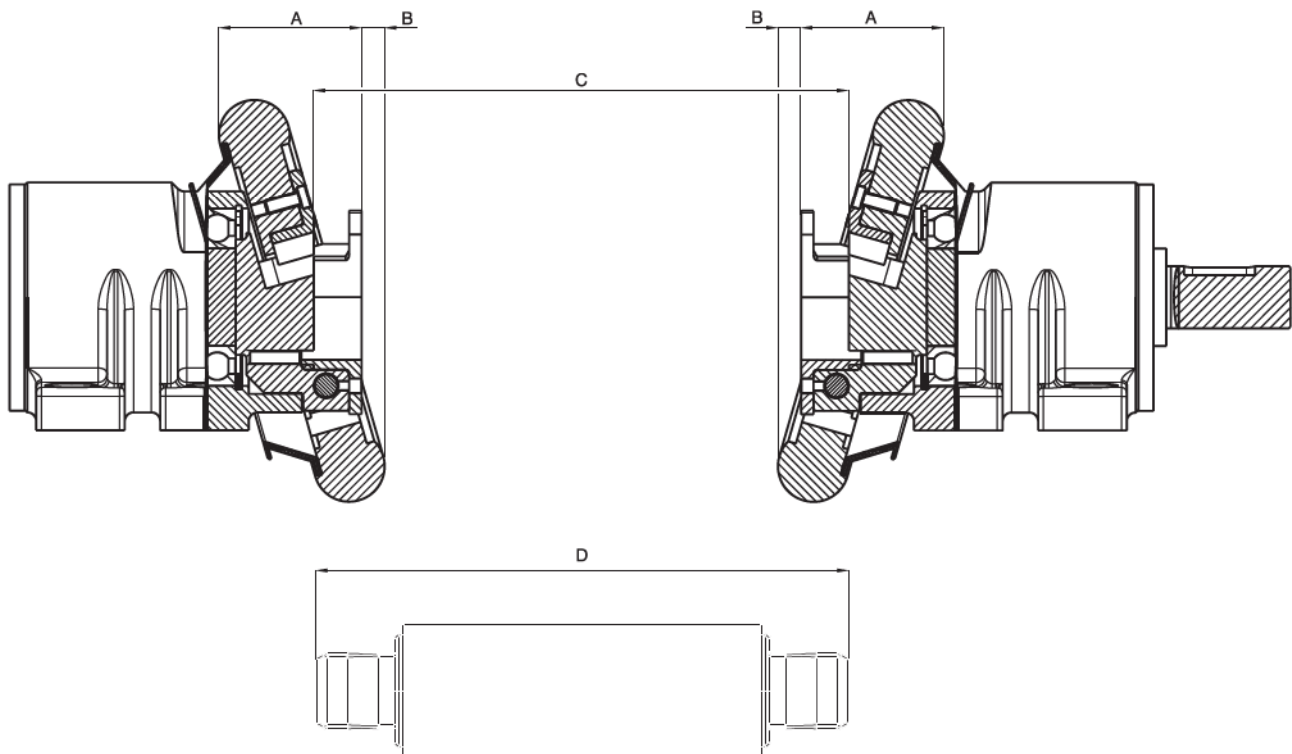
Please use only original spare parts. Boschert uses harmonized materials with proofed quality. Don't economize on quality.

Fingerguard is securely glued to hand wheel and not worn



**Generally safety chucks should always closed by hand.**

## 5.10 Winding shaft tolerances



Typ	A	B	x=(C-D)
Mini	38	8	0.5
19-25	54	9	0.5
22-30	61	8	0.5
30-40	73	13	0.5
40-50	81	13	0.5
50-80	106	16	0.5
80-120	145	18	0.5
120-180	175	24	1
170-200	216	24	1
170-230	230	18	1

x = necessary clearance

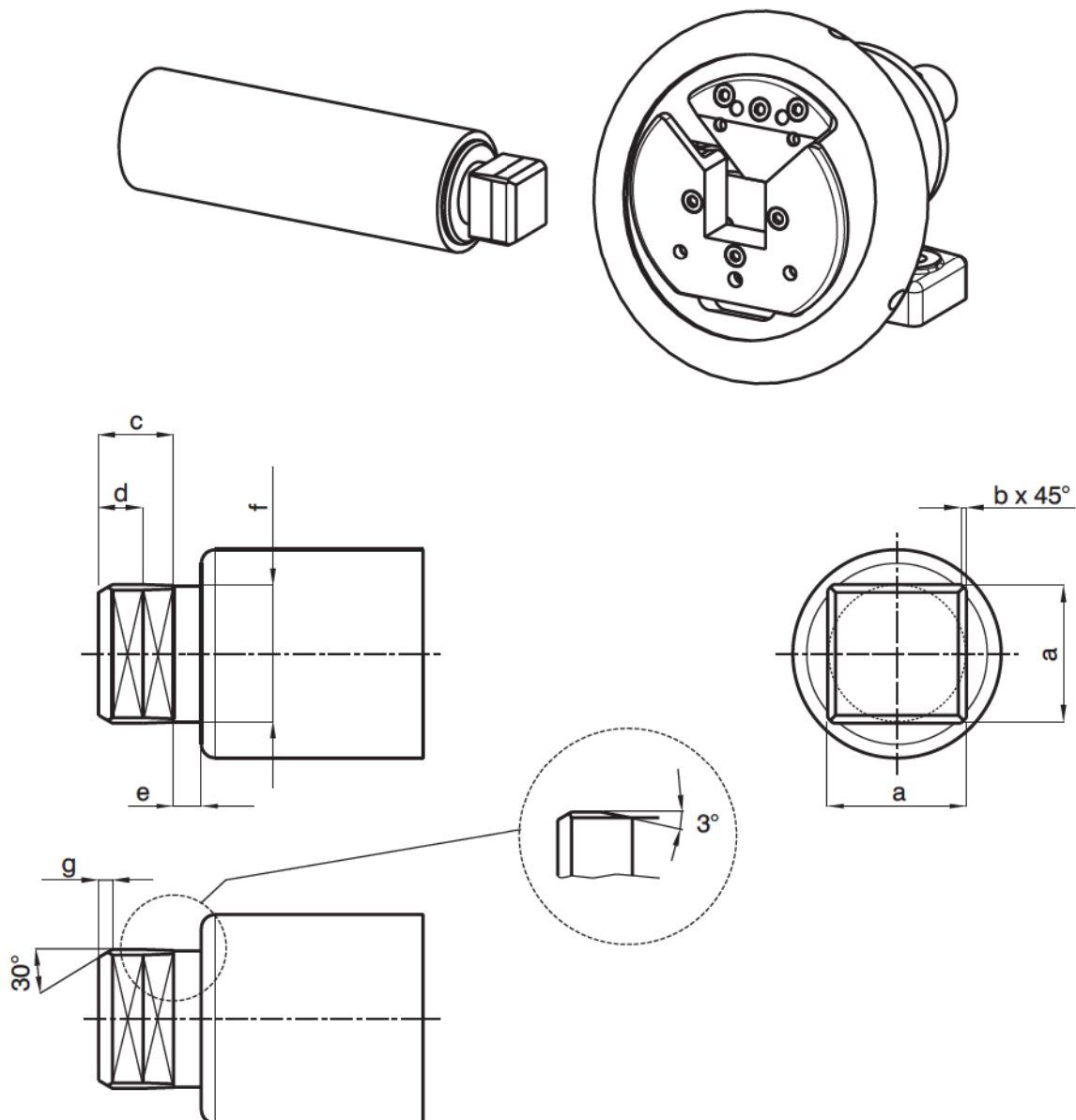
### Attention!

We emphasize that the close tolerances and exact manufacture of our new chucks make it necessary to **machine the winding shafts referring to the drawings and dimensions above.**

Before running the chucks for the first time, **please check if the handwheels close easily to ensure that the winding bar fits correctly.**



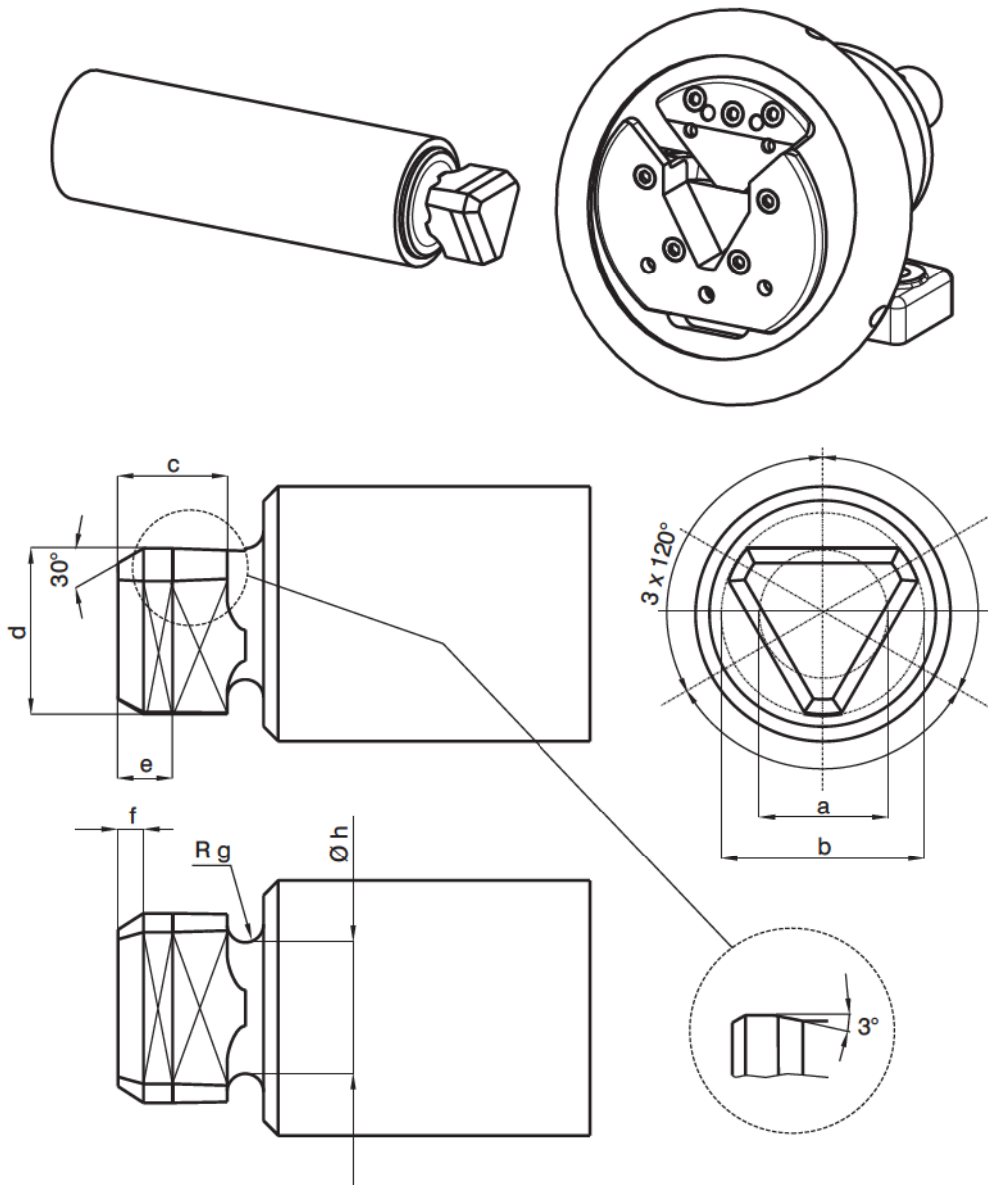
## 5.20 Winding shaft tolerances VT1



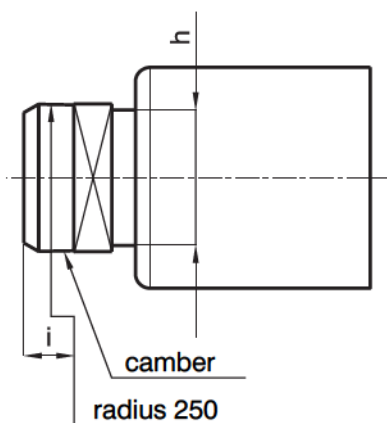
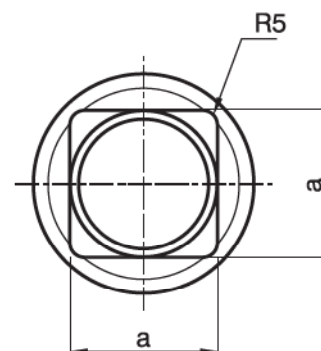
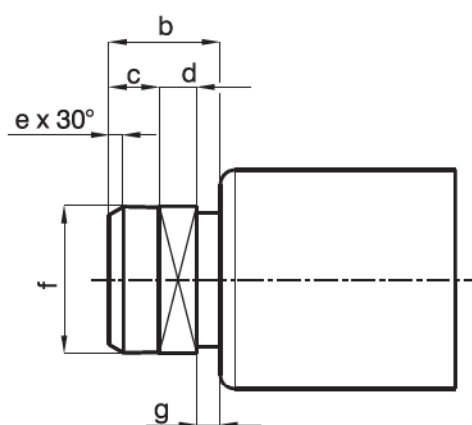
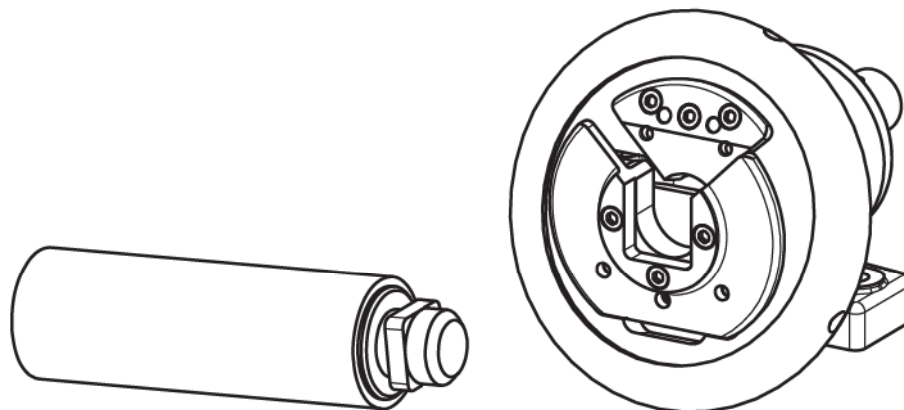
	VT1/VT2						
	a f7	b	c	d	e	Ø f	g
<b>Mini</b>	14-20	1	11.5 -0.2	8	8	a-1 -0.1/-0.2	3
<b>19 - 25</b>	19-25	1	18.5 -0.2	10	8	a-1 -0.1/-0.2	3
<b>22 - 30</b>	22-30	1	21.5 -0.2	11	8	a-1 -0.1/-0.2	4
<b>30 - 40</b>	30-40	1.5	24 -0.2	12.5	10	a-1 -0.1/-0.2	5
<b>40 - 50</b>	40-50	2	26 -0.2	13.5	10	a-1 -0.1/-0.2	5
<b>50 - 80</b>	50-80	3	34 -0.3	17.5	17	a-1 -0.1/-0.3	6
<b>80 - 120</b>	80-120	4	54 -0.5	27.5	22	a-1 -0.1/-0.3	16
<b>120 - 180</b>	120-180	5	64 -0.5	35	25	a-1 -0.1/-0.3	20
<b>170 - 200</b>	170-200	6	84 -0.5	45	25	a-1 -0.1/-0.3	30
<b>170 - 230</b>	170-230	6	89 -0.5	48	25	a-1 -0.1/-0.3	32

VT2: 50-80 a > 60 mm (2 1/2") = „b“ = 4

# Winding shaft tolerances VT6

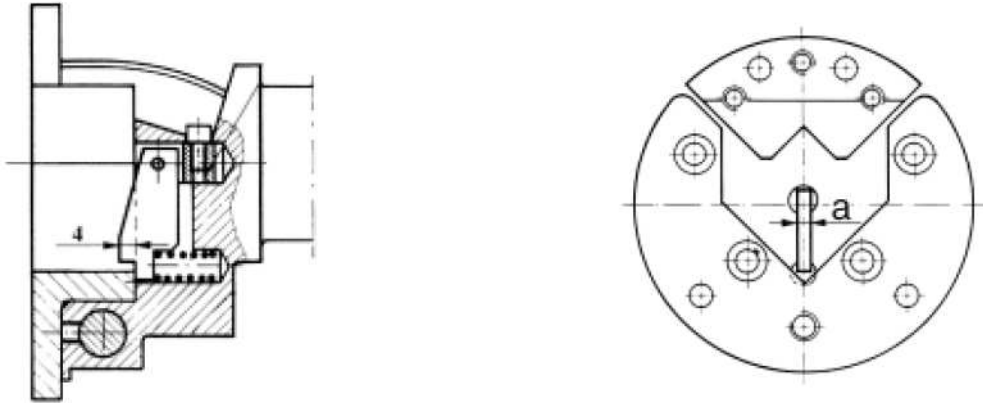


	VT6							
	a f7	b f7	c	d f7	e	f x 30°	g	h
Mini	20	27	11.5	23.5	7.5	3	4	20 -0.1/-0.2
19 - 25	20	27	18.5	23.5	12	3	4	20 -0.1/-0.2
22 - 30	30	44	21.5-0.2	37	14	5	4	30 -0.1/-0.2
30 - 40	36	54	24 -0.2	45	15	7	5	36 -0.1/-0.2
40 - 50	46	69	26 -0.2	57.5	16	7	5	46 -0.1/-0.2
50 - 80	67	104	34 -0.3	85.5	20	7	8.5	67 -0.2/-0.4
80 - 120	96	148	54 -0.5	122	30	18	11	96 -0.2/-0.4



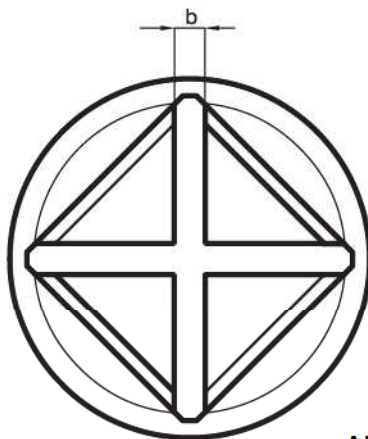
	VT7									
	a	b	c	d	e x 30°	Ø f h7	g	Ø h -0.2	i	
22 - 30	30 +0.1/+0.3	32,5	14 +0.2/+0.3	10.5 -0.1	4	30	8 +0.1	26 -0.2	6	
30 - 40	40 +0.1/+0.3	37	18 +0.2/+0.3	11 -0.1	5	40	8 +0.1	36 -0.2	6	
40 - 50	50 +0.1/+0.3	38	17 +0.2/+0.3	13 -0.1	5	50	8 +0.1	46 -0.5	6	
50 - 80	50 +0.2/-0.2	55	23 +0.2/+0.3	17 -0.1	6	50	15 +0.1	45 -0.2	9	
	80 +0.1/+0.3	55	23 +0.2/+0.3	17 -0.1	6	80	15 +0.1	74 -0.2	9	

In order to ensure the undriven chucks types VT2 and VT6 will lock automatically, a radial driver is offered.

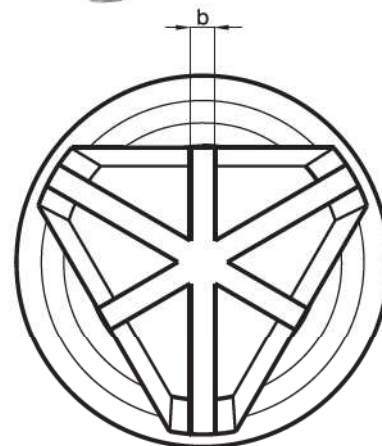


## Design of the shaft end for radial driver

VT2



VT6



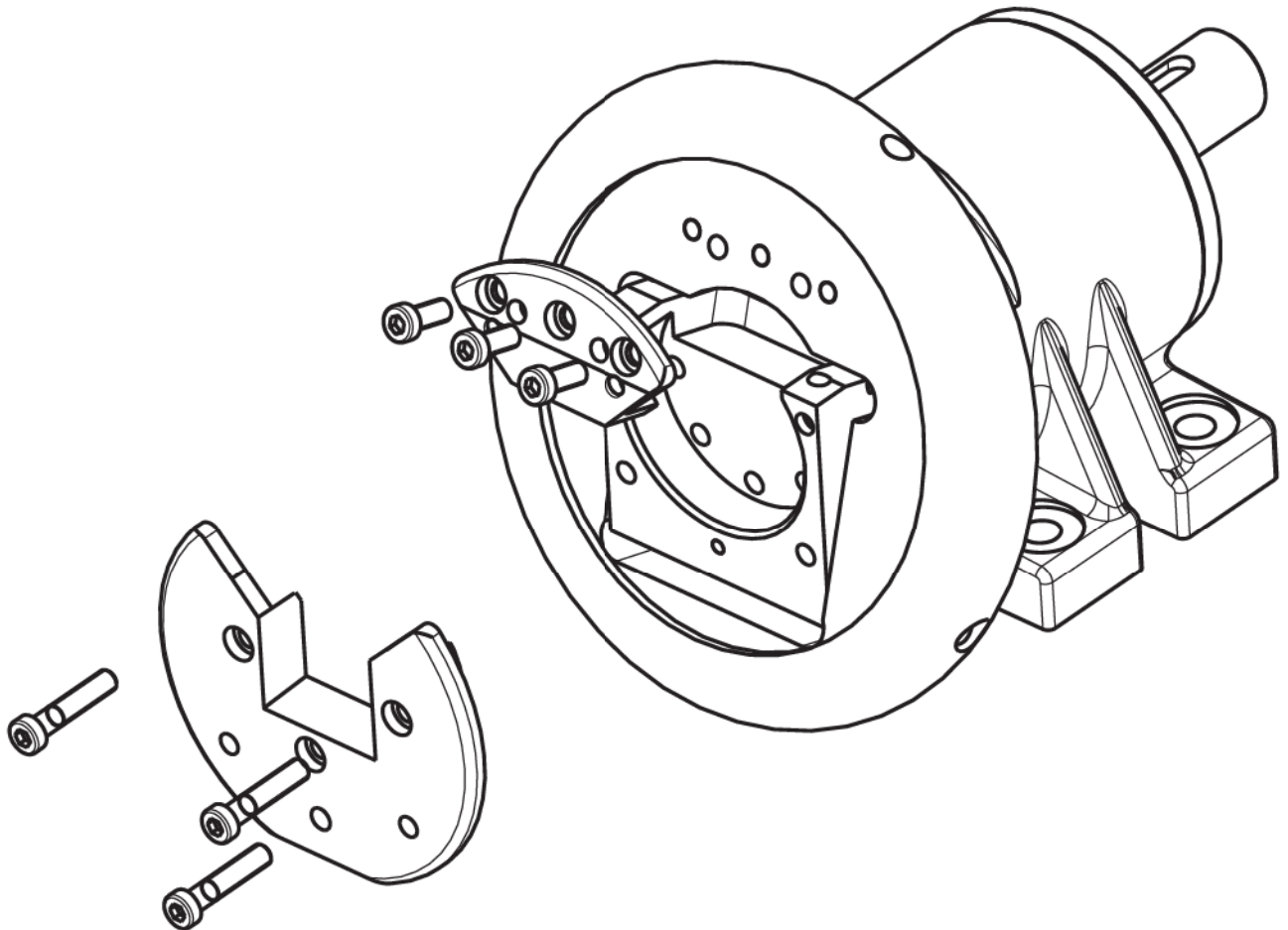
All slots 5 mm (0.1969") deep.

	a	b
Chuck Typ 22-30	4 <sup>-0.02</sup> <sub>-0.05</sub>	4 <sup>+0.1</sup> <sub>+0.05</sub>
Chuck Typ 30-40	5 <sup>-0.02</sup> <sub>-0.05</sub>	5 <sup>+0.15</sup> <sub>+0.1</sub>
Chuck Typ 40-50	5 <sup>-0.02</sup> <sub>-0.05</sub>	5 <sup>+0.15</sup> <sub>+0.1</sub>
Chuck Typ 50-80	5 <sup>-0.02</sup> <sub>-0.05</sub>	5 <sup>+0.15</sup> <sub>+0.1</sub>

Info  
5.21

Info  
5.22

## 5.30 Info Wearing-Parts



### **Attention!**

When ordering it is important that shafts from the C-chuck subsequently cannot be fitted with VT.

However it is possible to convert C-chucks to VT-chucks by changing the shafts and handwheels with the VT type.

## Info Wearing-Parts



The demand for higher speed and greater torque led to the development of the VT-insert. All safety chucks of size 22-30 up to 80-120 can be delivered from BOSCHERT with VT-inserts (wearing-parts). Chucks size 120-180 up to 170-230 are provided with wear plates.

### **Important features of the VT-Chucks are:**

- changing of VT wearing parts can be carried out in just a few minutes with the chucks in situ reducing down time to an absolute minimum
- easy change to other square sizes through replacement of the wearing parts in the same chuck
- VT parts can be supplied hardened to customers needs or in soft condition to protect the more expensive winding shafts
- low stock-keeping costs of the VT
- change from one geometry to another (SQ. to VT-7)

Especially the user, who is using safety chucks with special shaft end should consider chucks with wearing parts in order to assure a fast delivery of spare parts. The wearing parts are available from stock in most standard sizes, while, the time of delivery for shafts, especially with special shaft end, has to be arranged.

We recommend our customers who use wearing parts to put one or more sets of wearing parts in stock to be used in case of an emergency.

When ordering please remember that shafts from the C-chuck subsequently cannot be fitted with VT.

However it is possible to covert C-chucks to VT-chucks by changing the shafts and handwheels with the VT type.

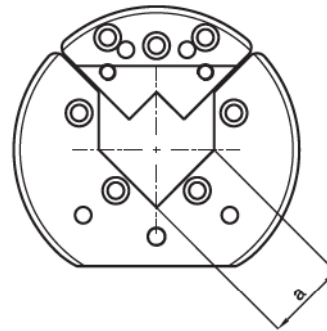
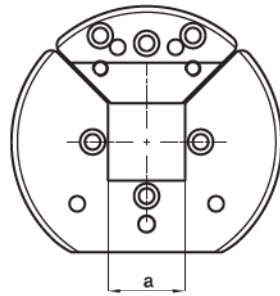
### **Note at VT2 chucks:**

max. torque= 0.7 x catalogue value  
max. weight= 0.8 x catalogue value

### **Generally safety chucks should always be closed by hand.**

In order to ensure the undriven chucks types VT2 or VT6 to lock automatically, a radial driver is offered.

# Dimension sheet VT-inserts

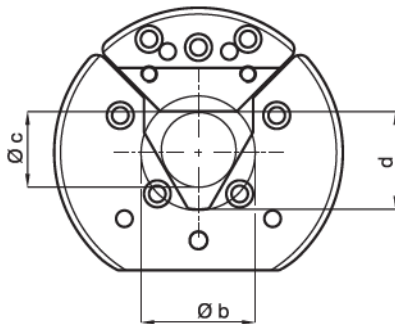


## VT1/VT2

	dimension a (mm)										
<b>22 - 30</b>	25	30									
<b>30 - 40</b>		30	32	35	40						
<b>40 - 50</b>					40	45	50				
<b>50 - 80</b>							50	60	80		
<b>80 - 120</b>								80	100	120	

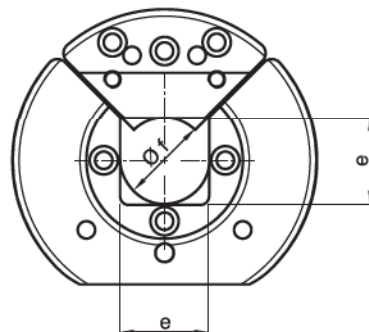
	dimension a (inch/mm)										
<b>22 - 30</b>	1"	1 1/8"	1 1/4"								
	25.4	28.57	31.75								
<b>30 - 40</b>			1 1/4"	1 1/2"							
			31.75	38.1							
<b>40 - 50</b>			1 1/4"	1 1/2"	1 3/4"	2"					
			31.75	38.1	44.45	50.8					
<b>50 - 80</b>						2"	2 1/2"				
						50.8	63.5				
<b>80 - 120</b>										4"	
										101.6	

VT2: 50-80 a = max. 63.5    80-120 a = max. 100



## VT6

	dimensions (mm)		
	Ø b	Ø c	d
<b>22 - 30</b>	45	30	37.5
<b>30 - 40</b>	55	36	45.5
<b>40 - 50</b>	70	46	58
<b>50 - 80</b>	105	67	86
<b>80 - 120</b>	150	96	123



## VT7

	dimension (mm)	
	e	Ø f F7
<b>22 - 30</b>	31	30
<b>30 - 40</b>	41	40
<b>40 - 50</b>	51	50
<b>50 - 80</b>	51	50
	81	80

Special version on customer request

Info  
5.23

**Generally safety chucks should always be closed by hand.**

In order to ensure the undriven chucks types VT2 or VT6 to lock automatically, a radial driver is offered.

# Maintenance inspection suggestions



To better maintain your Boschert Safety Chucks please check the following points:

Fingerguard is securely glued to hand wheel and not worn

Check to see that the detent in the shoulder of the seat opening is concentric, not deformed or elongated

After inspecting, or when replacing the hinge pin, you should use a light coat of general purpose grease to lubricate it.

Replacable insert are matched and have the same indentification number stamped on the backside of the top piece and the bottom piece.

This set screw locates the position of the hinge pin. It is a size (M5) and can be removed with a 2.5 Allen wrench.

Use new screws and pins when installing a new replaceable insert.

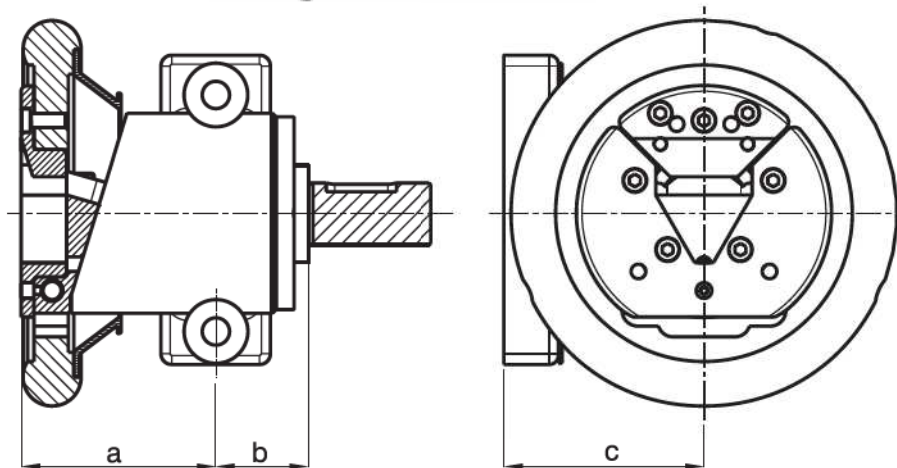
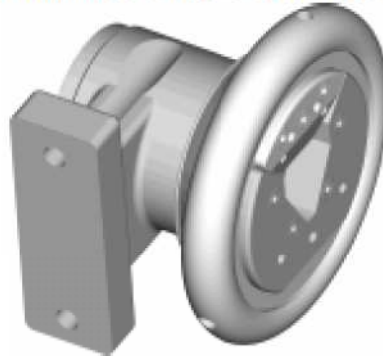
The bottom of the housing is 1-1.5 mm behind the hand wheel. Check to see that the housing is not worn at this location.

When installing new replacement VT inserts, the holes have to be reamed again.



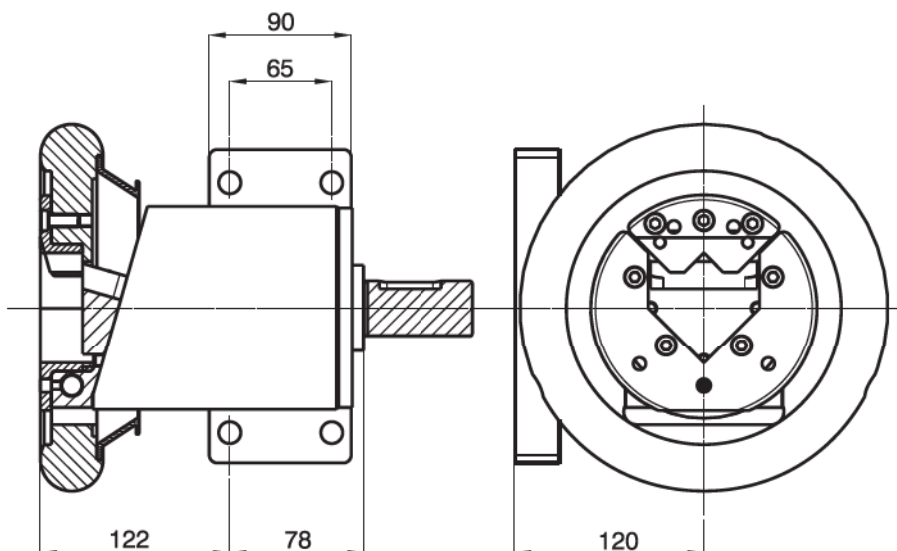
## 5.40 Foot mounted chucks for 90° Mounting

Foot mounted chucks to fix at a vertical frame



Type 22-30 / 30-40

	a	b	c
<b>ST 22 - 30</b>	92	40	85
<b>ST 30 - 40</b>	107	45	110

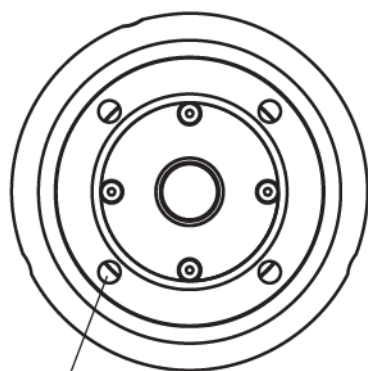
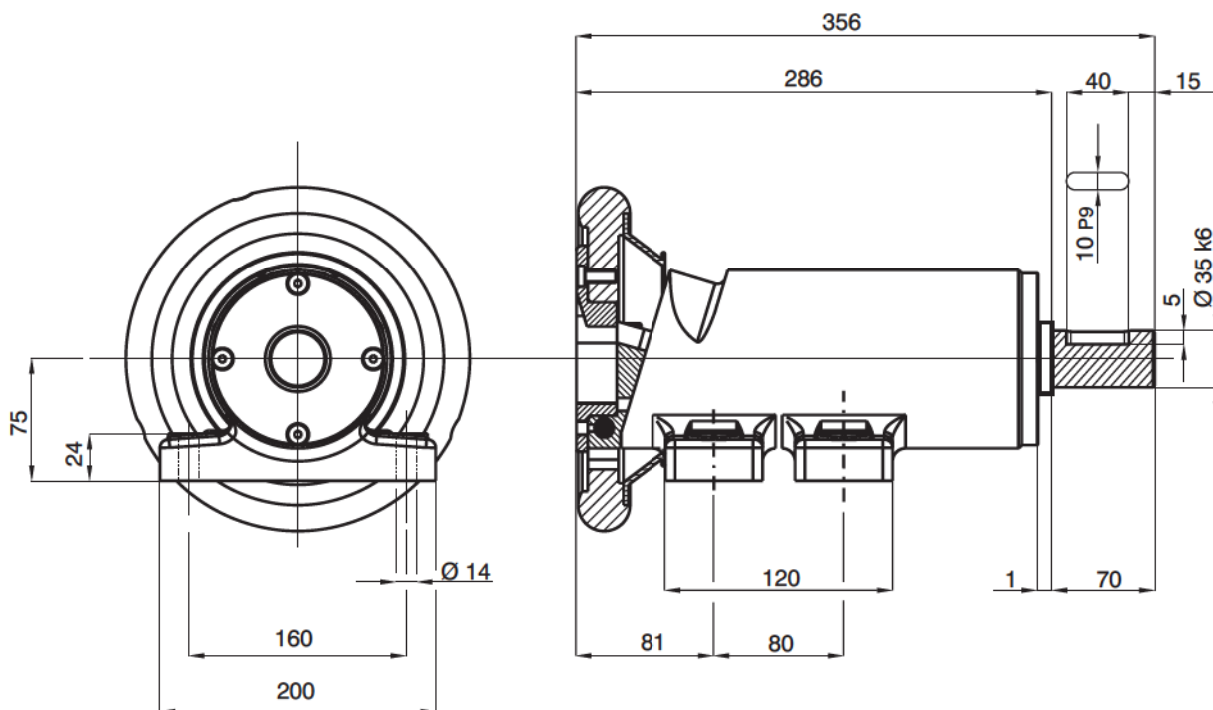


Type 40-50

Other dimensions as standard chucks

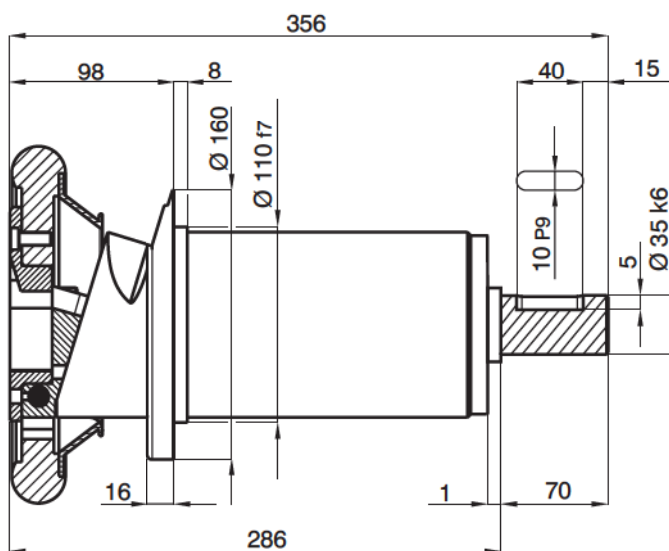
above showed chuck = 90° turned right

# Flange and foot mounted chuck Extended Chucks type 30 - 40



TK Ø 135 4 x Ø 13

TK = bolt hole circle



Beam weight max.:

max. 2000 kg (max. 4410 lbs)

Square bar:

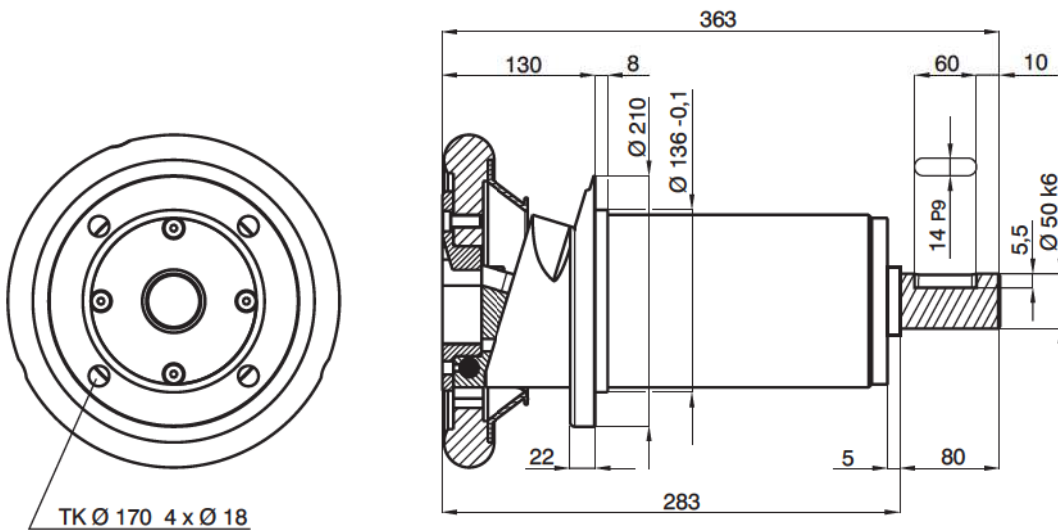
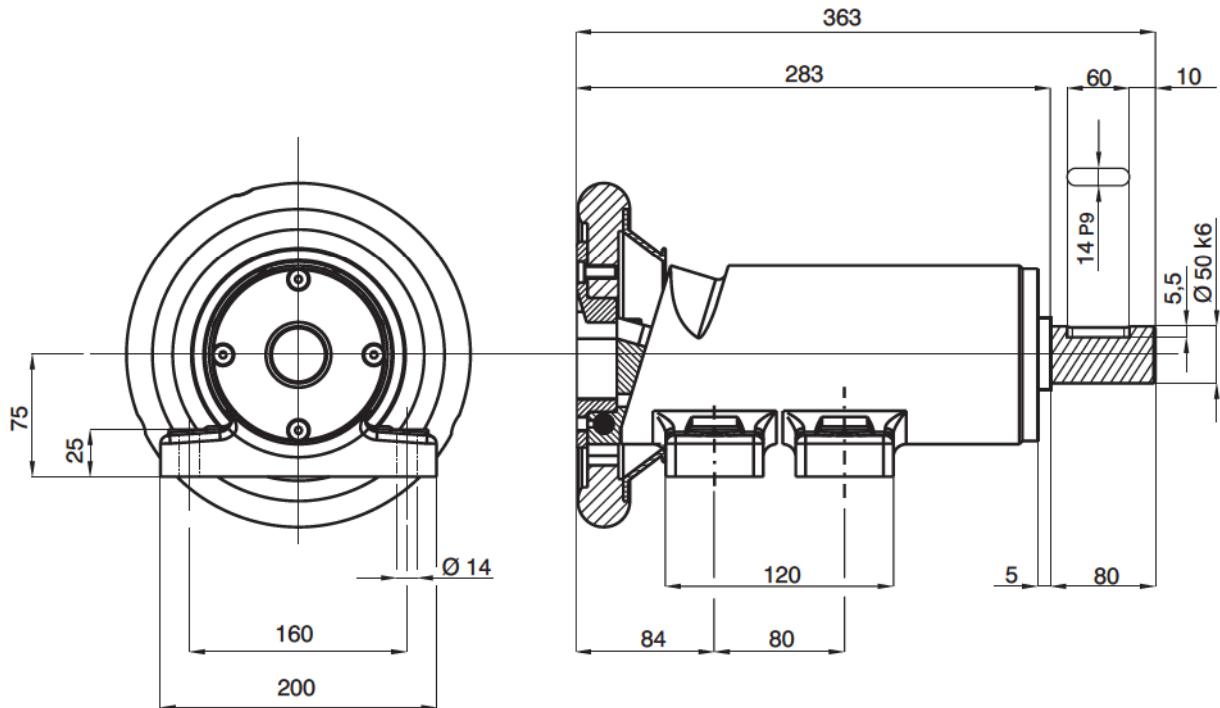
30 mm - 40 mm (1.1811" - 1.5748")

Torque:

300 Nm (220 ft/lb)

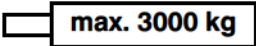


Standard dimension see chapter 2.30

# Flange and foot mounted chuck Extended Chucks type 40 - 50



TK  $\varnothing$  170 4 x  $\varnothing$  18

TK = bolt hole circle

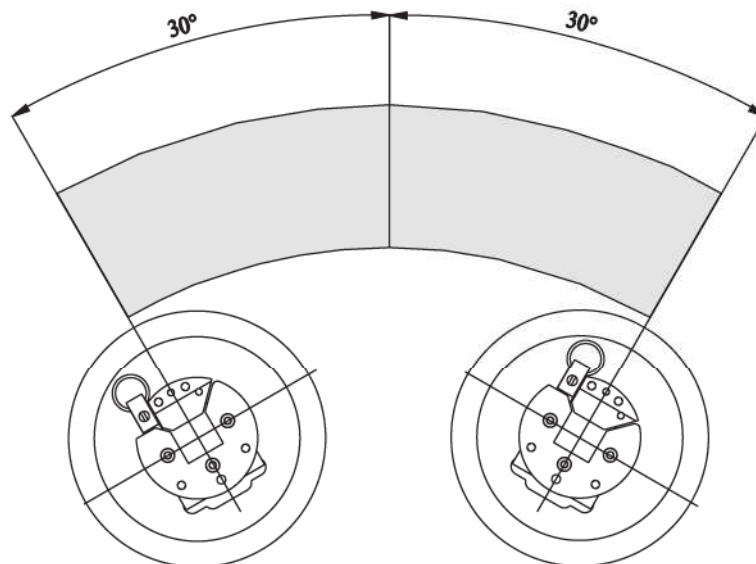
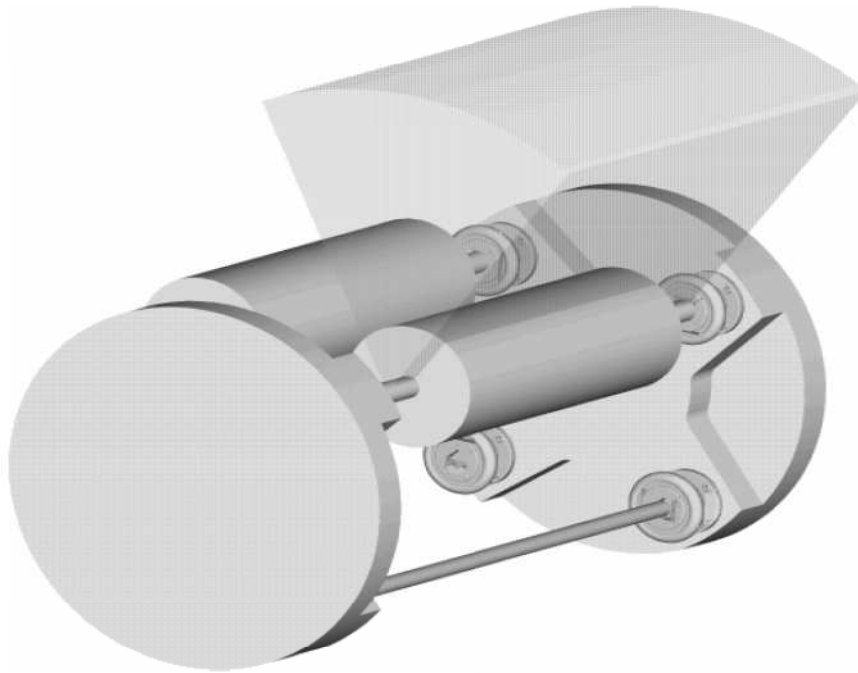
Beam weight max.:  max. 3000 kg (max. 6610 lbs)  
 Square bar:  40 mm - 50 mm (1.5748" - 1.9685")  
 Torque:  1000 Nm (720 ft/lb)

Standard dimension see chapter 2.40

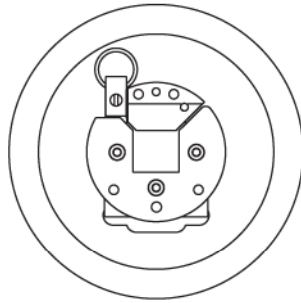
## Extended opening angle



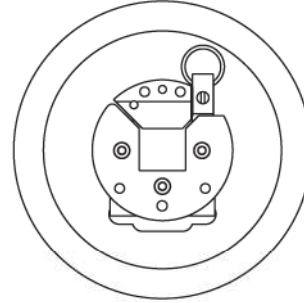
We provide chucks with extended opening angle especially for turret winders, because it allows easy exchange of the beam even when the chuck is not in exact vertical position for loading.



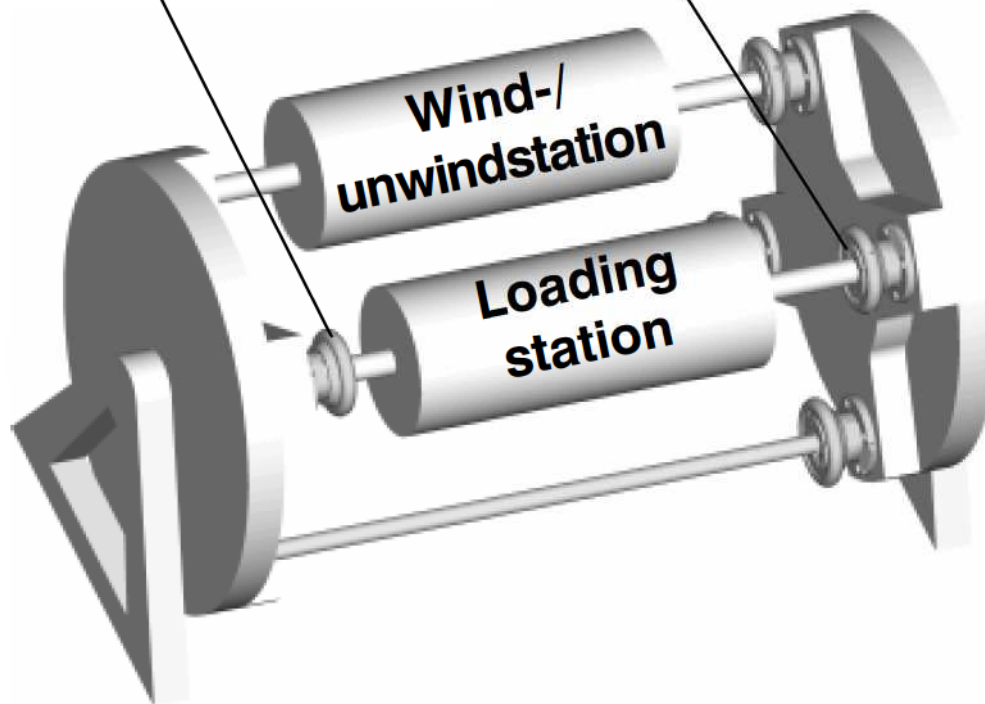
Optional opening angle to both sides up to max. 30°.



Handwheel lock type left

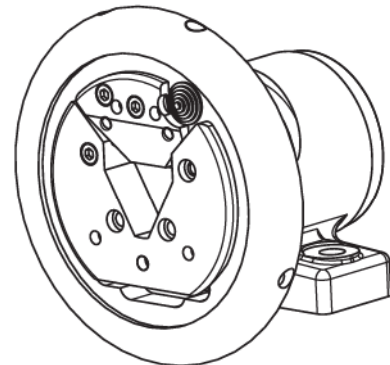
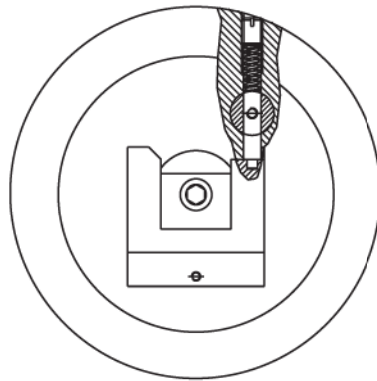
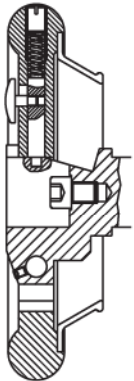


Handwheel lock type right

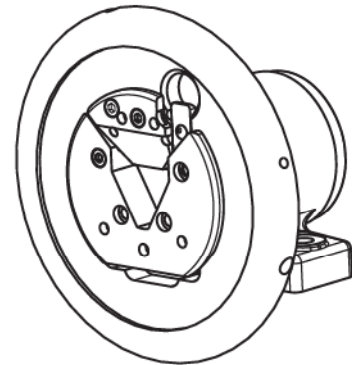
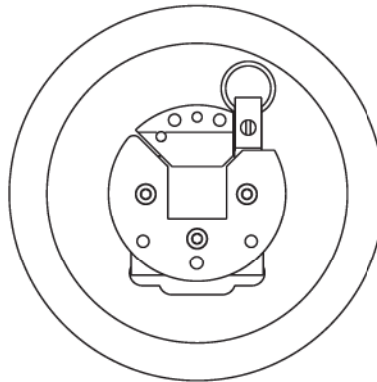
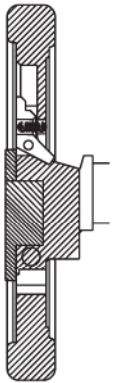


Normally the face cam on the housing prevents an opening of the handwheel. On a turret winder, the safety chucks are in normal position, when they are in the loading position. For wind or unwind the chucks are turned 180° and now work upside down. In that position, the security of the face cam apex is only partly in order. Therefore we recommend a handwheel lock.

# Handwheel lock



Handwheel lock type I  
only type 22-30

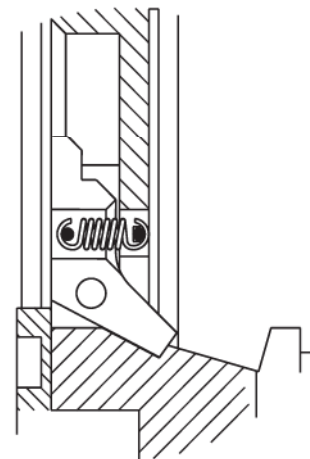


Handwheel lock type II

The handwheel lock type II is a very solid design.

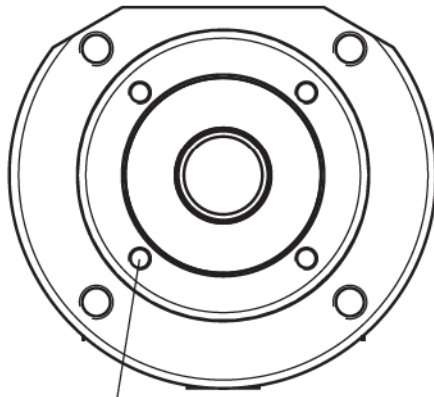
On using the handwheel lock type II on type 30-40 and 40-50 the handwheel-Ø will be 250 mm.

In case of order note: The position of the lock (left or right) is necessary.



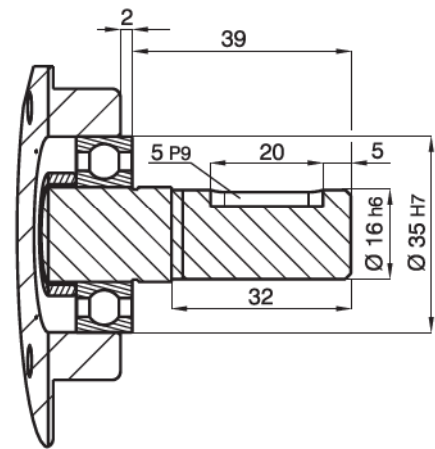
## 5.50 Shaft ends ESB Mini/19-25

### shaft end Mini



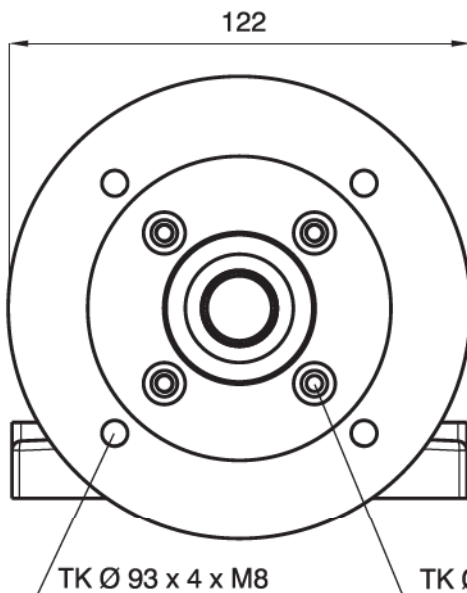
TK  $\varnothing$  42 x 4 x M4

TK = bolt hole circle



On using brakes and clutches TK is  $\varnothing$  42 x 4 x M5

### shaft end 19-25

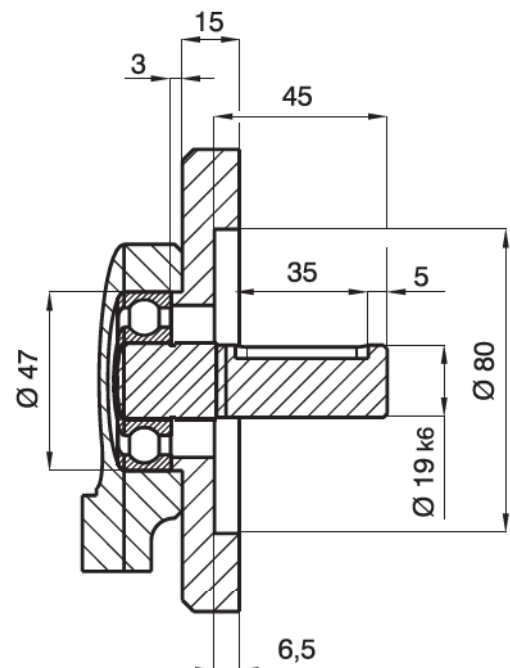


TK  $\varnothing$  93 x 4 x M8

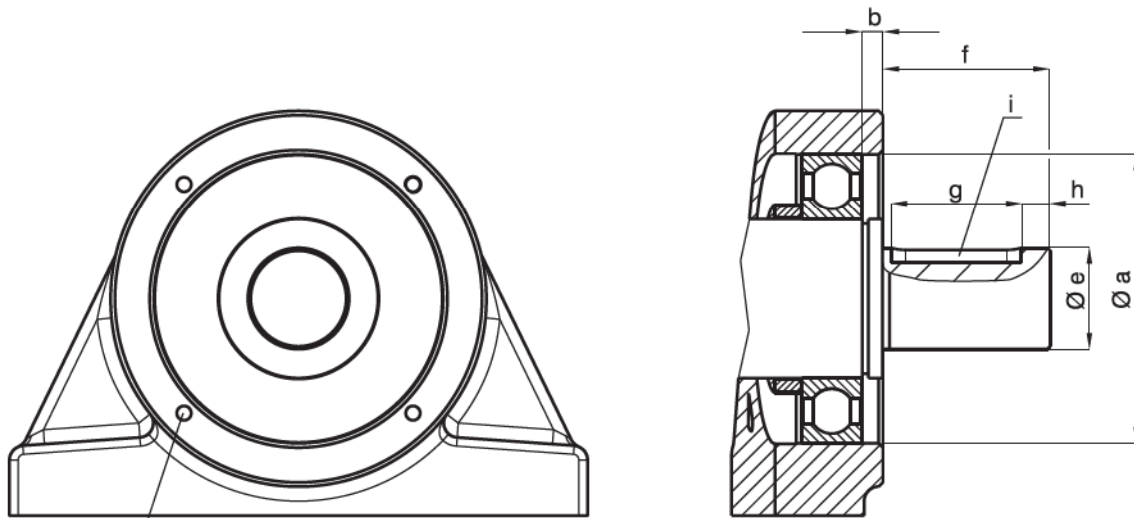
TK  $\varnothing$  56

TK = bolt hole circle

housing: 4 x M6  
adapter flange: 4 x  $\varnothing$  6.6



## shaft end ESB



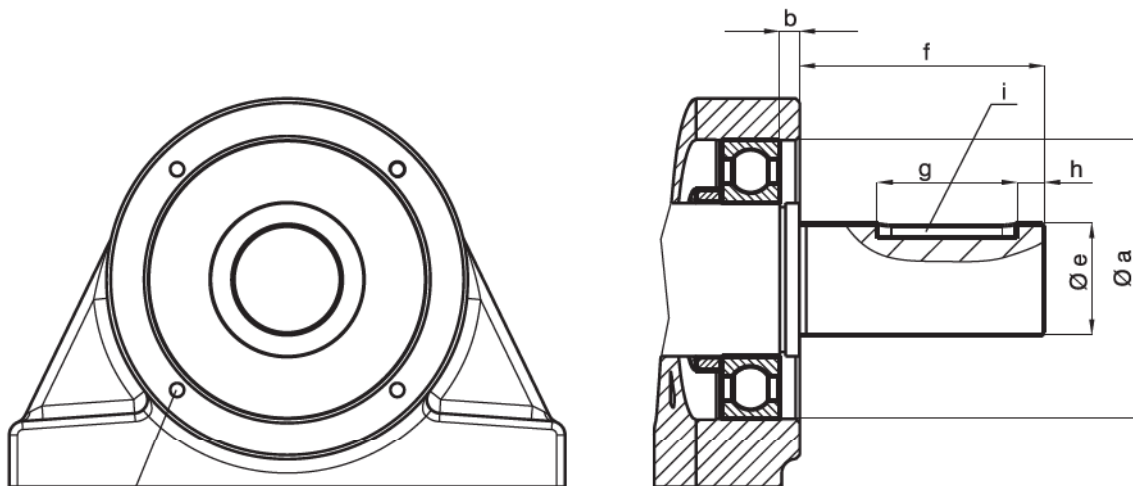
TK Ø c x 4 x d

TK = bolt hole circle

	Ø a	b	Ø c	d	Ø e f7	f	g	h	i P9
22 - 30	62	2	73.5	M6	28	39.5	30	3	8
30 - 40	80	5	93	M6	35	40	32	4	10
40 - 50	100	7.5	112	M6	45	58	45	8	14

On using brakes and clutches d = M8

## shaft end ESB i



TK Ø c x 4 x d

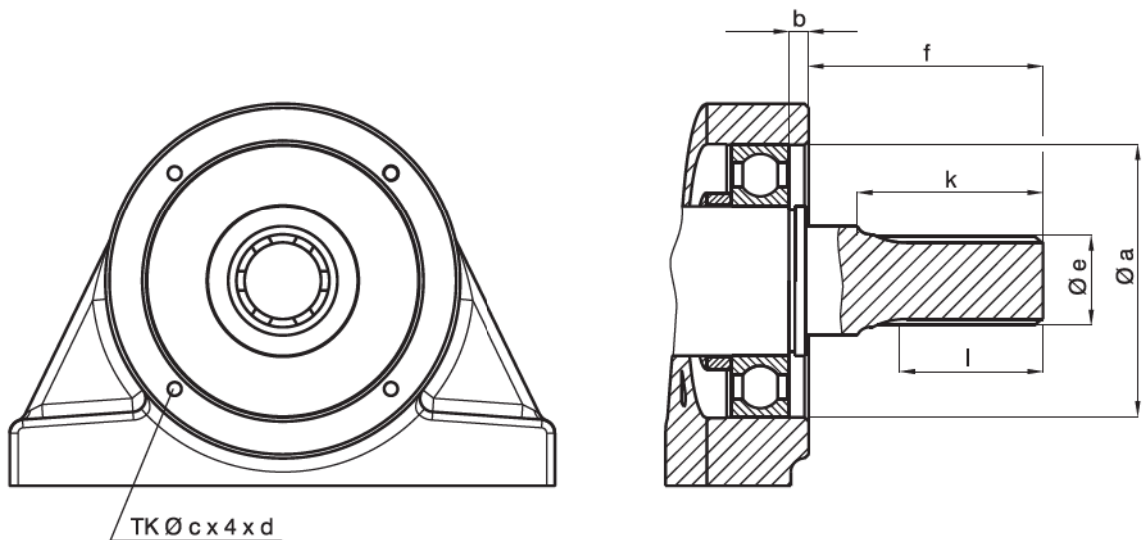
TK = bolt hole circle

	Ø a	b	Ø c	d	Ø e f7	f	g	h	i P9
30 - 40	80	5	93	M6	40	84.5	50	5	12
40 - 50	100	7.5	112	M6	40	84.5	50	5	12

On using brakes and clutches d = M8



## shaft end DSB



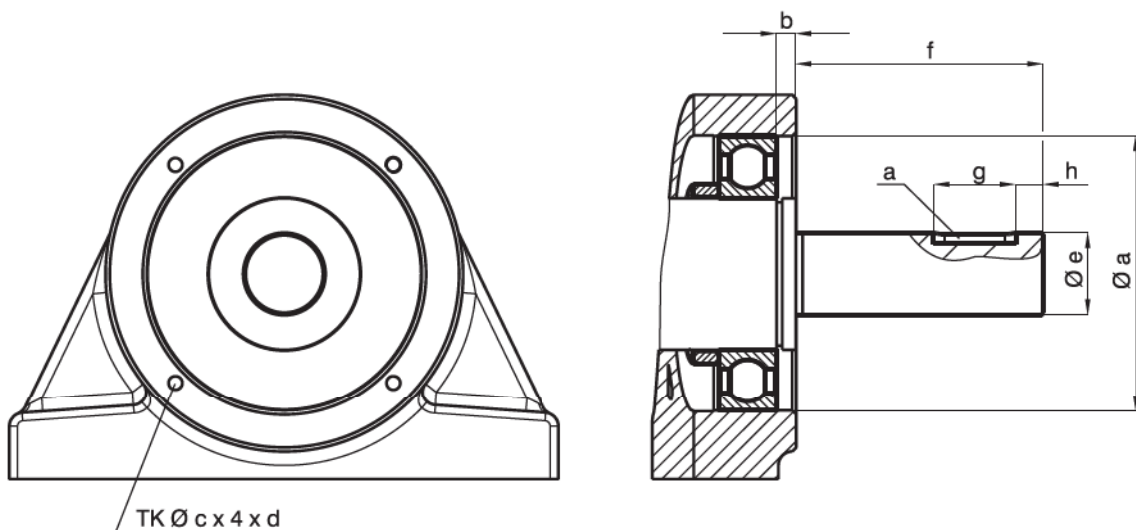
TK = bolt hole circle

	$\varnothing a$	b	$\varnothing c$	d	f	k	l
30 - 40	80	5	93	M6	89	68	50
40 - 50	100	7.5	112	M6	85.5	68	50
50 - 80	140	7.5	154	M6	87	68	50

$\varnothing e$  = spline shaft 6 x 28 x 34 DIN 5463

On using brakes and clutches d = M8

## shaft end RU

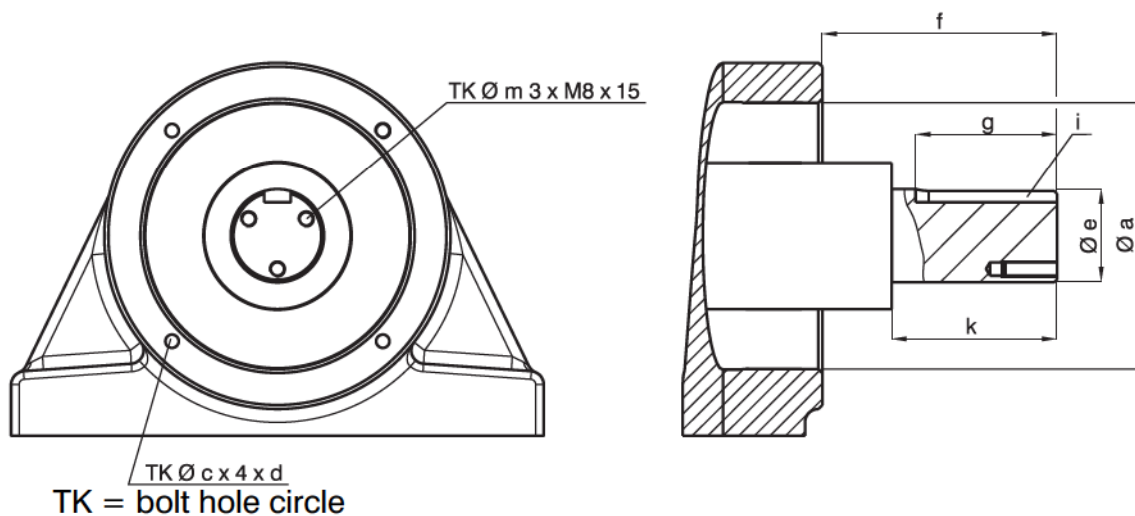


TK = bolt hole circle

	$\varnothing a$	b	$\varnothing c$	d	$\varnothing e$ h7	f	g	h	i P9
22 - 30	62	2	73.5	M6	30	93.5	30	5	8
30 - 40	80	5	93	M6	30	90	30	5	8
40 - 50	100	7.5	112	M6	30	88	30	5	8

On using brakes and clutches d = M8

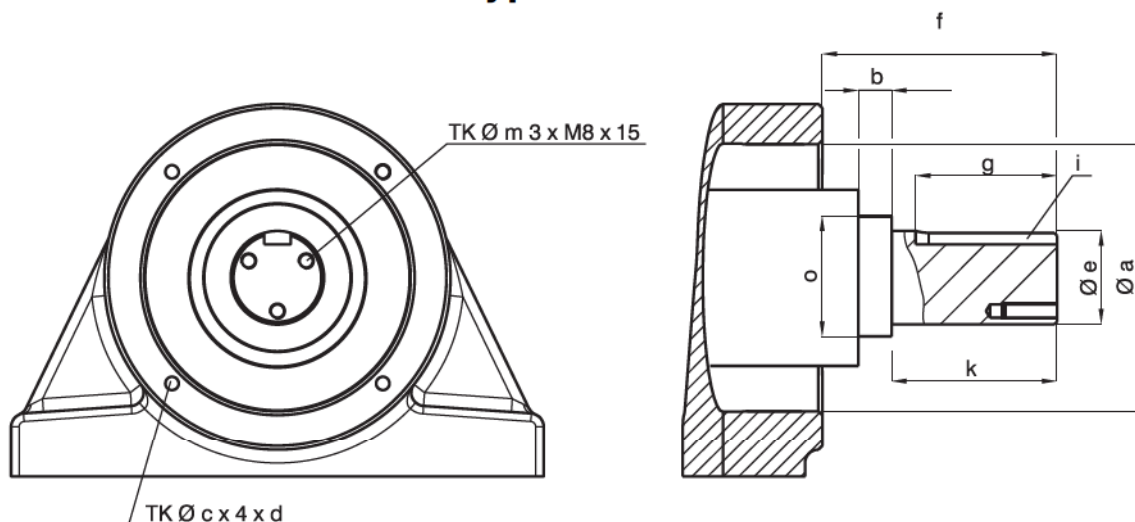
## shaft end HRU 1,5 kW type 30-40



	$\varnothing$ a	b	$\varnothing$ c	d	$\varnothing$ e j6	f	g	i P9	k	m
<b>30 - 40</b>	80	7.5	96	M6	35	98	52	10	62	25

On using brakes and clutches d = M8

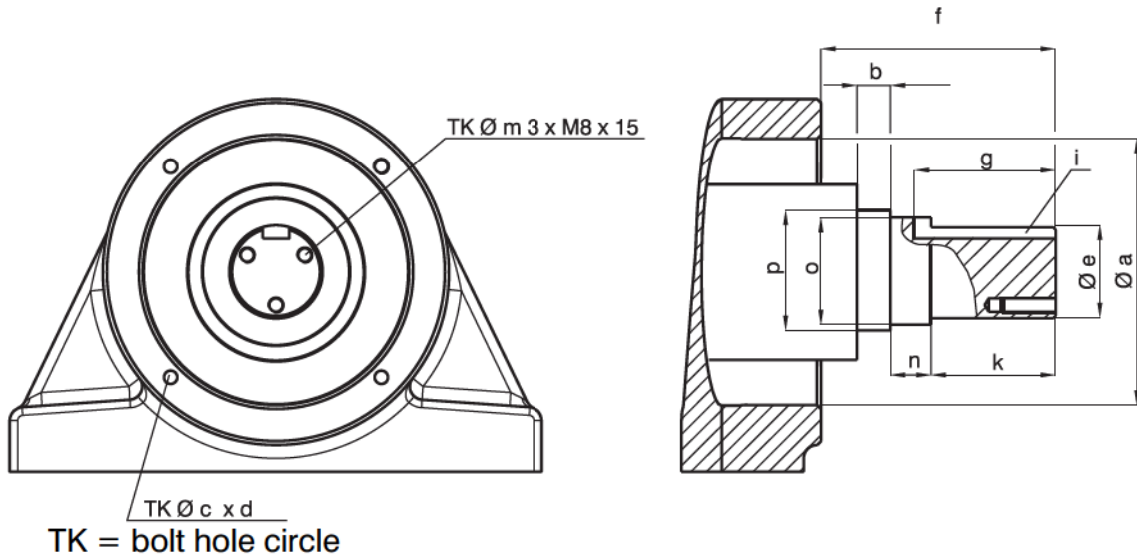
## shaft end HRU 1,5 kW type 30-40



	$\varnothing$ a	b	$\varnothing$ c	d	$\varnothing$ e j6	f	g	i P9	k	m	o
<b>40 - 50</b>	100	10	112	M6	35	98	52	10	62	25	40

On using brakes and clutches d = M8

## shaft end HRU 3 kW type 40-50/50-80



	Ø a	b	Ø c	d	Ø e j6	f	g	i P9	k	m	n	o	p
<b>40 - 50</b>	100	6	112	4 x M6	42	102.7	56	12	50	30	18.7	45j6	50
<b>50 - 80</b>	140	21.5	154	6 x M8	50	149	64	14	56	34	44	55k6	60

On using brakes and clutches d = M8

## 5.60 Trouble shooting



Error description	Possible faults
It is difficult to open and close the hand wheel	<ul style="list-style-type: none"> <li>- The journal was not made to specification as shown on catalogue page 2.10</li> <li>- The journal tolerance is incorrect</li> <li>- There is no chamfer on the ends of the roll shaft</li> <li>- The Safety Chucks are not in alignment</li> <li>- The roll shaft is deflecting and bending up in the seat of the Safety Chuck. The seats of the Safety chucks have been rounded by wear and the roll shaft journals are cocked in the seats causing binding.</li> </ul>
Unloaded roll shaft is difficult to rotate when in the Safety Chucks	<ul style="list-style-type: none"> <li>- The journal tolerance is incorrect</li> <li>- The safety Chucks are not in alignment</li> <li>- The roll shaft journals are out of alignment with each other</li> </ul>
The roll shaft is difficult to install or remove from the Safety Chucks. The roll shaft is stuck in the seat of the Safety Chucks	<ul style="list-style-type: none"> <li>- The journal tolerance is incorrect</li> <li>- The safety Chucks are not in alignment</li> <li>- Not enough tolerance between the overall length of the roll shaft and the distance between the Safety Chuck</li> <li>- The seats of the Safety Chucks have been rounded by wear and the roll shaft journals are cocked in the seats causing binding</li> </ul>
The journal is worn. The seat of the Safety Chuck is worn.	<ul style="list-style-type: none"> <li>- Excessive weight and/or excessive torque</li> <li>- Limitations to VT2 insert not complied with</li> <li>- Overload of the chuck</li> <li>- The hardness of the journal and the hardness of the seat of the Safety Chuck are not compatible</li> <li>- The safety Chucks are not in alignment</li> </ul>
Noisy operation	<ul style="list-style-type: none"> <li>- The mounting surfaces for the Safety Chucks are not level or are misaligned</li> <li>- The roll shaft journal is falling inside the seat of the Safety Chuck</li> <li>- There is tramp material caught between the hand wheel and the housing</li> </ul>

Error description	Possible faults
<p>Empty Safety Chucks are difficult to rotate by hand</p>	<ul style="list-style-type: none"> <li>- The ball bearings are worn out</li> <li>- A drive or brake is engaged on Safety Chucks</li> <li>- The hinge pin is bent inside the hand wheel (see page 5.05 item 5.3)</li> </ul>
<p>The handwheel opens during operation. There is black powder around the housing. There is a groove in the back side of the handwheel. The bottom of housing, at the front side, has been worn away</p> <p><b>Warning: This is a dangerous situation</b></p>	<ul style="list-style-type: none"> <li>- The spring and ball in the detent system is damaged or destroyed</li> <li>- Too much tolerance between the overall length of the roll shaft and the distance between the Safety Chucks</li> <li>- Worn roll shaft journals. The load bearing foot print of the roll is no longer seated in the bottom of the seat. It is hanging at the front of the seat where the seat meets the face of the Safety Chuck. It tries to open the Safety Chuck.</li> <li>- Deflecting roll shaft journal. It has the same effect on the Safety Chuck as the worn roll shaft journal.</li> </ul>

## 6.00 Brake schedule



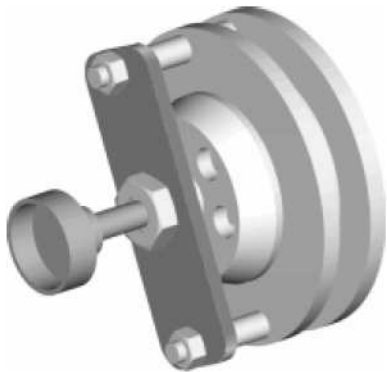
	Mini	ESB	ESB i	DSB	Performance	Performance 200
VT-/C-Chuck	Nm (ft/lb)	Nm (ft/lb)	Nm (ft/lb)	Nm (ft/lb)	Nm (ft/lb)	Nm (ft/lb)
<b>Mini</b>	30 (22)					
<b>19-25</b>		40/90 (29/65)				50 (36)
<b>22-30</b>		40/90 (29/65)				50 (36)
<b>30-40</b>		40/90 (29/65)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	50 (36)
<b>40-50</b>		50/110 (36/80)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	50 (36)
<b>50-80</b>				200/440 (140/320)	300/500 (220/360)	
<b>Sliding-Chuck</b>						
<b>22-30</b>		40/90 (29/65)				
<b>30-40</b>		40/90 (29/65)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	
<b>40-50</b>		50/110 (36/80)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	
<b>Series A</b>						
<b>A40</b>		40/90 (29/65)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	
<b>A50</b>		50/110 (36/80)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	
<b>A80</b>				200/440 (140/320)	300/500 (220/360)	
<b>Series P</b>						
<b>P40</b>		40/90 (29/65)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	
<b>P50</b>		50/110 (36/80)	50/110 (36/80)	200/440 (140/320)	300/500 (220/360)	

max. brake torque

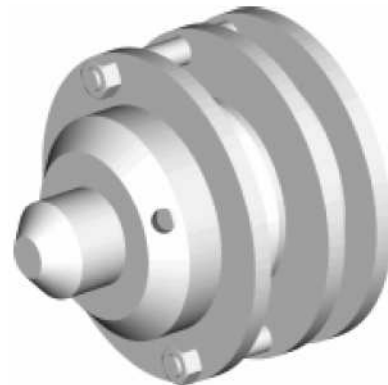
	MULTI 500	MULTI 1500	MULTI 3000
<b>type 22-30 - 50-80 A-/P-chuck, sliding chuck</b>			
brake torque Nm (ft/lb) per calliper	50 (36)	80 (58)	120 (87)
brake torque with max. no. of callipers Nm (ft/lb)	300 (220)	640 (460)	1200 (870)



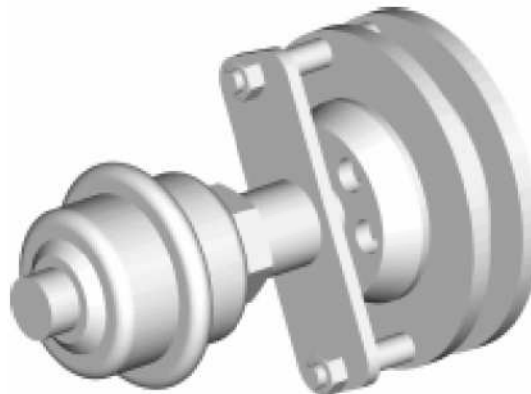
## 6.10 Single disc brake type ESB mini



Single disc brake manual



Single disc brake pneumatic



Single disc brake with membrane cylinder I for sensitive control

	ESB mini manual	ESB mini pneumatic	ESB mini membrane I
<b>type mini</b>			
performance kW (h.p.)	0.1 (0.075)	0.1 (0.075)	0.1 (0.075)
min. brake torque Nm (ft/lb)	1 (0.72)	3 (2.17)	2 (1.45)
max. brake torque Nm (ft/lb)	30 (22)	30 (22)	30 (22)

Form for calculation and enquiries see chapter 9.00