

# Operating Instructions for Disk-Type Tool Turret

0.5.480.516 -

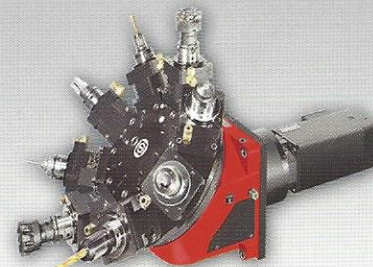
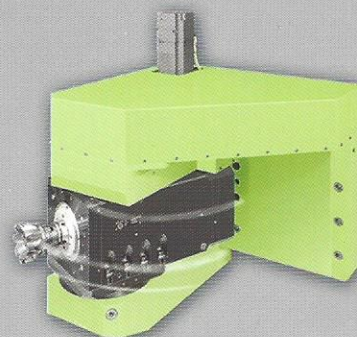
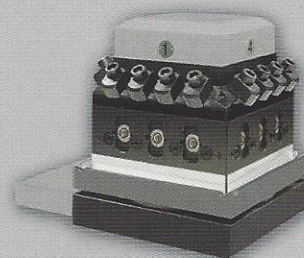
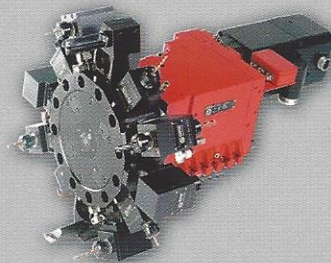
088 632	105 232	111 072
089 768	105 288	115 891
089 778	105 652	116 896
089 782	110 762	

**Sauter Feinmechanik GmbH**  
Carl-Zeiss-Str. 7  
D-72555 Metzingen / GERMANY

Postfach 1551  
D-72545 Metzingen / GERMANY

Tel. + 49 (0) 71 23 / 9 26-0  
Fax Service 71 23 / 9 26-1 93  
service@sauter-feinmechanik.com

[www.sauter-feinmechanik.com](http://www.sauter-feinmechanik.com)



# SAUTER

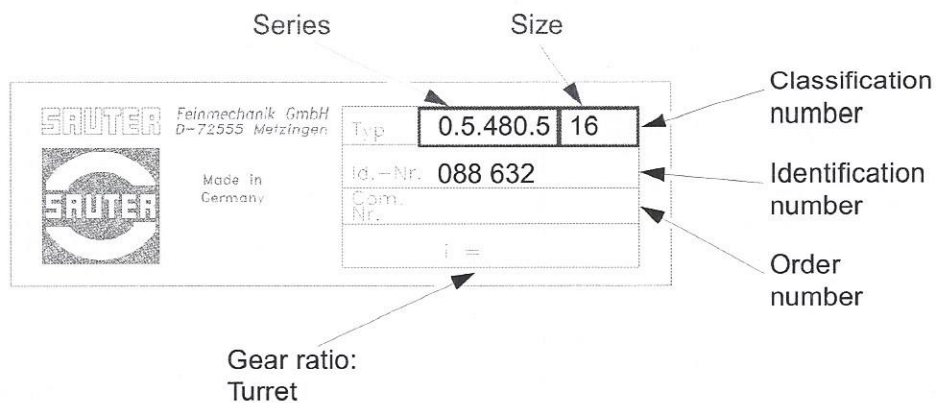


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088 632	105 232	111 072
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### Type plate on turret housing





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Diagram of functions: Disk-type tool turret 0.5.480 8/10 positions ..... SK - 920 e  
Wiring diagram: Disk-type tool turret ..... EP - 870 e

## Interpretation of symbols

### Warning notes



#### **WARNING** <sup>1)</sup>

This warning designates a potentially hazardous situation which may lead to serious injuries, or even death.



#### **WARNING** <sup>1)</sup>

Risk of electric shock due to high voltages!



#### **CAUTION** <sup>1)</sup>

This caution designates a potentially hazardous situation in which the product or property in its environment could be damaged.



#### **IMPORTANT**

For application notes and other useful information.



#### **Clearing**

Clear machine before carrying out any further work!

### Symbols for action instructions

- Designates an action instruction
- ⇨ Designates the result of an action
- Designates a cross-reference

Tools required: here, hexagonal pin wrench complete with T grip



Use M10 bolts, quality 12.9; use MoS<sub>2</sub> to lubricate the points marked, tightening torque 70 Nm.

M10 - 12.9



MoS<sub>2</sub>



70 Nm

### Abbreviations

max.	maximum
perm.	permissible
Fig.	figure
if nec.	if necessary
approx.	approximately
acc.	according (to)
incl.	inclusive (of)



## 1 Safety notes

The turret corresponds to the state of the art and the recognized technical safety rules. Nevertheless hazards and risks can occur.

### 1.1 Use within specifications

Operate turret only in perfect condition and in compliance with the Operating Instructions.  
Install and operate turret only in machines complying with the relevant regulations for workspace protection.

### 1.2 Required skills

Only trained and competent personnel may work on the turret; this personnel must have been instructed in accordance with the Operating Instructions and directly on the turret.



#### **WARNING**

Risk of personal injury or machine damage.  
All work on the electrical system is to be carried out by a competent electrical engineer <sup>1)</sup> only! Observe service and maintenance intervals for electrical lines at all times!

### 1.3 Notes on product-specific risks

Setting tasks require a 24V DC power supply.



#### **Clearing required prior to any work:**

- Switch the machine off.
- Push the motor protection switch for the turret into the OFF position.

1) According to DIN 31000: A competent **specialist person** is, whoever "... - due to his specialist training, knowledge and experience as well as knowledge of the relevant regulations - is in a position to evaluate the tasks assigned to him and able to recognize any potential dangers."



**WARNING**

In the event of a fault or a collision, unexpected rotation of the tool disk is possible.  
Injury hazard.



**CAUTION**

Do not attempt any further switching operations, if the turret is damaged, as otherwise considerable consequential damage may be caused.

- Call SAUTER Service.



**CAUTION**

Functional faults may be caused by an ingress of chips and contamination.

- Close open tool locations and cooling lubricant bores by means of suitable closing plugs.

For manual operation, turn the motor shaft with the help of a hexagonal pin wrench, complete with T-grip.



**WARNING**

A reversal of the moment of the motor results in the acceleration of the motor shaft. The hexagonal pin wrench may thus be unexpectedly accelerated.

Therefore, in order to avoid the ejection of the hexagonal pin wrench and resulting injuries, firmly grip the hexagonal pin wrench.

**1.4**

**Disposal**

- Comply with all national and regional disposal regulations and laws.

## 1.5 Liability and warranty

The information contained in these Operating Instructions is in conformity with the knowledge at the point of printing. Subject to modifications which occur within the framework of continuous further development.

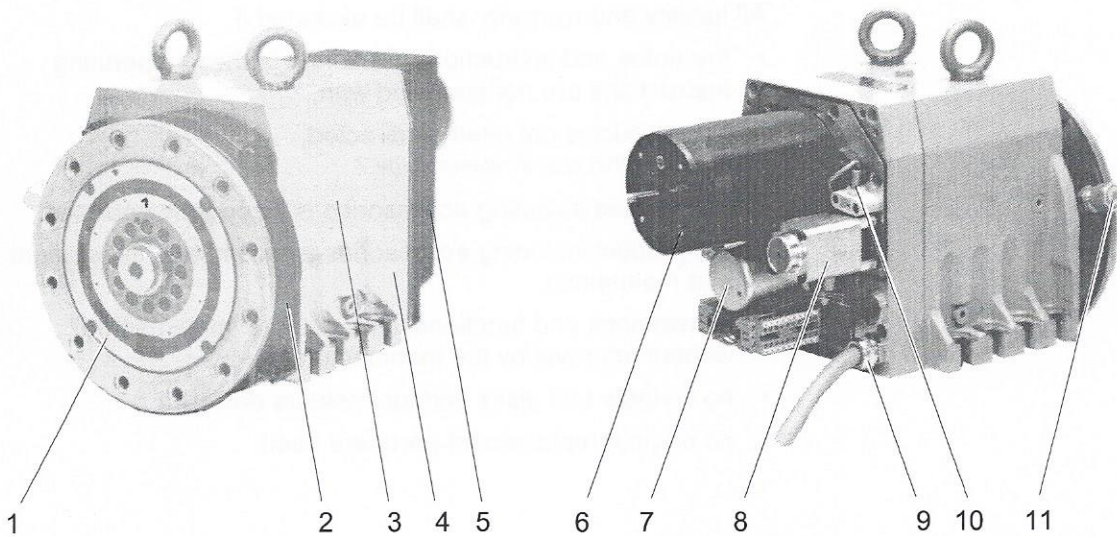
All liability and warranty shall be excluded if

- the notes and instructions contained in these Operating Instructions are not complied with,
- the product is not used as directed,  
→ *Use within specifications, page 7*
- the product including accessories is incorrectly operated,
- the product including accessories is incompetently repaired and maintained,
- conversions and functional changes are implemented without approval by the manufacturer,
- no suitable tool disks and tool holders are used,
- no original replacement parts are used.



## 2 Product description

### 2.1 Designation of parts



- 1 Locating disk
- 2 Cooling lubricant valve
- 3 Turret housing
- 4 Bedding plate
- 5 Covering hood for electric components
- 6 Turret motor
- 7 Angular encoder
- 8 Solenoid
- 9 Electric supply
- 10 Proximity switch S7  
"Check pre-indexation"
- 11 Cooling lubricant connection

## 2.2 Technical data

Series 0.5.480.5..

Size 16

Number of indexing positions		8 or 12 or 16
Perm. tangential torque <sup>1)</sup> (turret locked) at calculated safety	Nm	1,250 1.3
Perm. mass moment of inertia of tool disk, tool holders, and tools	kgm <sup>2</sup>	0.6 – 3.2 <sup>2)</sup>
Perm. unbalance (load moment) caused by tool holders and tools	Nm	32
Indexing times <sup>2)</sup> Theoretical cycle time (unlock/turn/lock) at rotating angle $\alpha$ [degrees]	s	$i \times \frac{41 + \alpha}{n} \times 0.17 + 0.1$
Gear ratio	i	see turret type plate
Motor speed	n rpm	see motor rating plate
Perm. indexing frequency	min <sup>-1</sup>	12.5 – 7 <sup>2)</sup>
Operating voltage/mains frequency		see motor rating plate
Degree of protection		IP 65
Turret mass (without tool disk)	kg	approx. 46
Maximum mass of the tool disk inclusive of tool holders and tools	kg	80
Maximum mass of the tool holders and tools fitted <sup>3)</sup>	kg	32
Perm. ambient temperature range	°C °F	+10 ... +40 +50 ... +104
Operating pressure for cooling lubricant <sup>4)</sup> Cooling lubricant valve – standard version constant supply	bar	7
externally switched supply	bar	14
Medium pressure valve (option)	bar	25

1) The perm. loads refer to processing without load shocks. Whenever processing is subject to intermittent cuts, shocks or impacts, a significantly reduction in the values needs to be taken into account.

2) Depending on gear ratio and mains frequency

3) For standard tool disks

4) In order to achieve an extended service life of the cooling lubricant valve, it is advisable to filter the cooling lubricant by  $\leq 100\mu\text{m}$ . Post-connected loads (spindle units with internal cooling lubricant guide a.o.) may require a higher degree of filter fineness. Note and comply with the manufacturer's instructions!

### 3 Manual mode

In manual mode, the mechanical functions of the disk-type tool turret will be checked:

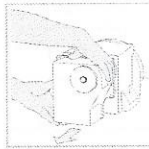
- following initial assembly to the machine
- during troubleshooting
- after a renewed setup following fault conditions



#### Clearing required prior to any work:

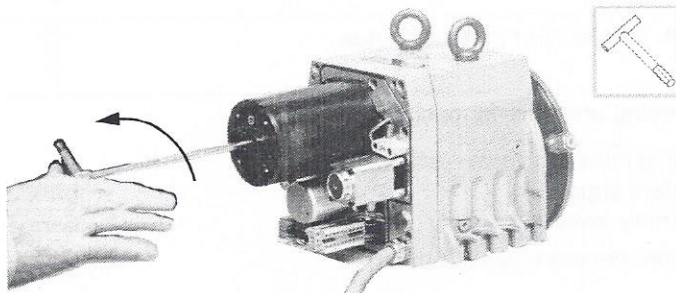
- Switch the machine off.
- Push the motor protection switch for the turret into the OFF position.

1. Undo fixing screws of covering hood, withdraw covering hood to rear. If necessary, use push-off screw.



2. Remove screw plug on motor housing.

#### Unlock turret



3. Use a hexagonal pin wrench, complete **with T-grip**, to rotate the motor shaft.
  - ⇨ If the disk-type tool turret is locked, the locating disk (or tool disk) does not co-rotate; the centre position of the lock can be felt.



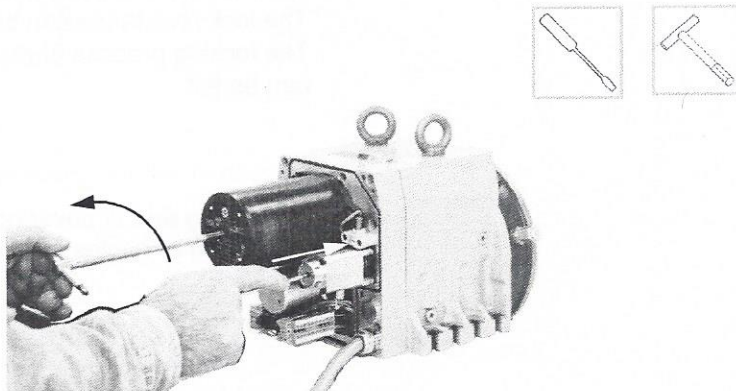


### WARNING

A reversal of the moment of the motor results in the acceleration of the motor shaft. The hexagonal pin wrench may thus be unexpectedly accelerated. Therefore, in order to avoid the ejection of the hexagonal pin wrench and resulting injuries, firmly grip the hexagonal pin wrench.

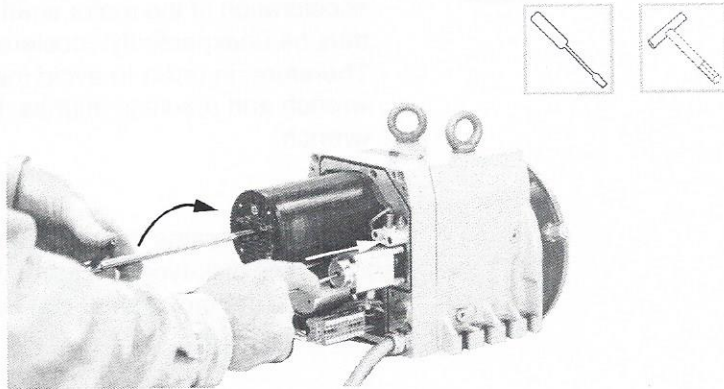
4. Keep the same direction of rotation, continue to rotate.
  - ⇒ The disk-type tool turret unlocks; a reversal of the moment on the motor shaft can be felt.

### Rotate tool disk



5. Keep direction of rotation, continue to rotate disk until locating disk (or tool disk) starts to turn as well.
6. Keep direction of rotation, continue to rotate disk until locating disk (or tool disk) has reached the position required, then press in the keeper by means of a screwdriver.
  - ⇒ The preindexing bolt engages into a hole.
  - ⇒ The tool disk cannot be rotated any further.

## Lock turret



- Reverse direction of rotation on the motor shaft whilst simultaneously pressing in keeper.
  - ⇒ The disk-type tool turret locks.  
The lock resistance can be felt when rotation is continued.  
The locking process ends, if the centre position of the lock can be felt.

On completion of setup or maintenance work:

- Screw in plug and fit covering hood.  
Note position of cables in order to avoid any pinching of the same.

## Lock turret in position 1



### IMPORTANT

For some setup and maintenance work the disk-type tool turret has to be locked in position 1.

#### Precondition

- Numeral 1 of the locating disk has reached its 12 o'clock position relative to the turret base area.  
or
- Position 1 of the tool disk is in working position.

- Use a hexagonal pin wrench, complete **with T-grip**, and rotate the motor shaft until position 1 has been reached.
- Press in the keeper by means of a screwdriver and rotate the motor shaft until the disk-type tool turret locks (see above).

## 4 Maintenance

Turret maintenance comprises the following tasks:

- \* Cleaning,
- \* Checking,
- \* Setting and
- \* Repair.

### 4.1 Safety notes

→ Page 7

### 4.2 Service intervals

Plan your tasks carefully in order to provide for troublefree operation and reduce necessary downtimes to a minimum.

The service life of the turret is approx. 2–3 million switchings. This value applies to collision-free operation in compliance with the specified operating conditions and the permissible loads.

→ Technical data, page 11

after 4,000 hours of operation	
Check cooling lubricant valve for wear and leakage. Replace any defective parts. → Page 22	User
Check oil of the turret gearbox chamber; if necessary, replenish oil. → Page 17	User

after 2½ years	
Check all electrical lines and connections for mechanical damage as well as embrittlement. Replace any defective parts.	User Specialist electrical engineer <sup>1)</sup>

1) According to DIN 31000: A competent **specialist person** is, whoever "... - due to his specialist training, knowledge and experience as well as knowledge of the relevant regulations - is in a position to evaluate the tasks assigned to him and able to recognize any potential dangers."

**Maintenance**

<b>after 8,000 hours of operation</b>	
Change the oil of the turret gearbox chamber. → Page 17	User

<b>after approx. 2–3 million switchings</b>	
The service life of the turret may possibly be reached, depending on the operating conditions involved. A general overhaul is recommended for further trouble-free operation.	SAUTER Service



## 4.3 Maintenance work

### Turret gearbox chamber

The turret gearbox chamber has to be serviced after 4,000 operating hours.



#### Clearing required prior to any work:

- Switch the machine off.
- Push the motor protection switch for the turret into the OFF position.

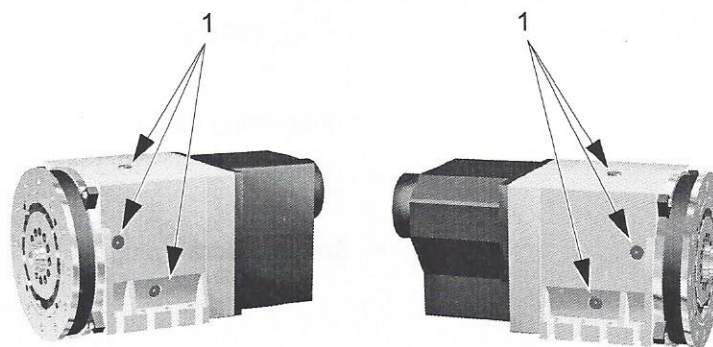


#### IMPORTANT

Improperly disposed used oil is a danger for our environment.

- Pay attention to the legal regulations for the waste disposal of used oil.

In line with the **setup position** of the disk-type tool turret, the following apertures (1) for draining or replenishing oil are provided:



#### Checking the oil

- Carefully unscrew oil drain plug and drain the oil (max. 10 cm<sup>3</sup>) into a suitable container.

**Maintenance work**  
**Turret gearbox chamber**




Assess oil condition

Condition	Cause	Action
Oil black or brown, without metallic abrasion	Natural consumption	–
Oil black or brown, with metallic abrasion	Internal parts of turret are damaged	Request SAUTER Service!
Oil white, mixed with cooling lubricant	Turret sealings are damaged	
None oil left	Turret sealings are damaged	

Changing the oil

- Open oil drain plug, drain waste oil.
- Close oil drain plug.
- Remove screw plug from oil charging hole.

Fill oil



170 cm<sup>3</sup>

lubricating oil    C                    acc. to ISO 6743/6  
 viscosity            ISO VG 46                    acc. to DIN 51562

- Screw in screw plug.

#### 4.4 Repairs after fault conditions



**Clearing required prior to any work:**

- Switch the machine off.
- Push the motor protection switch for the turret into the OFF position.

Fault	Cause	Remedy	Who carries out this task?
<b>Turret</b>			
Incorrect center height, tool disk offset relative to locating disk	Collision when turret is locked	Turn back tool disk in the annular groove and align	User → Page 21
Tool disk does not rotate	Gearwheels are defective	SAUTER Service	
Turret is difficult to operate  (Thermo protection device has responded)	Insufficient oil in the gearbox chamber	Check oil	User → Page 17
	Contactors are defective	Check motor drive	User
Turret no longer locks or the pre-indexing bolt gets caught	Collision during pivoting	SAUTER Service	
Tool disk does not stop in the selected position	Angular encoder is not correctly adjusted or defective	Check angular encoder, set or replace if necessary	User → Page 23, page 25
	Proximity switch S7 does not switch	Check proximity switch S7, set or replace if necessary	User → Page 27
Tool disk stops in between two positions	Chips between tool disk and turret	Remove tool disk, remove chips	User
Leakage oil escapes	Seals are defective	SAUTER Service	

## Possible faults and remedies

Fault	Cause	Remedy	Who carries out this task?
Cooling lubricant is not being transferred	Cooling lubricant valve is defective	Replace cooling lubricant valve	User → Page 22
	Cooling lubricant valve/line is blocked	Blow cooling lubricant valve/line clear	
Cooling lubricant escapes between tool disk and turret	Cooling lubricant valve is defective	Replace cooling lubricant valve	
Tangential play of tool disk when turret is locked	Collision while turret is locked	SAUTER Service	
	Wear due to lack of oil		



SAUTER Feinmechanik GmbH  
 Postfach 1551  
 D-72545 Metzingen  
 Germany



++49 (0) 7123-926-0



++49 (0) 7123-926-193



service@sauter-feinmechanik.com



## 4.5 Aligning the tool disk

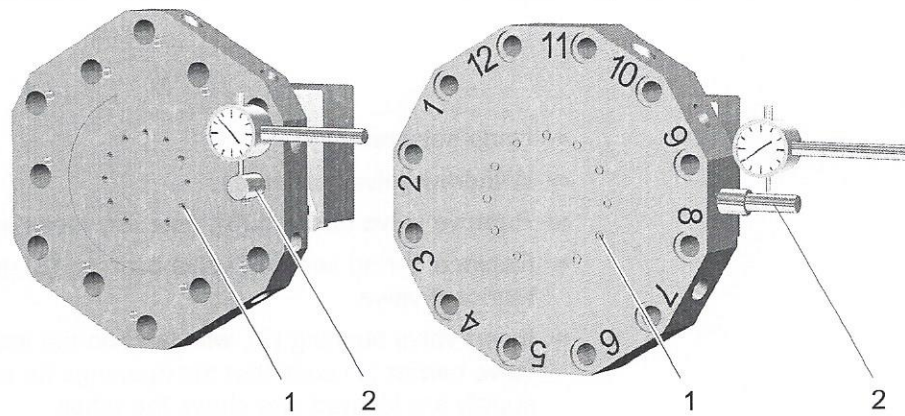
### Preparation



#### Clearing required prior to any work:

- Switch the machine off.
- Push the motor protection switch for the turret into the OFF position.
  
- Lock turret.  
→ *Manual mode, page 12*

### Aligning



- If necessary, undo screws (1).
- Align the locating hole to center height of the machine; use a plug gauge (2) if required.
- Tighten screws (1).

M8 - 12.9



MoS<sub>2</sub>



39 Nm

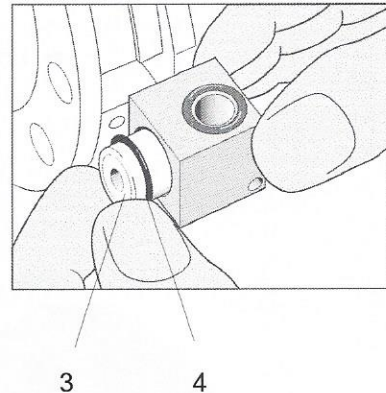
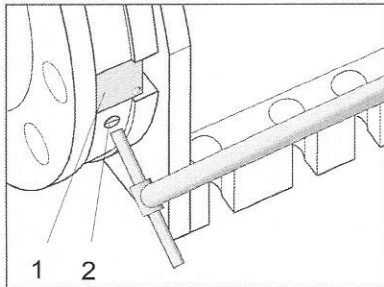
## 4.6 Replacing the cooling lubricant valve <sup>1)</sup>

The cooling lubricant valve is a wearing part and has to be serviced after 4,000 hours of operation.

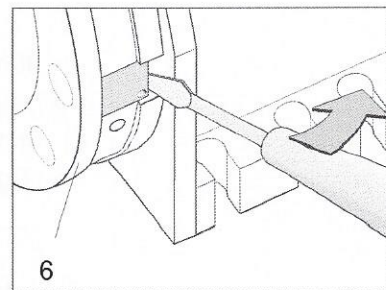
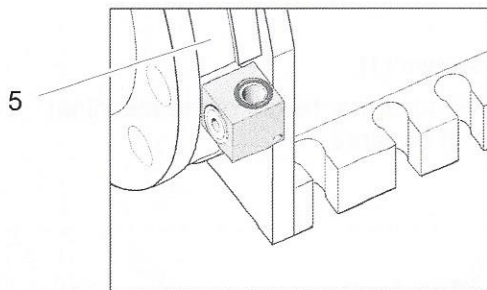


### Clearing required prior to any work:

- Switch the machine off.
- Push the motor protection switch for the turret into the OFF position.



- Undo setscrew (2).
- Withdraw valve carrier (1).
- Remove valve bushing (3), note any loose internal parts!
- Replace O-ring seal (4), valve bushing (3) or entire cooling lubricant valve.
- Insert valve bushing (3), with land on the inside, into the valve carrier (1) such that the openings for cooling lubricant supply are located one above the other.



- Insert valve carrier (1) into the cooling lubricant ring (5) and press again locating disk (6).
- Tighten setscrew (2). In the process, ensure that setscrew (2) engages in the groove of valve carrier (1).

1) Customized versions may also differ from the present version.

## 4.7 Adjusting the angular encoder



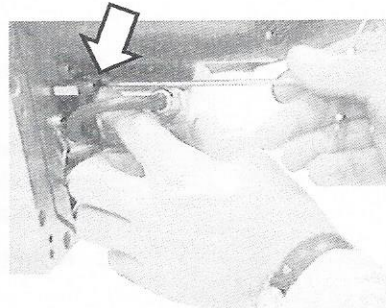
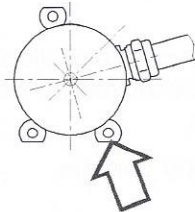
### IMPORTANT

Setting tasks require a 24V DC power supply.

#### Preparation

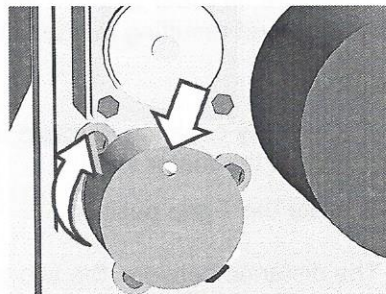
- ▶ Lock disk-type tool turret in position 1.

→ *Manual mode, page 12*



- ▶ Undo claws by means of a hexagonal pin wrench.

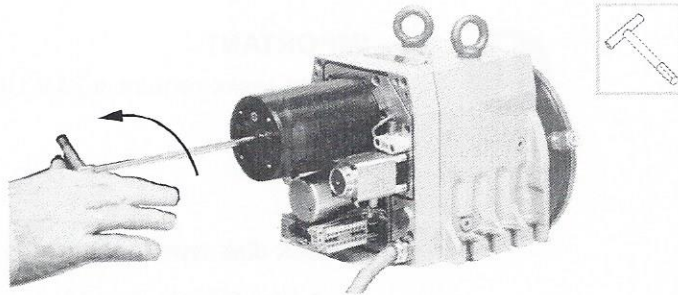
#### Adjusting



- ▶ Rotate angular encoder out of position until illuminated diode lights up.
- ▶ Clamp in angular encoder by means of the claws.



Checking the setup for symmetry



1. Use hexagonal pin wrench **with T-grip** for rotating the motor shaft.
2. Rotate motor shaft until illuminated diode on the angular encoder or the indication "Position 1" on the machine are extinguished.
3. Note the T-grip position.



**WARNING**

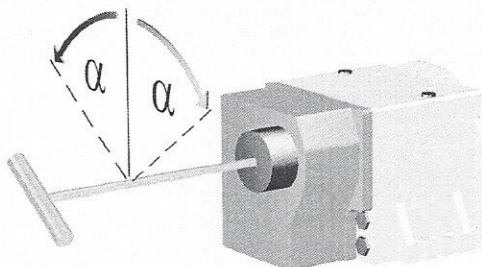
A reversal of the moment of the motor results in the acceleration of the motor shaft. The hexagonal pin wrench may thus be unexpectedly accelerated.

Therefore, in order to avoid the ejection of the hexagonal pin wrench and resulting injuries, firmly grip the hexagonal pin wrench.

4. Carefully continue to rotate until a moment reversal can be felt on the motor shaft.
5. Note the T-grip position.

The distance between the two grip positions characterizes the angle range.

6. Repeat steps 1 to 5 with reverse direction of rotation. The angle  $\alpha$  must be the same for both directions of rotation!



By turning the angular encoder out of position, any dissymmetry can be removed.



## 4.8 Replacing the angular encoder



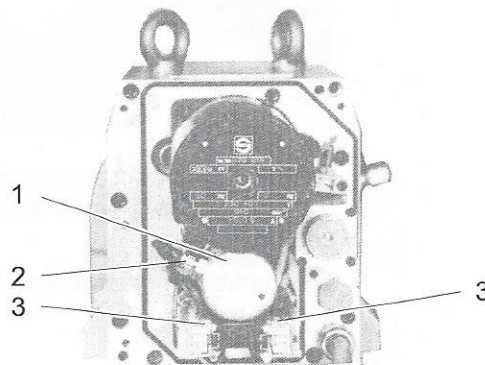
### IMPORTANT

Setting tasks require a 24V DC power supply.

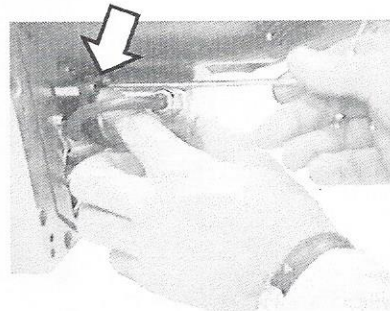
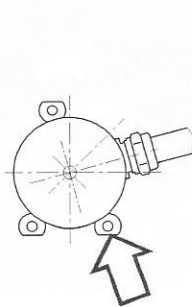
#### Preparation

- ▶ Lock disk-type tool turret in position 1.

→ *Manual mode, page 12*

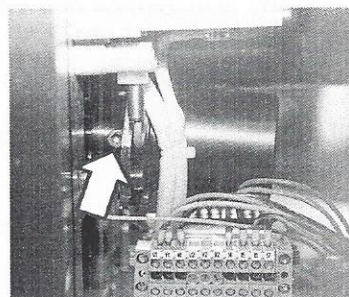


- ▶ Note the position of the cable outlet (2) on the angular encoder (1), remove attachment.
- ▶ Undo cables (3) on terminal strip (note where they are connected).



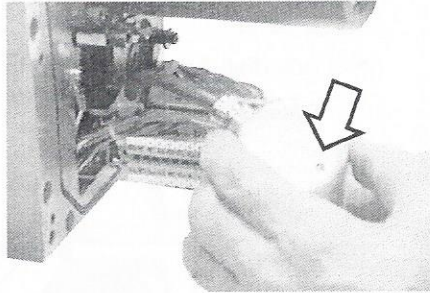
- ▶ Undo claws by means of a hexagonal pin wrench.

#### Replacing



- ▶ Undo setscrew.

- Carefully withdraw angular encoder.
- Connect new angular encoder electrically.
  - *Wiring diagram: Disk-type tool turret EP - 870 e in the appendix to these Operating Instructions.*



- Rotate shaft of the angular encoder until the illumination of the LED on the angular encoder indicates the "Position 1" setting.  
This indication must remain whilst the following steps are carried out.



#### IMPORTANT

The LED is used only to indicate position 1 during the adjustment work. It is no position indicator during operation.



- Ensure that the cable outlet is in its correct position.
- Insert the shaft of the angular encoder into the bore of the flexible shaft and introduce carefully until the angular encoder is in contact with the plate. Ensure that the claws are in their correct position!
- Use setscrew to attach the angular encoder to the shaft.
- If necessary, check the adjustment of the angular encoder.
  - *Page 24*
- Use claws to secure the angular encoder.
- Fit covering hood. Note position of cables in order to avoid any pinching of the same.

## 4.9 Proximity switch S7



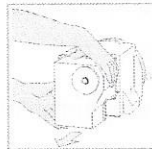
### IMPORTANT

Setting tasks require a 24V DC power supply.

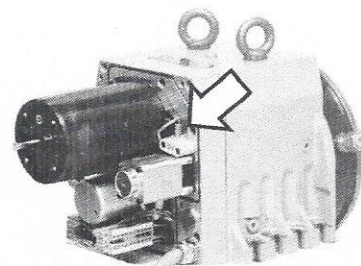
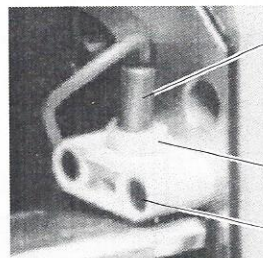


### Clearing required prior to any work:

- Switch the machine off.
- Push the motor protection switch for the turret into the OFF position.
  
- Undo fixing screws of covering hood, withdraw covering hood to rear. If necessary, use push-off screw.



### Replacing



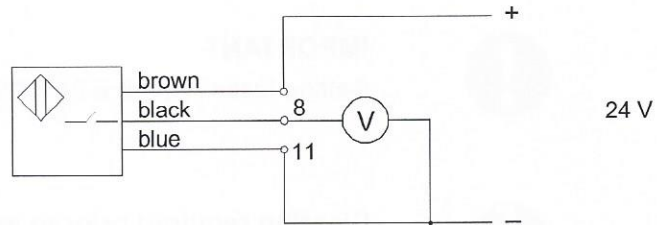
- Undo clip (3) and withdraw proximity switch (1) from eccentric bushing (2).



## Repairs after fault conditions Proximity switch S7



### Checking

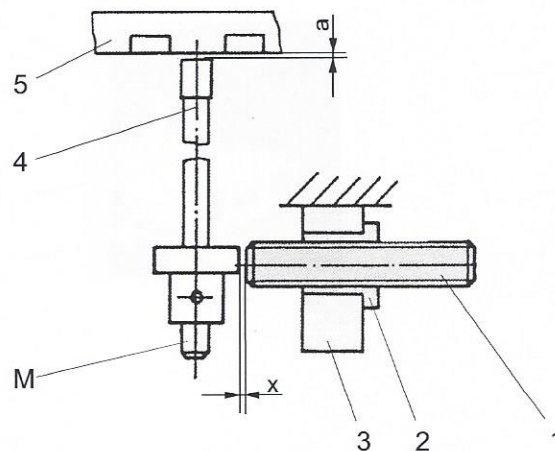


H-Signal  $\geq 90\%$  of rated voltage

- ▶ Apply a voltage of 24 V DC to the proximity switch (1).  
The proximity switch is energized when the LED lights up.
- ▶ Insert tested/new proximity switch (1).

### Adjusting

- ▶ Unlock disk-type tool turret.  
→ *Manual mode, page 12*
- ▶ Move disk-type tool turret into a location between two positions.  
If the keeper (M) is operated, the preindexing bolt (4) can be pressed in partially only.



- ▶ Set switching distance  $x = 0.3 - 0.5$  mm.
- ▶ Determine dimension  $a$ .

$a$  = stroke of the preindexing bolt (4) up to the damping ring (5) when the solenoid is operated manually (corresponds to the press-in depth of the keeper (M)).



- Adjust proximity switch (1) on eccentric bushing (2) such that its signal begins to drop after a  $+ 2^{+0.5}$  mm immersion depth of the preindexing bolt.

Any greater immersion depth may cause the motor to be blocked.

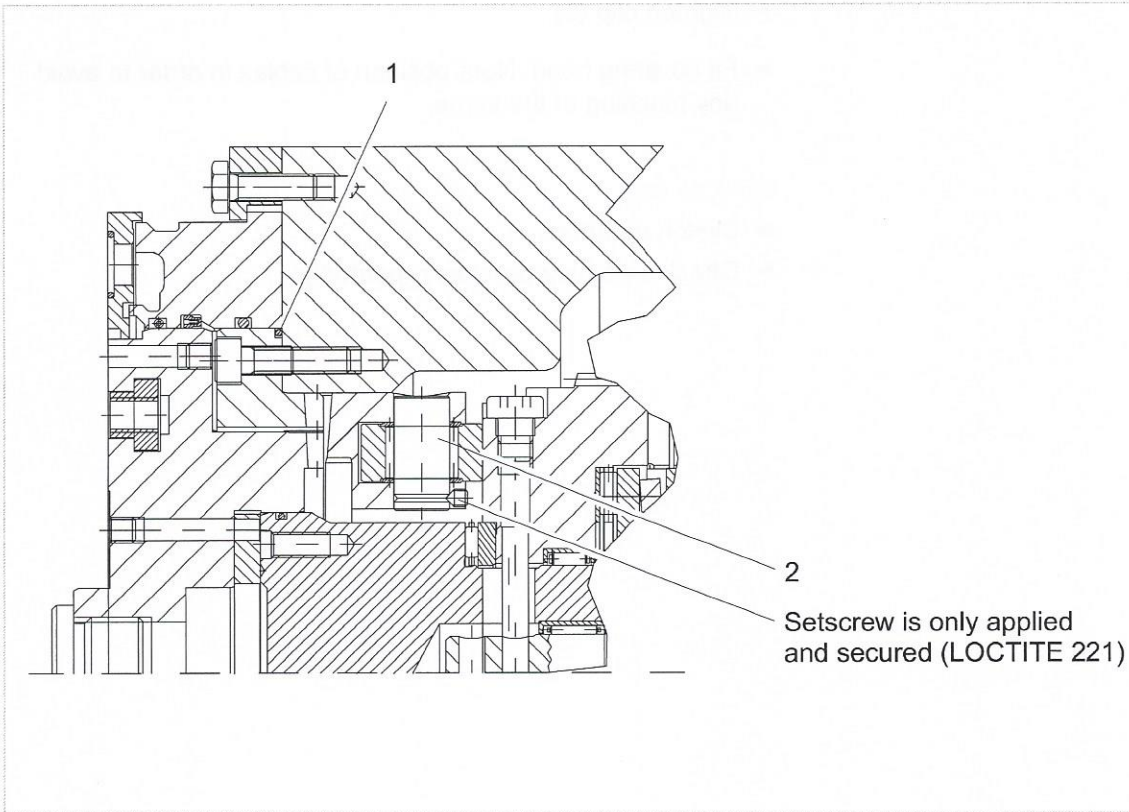
- Tighten clip (3).
- Fit covering hood. Note position of cables in order to avoid any pinching of the same.

#### Function test

- Switch on turret.
- Check switching process repeatedly.

## 5 Replacement parts

### 5.1 Indexing

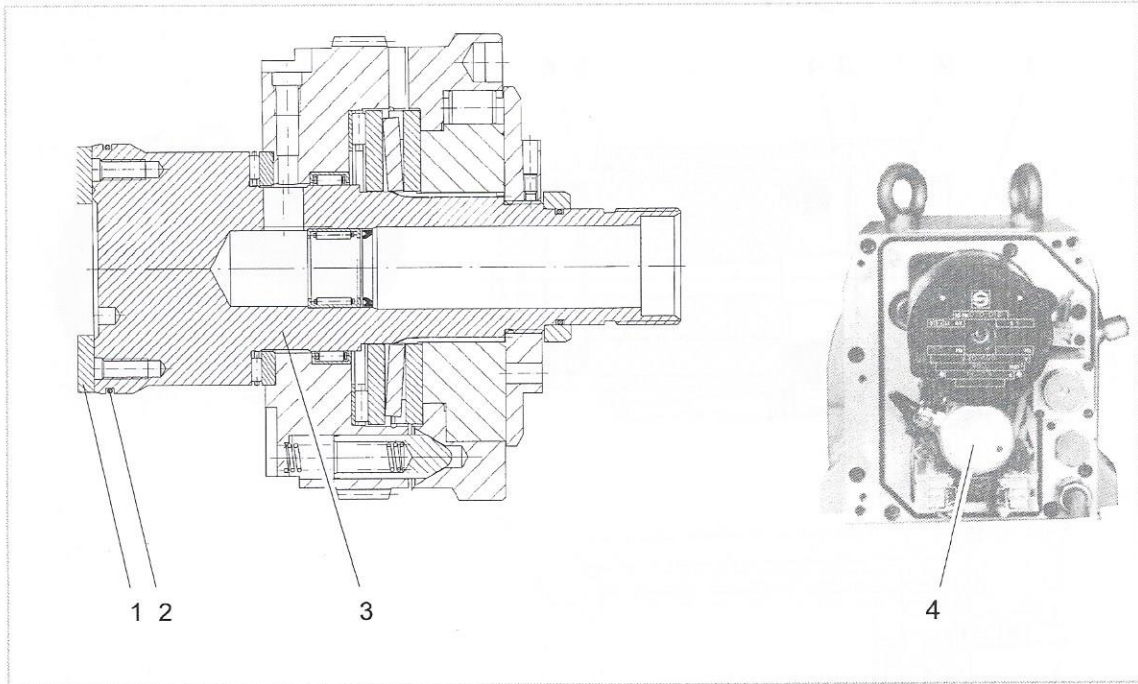


**IMPORTANT**

Only use the order form if you wish to order any replacement parts!

No.	Ident No.	Designation	Qty.
1	058 943	O-ring seal	1
2	101 419	Replacements parts group, indexing	3
	<b>IMPORTANT</b>	Request assembly guideline MR 02.025!	

## 5.2 Clamping and angular encoder

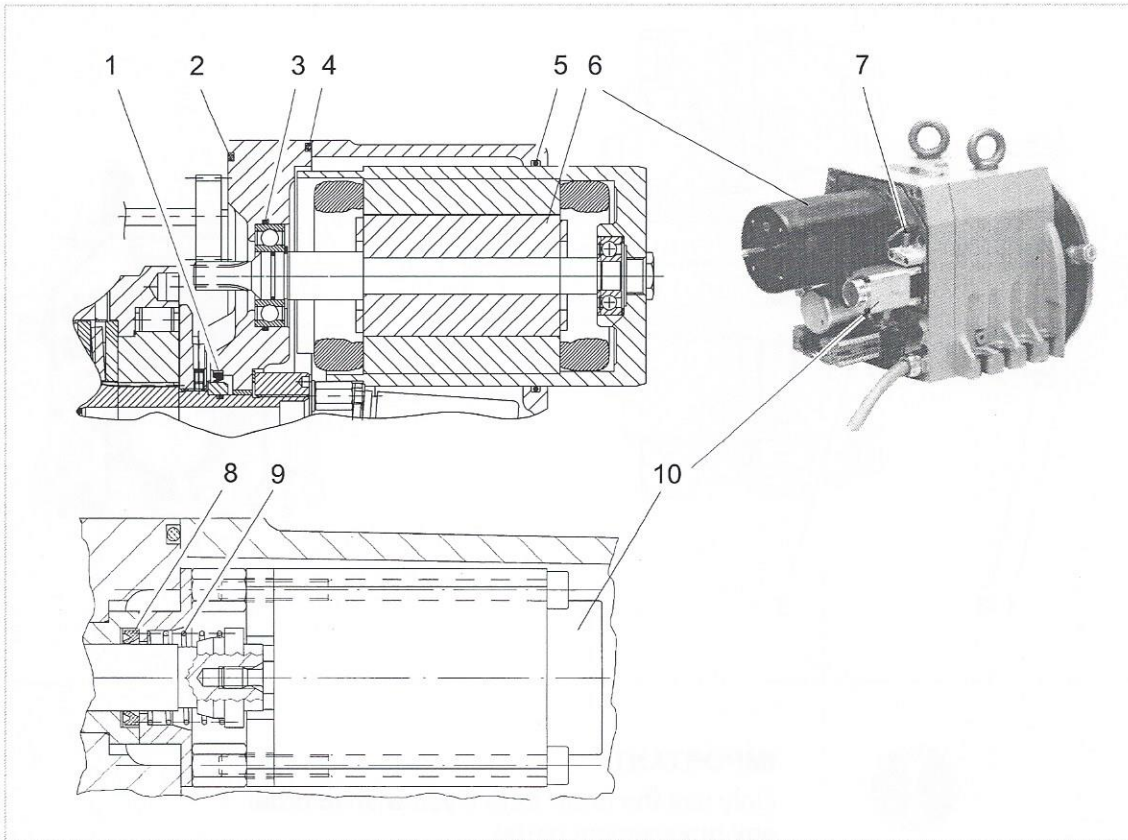


### IMPORTANT

Only use the order form if you wish to order any replacement parts!

No.	Ident No.	Designation	Qty.
1	069 947	Disk (for tuning)	1
2	063 360	O-ring seal	1
3		Replacement parts group, clamping	1
	<b>IMPORTANT</b>	Request assembly guideline MR 02.025!	
4	105 500	Angular encoder	1

### 5.3 Gear, drive, pre-indexation

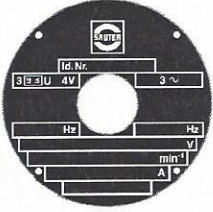


**IMPORTANT**

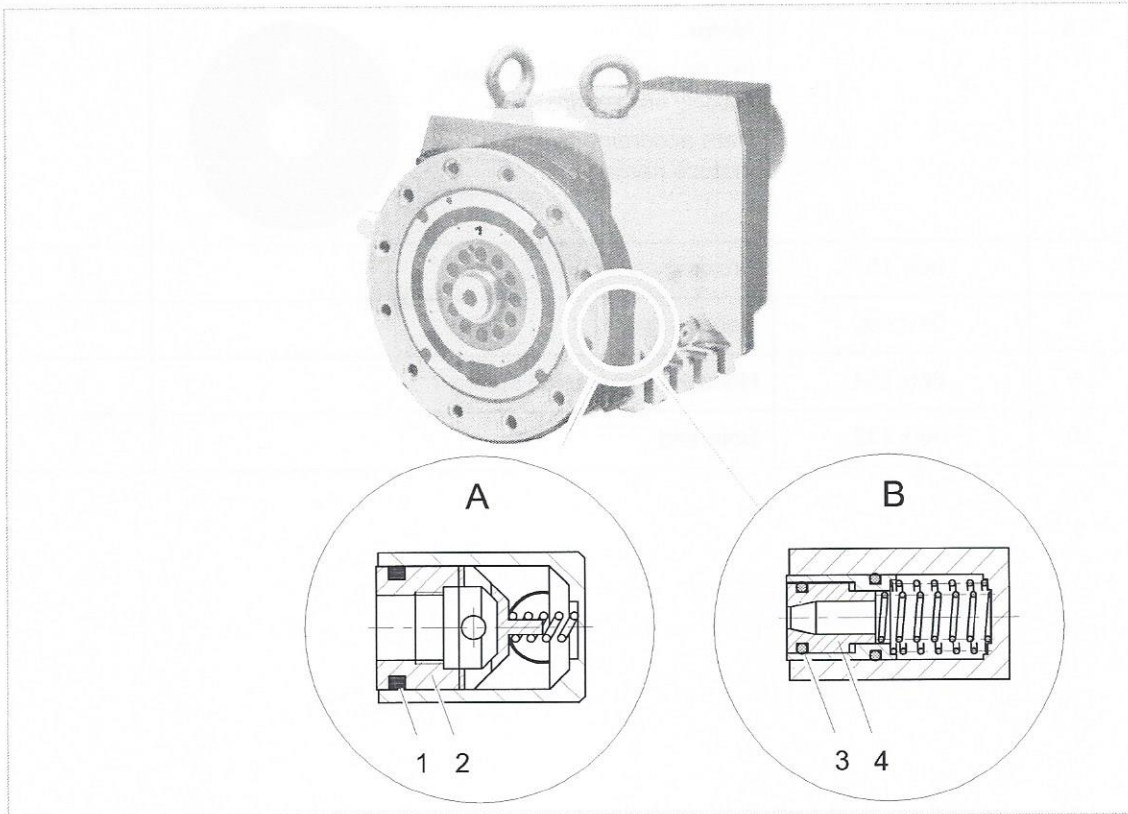
Only use the order form if you wish to order any replacement parts!

No.	Ident No.	Designation	Qty.
1	069 916	Sealing ring	1
2	058 506	O-ring seal	1
3	001 031	O-ring seal	1
4	060 254	O-ring seal	1
5	065 718	O-ring seal	1



No.	Ident No.	Designation	Qty.
6		Motor (will be supplied complete with housing and bearing) Data according to motor's nameplate: 	1
7	004 157	Proximity switch	1
8	040 690	Sealing ring	1
9	065 754	Helical compression spring	1
10	066 293	Solenoid	1

5.4 Cooling lubricant valve <sup>1)</sup>

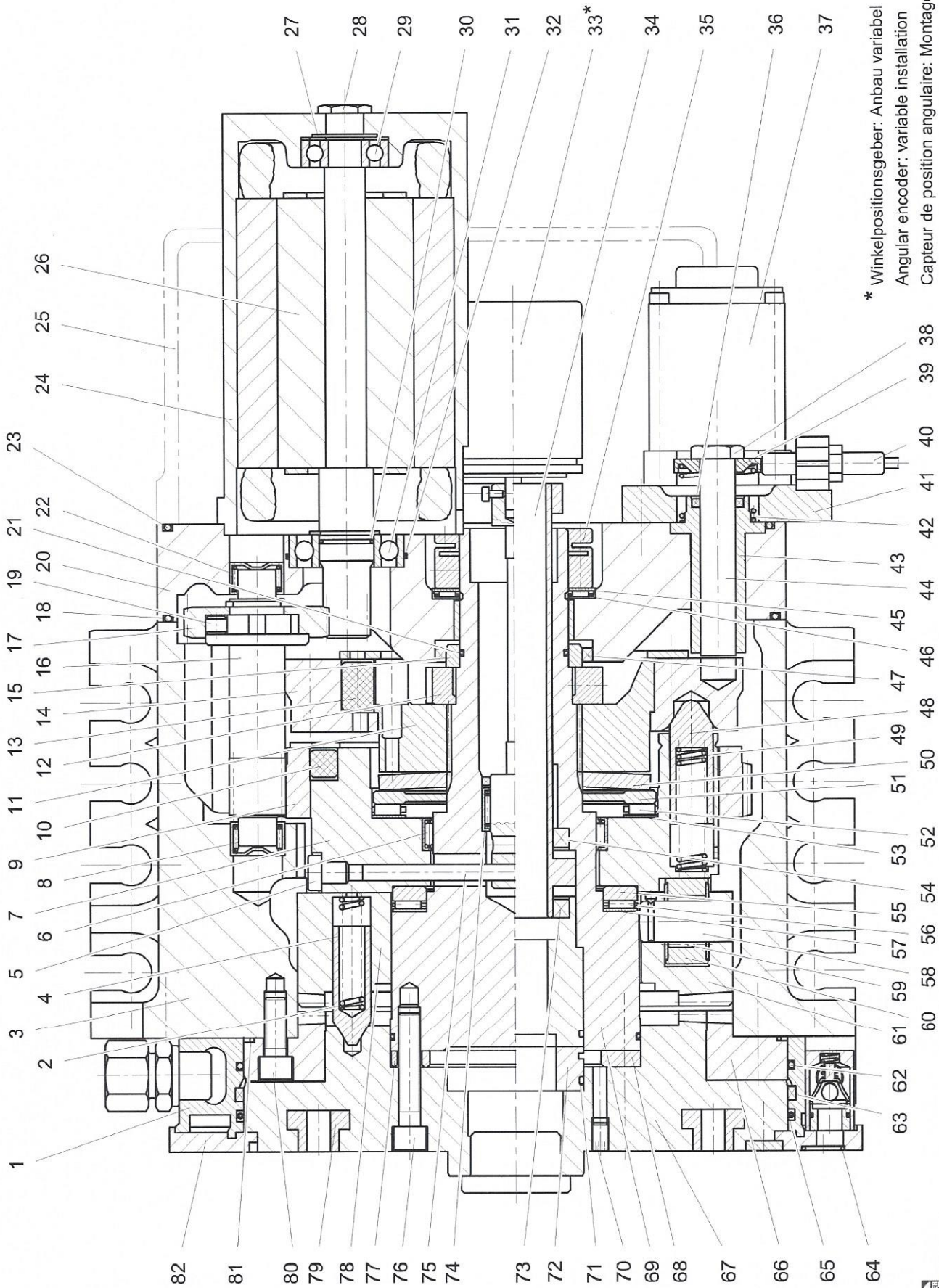


**IMPORTANT**

Only use the order form if you wish to order any replacement parts!

No.	Ident No.	Designation	Qty.
for standard version			
A	101 904	Cooling lubricant valve, complete <sup>1)</sup>	1
1	059 658	O-ring seal	1
2	033 424	Bushing	1
for medium pressure valve			
B	101 353	Cooling lubricant valve, complete <sup>1)</sup>	1
3	058 501	O-ring seal	1
4	086 925	Bushing	1

1) Customized versions may also differ from the present version.



\* Winkelpositionsgeber: Anbau variabel  
 Angular encoder: variable installation  
 Capteur de position angulaire: Montage variable

**0.5. 480.5..**







++49 (0) 7123-926-193



++49 (0) 7123-926-0



service@sauter-feinmechanik.com



Service  
SAUTER Feinmechanik GmbH  
Postfach 1551  
D-72545 Metzingen  
Germany

Company:

Street:

Postal Code

City:

Name:

Tel.:

Fax:

Assembly	Ident No.	Designation	Qty.

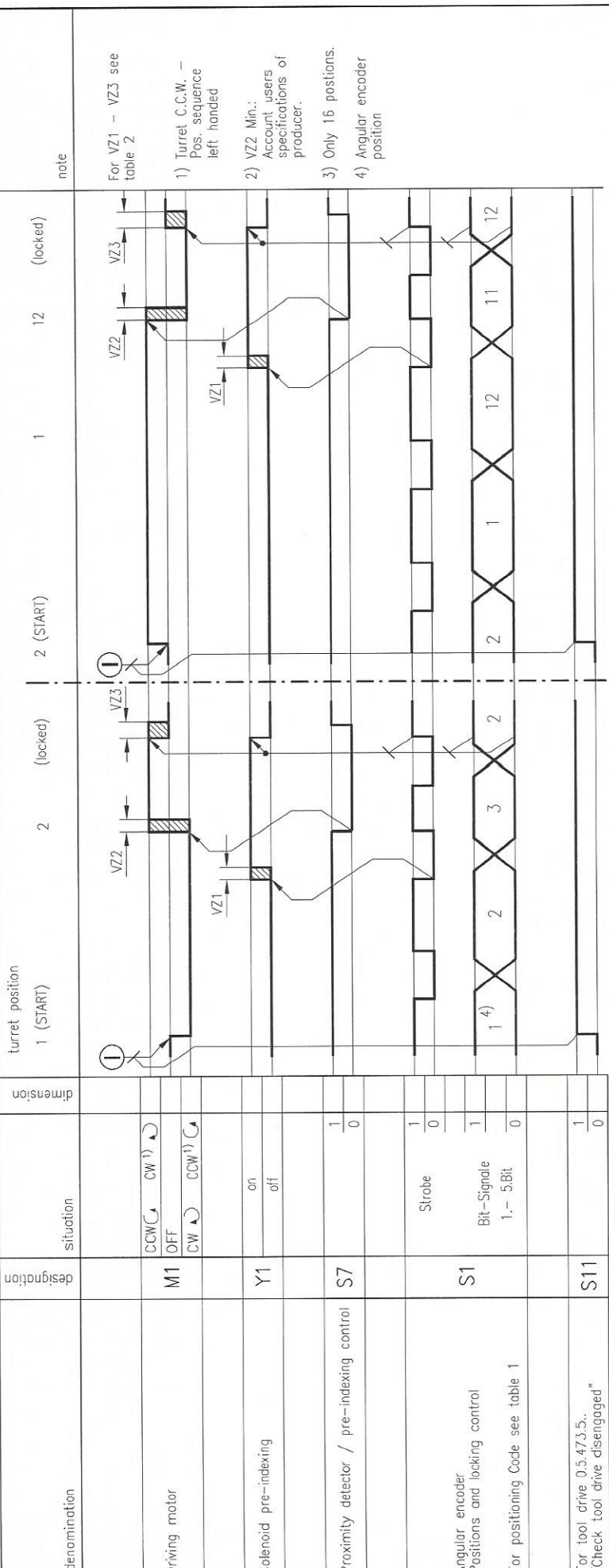
<b>i</b>	Read off the following data from the type plate and always complete.	
	Typ	
	Ident-Nr.	
	Com. Nr.	



Control sequence diagram

SAUTER-DISK-type tool turret  
0.5.4...5... 12/16 Positionen

SK-919 e  
Z-Doku-IdNr.: 090571



note

For VZ1 - VZ3 see table 2

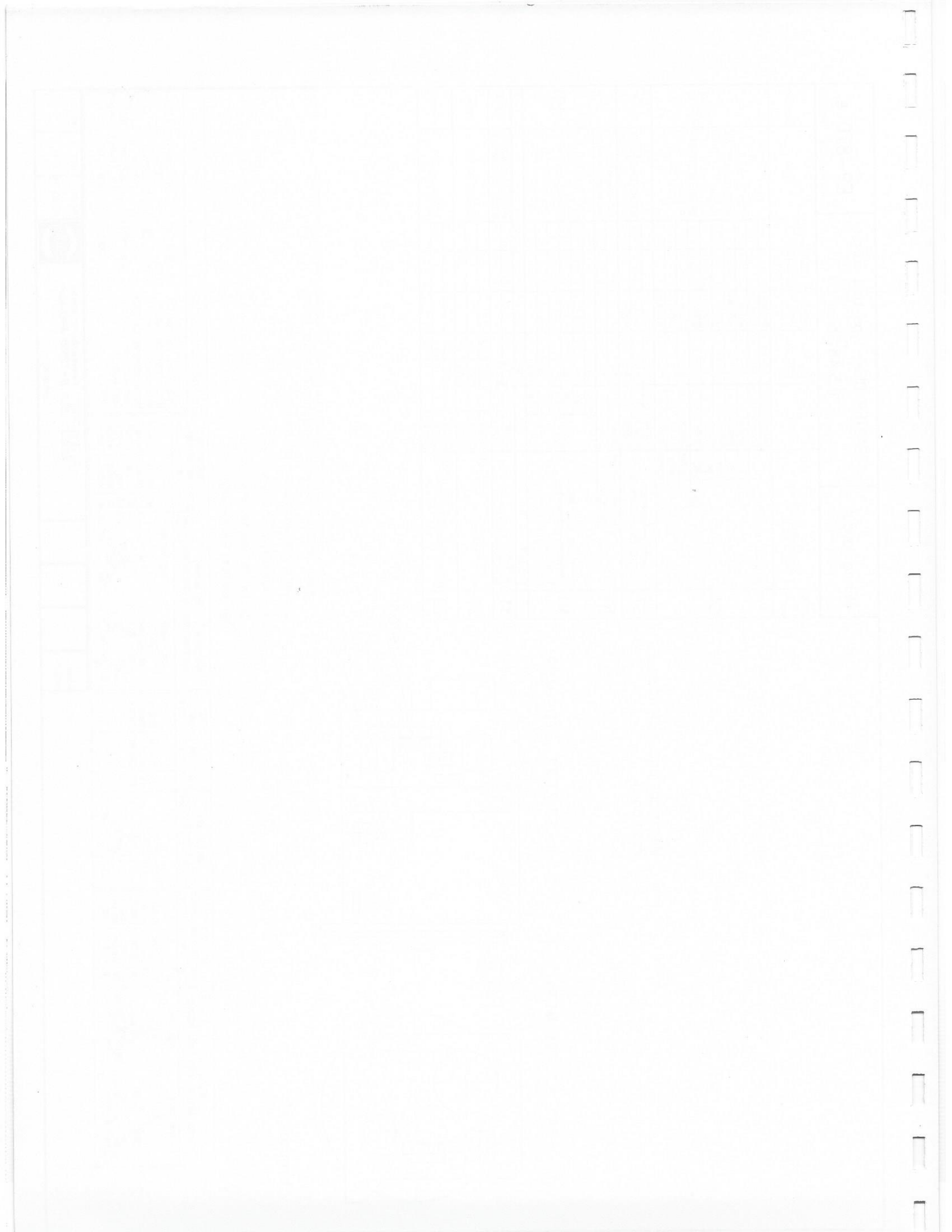
- 1) Turret C.C.W. - Pos. sequence left handed
- 2) VZ2 Min.: Account users specifications of producer.
- 3) Only 16 positions.
- 4) Angular encoder position

Table 1

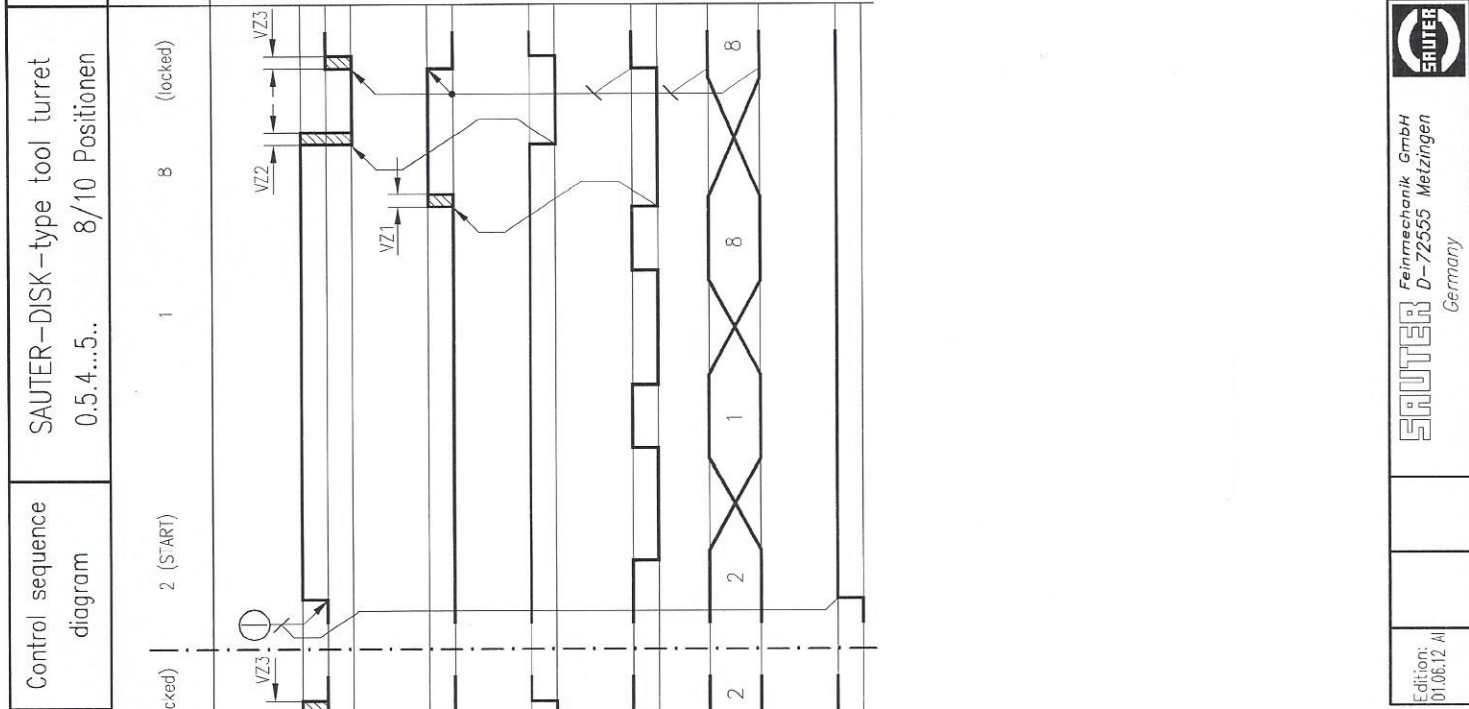
Funktion	Angular encoder position															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Strobe	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.Bit	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
2.Bit	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
3.Bit	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1	0
4.Bit	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
5.Bit	1	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
6.Bit	1	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1

Table 2

Admissible delay time	VZ1 (ms)		VZ2 (ms)		VZ3 (ms)	
	Min.	Max.	Min.	Max.	Min.	Max.
VZ1 (ms)		30				
VZ2 (ms)			2)	60		
VZ3 (ms)				40		







denomination	designation	situation	dimension
01			
02			
03			
04	M1	CCW CW 1)	
05	Driving motor	OFF	
06		CW	
07			
08			
09	Solenoid pre-indexing	on	
10		off	
11			
12			
13	Proximity detector / pre-indexing control		1
14			0
15			
16			
17		Strobe	1
18			0
19	Angular encoder		
20	Positions and locking control	Bit-Signale	1
21		1.- 4.Bit	0
22	For positioning Code see table 1		
23			
24			
25	For tool drive 0.5.473.5..		1
26	"Check tool drive disengaged"		0

denomination	designation	situation	dimension
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			

**Table 1**

Function	Angular encoder position
Strobe	1 1 1 1 1 1 1 1 1 1
1.Bit	1 0 1 0 1 0 1 0 1 0
2.Bit	0 1 1 0 0 1 1 0 0 1
3.Bit	0 0 0 1 1 1 1 0 0 0
4.Bit	0 0 0 0 0 0 0 0 1 1
Parity-Check	1 1 1 0 1 0 0 1 1 0

**Table 2**

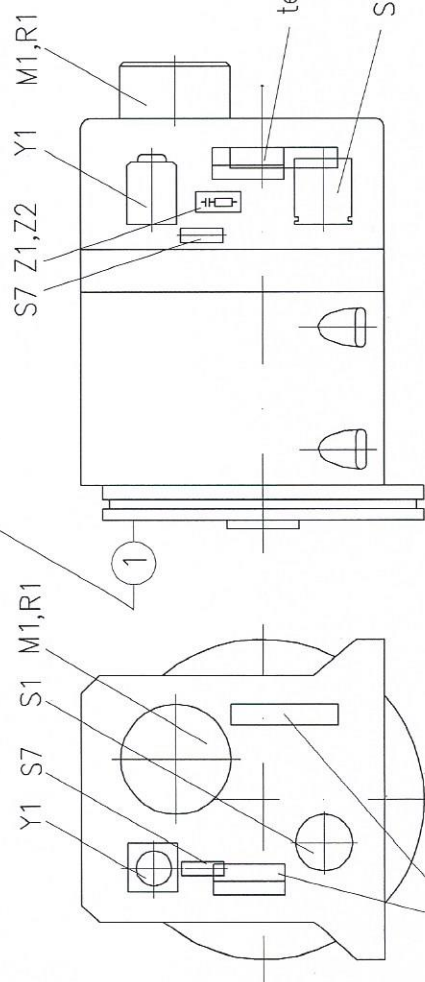
Admissible delay time	Min.	Max.
VZ1 (ms)		30
VZ2 (ms 2)		60
VZ3 (ms)		40

Wiring layout

0.5.480  
1.5..

designa- tion	Element/Function	Line	terminal	cable ④ 14x0,34 12x0,75 mm <sup>2</sup>	Type	Supplier
S1	Angular encoder	brown (+)	T2	brown	BRG82-W <sub>08</sub> <sup>08</sup> P-L-K 12-EP- BRG00-WCD16-EP- P-L-K	Balluff
		blue (-)	T1	blue		
		white	1	white		
		yellow	2	yellow		
		green	3	green		
		lilac	4	lilac		
S7	Proximity-Detector control pre-indexing	transparent	13	transp.	BKS 516-34-E <sub>0</sub> C-01	Balluff
		brown (+)	12	brown		
		blue (-)	11	blue		
R1	Posistor-heat detector	blue	14	blue	PTC-Thermistor DIN 44081 U <sub>5</sub> ≤4V DC	
M1	3-Phase A.C. Motor (release-indexing- locking)	②	15	4		SAUTER
Y1	Ground		16	1		
Z1	Solenoid pre-indexing	brown (+)	16	6	2AV= 20A to size 516 40%ED; 28A from 520	Schultz
Z2	Motor screening unit	black 1	U1	2	RC3/PG 91.206	Peters
		black 2	V1	3		
Z2	Motor screening unit	black 3	W1	8	RC3/PG 91.206	Peters
		black 1	U2	9		
Z2	Motor screening unit	black 2	TU	10	RC3/PG 91.206	Peters
		black 3	1W	10		

Mechanical and electrical  
Position 1



- ① for this, protective motor switch (thermistor) is required. Without thermistor motor protector no guarantee in case of motor failure.
- ③ Diode 1N4006 (mounted to terminals).
- ④ depending on the turret's outfit.
- ⑤ for 16 positions only.
- ⑥ for ΔYY-motor only.

Motor M1 Driving Motor with two speeds	Motor M1 (3-wires)	Motor M1 (6 wires)	Motor M1 (6 wires)	Technical Data of:
low speed 1U L1 2U L1 1W L1 2W L1 1V L1 2V L1 L3 high speed 1U L2 2U L2 1W L2 2W L2 1V L2 2V L2 L3	low voltage U1 V1 W1 U2 V2 W2 L30 W1 L3	high voltage U1 V1 W1 U2 V2 W2 L30 W1 L3	increasing positions sequence CW CCW U1 V1 W1 U2 V2 W2 L30 W1 L3	S1 S7 Operating voltage: 15-30V DC Max. residual ripple: 10% Max. load current: 50mA (⊕ 25mA) 200mA Nom. sensing distance: 1mm Temperature range: 0° bis +60°C Function: -20° bis +65°C Type: n.o. (make) pnp logic

### 霄特國際股份有限公司

台灣：台中市南屯區環中路 4 段 368 號  
電話：+886-4-23805836  
傳真：+886-4-23805832  
信箱：[info@sauter-asia.com](mailto:info@sauter-asia.com).  
網址：[www.sauter-asia.com](http://www.sauter-asia.com)

### Sauter Asia company limited

No. 368, Sec. 4, Huanzhong Road, Taichung 408, Taiwan  
TEL：+886-4-23805836  
FAX：+886-4-23805832  
E-Mail：[info@sauter-asia.com](mailto:info@sauter-asia.com).  
Website：[www.sauter-asia.com](http://www.sauter-asia.com)

### 上海精億肖特自動化系統有限公司

上海：上海市松江區新橋鎮場東路 333 弄 99 號(百佳花園) 瀋陽：瀋陽市瀋河區先農壇路 30-5 號 111 室  
電話：+86-21-57649075 電話：+86-24-24159866  
傳真：+86-21-57649076 傳真：+86-24-24159877  
信箱：[infocn@gptrading.net](mailto:infocn@gptrading.net) 信箱：[syb@gptrading.net](mailto:syb@gptrading.net)