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

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Operating Instructions
for
Disk-Type Tool Turret

0.5.480.516 -

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>088 632</td>
<td>105 232</td>
<td>111 072</td>
</tr>
<tr>
<td>089 768</td>
<td>105 288</td>
<td>115 891</td>
</tr>
<tr>
<td>089 778</td>
<td>105 652</td>
<td>116 896</td>
</tr>
<tr>
<td>089 782</td>
<td>110 762</td>
<td></td>
</tr>
</tbody>
</table>

Type plate on turret housing

- **Series**: 088 632
- **Size**: 0.5.480.5 16
- **Classification number**: 088 632
- **Identification number**: 0.5.480.5
- **Order number**: 16
- **Gear ratio**: Turret

Made in Germany
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Survey: Disk-type tool turret 0.5.480.5..
Ordering replacement parts
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Diagram of functions: Disk-type tool turret 0.5.480 12/16 positions ........ SK - 919 e
Diagram of functions: Disk-type tool turret 0.5.480 6/16 positions ........ SK - 920 e
Wiring diagram: Disk-type tool turret ........................................... EP - 574 e
Interpretation of symbols

Warning notes

WARNING 1)
This warning designates a potentially hazardous situation which may lead to serious injuries, or even death.

WARNING 1)
Risk of electric shock due to high voltages!

CAUTION 1)
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!

1) Classification of signal words acc. to ANSI Z535.4
Interpretation of symbols

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 MoS₂ to lubricate the points marked, tightening torque 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 1) 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,
  → Use within specifications, page 7
- the product is not used as directed,
- 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of indexing positions</td>
<td></td>
<td>8 or 12 or 16</td>
</tr>
<tr>
<td>Perm. tangential torque ¹) (turret locked) at calculated safety</td>
<td>Nm</td>
<td>1,250</td>
</tr>
<tr>
<td>Perm. mass moment of inertia of tool disk, tool holders, and tools</td>
<td>kgm²</td>
<td>0.6 – 3.2 ²)</td>
</tr>
<tr>
<td>Perm. unbalance (load moment) caused by tool holders and tools</td>
<td>Nm</td>
<td>32</td>
</tr>
<tr>
<td>Indexing times ²)</td>
<td>s</td>
<td>i \times \frac{41 + \alpha}{n} \times 0.17 + 0.1</td>
</tr>
<tr>
<td>Theoretical cycle time (unlock/turn/lock) at rotating angle (\alpha) [degrees]</td>
<td></td>
<td>see turret type plate</td>
</tr>
<tr>
<td>Gear ratio i</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor speed n</td>
<td>rpm</td>
<td></td>
</tr>
<tr>
<td>Perm. indexing frequency</td>
<td>min⁻¹</td>
<td>12.5 – 7 ²)</td>
</tr>
<tr>
<td>Operating voltage/mains frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td></td>
<td>IP 65</td>
</tr>
<tr>
<td>Turret mass (without tool disk)</td>
<td>kg</td>
<td>approx. 46</td>
</tr>
<tr>
<td>Maximum mass of the tool disk inclusive of tool holders and tools</td>
<td>kg</td>
<td>80</td>
</tr>
<tr>
<td>Maximum mass of the tool holders and tools fitted ³)</td>
<td>kg</td>
<td>32</td>
</tr>
<tr>
<td>Perm. ambient temperature range</td>
<td>°C</td>
<td>+10 ... +40</td>
</tr>
<tr>
<td></td>
<td>°F</td>
<td>+50 ... +104</td>
</tr>
<tr>
<td>Operating pressure for cooling lubricant ⁴)</td>
<td>bar</td>
<td>7</td>
</tr>
<tr>
<td>Cooling lubricant valve – standard version</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant supply</td>
<td>bar</td>
<td>14</td>
</tr>
<tr>
<td>Externally switched supply</td>
<td>bar</td>
<td>25</td>
</tr>
<tr>
<td>Medium pressure valve (option)</td>
<td>bar</td>
<td></td>
</tr>
</tbody>
</table>

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 ≤ 100 μm. 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

7. 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:

8. 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.

1. Use a hexagonal pin wrench, complete with T-grip, and rotate the motor shaft until position 1 has been reached.
2. 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 trouble-free 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

<table>
<thead>
<tr>
<th>after 4,000 hours of operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check cooling lubricant valve for wear and leakage. Replace any defective parts.</td>
</tr>
<tr>
<td>→ Page 22</td>
</tr>
<tr>
<td>Check oil of the turret gearbox chamber; if necessary, replenish oil.</td>
</tr>
<tr>
<td>→ Page 17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>after 2½ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check all electrical lines and connections for mechanical damage as well as embrittlement. Replace any defective parts.</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>after 8,000 hours of operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change the oil of the turret gearbox chamber.</td>
</tr>
<tr>
<td>User</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>after approx. 2–3 million switchings</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>SAUTER Service</td>
</tr>
</tbody>
</table>
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 cm³) into a suitable container.
## Maintenance work
### Turret gearbox chamber

Assess oil condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil black or brown, without metallic abrasion</td>
<td>Natural consumption</td>
<td></td>
</tr>
<tr>
<td>Oil black or brown, with metallic abrasion</td>
<td>Internal parts of turret are damaged</td>
<td></td>
</tr>
<tr>
<td>Oil white, mixed with cooling lubricant</td>
<td>Turret sealings are damaged</td>
<td>Request SAUTER Service!</td>
</tr>
<tr>
<td>None oil left</td>
<td>Turret sealings are damaged</td>
<td></td>
</tr>
</tbody>
</table>

### Changing the oil

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

### Fill oil

- 170 cm³ 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.

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

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

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- [ ] 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

MoS₂

39 Nm
4.6 Replacing the cooling lubricant valve ¹)

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 24 V 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.
Repairs after fault conditions
Adjusting the angular encoder

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.
Repairs after fault conditions
Replacing the angular encoder

 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 24 V 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 ≥ 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)).
Repairs after fault conditions
Proximity switch S7

Adjust proximity switch (1) on eccentric bushing (2) such that its signal begins to drop after a + 2\(^{\circ}\)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

Setscrew is only applied and secured (LOCTITE 221)

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Ident No.</th>
<th>Designation</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>058 943</td>
<td>O-ring seal</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>101 419</td>
<td>Replacements parts group, indexing</td>
<td>3</td>
</tr>
</tbody>
</table>

IMPORTANT Request assembly guideline MR 02.025!
5.2 Clamping and angular encoder

![Diagram showing parts labeled 1, 2, 3, and 4]

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Ident No.</th>
<th>Designation</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>069 947</td>
<td>Disk (for tuning)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>063 380</td>
<td>O-ring seal</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Replacement parts group, clamping</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>IMPORTANT</strong> Request assembly guideline MR 02.025!</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>105 500</td>
<td>Angular encoder</td>
<td>1</td>
</tr>
</tbody>
</table>
## 5.3 Gear, drive, pre-indexation

![Diagram of gear and motor](image)

---

**IMPORTANT**

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Ident No.</th>
<th>Designation</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>069 916</td>
<td>Sealing ring</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>058 506</td>
<td>O-ring seal</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>001 031</td>
<td>O-ring seal</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>060 254</td>
<td>O-ring seal</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>065 718</td>
<td>O-ring seal</td>
<td>1</td>
</tr>
</tbody>
</table>
# Replacement parts
## Gear, drive, pre-indexation

<table>
<thead>
<tr>
<th>No.</th>
<th>Ident No.</th>
<th>Designation</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td>Motor (will be supplied complete with housing and bearing)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data according to motor's nameplate:</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>004 157</td>
<td>Proximity switch</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>040 690</td>
<td>Sealing ring</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>065 754</td>
<td>Helical compression spring</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>066 293</td>
<td>Solenoid</td>
<td>1</td>
</tr>
</tbody>
</table>
Replacement parts
Cooling lubricant valve

5.4 Cooling lubricant valve

![Diagram showing parts A and B with labels 1, 2, 3, 4]

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Ident No.</th>
<th>Designation</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>101 904</td>
<td>Cooling lubricant valve, complete 1)</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>059 658</td>
<td>O-ring seal</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>033 424</td>
<td>Bushing</td>
<td>1</td>
</tr>
</tbody>
</table>

for medium pressure valve

| B   | 101 353   | Cooling lubricant valve, complete 1)             | 1    |
| 3   | 058 501   | O-ring seal                                      | 1    |
| 4   | 086 925   | Bushing                                          | 1    |

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

Company:

Street:

Postal Code

City:

Name:

Tel.:

Fax:

<table>
<thead>
<tr>
<th>Assembly</th>
<th>Ident No.</th>
<th>Designation</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Read off the following data from the type plate and always complete.

<table>
<thead>
<tr>
<th>Typ</th>
<th>Ident-Nr.</th>
<th>Com. Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We will be pleased to answer your enquiries and receive your feedback information.
Table 1

<table>
<thead>
<tr>
<th>Function</th>
<th>Angular encoder position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Strobe</td>
<td>1</td>
</tr>
<tr>
<td>1.Bit</td>
<td>1</td>
</tr>
<tr>
<td>2.Bit</td>
<td>0</td>
</tr>
<tr>
<td>3.Bit</td>
<td>0</td>
</tr>
<tr>
<td>4.Bit</td>
<td>0</td>
</tr>
<tr>
<td>Party-Check</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Admissible delay time</th>
<th>V21 (ms)</th>
<th>V22 max (ms)</th>
<th>V23 max (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>10</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Max.</td>
<td>40</td>
<td>50</td>
<td>40</td>
</tr>
</tbody>
</table>

For VZ1 - VZ3 see Table 2

1) Turret C.C.W. – Pos. sequence left handed
2) V22 Min.: Account users specifications of producer.
3) Angular encoder position

SK-920 e
Z-830406 Nr. 015512

Note

1. Turret C.C.W. – Pos. sequence left handed
2. V22 Min.: Account users specifications of producer.
3. Angular encoder position

For VZ1 - VZ3 see Table 2

<table>
<thead>
<tr>
<th>Function</th>
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<tr>
<td></td>
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<td>1</td>
</tr>
<tr>
<td>2.Bit</td>
<td>0</td>
</tr>
<tr>
<td>3.Bit</td>
<td>0</td>
</tr>
<tr>
<td>4.Bit</td>
<td>0</td>
</tr>
<tr>
<td>Party-Check</td>
<td>1</td>
</tr>
</tbody>
</table>
for this, protective motor switch (thermistor) is required. Without thermistor motor protector no guarantee in case of motor failure.

@ Blade 1N4006 (mounted to terminals).
@ depending on the turret’s outfit.
@ for 16 positions only.
@ for ΔYY—motor only.

Driving Motor with two speeds

Motor M1 (3-wires) 1

- Low speed
- High speed

Motor M1 (3-wires)

- U1, V1, W1
- L1, L2, L3

Motor M1 (6-wires) Connection to terminals

- U1, V1, W1, L1, L2, L3

Motor M1 (6-wires) Connection to terminals

- U1, V1, W1, L1, L2, L3

Technical Data at: S1 S7

- Operating voltage: 15-30V DC
- Max. residual ripple: 10%
- Max. load current: 50mA (max. 25mA)
- Nom. sensing distance: 1mm
- Temperature range: 0°C to +60°C
- n.o.: (male) function: pnp logic