Operating Instructions

BB-1257en

Disc-Type Tool Turret

434.016

revision 2024/11/11

The present manual is part of the product.

- The manual should be kept in an easily accessible place during the product's lifetime.
- The manual should be passed on to the next owner /user of the product.
- Make sure that any possible supplement received is duly added to the manual.

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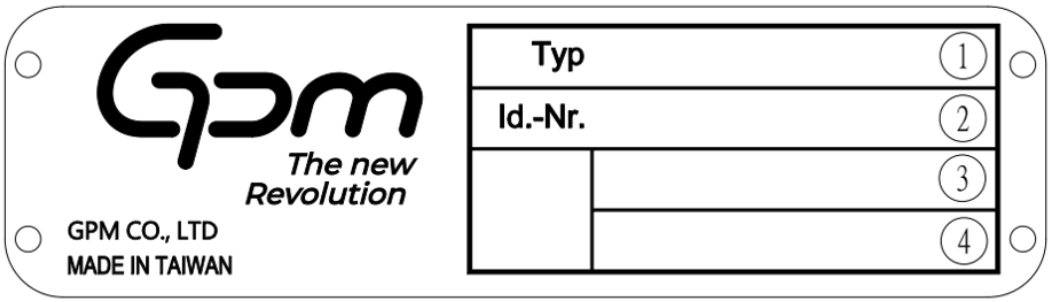
Declaration

1. The customer should carefully read this product operational manual to ensure correct use of the product.
2. The customer should ensure that the following items meet the requirements specified by the manufacturer: hydraulic pressure, diameter & length of oil tube, and voltages of electrical appliances. The manufacturer will not uphold warranty in cases of failures such as short-circuit burning, collision, and gear damage resulting from incorrect operation or human error.
3. The customer should carefully read “Safety Notes” to prevent personal injury or damage to the machine.
4. This product is covered by a 1-year warranty for non-human factors.
5. When the product is delivered, the customer should check the product and its accessories with the delivery personnel to make sure all items are included. After the check is completed, responsibility for this product is immediately transferred to the customer. If parts are found to be missing afterwards, the customer will be deemed to have lost them, and the cost of replacements will be based upon the price of individual products.
6. The parameters of the servo drive have been set and optimized by our engineers before delivery. The parameters of each servo drive are different from one other and cannot be used on other turrets; doing so may cause accuracy, operations and deviation errors.
7. The parameters of the servo drive are password protected. The password will not be provided if it is not absolutely necessary, to prevent the customer or user from arbitrarily changing the parameters and causing damage to the turret or servo drive. If changing the parameters is necessary, please contact our after-sales service team.
8. If you have any product- or technical-related issues, please contact us.
9. Note: For high-pressure (over 50 bar) coolant turrets, a high-pressure tool holder must be used.

Type plate on turret housing:



1. Classification number (series, size)
2. Identification number
3. Order number
4. Gear ratio

BB-1257

Classification number：	Identification number：
434.016	

Table of contents

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

- Install and operate turret only in machines complying with the relevant regulations for workspace protection.
- Operate turret only in perfect condition and in compliance with the Operating Instructions.
- Attention：High pressure turret exceeding 50 bar：For safety purpose, it is required to use high pressure tool holders which match specifications of turret.

BMT interface

- Exclusively use tool holders/spindle units with specification dimensions in accordance with the given SK: → *SK-1663*
- Use tool holders for static tools together with the GPM closing plug with O-ring only.
- Seal all unoccupied tool holding fixtures:
  - each with GPM closing plug with O-ring and with GPM closing plate.

1.2 Required skills

- Work may only be performed on these turrets by qualified staff.
- These are persons who are able to identify risks and to prevent possible hazards on the basis of their special training and their experience (IEC 60 201-1).
- All work on the electrical system is to be carried out only by a qualified electrical engineer.
- Only trained and competent personnel may work on these turrets; this personnel must have been trained in accordance with the Operating Instructions and directly on these turrets.

1.3 Notes on product-specific risks

Setting tasks require a 24V DC power supply.

Clearing required prior to any work:

➢Switch the machine power off.

➢Depressurize turret. → *Hydraulic Diagram*

WARNING

Injury hazard.

On startup, unexpected rotation of the tool disk is possible.

➢Following installation of the turret, line A must be pressurized first.

WARNING

Injury hazard.

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

➢Perform any work on the turret, in particular in the swiveling range of the tools, only, if the turret has been depressurized.

WARNING

Risk of injury posed by moving machinery components.

If power supply and hydraulic circuits are turned on for adjustment operations:

➢Secure workplace with warning sign.

➢Prevent actuation by other persons; secure control panel.

➢Do not stay close to moving machinery components, especially within the swiveling range of the tools.

CAUTION

Risk of material damage.

The tool drive motor must be set in order to enable correct coupling.

➢Remove all tool holders/spindle units.

➢Perform basic adjustments for the tool drive motor.

CAUTION

Risk of material damage.

The coupling for the spindle unit can be seriously damaged.

➢Exclusively use tool holders/spindle units with specification dimensions in accordance with the given SK: → *SK-1663*

CAUTION

Risk of material damage.

➢Use tool holders for static tools together with the GPM closing plug with O-ring only.

➢Seal all unoccupied tool holding fixtures:

- each with GPM closing plug with O-ring and with GPM closing plate.

CAUTION

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

➢Call GPM Service.

1.4 Disposal

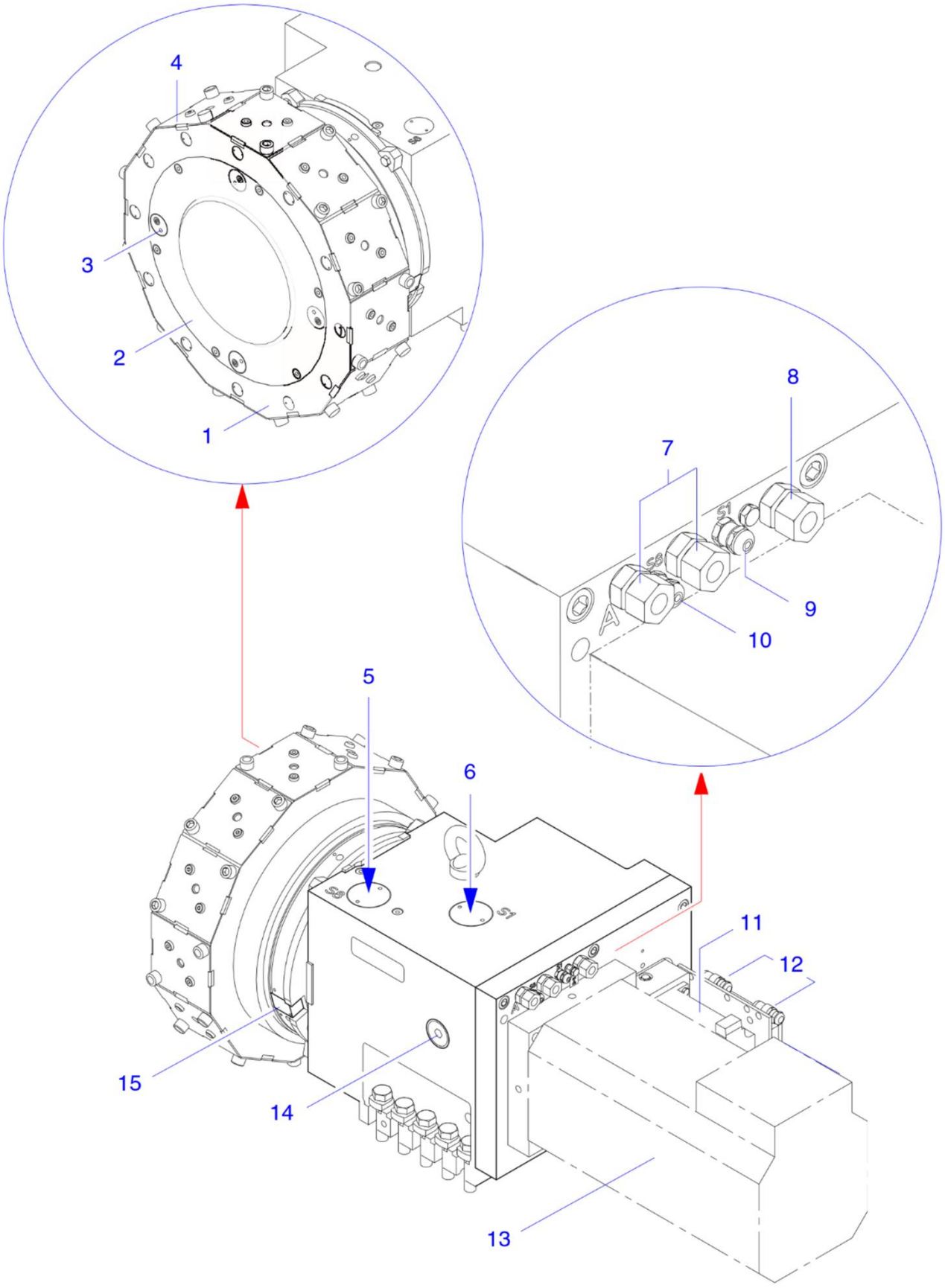
➢Comply with all national and regional disposal regulations and laws.

2 Product description

2.1 Overview of product variants

Turret drive	
GPM turret motor with incremental encoder	→*Page 48*
GPM turret motor with absolute encoder	
Turret motor not from GPM	→*Page 11*
Tool drive	
Version Direct drive with coupling	→*Page 12,*
Tool drive motor not from GPM	*Page 29*
Tool disk	
Tool holding fixture/coupling profile BMT	→*SK-1663*
Tool holders/spindle units	→*Page 21*
Closing plug for tool holding fixture	→*Page 21*
Draining without any air purge through outlet apertures inside the tool disk	→*Page 28*
Cooling lubricant valve	→*Page 41*
cartridge	
with valve carrier	

2.2 Designation of parts



1. Tool disk
2. Closing plate for the tool disk
3. Aperture for draining the tool disk
4. GPM closing plug for tool holding fixture

5. Proximity switch S8
6. Proximity switch S1

7. Hydraulic connections A and B
8. Cooling lubricant connection
9. Cable lead-through for proximity switch S1
10. Cable lead-through for proximity switch S8

11. Turret motor [1)]
12. Electrical connections [1)]
13. Tool drive motor [1) 2)]

14. Screw plug at opening for alignments
15. Cooling lubricant valve [1)]

[1)] depending on the order

[2)] not included in scope of delivery

2.3 Technical data

Turret			
Number of indexing positions		8 or 12 or 16	
Perm. advance force	F_Z at r = 200mm	10000	N
Perm. transverse force	F_X at a = 200mm	8000	N
Perm. tangential load (turret locked)		1800	Nm
Perm. mass moment of inertia of tool disk, tool holders, and tools out of this:		1.8	kgm^2
Perm. unbalance (load moment) caused by tool holders and tools		25	Nm
Rotation of tool disk – incl. acceleration and braking per fractional pitch		0.12	s
– without acceleration and braking per additional fractional pitch		0.07	s
Unlocking time		0.10	s
Locking time		0.10	s
Perm. indexing frequency (median switching angle ϕm=90 °)		20	min^{-1}
Hydraulic operating pressure		50 ± 10%	bar
Absorption volume Lock or unlock turret		30	cm^3
Operating pressure for cooling lubricant [1]		5 … 25	bar
Turret mass (without tool disk)		approx. 50	kg
Max. mass of tool disk and tooling		80	kg
Perm. ambient temperature range		+10 ... +40 +50 ... +104	°C °F

Tool drive [2] [3] (Standard)				
Gear ratio	i	1		
Perm. speed [3] on tool drive coupling	n_{perm}	6000		rpm
Max. perm. torque [4] [5] on tool drive coupling	M_{perm}	25	32	Nm
Transferable power [3]	P_{perm}	10	8	kW
Suitable for spindle units coupling profile		BMT45	BMT 55	

Upgraded version Tool drive [2] [3] (Option)				
Gear ratio	i	1		
Perm. speed [3] on tool drive coupling	n_{perm}	8000		rpm
Max. perm. torque [4] [5] on tool drive coupling	M_{perm}	25	32	Nm
Transferable power [3]	P_{perm}	10	8	kW
Suitable for spindle units coupling profile		BMT45	BMT55	

[1] In order to achieve an extended service life of the cooling lubricant valve, it is advisable to filter the cooling lubricant by ≤ 100µm. 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!

[2] The data stated here may differ on special versions.

[3] → *Technical data 4xx.x16-TI02*

[4] M_{perm} is the permissible peak load for the gears. The torque must be limited on the motor frequency converter to the value indicated, while adhering to the gear ratio involved! The useful power data depend on the performance characteristic curve of the motor type used.

[5] The permissible torque can be utilized for non-pulse machining operations. For strongly pulsed machining operations - e.g., inserted tooth milling cutters and others - only a significantly reduced drive torque should be applied to protect the gears against any overloads.

3 Assembly and installation

Condition of supply

- The tool drive motor is not included in the scope delivery.
  Part of the coupling is already mounted with a spacer for assembly; spacer bush, driver and the second coupling part are supplied.
- The tool disk and gear head are aligned.
- All unoccupied tool holding fixtures are sealed - each with GPM closing plug with O-ring and with GPM closing plate.
- The turret is vented.
- The turret is test run.

3.1 Overview

Assembling	
Turret motor	
Turret Motor not from GPM	→*Page 11*
Tool drive motor	
for tool drive Version Direct drive with coupling	→*Page 12*
Connecting	
Electrical installation (motors, sensors)	
GPM turret motor	→*EPB-1343*
Turret Motor not from GPM	→*EPB-1332*
Control lines (sensors, Control Unit, machine control)	
Cooling lubricant [operating pressure, filter fineness]	→*Page 9*

3.2 Turret motor

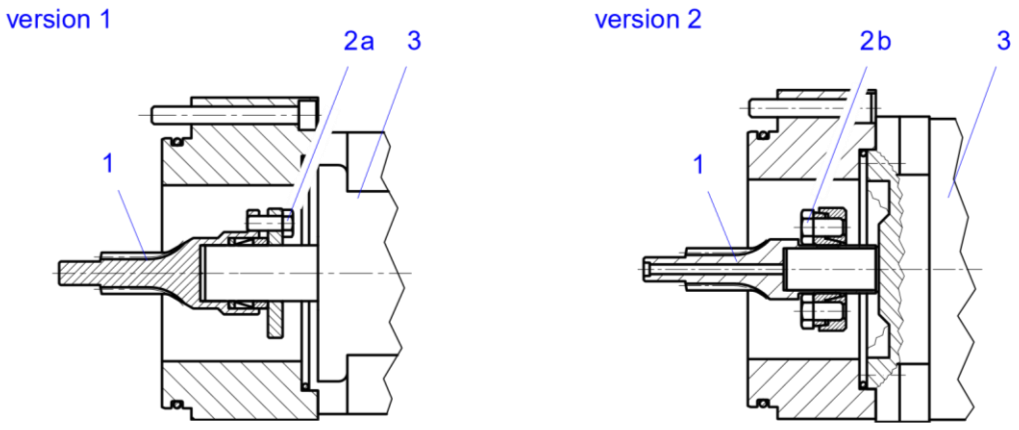
Turret motor not from Messrs. GPM

Preparation

Clearing required prior to any work:

➢Switch the machine off.

Assembling



1	Pinion shaft
2a	Screws M5×12 - 10.9 for clamping (pinion)
2b	Screws M6 for clamping (pinion)
3	Motor, screws for fastening (not included in scope of delivery)

IMPORTANT

➢Attach pinion axially to stop at front end of shaft or on shaft collar, depending on the version involved.

➢Tighten screws (2) crosswise.

M5  8.5Nm or M6  12Nm

➢Mount turret motor with pinion.

➢Screw the motor to the flange.

Basic settings → *Page 14*

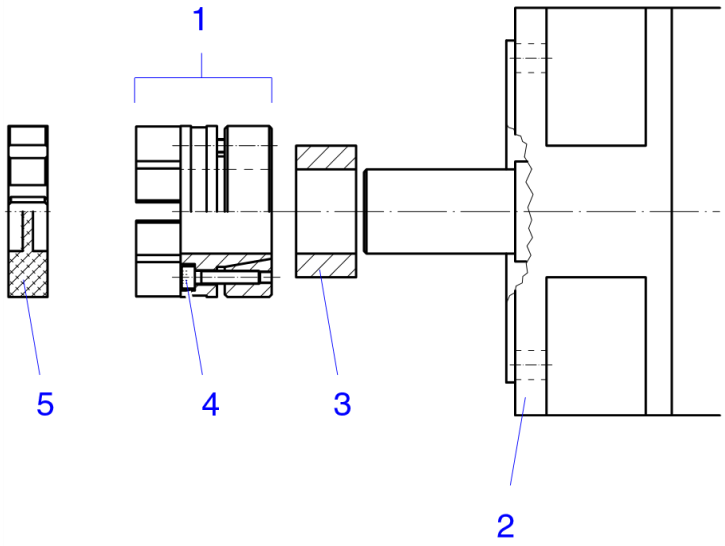
3.3 Tool drive motor

Preparation

Clearing required prior to any work:

➢Switch the machine off.

Assembling



➢Push the spacer sleeve (3) onto the shaft end as far as the stop.

➢Push the coupling part (1) onto the stop and align with the previously mounted coupling part.

➢Tighten screws (2) crosswise.

➢Screw in clamping screws (4) down to stop and tighten slightly.

➢Tighten clamping screws evenly and crosswise until the appropriate tightening torque is reached.

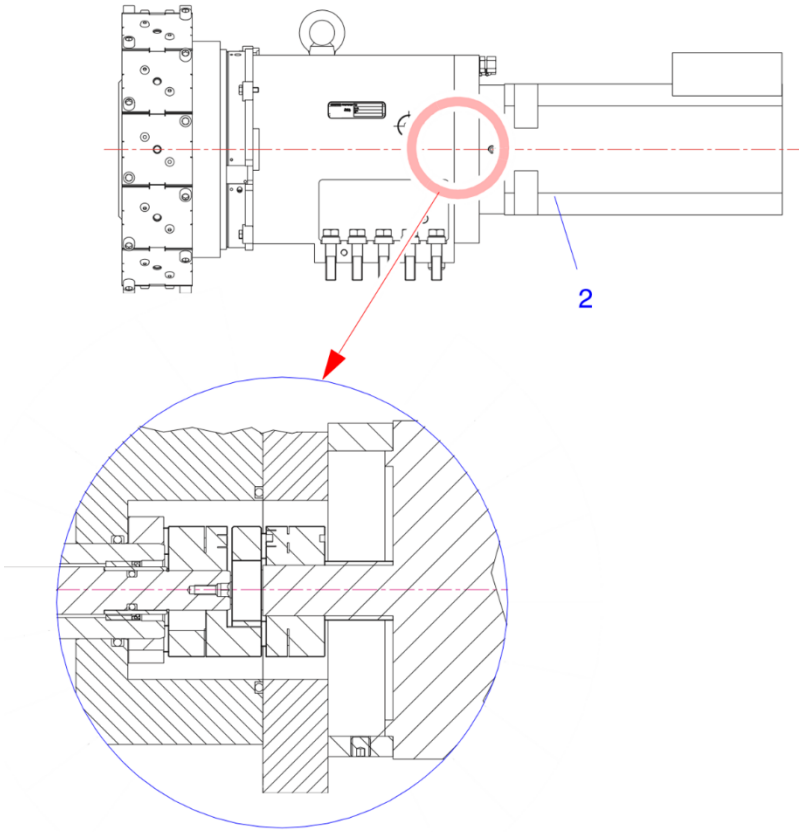

7Nm

➢Oil the flanks of the driver (5).


Sliding oil free of molybdenum disulphide

➢Install driver (5).

Assembling



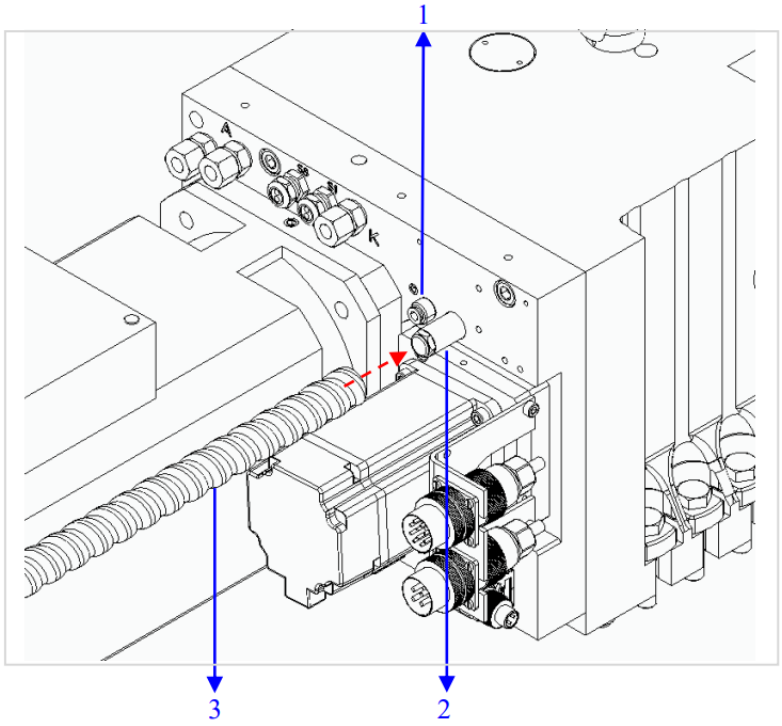
➢Join the coupling.

➢Screw the motor (2) to the flange.

Basic settings → *Page 16*

3.4 Turret air cooling system (Option)

BMT upgraded Turret features



1 Air inlet

2 Air outlet (hot air)

3 Flexible conduit

- ➢ Air pressure opening time synchronized with the customer's power motor.
- ➢ The power motor selected by the customer must have fan cooling.
- ➢ The internal temperature limit of the turret is 70°C, monitored by a temperature sensor.
- ➢ The customer can cover the air outlet with a flexible conduit themselves.

4 Start-up

4.1 Safety notes

DANGER

Danger of death due to high electrical voltage.

Risk of injury due to live and/or rotating parts.

Risk of injury due to hot surfaces.

- All work on electric motors must be carried out by a skilled electrician.

Electric and hydraulic supply may have to be switched on for aligning and adjusting work.

WARNING

Risk of injury posed by moving machinery components.

➢Secure workplace with warning sign.

➢Prevent actuation by other persons; secure control panel.

➢Do not stay close to moving machinery components, especially within the swiveling range of the tools.

4.2 Overview

Checking	
Hydraulic system	→*HP-544*
Vent hydraulic system	→*Page 18*
Basic settings	
for the turret motor	→*Page 14*
for the tool drive motor	→*Page 16*
Function check	→*SK-1598*

4.3 Turret motor

Basic settings

IMPORTANT

The turret reference point may have to be redefined, if necessary, after turret motor assembly as well as after failures/ repairs.

WARNING

Risk of injury posed by moving machinery components. If power supply and hydraulic circuits are turned on for adjustment operations:

➢Secure workplace with warning sign.

➢Prevent actuation by other persons; secure control panel.

➢Do not stay close to moving machinery components, especially within the swiveling range of the tools.

CAUTION

Risk of material damage.

The tool drive motor must be set in order to enable correct coupling.

➢Remove all tool holders/spindle units.

Basic procedure

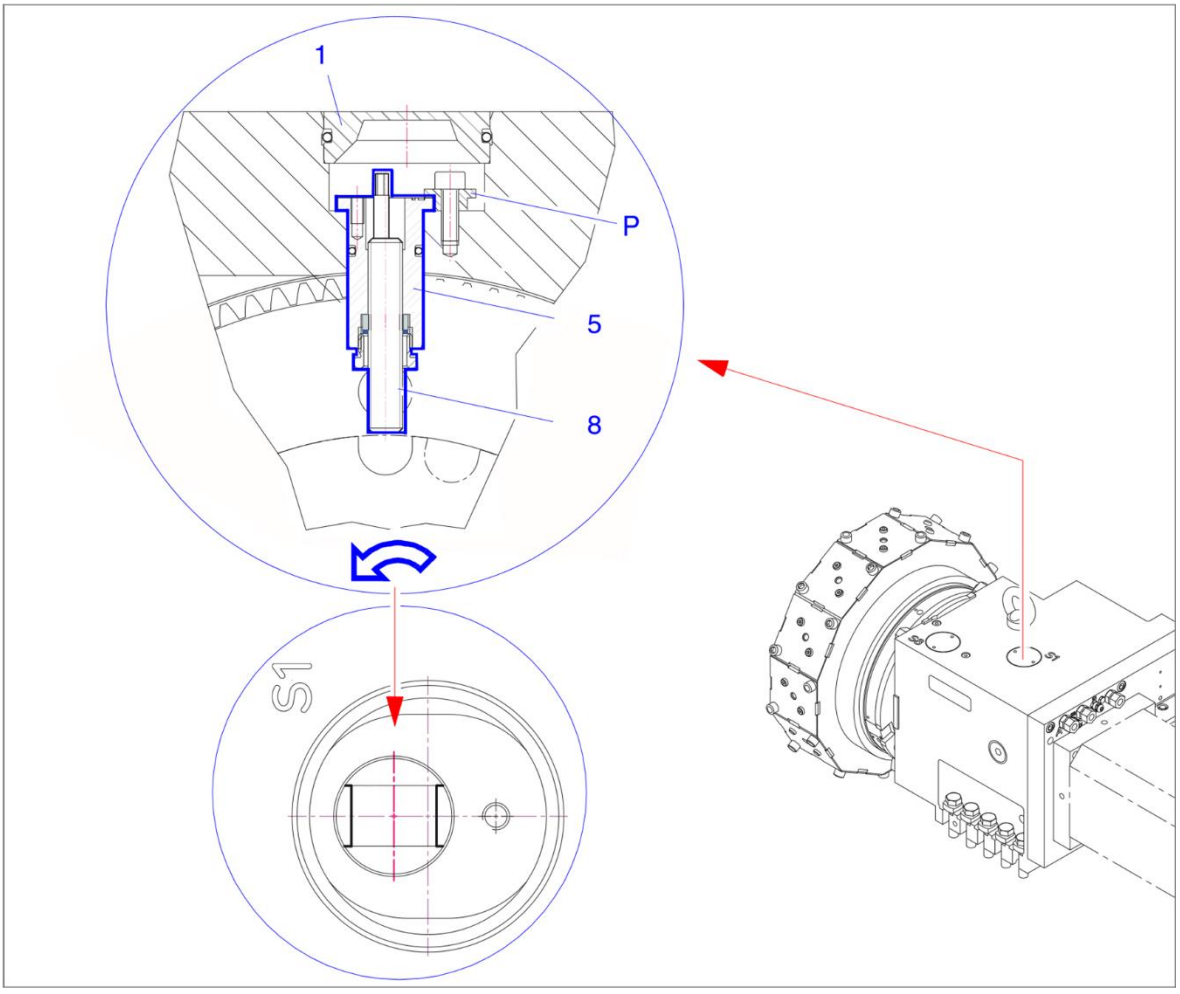
1.	Unlock turret.	
2.	Determine position 1.	
	Proximity switch S1 is mounted:	→ *Drive to position 1*
	Proximity switch S1 is faulty or not mounted:	→ *Adjust position 1*
3.	Lock turret.	
4.	Pass the position/value for position 1 to the control unit.	

Drive to position 1

➢Rotate tool disk step by step until proximity switch S1 is no longer activated.

➪LED OFF/ signal “Position 1”.

Adjust position 1



➢Lock turret.

➢Remove plug (1) with plug extractor.

➢Loosen claw (P).

➢Turn the tool disk until the hole (1) is visible.

➢Pull out holder (5).

➪The groove can be observed through the bore.

➢Unlock turret.

➢Rotate tool disk until the groove is situated in the center of the bore.

➢Lock turret.

➢Insert holder (5) and fasten with claw (P).

➢Insert plug (1).

Checking

Proximity switch S1 is not activated (LED OFF and/or no signal).

4.4 Tool drive motor

WARNING

Risk of injury posed by moving machinery components. If power supply and hydraulic circuits are turned on for adjustment operations:

➢Secure workplace with warning sign.

➢Prevent actuation by other persons; secure control panel.

➢Do not stay close to moving machinery components, especially within the swiveling range of the tools.

CAUTION

Risk of material damage.

The tool drive motor must be set in order to enable correct coupling.

➢Remove all tool holders/spindle units.

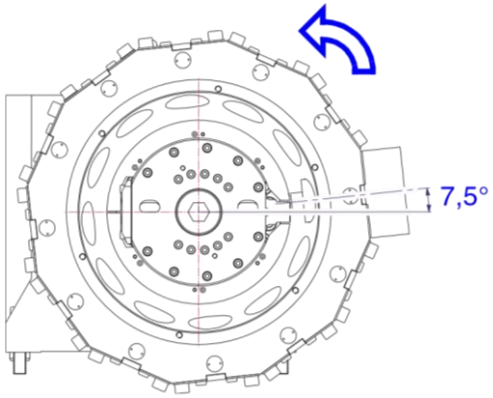
➢Perform basic adjustments for the tool drive motor.

Preparation

➢Take turret motor and tool drive motor out of control.

The low-potential circuit of the machine control unit must remain active when doing so.

➢Unlock turret.



➢Rotate the tool disk manually by 7.5 degrees.

➢Lock turret.

➢Remove the closing plug of the tool holding fixture in working position.

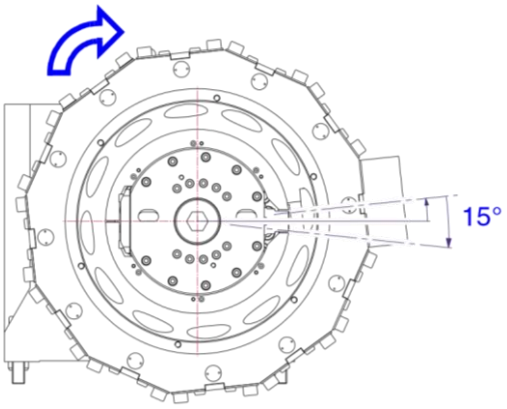
➢Insert a spindle unit into the working position, but do not screw down.

Basic settings

1. Turn the spindle unit shaft manually until a resistance can be felt.
   Read off the tool spindle position on the machine control and record as value 1.
2. Then turn the spindle unit shaft in the opposite direction until a resistance can be felt.
   Read off the tool spindle position on the machine control and record as value 2.

➢Remove spindle unit.

➢Unlock turret.



➢Rotate tool disk manually by 15 degrees in the opposite direction.

➢Lock turret.

➢Insert a spindle unit into the working position, but do not screw down.

3. Repeat steps 1 and 2, recording the respective values.
4. Determine the average value of the recorded values and enter in the machine control as reference point offset for the tool drive motor.

Function Checking

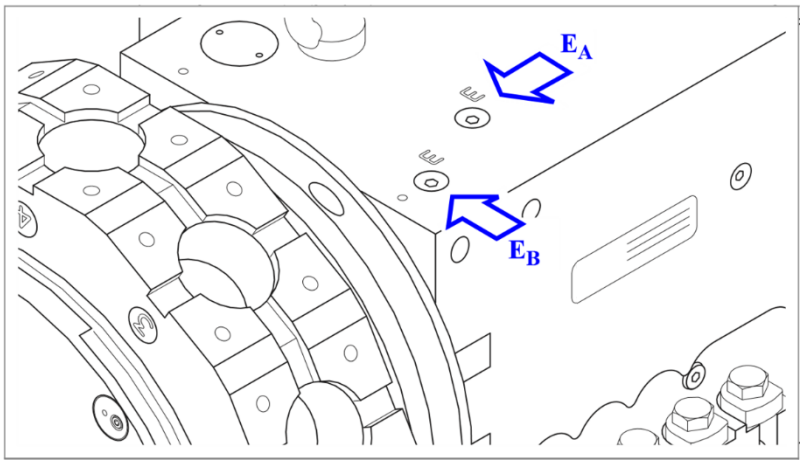
➢Mount spindle unit. → *Page 21*

➢Check function. → *Diagram of functions*

4.5 Hydraulic system

Condition of supply

- The cylinders of the turret are filled with hydraulic oil.
- Hydraulic connections A and B are closed.
- The turret is vented.



- Each internal hydraulic line features **at least** 1 venting bore.
- All venting bores are provided with venting screws and marked with an **E**.

Connecting

IMPORTANT

It must be possible to pressurize the hydraulic lines of the turret for locking and unlocking operations, even if the machine is stopped.

→ *Hydraulic diagram*

→ *Hydraulic operating pressure: Technical data, page 9*

IMPORTANT

Air penetrates into the hydraulic system of the turret during installation and connection to the hydraulic circuit of the machine.

Air inside the hydraulic system poses a risk to trouble-free turret operation.

After installation and connection:

➢Vent carefully in a technically appropriate manner.

➢Perform the electrical installation of the turret.

➢Switch on turret motor and tool drive motor.

➪This makes it possible to keep the tool disk to its position following unlocking operations.

➢Switch hydraulic supply on.

WARNING

Risk of injury posed by moving machinery components.

➢Secure workplace with warning sign.

➢Prevent actuation by other persons; secure control panel.

➢Do not stay close to moving machinery components, especially within the swiveling range of the tools.

Venting

IMPORTANT

Several liters of oil may have to be drained for complete venting, if necessary, depending on the size of the hydraulic system/length of the hydraulic hoses.

➢Collect the hydraulic oil and dispose of it in a technically appropriate manner.

Start with one hydraulic line, e.g. line A

1. Adjust pressure for hydraulic line A: max. 50bar.

WARNING

Risk of injury by high pressure inside the hydraulic system.

➢Do not unscrew venting screw.

2. Loosen venting screw with a maximum of 2 revolutions, allow the oil to escape and close the venting screw again.
   Lock and unlock the turret several times over.
   Repeat the whole process several times over.
3. For complete venting, the hydraulic line must be vented successively by means of all venting bores installed.

➪The hydraulic line is entirely vented when oil flows out of the venting bores without any bubbles.

➢Vent the remaining lines by applying the same principle.

5 Operation

5.1 Overview

Changing	
Tools	→*Page 21*
Tool holders for static tools	
Spindle units for driven tools	→*Page 22*
Sealing for all unoccupied tool holding fixture	→*SK-1663*
Checking	
Hydraulic system	→*HP-544*
Vent hydraulic system	→*Page 19*
Drainage for the tool disk	→*Page 29*
Fault elimination	→*Page 25*

5.2 Tools

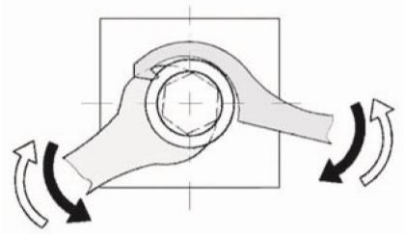
CAUTION

Risk of machine damage due to changing a driven tool incorrectly:

Impacts on the tool holding fixture can damage the turret drive train.

Therefore, always change driven tools as follows:

➢When loosening /clamping the tool holding fixture, always support it with a second spanner.



or

➢Remove spindle unit, change tool and refit spindle unit.

5.3 Tool holders and spindle units

CAUTION

To ensure safe sealing of the tool disk interior and to avoid potential damage to property:

and

To avoid damage to the coupling for the spindle unit:

➢Observe the coupling profile. → *Technical data, page 9*

➢Exclusively use tool holders/spindle units with specification dimensions in accordance with the given SK: → *SK-1663*

➢Use tool holders for static tools together with the GPM closing plug with O-ring only.

➢Seal all unoccupied tool holding fixtures:

- each with GPM closing plug with O-ring and with GPM closing plate. →*Figure, Page 22*

IMPORTANT

➢Do not clean with compressed air!

➢Only use cloth to clean.

Establish initial state

WARNING

Risk of injury posed by moving machinery components.

➢Secure workplace with warning sign.

➢Prevent actuation by other persons; secure control panel.

➢Do not stay close to moving machinery components, especially within the swiveling range of the tools.

➢Move tool drive motor to its zero position (e.g. using “Positioning spindle”).

➢Unlock turret.

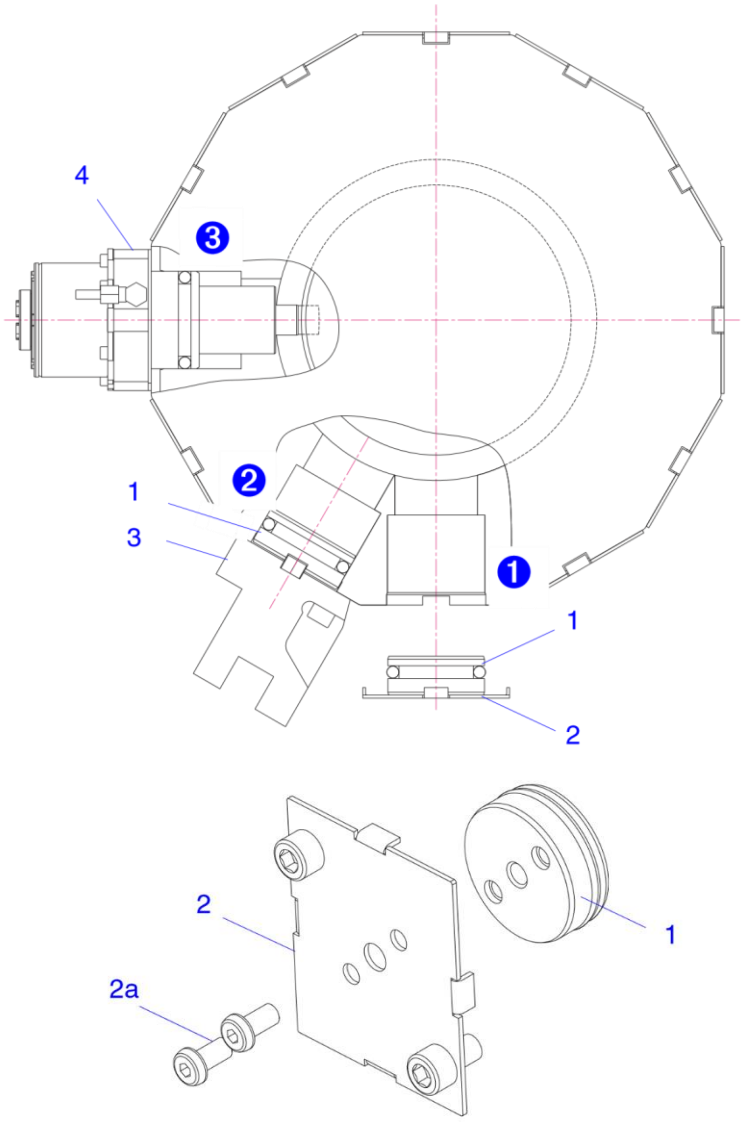
➢Rotate the tool disk until the position to be equipped is placed in horizontal position.

➢Lock turret.

➢Deenergize turret motor and tool drive motor.

➢If a tool is mounted in the position to be equipped, disassemble it.

➢Clean tool disk coarsely.



1	GPM closing plug with O-ring
2	GPM closing plate
2a	Screws for fastening of the GPM closing plug with O-ring
3	Tool holder for static tools
4	Spindle unit for driven tools

Disassembling

➢Depending on variant ❶, ❷ or ❸, disassemble the equipment from the tool disk.

➢Clean the contact surface of the tool disk.

➢Clean the disassembled equipment and check O-rings, replace if necessary.

IMPORTANT

A GPM closing plug with O-ring (1) is required for equipment variant ❷.

➢This can be disassembled from an unneeded GPM closing plate (2).

Otherwise:

➢Store the unneeded GPM closing plates (2) and GPM closing plugs with O-ring (1).

➢Clean new equipment if necessary.

Check O-rings and replace if necessary.

In addition, for spindle units:

➢Check the coupling profile for wear, replace spindle unit if necessary.

Assembling

➢Insert GPM closing plug with O-ring (1) and tool holder (3) or spindle unit (4).

➢Tighten screws, noting screw-in depth and tightening torque!

BMT45/55		4 x M10 - 8.8		49 Nm

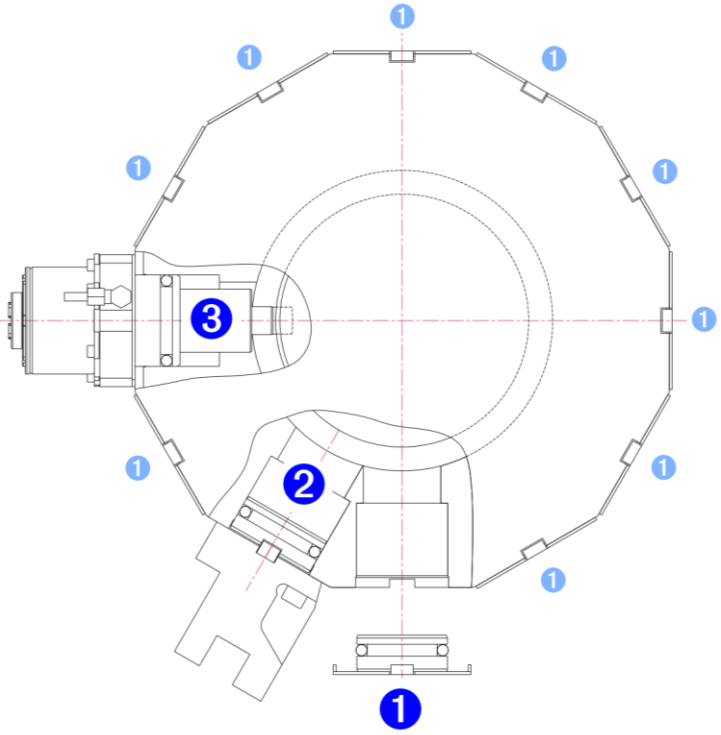
➢Seal all unoccupied tool holding fixtures:

- each with GPM closing plug with O-ring (1) and GPM closing plate (2).

BMT45/55		2 x M10 - 8.8		49 Nm

Check tool disk

Are all tool holding fixtures occupied?



❸	For driven tools
	Spindle unit with specification dimensions in accordance with the given SK
❷	For static tools
	GPM closing plug with O-ring
	and
	Tool holder with specification dimensions in accordance with the given SK
❶	Without tools
	GPM closing plug with O-ring
	and
	GPM closing plate

5.4 Possible faults and remedies

Clearing required prior to any work:

➢Switch the machine power off.

➢Depressurize turret.

Fault	Cause	Remedy	Who carries out this task?
Incorrect center height, tool disk offset relative to locating disk	Collision when turret is locked	Align tool disk	User → *Page 33*
Tool disk does not rotate	Gearwheels are defective	Replace defective parts	GPM Service
	Turret motor or control unit defective	*see Operating Instructions of the machine*	
Turret does not lock	Axis has rotated out of position relative to the gearwheel	Align axis to gearwheel	GPM Service
	Proximity switch S8 does not switch	Check proximity switch S8, set or replace if necessary	User → *Page 39*
Reference point travel for turret not possible	Proximity switch S1 does not switch	Check proximity switch S1, set or replace if necessary	User → *Page 37*
Tool disk rotates in one direction only	Turret motor or control unit defective	*see Operating Instructions of the machine*	
Tool disk does not stop in the selected position or positions into place with strong impact	Turret motor or control unit defective		
Leakage oil escapes	Seals are defective	Replace defective parts	GPM Service
Cooling lubricant is not being transferred	Cooling lubricant valve is defective	Replace defective parts	User → *Page 41*
	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 defective parts	

Fault	Cause	Remedy	Who carries out this task?
Tool drive			
Tool is not driven	Gearwheels are defective	Replace defective parts	GPM Service
	Tool drive motor is defective	Replace defective parts	User → *Page 29*
Collision between tool disk and gear head	Tool disk is displaced	Align tool disk	User → *Page 33*
	Gear head is not in the correct position	Align gear head	GPM Service → *Page 29*

6 Maintenance

Safety notes → *Page 4*

6.1 Overview

Planned preventive maintenance	→ *Page 26*
Repairs after fault conditions	→ *Page 24*

6.2 Service life

The service life of the turret is approx. 8 million switchings or approx. 5 years.

The service life of the tool drive unit is approx. 8000 operating hours.

These values apply to

- collision-free operation,
- compliance with the specified operating conditions and the permissible loads, → *Technical data*

6.3 Service intervals

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

IMPORTANT

➢Maintenance intervals must be adapted to the operating conditions involved.

after 500 operating hours of the machine and/or every month respectively	Clean apertures for drainage of the tool disk.	User → *Page 29*
	Check tool holders/spindle units on tool disk for proper seating. Check sealing rings on tool holders/ spindle units and replace tool holders/ spindle units, if necessary.	User → *Page 22*
after 4000 operating hours of the machine respectively	Check cooling lubricant valve for wear and leakage. Replace any defective parts.	User → *Page 42*
	Check turret gearbox chamber.	User → *Page 28*
after 2½ years respectively	Check all electrical and hydraulic lines and connections for mechanical damage as well as embrittlement. Replace any defective parts.	User Specialist electrical engineer [1)]
after 8000 operating hours of the machine respectively	The service life of the tool drive unit may possibly be reached, depending on the operating conditions involved. A general overhaul is recommended for further trouble-free operation.	GPM Service
after approx. 8 million indexing operations and/or approx. 5 years respectively	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.	GPM Service

[1)] These are persons who are able to identify risks and to prevent possible hazards on the basis of their special training and their experience (IEC 60 201-1).

6.4 Maintenance work

Turret gear chamber

- The product is lubricated with grease. Lubricant used:

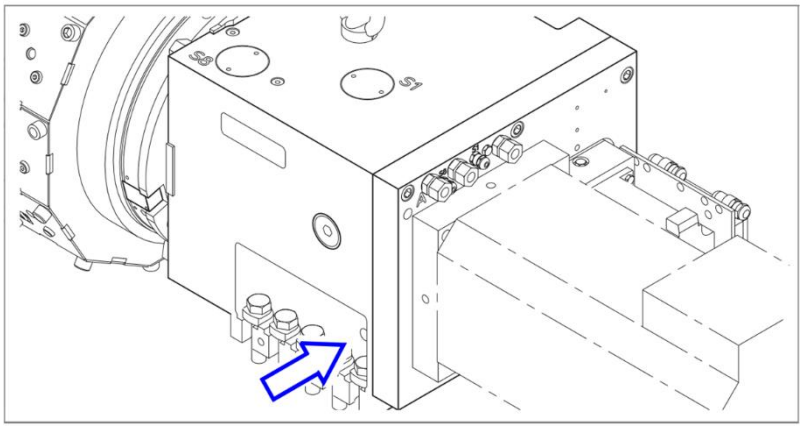
CENTOPLEX CX4/375 (KLÜBER)

- Lubrication must be checked after 4,000 operating hours respectively.

Clearing required prior to any work:

➢Switch the machine power off.

➢Depressurize turret.



➢Clear access to opening on turret housing.

➢Remove screw plug off opening.

➢Take grease sample and assess grease condition:

Condition	Cause	Measure
Grease: black or brown, without metallic abrasion	Trace of natural wear	–
No grease visible on gear	Natural consumption	➢Replenish grease. CENTOPLEX CX4/375
Grease: black or brown, with metallic abrasion	Internal parts of turret are damaged	➢Request GPM Service!
Grease: white, mixed with cooling lubricant	Turret sealings are damaged	
Grease mixed with oil		

➢Re-insert screw plug.

Tool disk

- The outlet apertures inside the tool disk must be checked after 500 operating hours respectively.

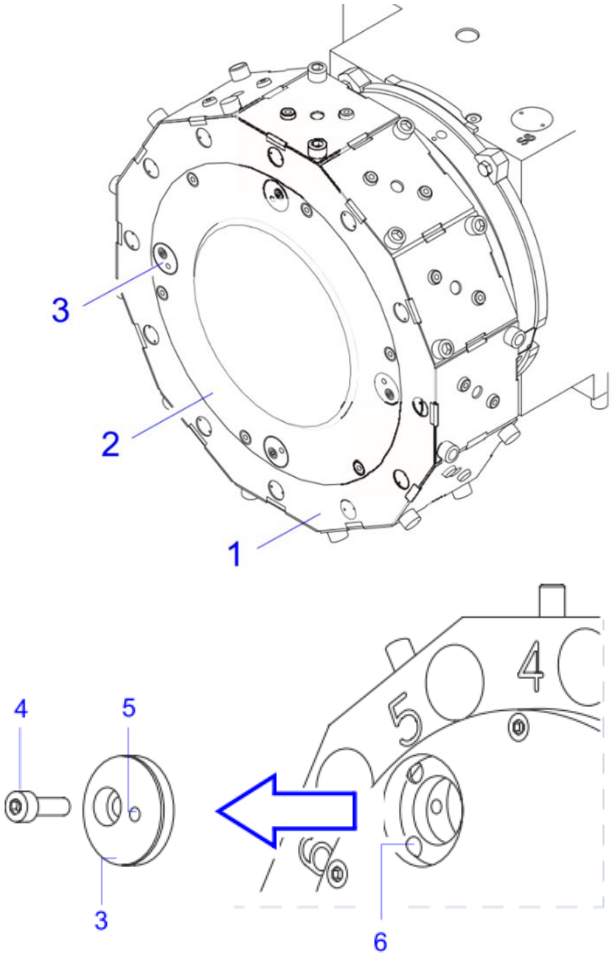
Clearing required prior to any work:

➢Switch the machine power off.

➢Depressurize turret.

Clean outlet apertures inside the tool disk

There may be slight differences compared to the figures.



1 Tool disk
2 Closing plate for the tool disk
3 Bolt
4 Screw
5 Extracting thread
6 Outlet aperture inside the closing plate

Clean

1. Clean coarse dirt from closing plate for tool disk using a cloth.
2. Unscrew screw.
3. Rotate screw a few times to screw it into the extracting thread and take out bolt.
4. Clean bolt.
5. Replace parts, if necessary. → *Page 52*
6. Clean aperture inside closing plate using a cloth.
7. Re-attach bolt and screw in screw.
8. Clean all outlet apertures in line with this principle.

Function check

➢Check, whether air is flowing out of all outlet apertures.

Clean again, if necessary.

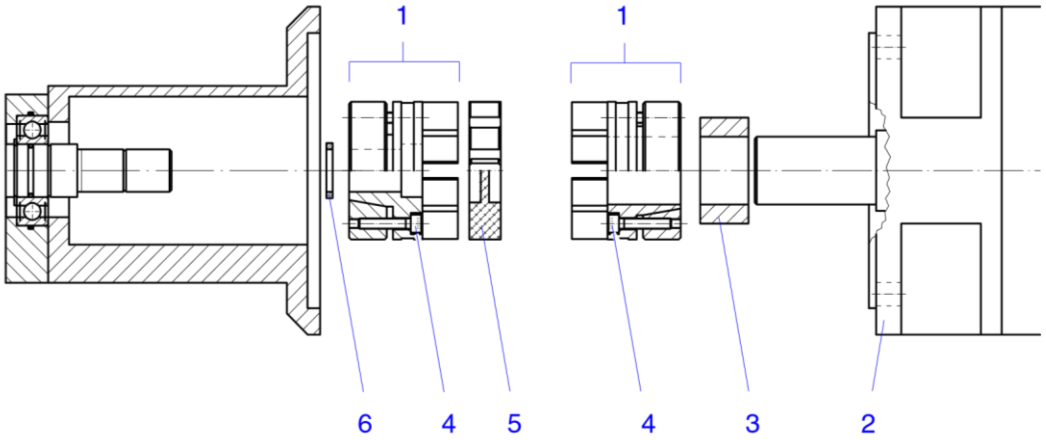
6.5 Tool drive motor

Clearing required prior to any work:

➢Switch the machine power off.

➢Depressurize turret.

Disassembling



➢Remove motor (2) and driver (5).

➢Loosen clamping screws (4) (several revolutions).

➢Remove the clamping screws located close to each forcing thread, and screw into the forcing thread down to stop.

➢Tighten the screws evenly and crosswise, and continue to remove the remaining clamping screws, if necessary.

➪The clamping ring is pushed by the conical clamping ring hub.

➢Extract coupling components (1).

Assembling → *Page 12*

Basic settings → *Page 16*

6.6 Gear head

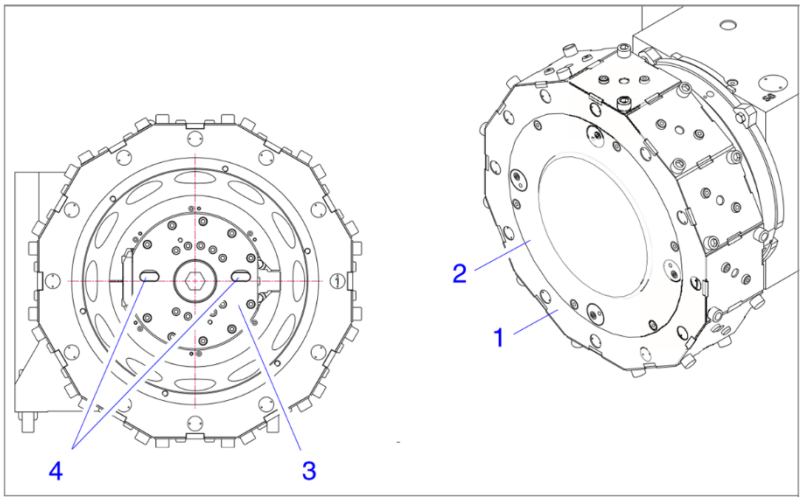
IMPORTANT

The gear head may need to be realigned after faults/repair work.

Basic procedure

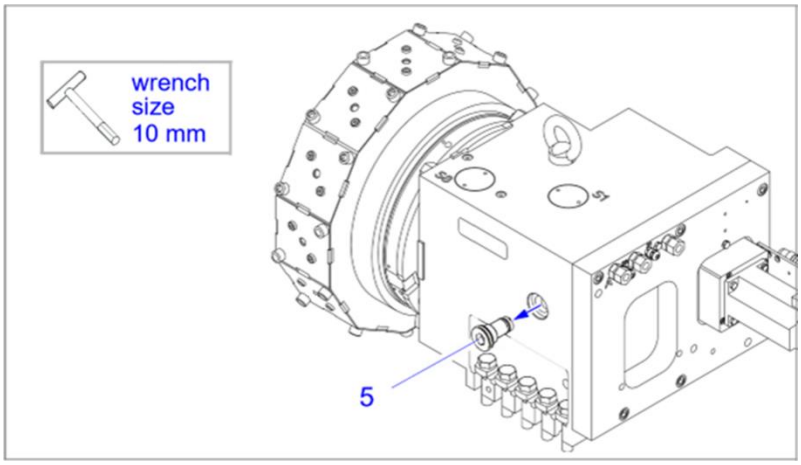
1.	Lock turret.	
2.	Depressurize turret.	
3.	Deenergize turret motor.	
	If the tool drive motor is mounted:	
4.	Deenergize tool drive motor.	
5.	Remove all tool holders/spindle units.	
6.	Align gear head.	→ *Page 31*
7.	Adjust tool drive motor.	→ *Page 18*

Preparation



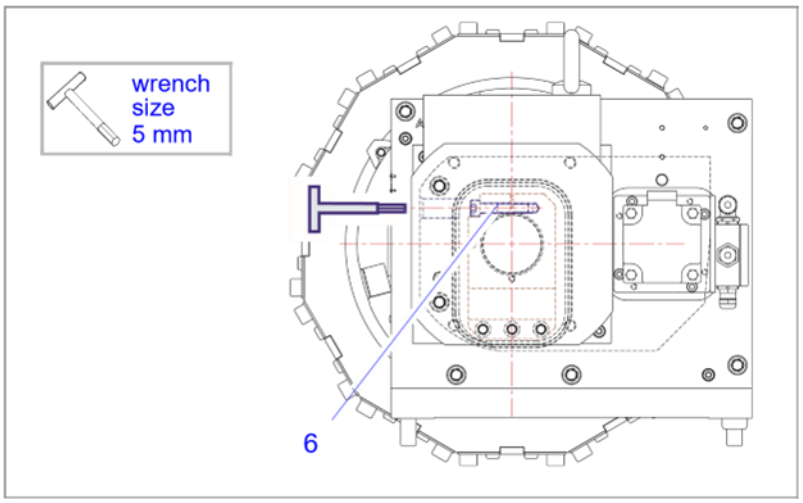
➢Remove closing plate (2) for the tool disk (1) (6 screws).

➪It will then be possible to check the position of the slots (4) in the gear head (3) during alignment.



➢Unscrew screw plug (5).

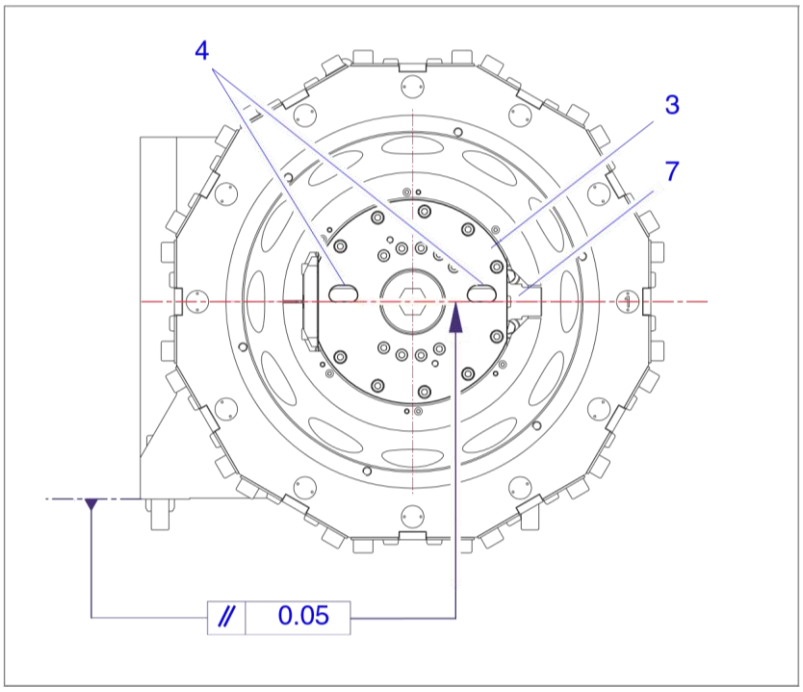
➪The screw (6) on the clamping plate is accessible through the bore.



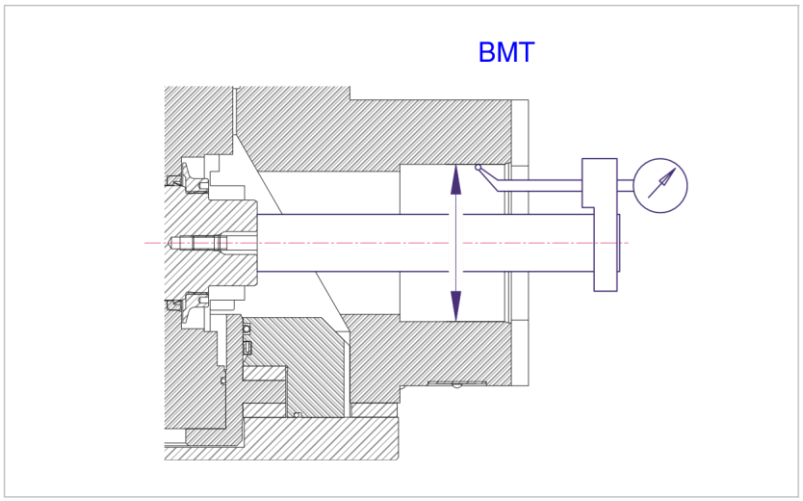
➢Loosen screw (6).

➢Turn the gear head (3) until the coupling (7) for the spindle unit is in the working position.

Aligning

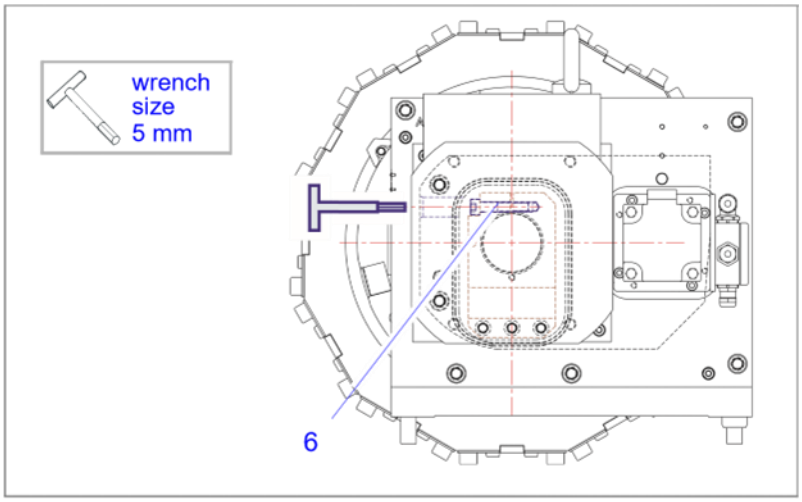


➢Align slots (4) with the bolt-down surface of the turret. or

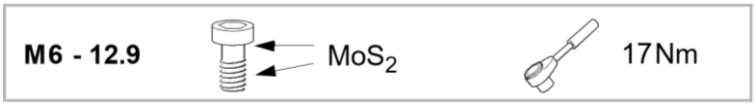


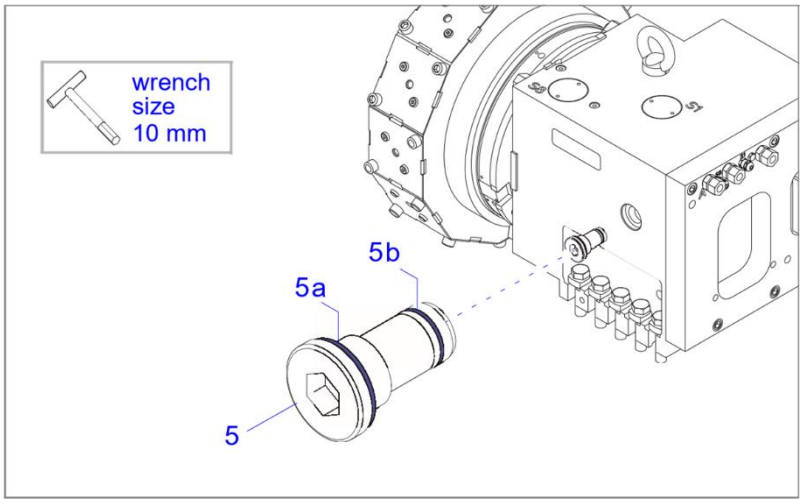
➢Align the tool drive motor concentrically with the locating hole in the tool disk.

runout error	max. 50µm	BMT



➢Tighten screw (6).





➢Check sealing ring (5a) and O-ring (5b) and replace if necessary.

➢Screw in screw plug (5).

➢Screw on closing plate (2) for the tool disk (1) again.

Mount tool drive motor, if necessary → *Page 12*

Basic settings → *Page 16*

6.7 Tool disk

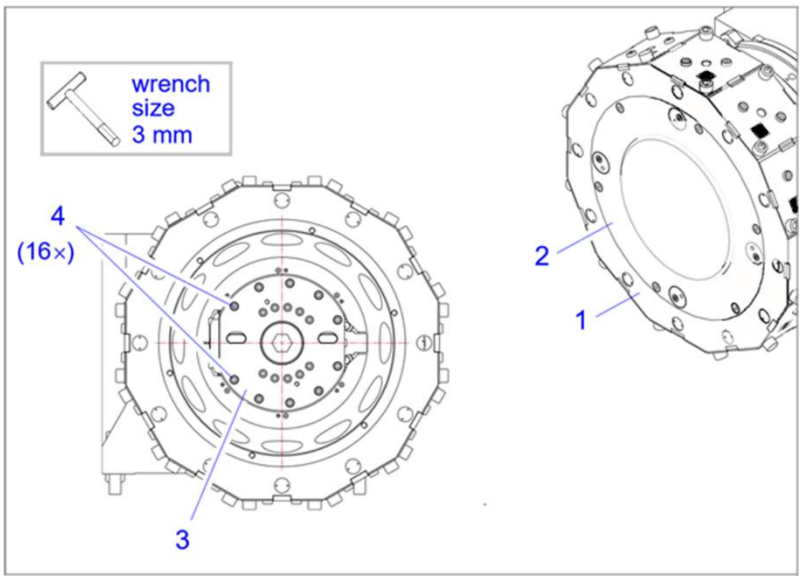
IMPORTANT

The tool disk may need to be realigned after faults/repair work.

Basic procedure

Preparation	
1. Lock turret.	
2. Depressurize turret.	
3. Deenergize turret motor.	
4. Deenergize tool drive motor.	
5. Remove all tool holders/spindle units.	
Checking	
6. Check the adjustment of the tool disk.	→ *Page 35*
Aligning	
7. Dismantle tool drive motor.	→ *Page 29*
8. Dismantle gear head.	→ *Page 34*
9. Align tool disk.	→ *Page 35*
10. Mount gear head.	
11. Align gear head.	→ *Page 29*
12. Mount tool drive motor.	→ *Page 12*
Adjusting	
13. Adjust tool drive motor.	→ *Page 16*

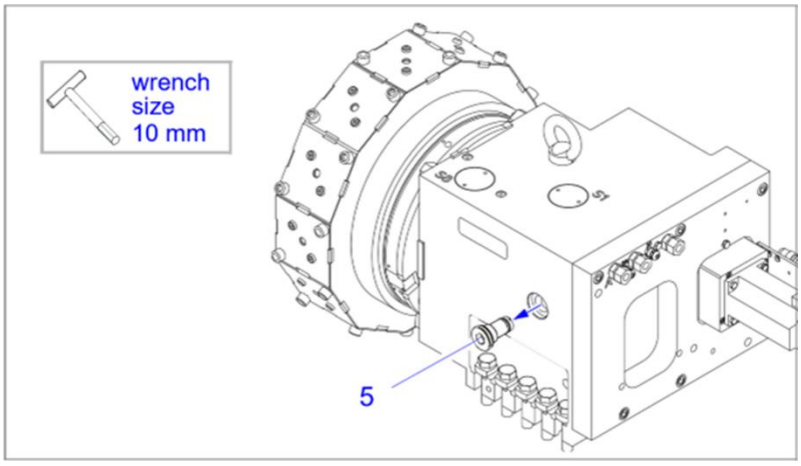
Dismantling the gear head



➢Remove closing plate (2) for the tool disk (1) (6 screws).

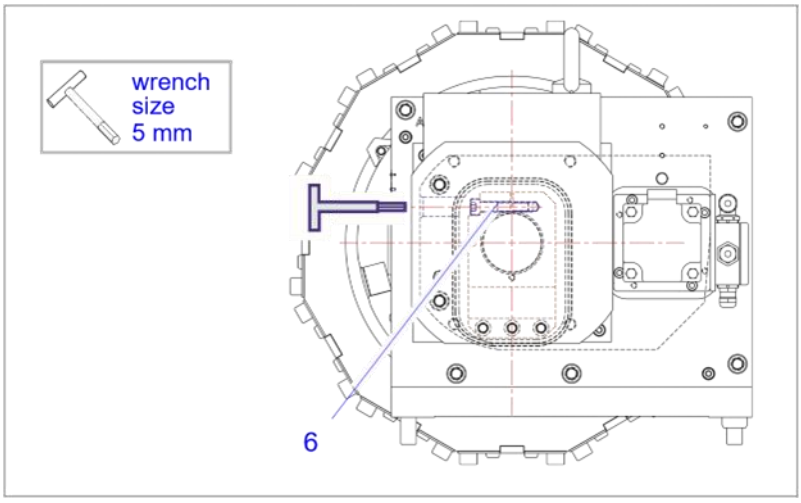
➪The gear head (3) is accessible.

➢Unscrew screws (4) in the gear head (3).



➢Unscrew screw plug (5).

➪The screw (6) on the clamping plate is accessible through the bore.



➢Loosen screw (6).

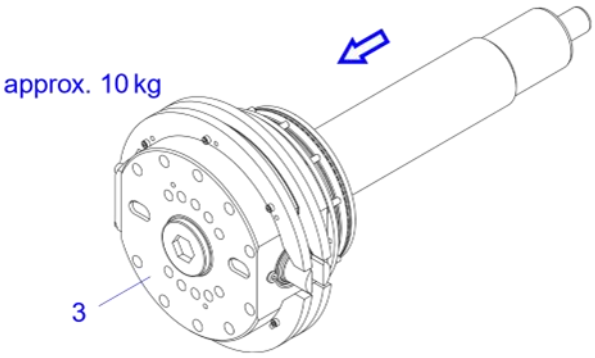
WARNING

Risk of injury.

In order to avoid hand injuries (crushing) when dismantling the gear head or to prevent the gear head from slipping out (depending on the installation position):

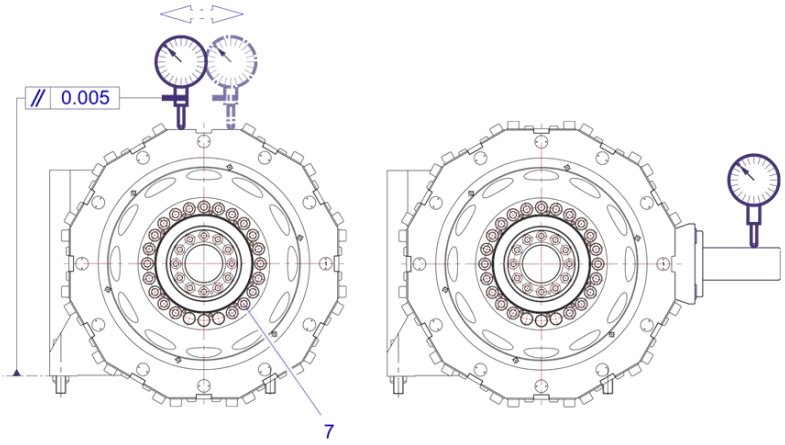
➢Pay attention to mass and mass distribution.

➢Secure the gear head if necessary.



➢Carefully remove the gear head (3).

Aligning the tool disk



➢Loosen screws (7).

➢Align the locating hole to center height of the machine.

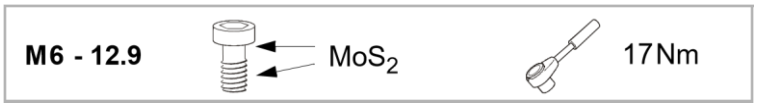
➢Tighten screws (7).

M8 - 12.9		MoS_2	41 Nm

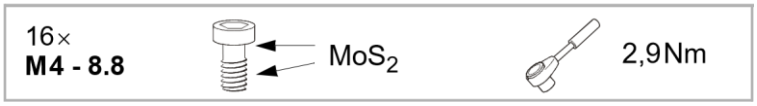
Mounting the gear head

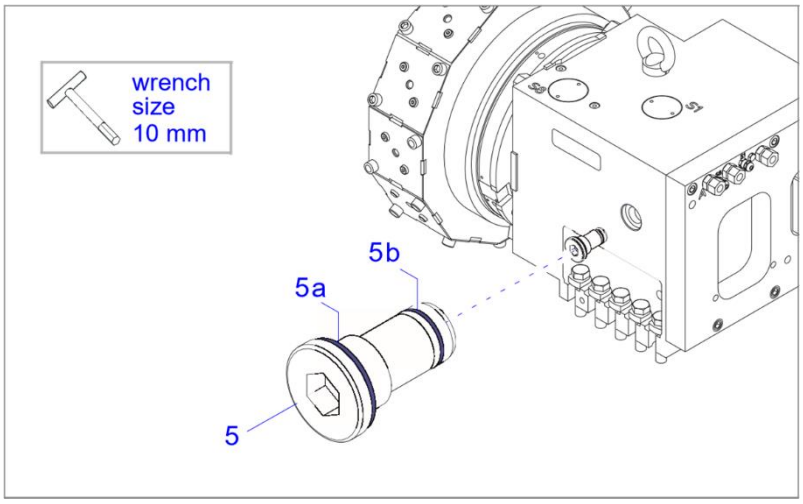
➢Carefully insert the gear head (3).

➢Tighten screw (6).



➢Screw in screws (4) and tighten.





➢Check sealing ring (5a) and O-ring (5b) and replace if necessary.

➢Screw in screw plug (5).

➢Screw on closing plate (2) for the tool disk (1) again.

Mounting the tool drive motor → *Page 12*

Aligning the gear head → *Page 29*

Basic settings → *Page 16*

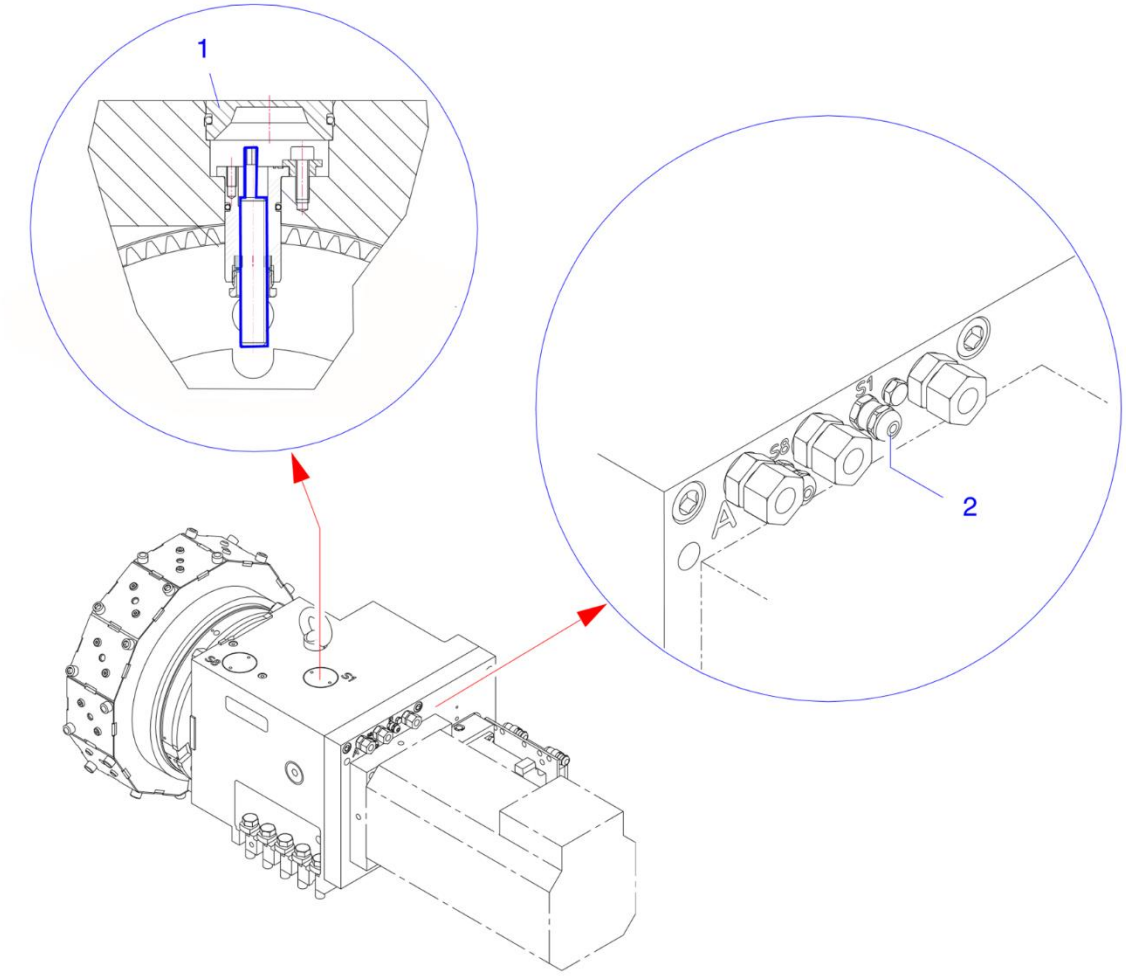
6.8 Proximity switch S1

IMPORTANT

Setting tasks require a 24V DC power supply.

Preparation

➢Lock turret.

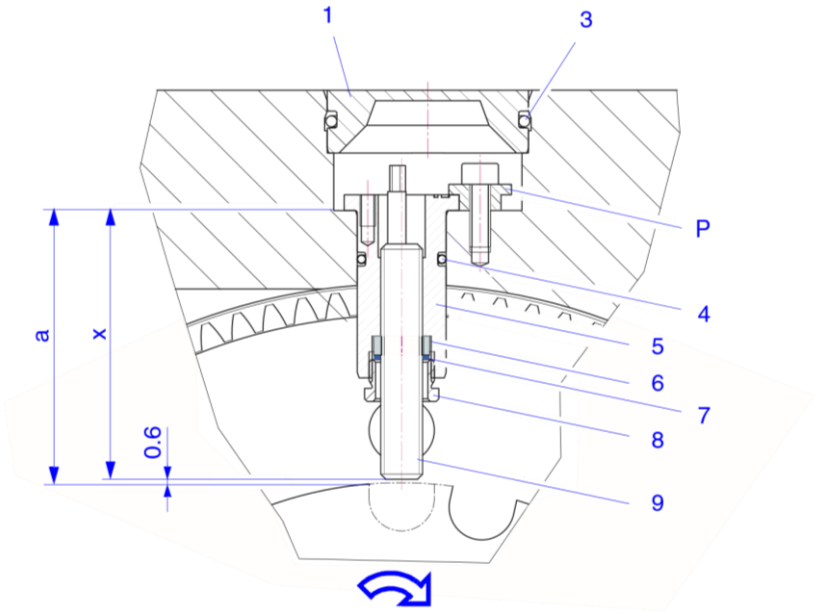


➢Remove plug (1) using a plug extractor.

➢Uninstall proximity switch.

➢Slacken traction relief (2) and pull cable through.

Replacing



➢Loosen claw (4).

➢Pull out holder (5).

➢Measure dimension x and record.

➢Unlock turret.

➢Do not rotate tool disk to position 1, but to any other position.

➪As a result, the distance a can be measured accurately on gear (8).

➢Measure distance a with depth gauge and record.

➢Lock turret.

➢Apply *Replacement parts group* [parts (4) ... (9)].

➢Loosen pressure screw (8).

Adjusting

➢Set the proximity switch according to the noted dimension x or to x = a - 0.6 mm.

➢Lock proximity switch (11) with pressure screw (10), during that control dimension x.

➢Insert holder (5) and fasten with claw (P).

➢Pull cable through and fasten.

➢Insert plug (1).

➢Connect proximity switch electrically.

Function check

➢Unlock turret.

➪Proximity switch S8 is no longer activated (LED OFF/no signal).

➢Rotate tool disk step by step until proximity switch S1 is no longer activated.

➪LED OFF/ signal “Position 1”.

➢Lock turret.

➪Proximity switch S8 is activated (LED ON/signal “Turret locked”).

6.9 Proximity switch S8

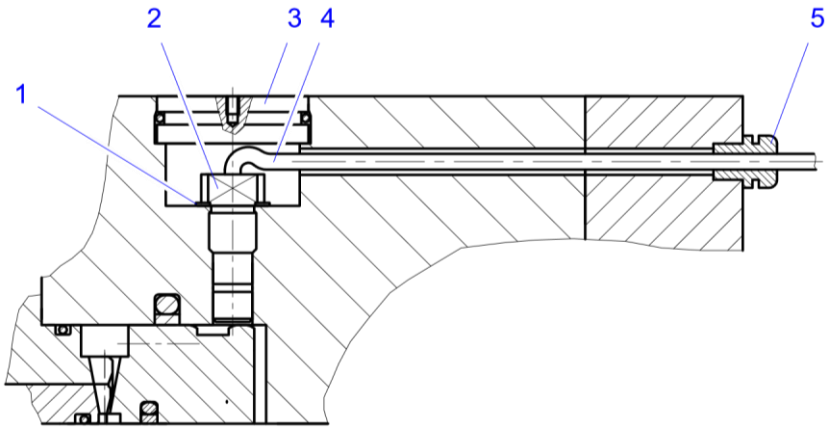
Position of the proximity switch: → *Page 49*

IMPORTANT

Setting tasks require a 24V DC power supply.

Preparation

➢Lock turret.



Replacing

WARNING

Injury hazard.

Proximity switch extending inside the pressurized chamber.

➢Depressurize turret!

➢Remove plug (3) using a plug extractor.

➢Slacken traction relief (5) and pull cable (4) through.

➢Unscrew defective proximity switch (2) using an appropriate wrench.

➢Screw in new proximity switch by re-using already available shims (1).→ *Function check*

Function check

WARNING

Risk of injury posed by moving machinery components.

If power supply and hydraulic circuits are turned on for adjustment operations:

➢Secure workplace with warning sign.

➢Prevent actuation by other persons; secure control panel.

➢Do not stay close to moving machinery components, especially within the swiveling range of the tools.

➢Turn on hydraulic supply system.

Tightness

1. Check proximity switch for tightness.

Lock/ unlock in any position and check signals:

2. Lock turret.

   ➪Proximity switch S8 is activated (LED ON and/or signal “Turret locked”).

3. Unlock turret.

   ➪Proximity switch S8 is no longer activated (LED OFF and/or no signal).

If a different result is obtained: → *Replacing*

Lock in specified position and check signals:

4. Unlock turret.
5. Affix marking to tool disk and rotate tool disk manually by 3-3.5 degrees.

   ➪ Hirth coupling is in “head-to-head” position.

6. Lock turret.

   ➪ Proximity switch S8 is no longer activated (LED OFF and/or no signal).

In this case, proximity switch S8 is correctly adjusted. →*proceed with step 7.*

Otherwise: Perform steps → *Replacing* and use a further shim/further shims.

Final check

7. Unlock turret.
8. Turn tool disk manually back by 3-3.5 degrees (marking).
9. Lock turret.

   ➪ Proximity switch S8 is activated (LED ON and/or signal “Turret locked”).

➢Insert plug (3).

6.10 Cooling lubricant valve

- Cooling lubricant valves for GPM Disk-type tool turrets are executed depending on the order involved. The cooling lubricant connection may be situated on the valve.
- Cooling lubricant valves are wearing parts and must therefore be inspected after 4,000 operating hours of the machine respectively.
- For ordering replacement parts, the identification number of the cooling lubricant valve can be indicated, if engraved. Otherwise, the order number (i.e. Comm. No. on the turret nameplate) must be given.
- Operating pressure and filter fineness for cooling lubricant: → *Technical data*

Replacing the cooling lubricant valve

Clearing required prior to any work:

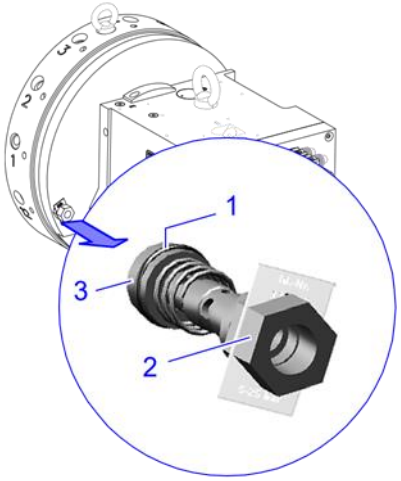
➢Switch the machine power off.

➢Depressurize turret.

➢Turn off cooling lubricant supply unit.

Cooling lubricant valve	
with valve carrier	→*Page 42*
Cartridge	→*Page 41*

Cooling lubricant cartridge



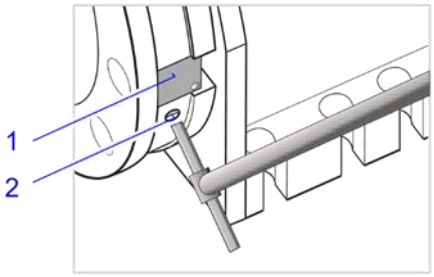
➢Unscrew screw plug (2).

➢Withdraw cooling lubricant cartridge complete with screw plug (2).

➢Check cooling lubricant cartridge; if necessary, replace bushing (3) and O-ring seal (1).

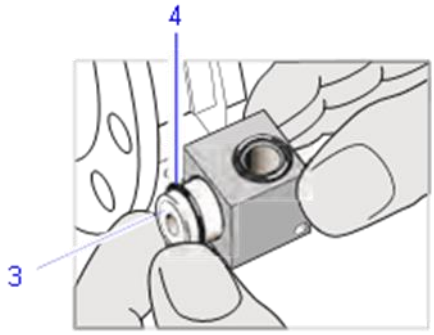
➢Refit cooling lubricant cartridge complete with screw plug.

Cooling lubricant valve with valve carrier



➢Loosen setscrew (2).

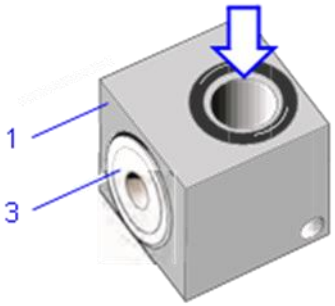
➢Withdraw valve carrier (1).



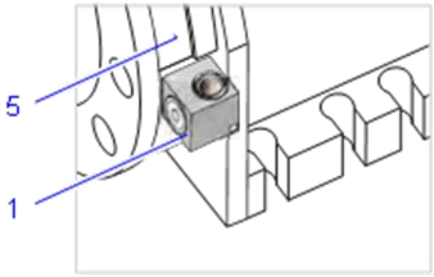
➢Remove valve bushing (3), note any loose internal parts!

➢Check O-ring seal (4).

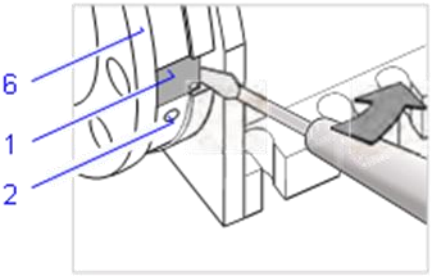
Replace cooling lubricant valve, if necessary.



➢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).



➢Press valve carrier (1) against locating disk (6).

➢Tighten setscrew (2).

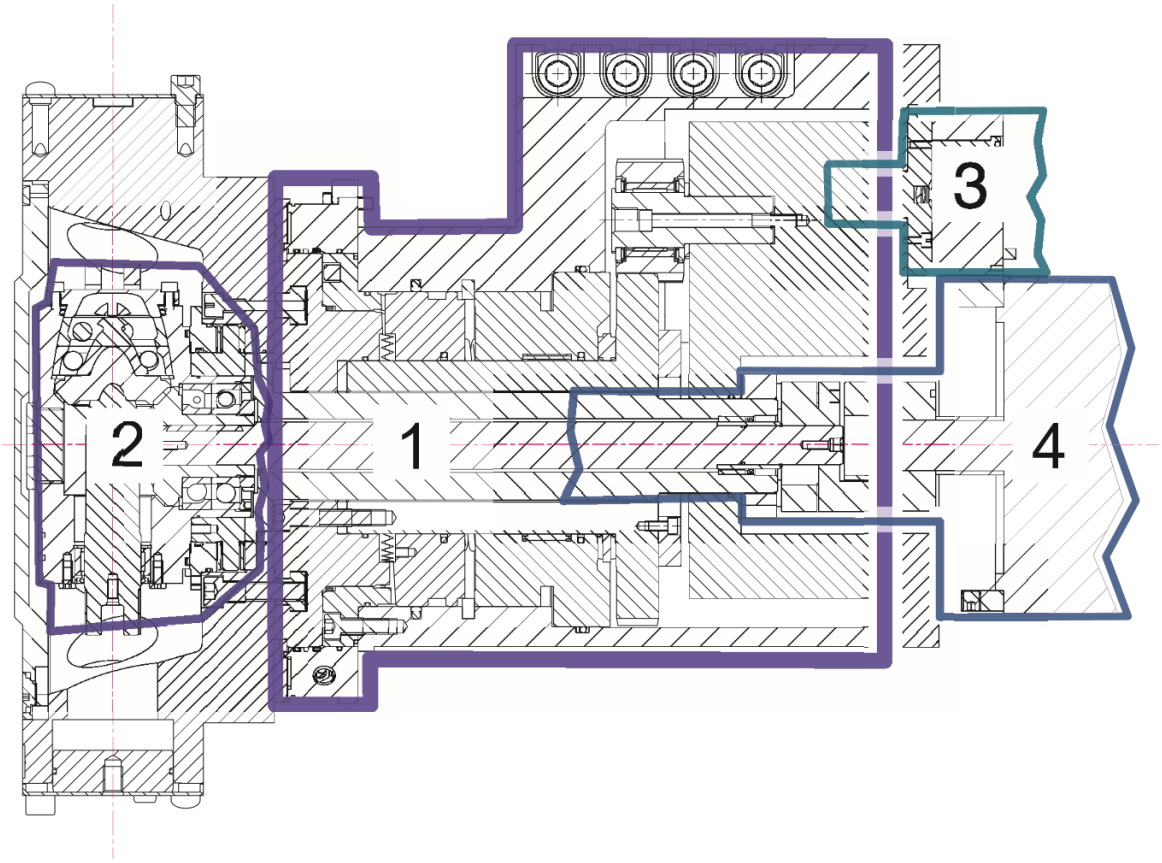
In the process, ensure that setscrew (2) engages in the groove of valve carrier (1).

7 Replacement parts

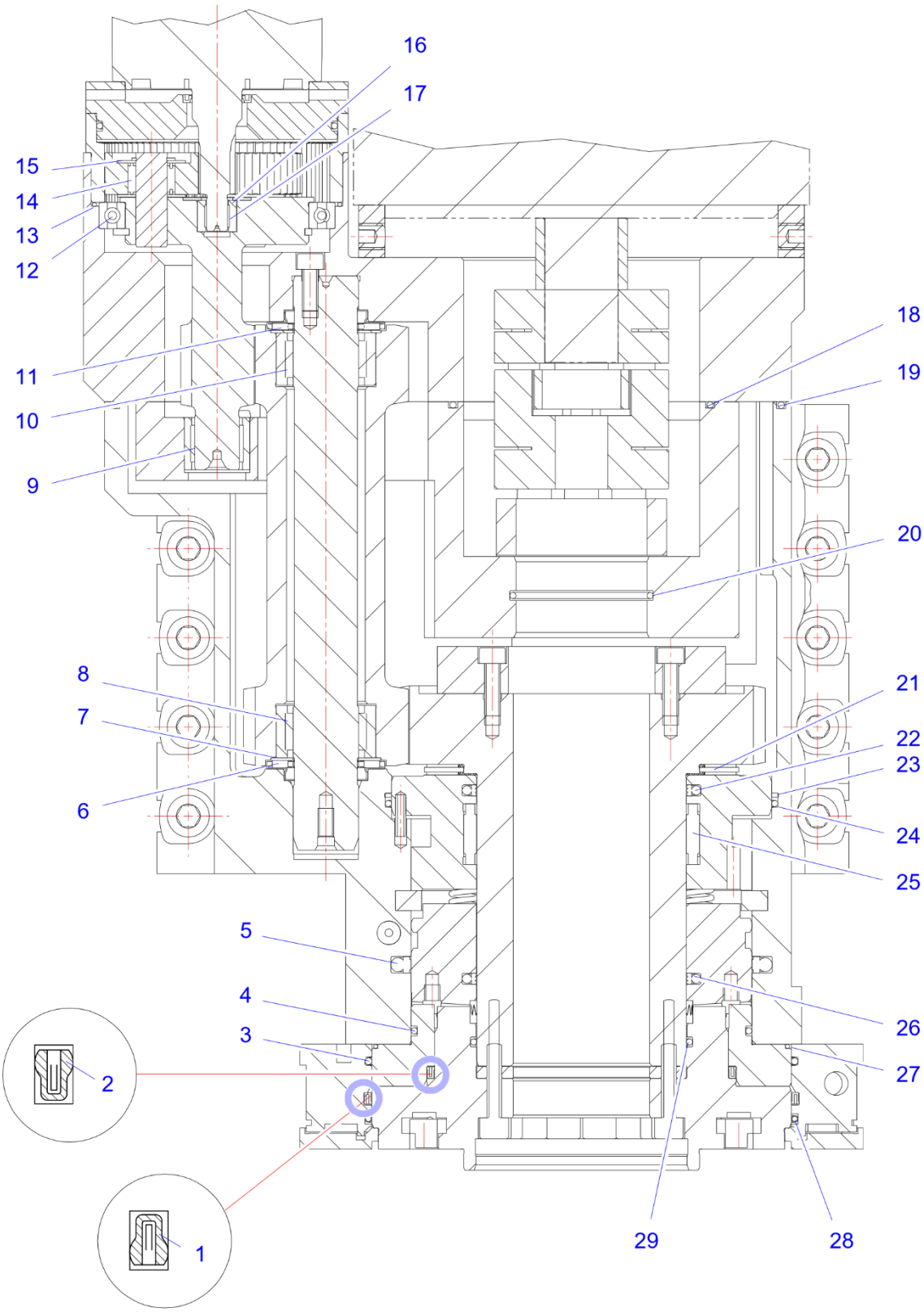
IMPORTANT

➢Please contact GPM Services.

➢Please follow the ordering instructions. → *Information at the end of the present manual*



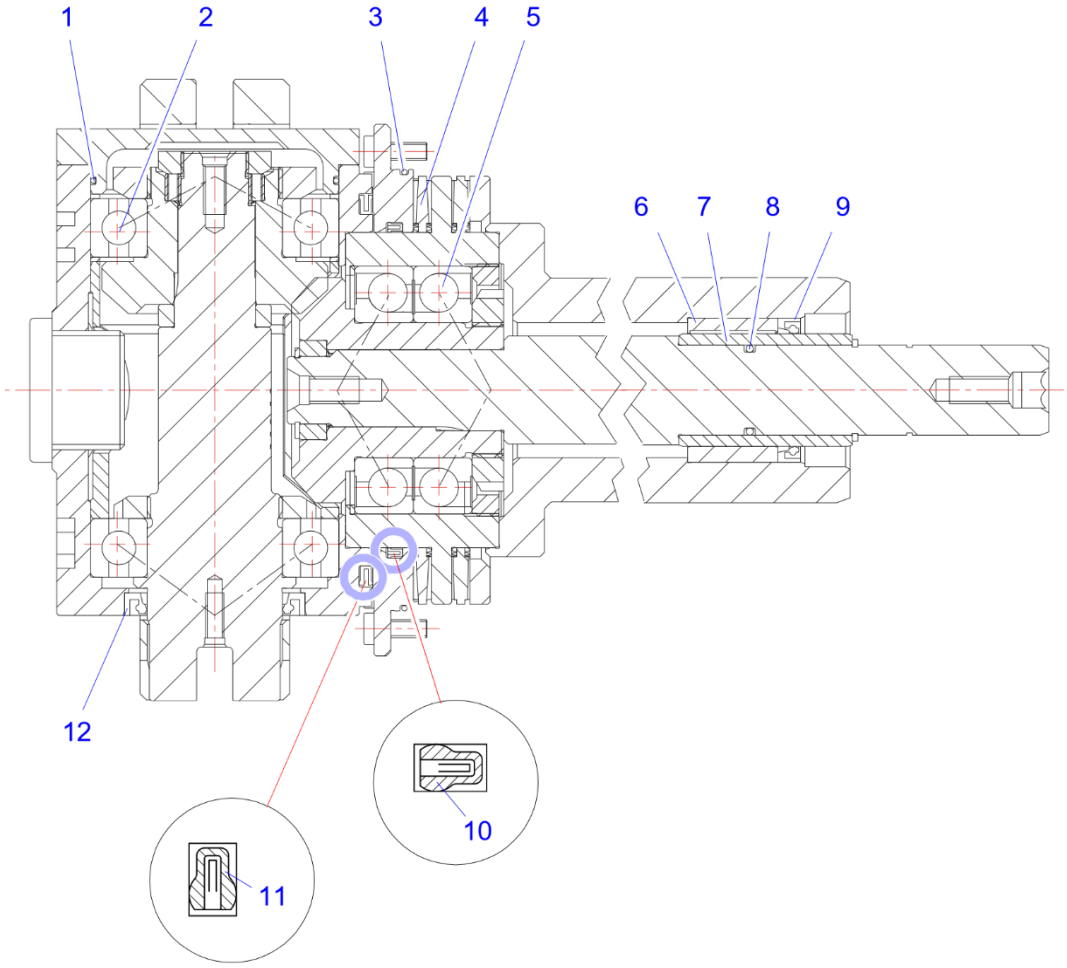
7.1 Turret (without drive)



No.	Ident No.	Designation	Qty.
1	037 320	FU groove ring	1
2	083 142	FU groove ring	1
3	063 361	O-ring seal	1
4	059 932	O-ring seal	1
5	083 064	Surface ring	1
6	081 412	Thrust needle roller bearing	1
7	038 836	Thrust bearing disk	1
8	082 318	Needle bearing	1
9	105 555	Needle bearing	1
10	082 318	Needle bearing	1
11	081 412	Thrust needle roller bearing	1
12	065 715	Deep groove ball bearing	1
13	086 726	O-ring seal	1
14	034 532	Needle roller and cage assembly	1
15	029 986	Thrust bearing disk	1
16	029 986	Thrust bearing disk	1
17	107 299	Needle bearing	1
18	060 801	O-ring seal	1
19	058 525	O-ring seal	1
20	080 559	O-ring seal	1
21	036 580	Thrust needle roller and cage assembly	1
22	118 040	Supporting ring	1
23	058 075	O-ring seal	1
24	058 075	O-ring seal	1
25	118 041	Needle cage	1
26	081 423	Surface ring	1
27	058 943	O-ring seal	1
28	036 588	Spaghetti hose	0.52m
29	063 239	O-ring seal	1

7.2 Gear head

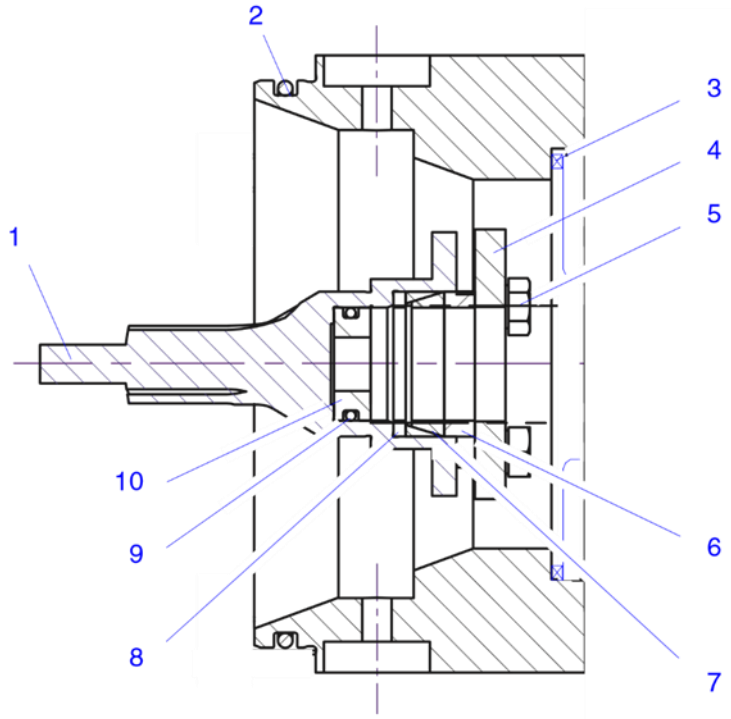
for inferfaces BMT 55



No.	Ident No.	Designation	Qty.
1	115 838	O-ring seal	1
2	082 535	Spindle bearing	2
3	100 879	O-ring seal	1
4	070 006	Thrust needle roller and cage assembly	2
5	146 476	Angular contact ball bearing	2
6	061 771	Needle bearing cup with open ends	1
7	076 733	Inner ring	1
8	058 546	O-ring seal	1
9	075 184	Radial seal for rotating shaft	1
10	143 950	FU groove ring	1
11	143 949	FU groove ring	1
12	074 861	Radial seal for rotating shaft	1

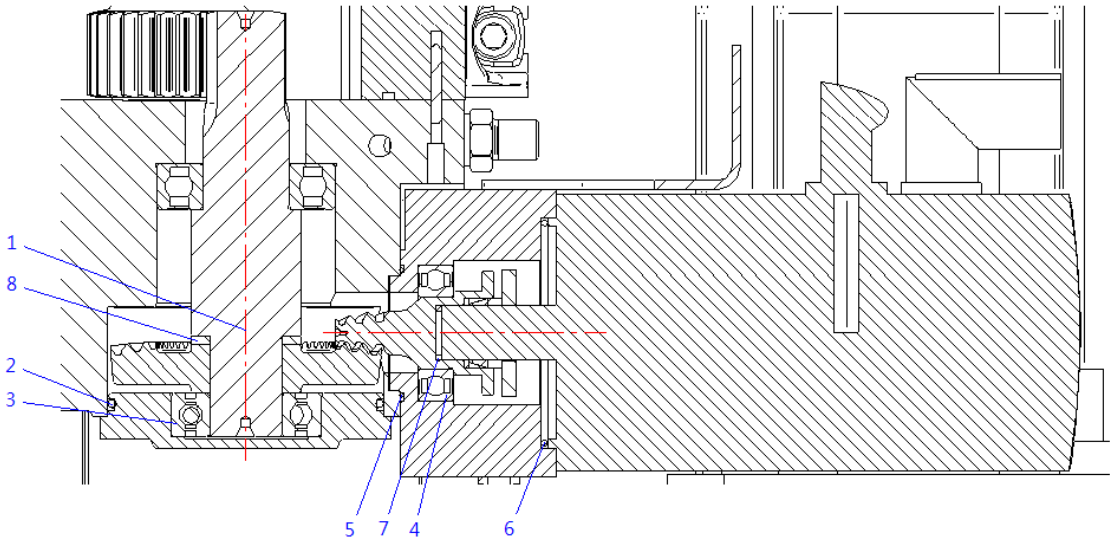
7.3 Turret drive

Turret motor not from Messrs. GPM



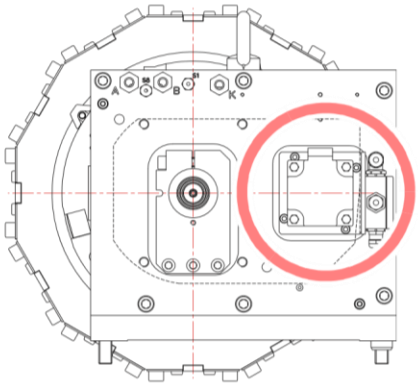
No.	Ident No.	Designation	Qty.
1	107 128	Pinion shaft	1
2	063 462	O-ring seal	1
3	066 853	O-ring seal	1
4	107 127	Flange	1
5	001 237	Screw	4
6	107 187	Ring	1
7	030 062	Tensioning element	1
8	107 129	Ring	1
9	074 558	O-ring seal	1
10	121 542	Ring	1

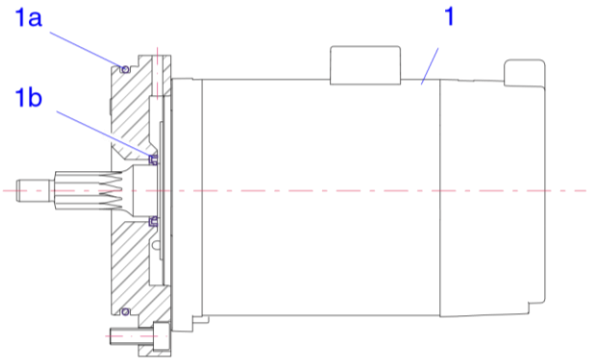
Turret motor turn 90 degrees



No.	Ident No.	Designation	Qty.
1	40301027-01	Gear shaft	1
2	065 718	O-ring seal	1
3	078 324	Bearing	1
4	056 354	Bearing	1
5	071 867	O-ring seal	1
6	000 186	O-ring seal	1
7	40505068-01	Ring	1
8	40505071-01	Ring	1

Turret motor from Messrs. GPM





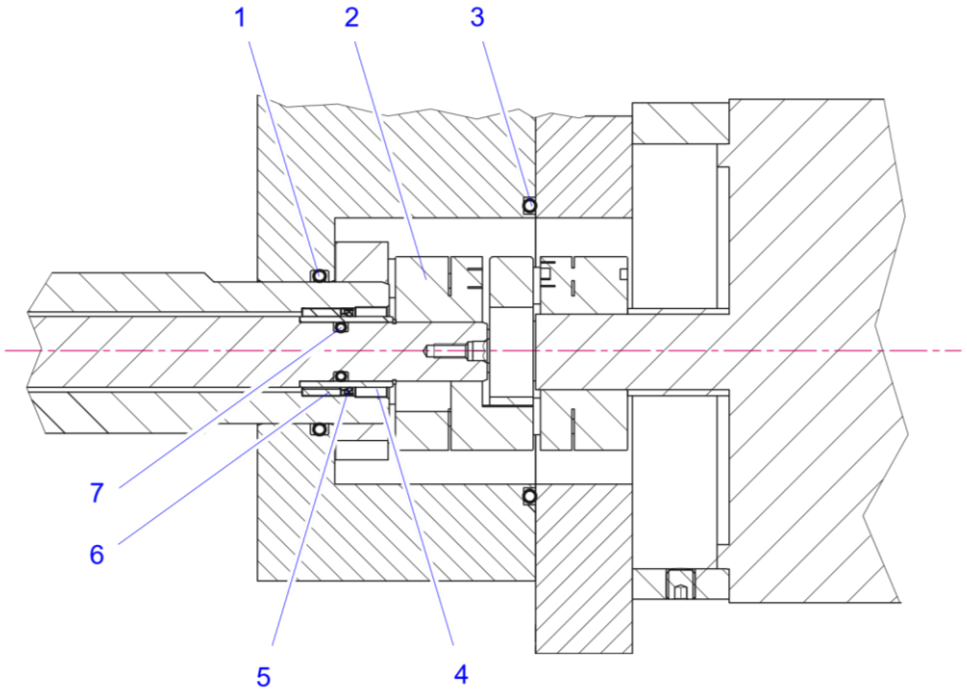
No.	Ident No.	Designation	Qty.
1		GPM Turret motor [1) 2)]	1
2	063 462	O-ring seal	1
3		Radial seal for rotating shaft [1)]	1

[1)] depending on the order

[2)] data according to motor's nameplate

7.4 Tool drive

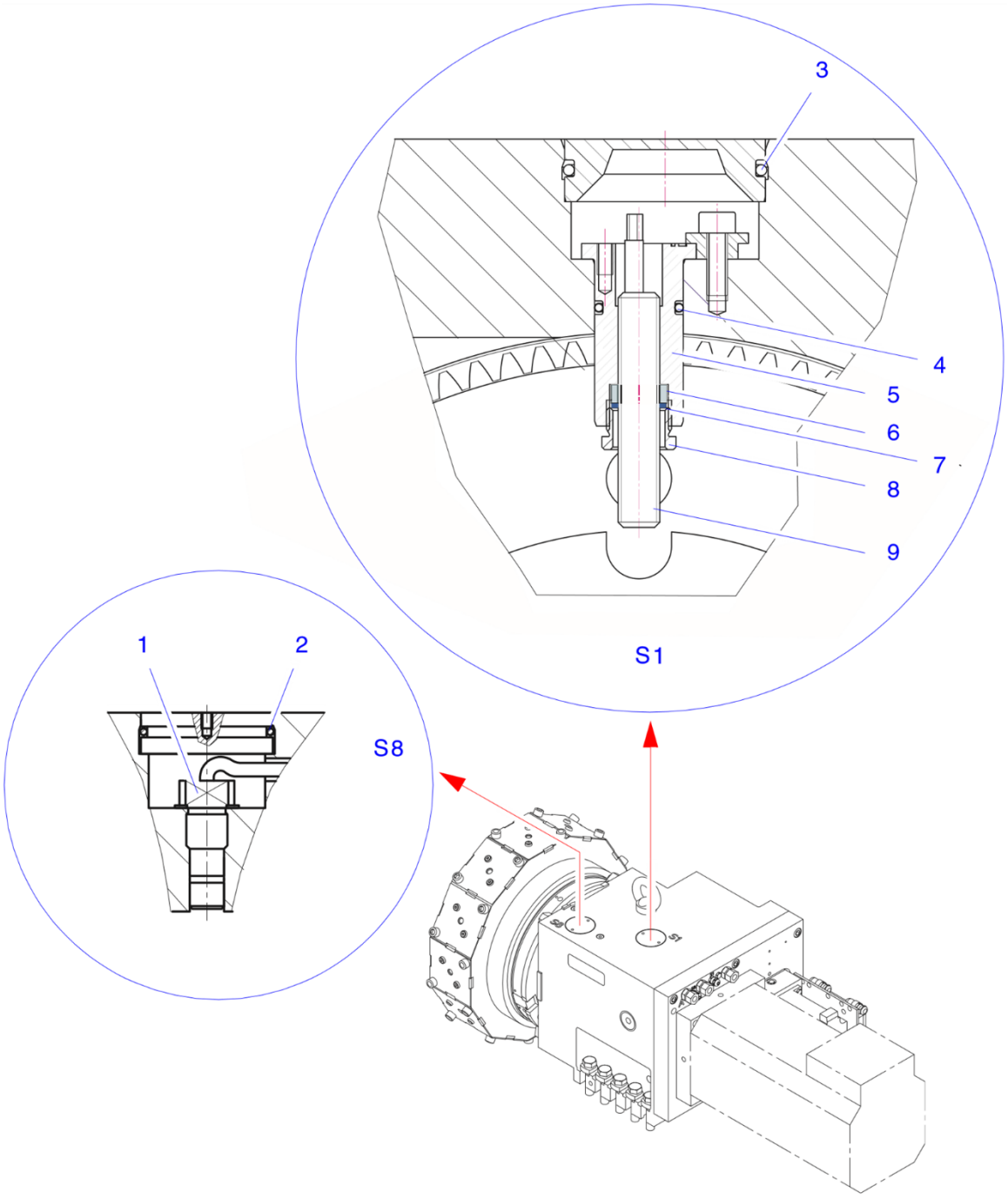
Version Direct drive with coupling



No.	Ident No.	Designation	Qty.
1	080 559	O-ring seal	1
2	136 203	Coupling [1)]	1
3	060 801	O-ring seal	1
4	076 733	Inner ring	1
5	075 184	Radial seal for rotating shaft	1
6	061 771	Needle bearing cup with open ends	1
7	058 546	O-ring seal	1

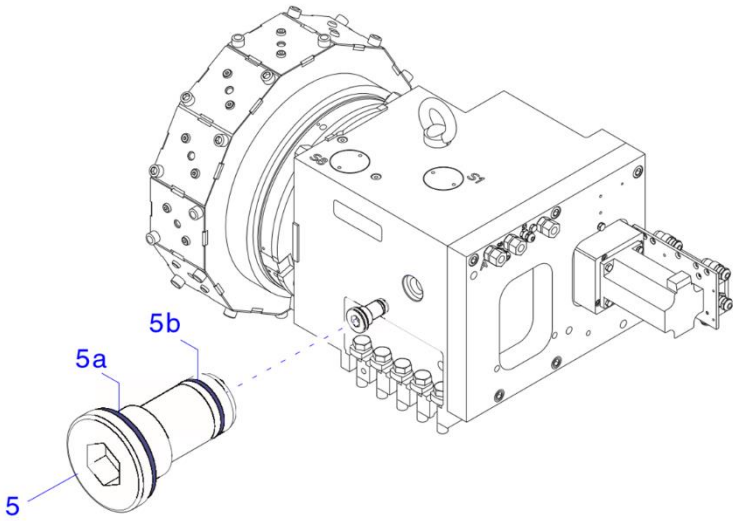
[1)] depending on the order

7.5 Proximity switches



No.	Ident No.	Designation	Qty.
1	105 582	Proximity switch	1
2	082 505	O-ring seal	1
3	082 505	O-ring seal	1
4…9	107 297	Replacements parts group *Limit switch*	1

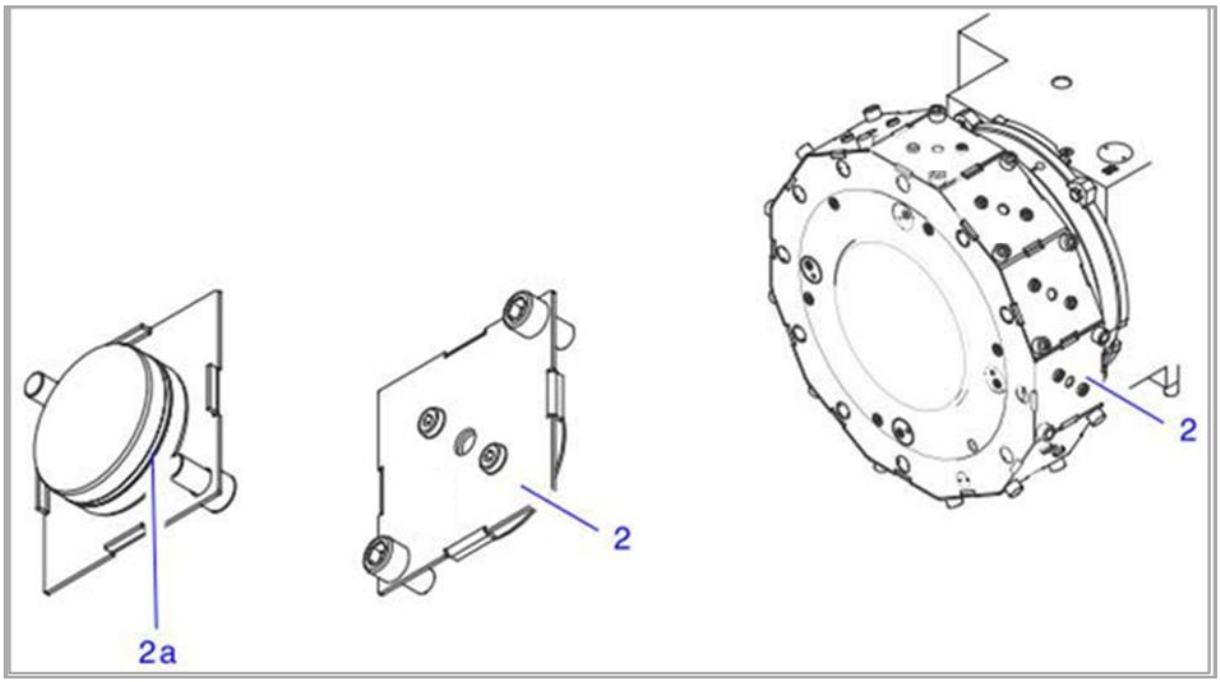
7.6 Screw plug for turret housing

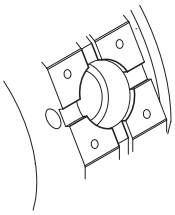


No.	Ident No.	Designation	Qty.
5	136 333	Screw plug	1
5a	038 306	Sealing ring	1
5b	065 089	O-ring seal	1

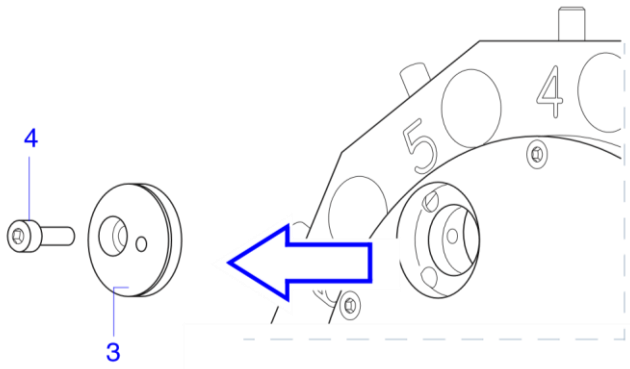
7.7 Tool disk

Closing plugs



	No.	Ident No.	Designation	Qty.
	for inferface BMT 45/55			
	2	143 890	GPM closing plug with O-ring seal	1
	2a	080 559	O-ring seal	1

Apertures for draining the tool disk

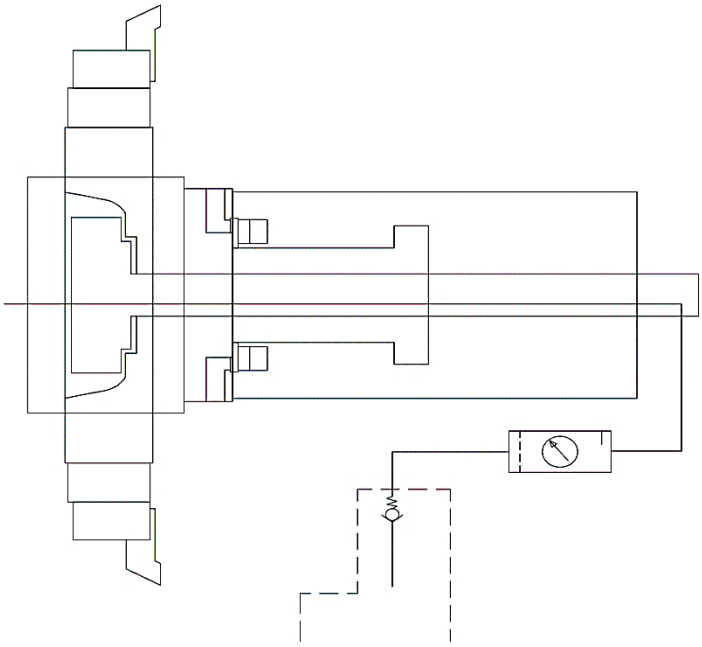


No.	Ident No.	Designation	Qty.
6	121 883	Bolt	4
4	000 446	Screw	4

Appendix

Disk-type tool turret		
Wiring diagram	EPB-1343	434.0xx GPM Turret motor
	EPB-1332	434.0xx Turret Motor not from GPM
Hydraulic diagram	HP-544	434.0xx
Diagram of functions	SK-1598	434.0xx
Tool drive		
Technical data	4xx.x16-TI02	Performance data of tool drive
Tool disk/tooling		
Specification dimensions for tooling	SK-1663	for tool holding fixtures BMT

Air pressure wiring diagram (option)	Turret model 434.0..	1／2



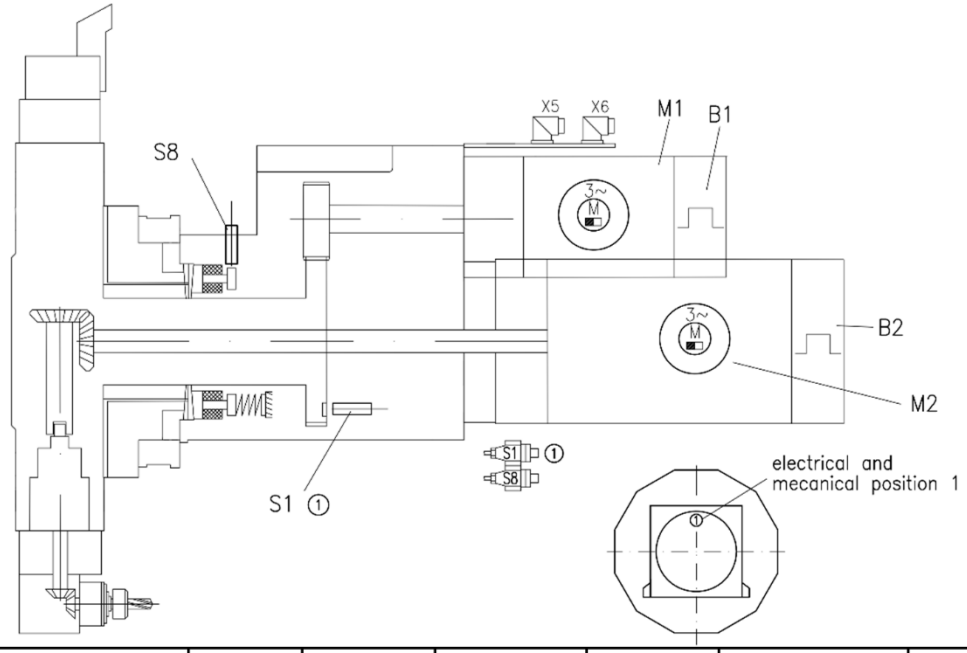
Not included in GPM delivery

- ➢ Application: Turret cooling circuit
- ➢ Use 4.5~5bar air pressure ; 100~110L/min
- ➢ Compressed air-three-point combination conditions

Compressed air quality acc. ISO 8573-1		
filtered	class5	5μm
dried	class4	+3 ° C
oiled	class3	<1 mg/m³

- The air supplied to the cooling circuit needs to be filtered through a three-point combination.
- The air pressure opening time is synchronized with the customer's power motor

Wiring layout	DISK Type Tool Turret 434.0.. Tool Turret driving motor DELTA	EPB–1343 en Z–Doku–IdNr.903963



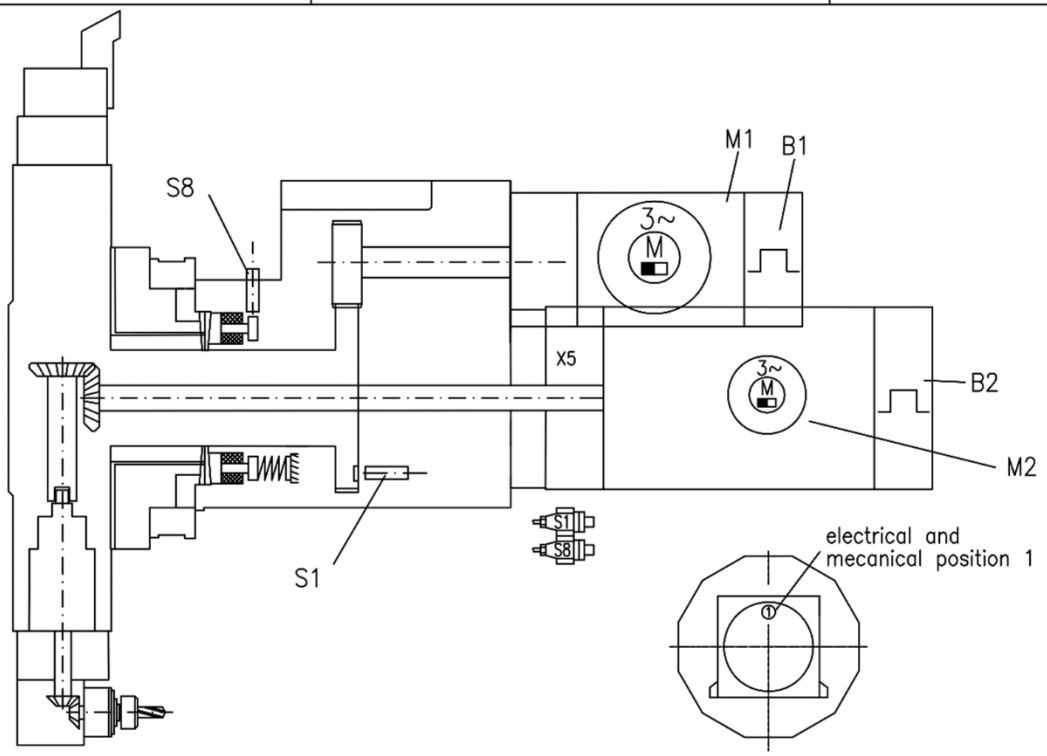
Designation	Element / Function		Line	Round plug connector M12 4pol. Pin Contact No.	Encoder Conector X6 Id.Nr. 137219 Contact.-No.	Encoder Connector X5 Id.Nr. Contact.-No.	Type	Supplier
T1	Temperature sensing (option)		white	1			TP100	GPM
			red	3				
S1 ①	Proximity switch "Reference point tool turret" (OPTION)		brown (+)	5			M8x45 Id.Nr. 004157	GPM
			blue (-)	4				
			black	1				
S8	Proximity switch "Tool turret locked"		brown(+)	5			M12x37 Id.Nr.105582	GPM
			blue (-)	4				
			black	2				
B1	Encoder system Tool turret absolute/ incremetal	T+	white		A		ECMA-CA0807 ZS ~~ECMA-C10807 CS~~ ~~ECMA-C10807 ZS~~	GPM
		T-	red-white		B			
		BT+	black		C			
		BT- ②	red-black		D			
		VCC	brown		G			
		CND	blue		H			
		schield	black (big)		I			
M1	Tool Turret driving motor AC-Servo		red U1			A		
			white V1			B		
			black W1			C		
	Ground		green			D		
B2	Tool Drive driving motor AC-Servo						Option	
M2	Encoder System Tool Drive						Option	

① incremental
② absolut

Konfiguration / Motortype	Abs.	Incr.	Battery	S1
ECMA–CA	②	–	②	–
	–	①	–	①

Technical Data of:	S1, S8
Operating voltage:	10–24V DC ±20%
Max. residual ripple:	10%
Max. load current:	200mA
Nom. sensing distance:	1mm
Temperature range:	–20° to +65°C
Function:	n.o. (make) function
Type:	pnp logic

Wiring layout	DISK Type Tool Turret 434.0..	EPB–1332 en Z–Doku–IdNr.903750

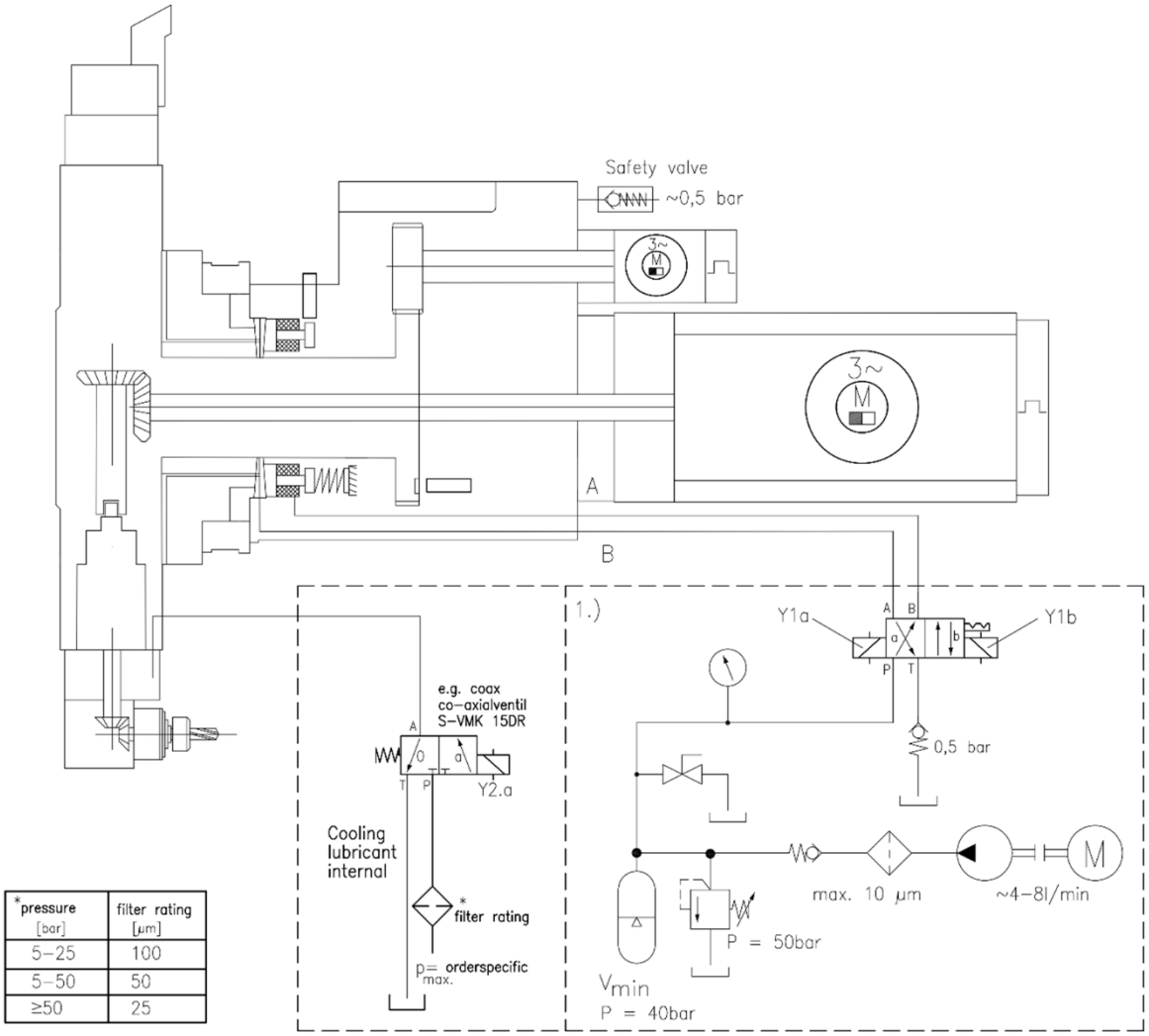


Designation	Element/Function	Line	Round plug connector M12 4pol. Pin Contact No.	Motor–Connector X5 GR1 6pol. Pin Contact.–No.	Encoder–Connector X6 Id.Nr. 137219 Contact.–No.	Motor–Connector X5 Id.Nr. 137218 Contact.–No.	Type	Suppier
S1	Proximity switch "Reference point tool turret" (OPTION)	brown (+)	5				M8 x 45 Id. Nr. 4157	Sauter
		blue (–)	4					
		black	1					
S8	Proximity switch "Tool turret locked"	brown (+)	5				M12x37 Id.Nr. 105.582	Sauter
		blue (–)	4					
		black	2					
M1	Tool Drive Motor AC–Servo						Option	
B1	Tool Drive Motor Encoder System						Option	
B2	Tool Drive Motor Encoder System 1.)							
M2	Tool Drive Motor AC–Servo 1.)							
	Ground	green–yellow						

1.) Option

Technical Data of:	S1, S8
Operating voltage:	10–24V DC ±20%
Max. residual ripple:	10%
Max. load current:	200mA
Nom. sensing distance:	1mm
Temperature range:	–20° to +65°C
Function:	n.o. (make) function
Type:	pnp logic

Hydraulics diagram	Disk–Type Tool Turret 434.0..	HP–544 en Z–Doku–IdNr. 902227



*pressure [bar]	filter rating [µm]
5–25	100
5–50	50
≥50	25

1.) Not included in delivery volume.

Pressure shutdown required while indexing.

Hydraulics supply (example)

Oil quantity required per indexing cycle		Size				
			16	20	25	32
V	[cm^3]	≈15	≈30	≈45	≈65	≈114
$\dot{V}$	[l/min]	≈20				

		Size				
		12	16	20	25	32
Recommended nominal diameter DN of line between distributing valve and turret:						
for line length	≤ 6	8	8	10	12	12
for line length	> 6	10	10	12	15	15
Recommended rated quantiti of valve		6	6	6	10	10

Table of functions		Y1a	Y1b
Turret	lock	1	0
	unlock	0	1

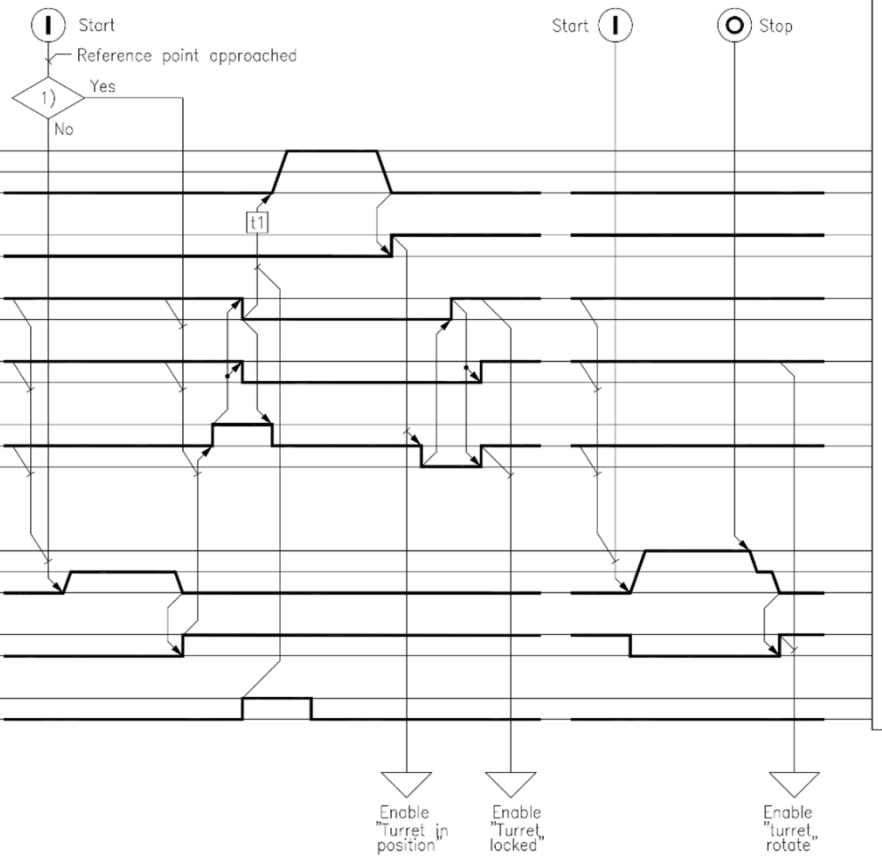
	Size				
	12	16	20	25	32
V [l]	0,7	0,7	0,7	2,0	2,0

Hydraulic operating pressure	50 bar ±10%
Oil viscosity:	32–46 mm^2/s
Recommended operating temperature of the hydraulic oil	25–55°C

Diagram of functions	DISK–Type Tool Turret 434.0..	3 sheet 1 SK–1598 en Z–Doku–IdNr. 902226

	Element/function	Code	Designation of state	State
01				
02				
03				
04				
05				
06				
07	Turret driving motor			
08	Turret "rotate"	M1	$n_{max.}$	ON
09				
10				OFF
11				
12	Setpoint pos. = actual pos.			1
13	(±0,16° Tool disk)			0
14				
18	Proximity switch "Turret locked"	S8		1
19				0
20				
21	Message			1
22	Turret locked and in position			0
23				
24	Valve solenoid	Y1	unlock	b 1
25	"Turret unlock – lock"			0
26			lock	a 1
27				
28				
29	Tool drive motor			
30	Tool drive working speed	M2	$n_{max.}$ = 4000min^{-1}	ON
31	Tool drive, approach zero–position			ON
32				OFF
33				
34	Tool drive in zero–position			1
35				0
36				
37	Message from control of machine			1
38	"Enable turret rotate"			0

Illustration:
Rotate Tool Turret



Comments

See also: EPB–1289
HP–544
EPB–1332
EPB–1343
EPB–1379

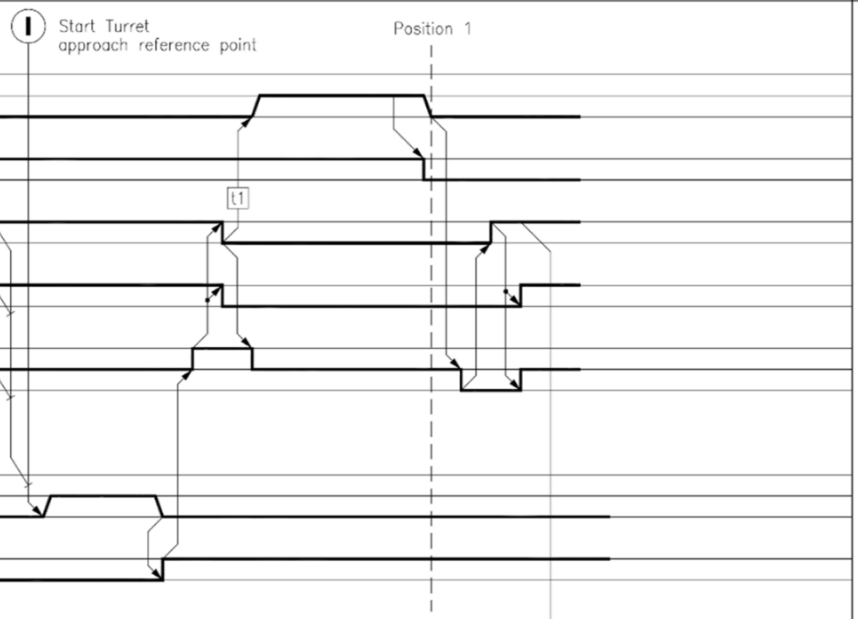
t1 = 50ms

1) Tool drive in zero–position?

		Diagram of functions	DISK-Type Tool Turret 434.0..	3 sheet 2 SK-1598 en Z-Doku-IdNr. 902226

	Element/function	Code	Designation of state	State
01				
02				
03	Turret driving motor			
04				
05	Turret "approach reference point"	M1		ON
06				OFF
07				
14	Proximity switch Reference point turret	S1		1
15				0
16				
17	Proximity switch "Turret locked"	S8		1
18				0
19				
20	Message Turret locked and in position			1
21				0
22				
23	Valve solenoid "Turret unlock – lock"	Y1	unlock	b 1
24				0
25			lock	a 1
26				
27				
28	Tool drive motor			
29		M2		
30	Tool drive, approach zero-position			ON
31				OFF
32				
33	Tool drive in zero-position			1
34				0
35				

Illustration:
approach reference point



Comments

See also: EPB-1289
HP-544
EPB-1332
EPB-1343
EPB-1379

t1 = 50ms

Illustration:
Tool drive
in zero-position.
Rotation of tool turret
is possible.

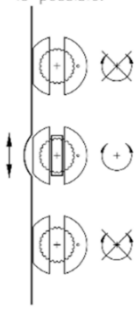


Illustration:
Tool drive not
in zero-position.
Rotation of tool turret
is not possible.

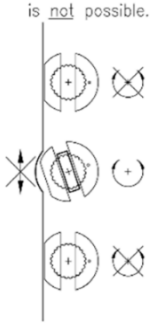
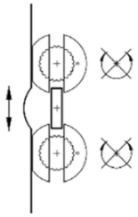
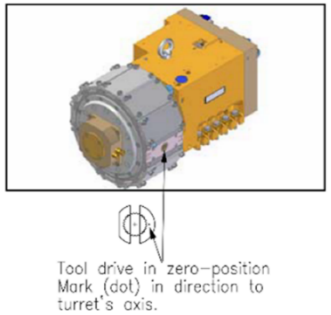


Illustration: Fault case
Tool turret in inter position.

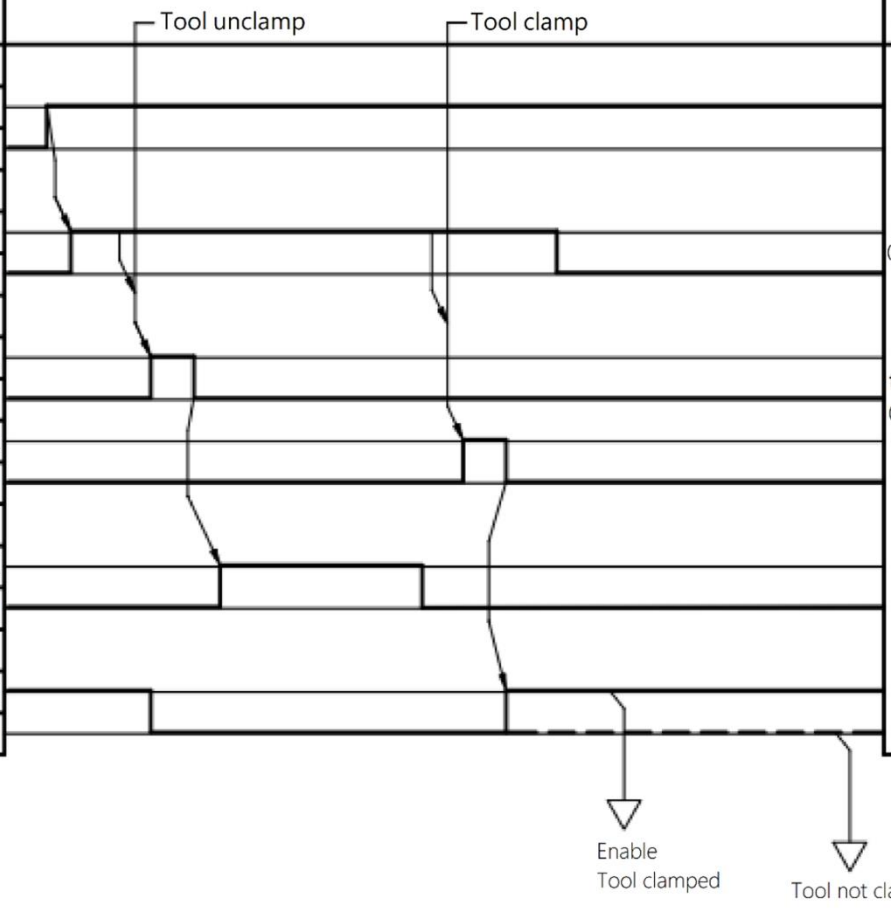
Tool drive
in zero-position.
Rotate tool drive
conditional possible.
(moving to the next
working position allowed).





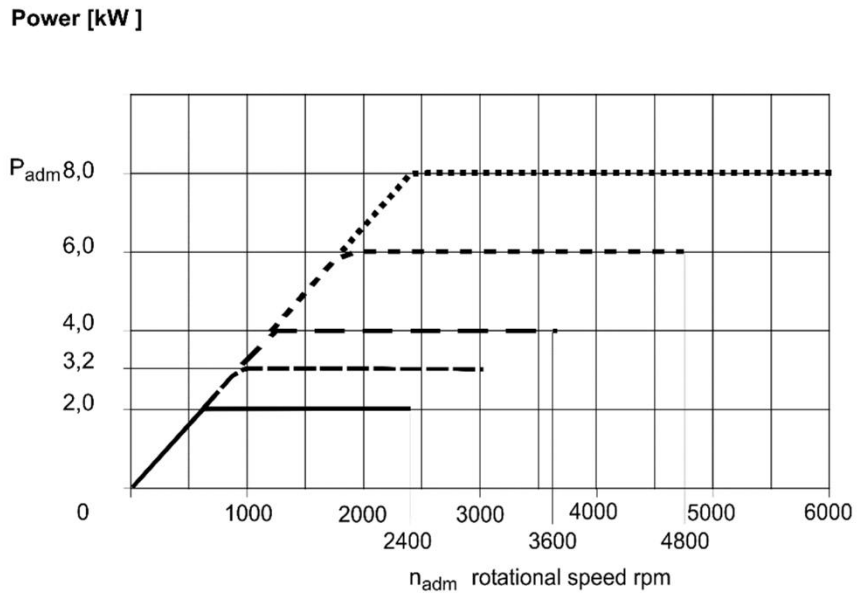
Tool drive in zero-position
Mark (dot) in direction to
turret's axis.

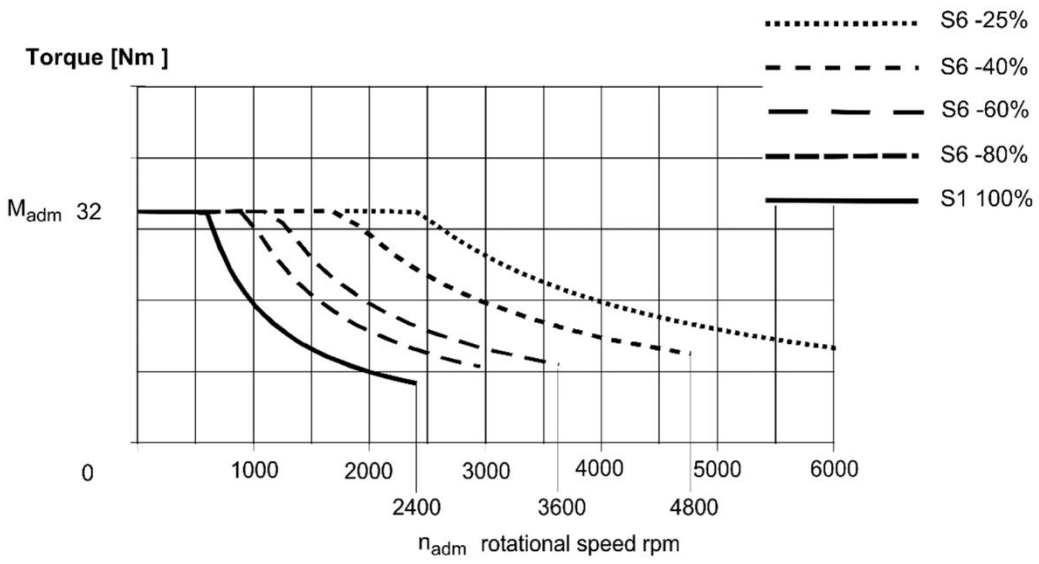
			Diagram of functions	DISK–Type Tool Turret 434.0..	3 sheet 3 SK–1598 en Z–Doku–IcNr. 902226	
	Element/function	Code	Designation of state	State	Illustration : Auto Tool Change unit (option)	Comments
01						
02	Setpoint pos. = actual pos.			1		
03				0		
04						
05	(A.T.C. unit)			1		(for tool change system)
06				0		
07						
08	Solenoid valve	Y2	unclamp	a 1		t ≒ 3sec. (according to hydraulic system)
09	Tool unclamp - clamp (clamp unit)			0		
10			clamp	b 1		
11				0		
12						
13	Solenoid valve	Y3		a 1		
14	Air purge			0		
15						
16	Solenoid valve	Y5		a 1		
17	Cleaning off air +Tool installation check			0		



1. A.T.C. unit / Solenoid valve Y2, Y3, Y5 are not included in delivery.

Technical Data	Performance Data Tool Drive (grease lubricated)	4xx.x16-TI02 en Id. Nr. 904553

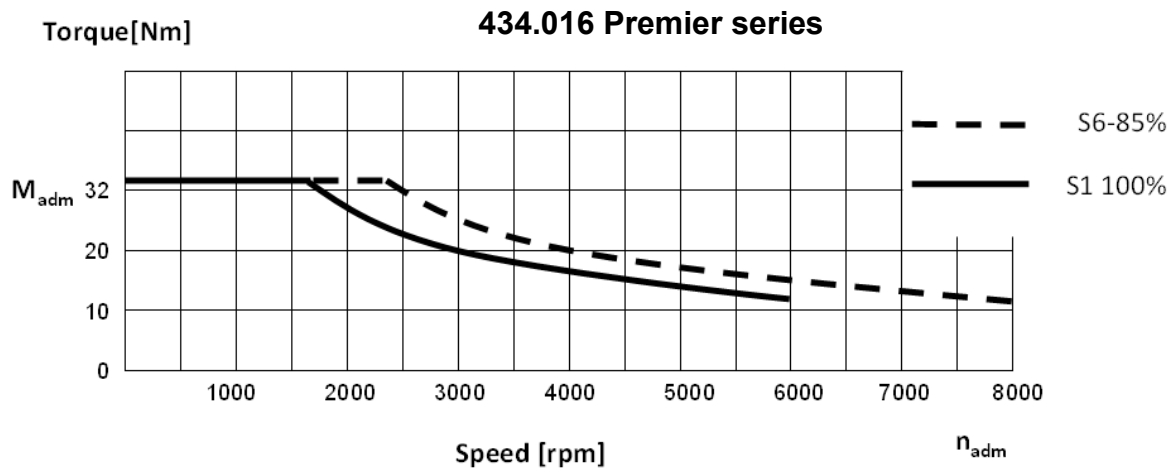




The data for duty type ED are valid for 10 min. duty cycle.

technical changes reserved

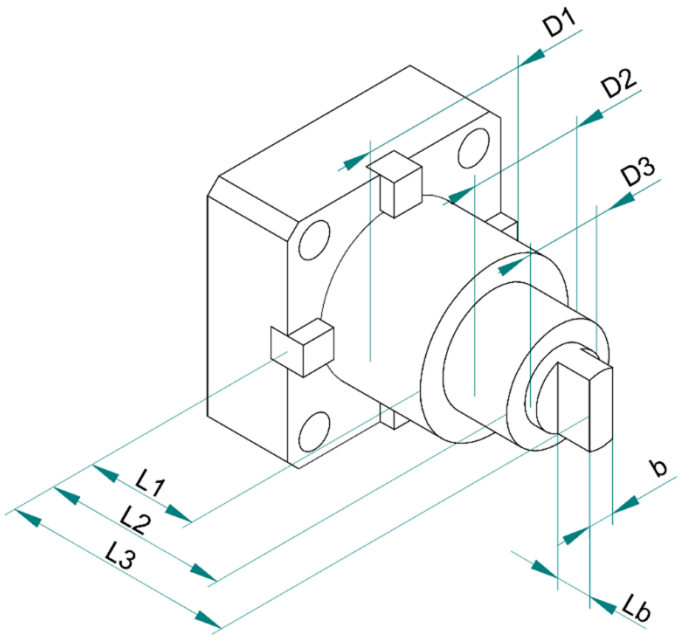
Performance data of tool drive for 434.016 Premier Series [Option]



Control measures for tooling	Disk-type tool turret with tool drive and disk-type radial	SK 1663 Id. Nr. 904517

Valid for Disk-type tool turret (only BMT interface)

434.016	**437.616**
434.020	**437.620**
434.025	**437.625**
434.032	



Tooling for interface	control measures [mm]							
	D1	D2	D3	b	L1	L2	L3	Lb
BMT 45	$44{,}9_{-0{,}05}$	35	23	$6_{-0{,}02}$	40	60	$84_{-0{,}3}$	8
BMT 55	$54{,}9_{-0{,}05}$	40	29	$8_{-0{,}02}$	30	75	$104_{-0{,}3}$	10
BMT 55 short	$54{,}9_{-0{,}05}$	40	29	$8_{-0{,}02}$	30	54	$83_{-0{,}3}$	10
BMT 65	$64{,}9_{-0{,}05}$	45	29	$10_{-0{,}02}$	32	81	$112_{-0{,}3}$	14
BMT 65 short	$64{,}9_{-0{,}05}$	45	29	$10_{-0{,}02}$	44	72	$91_{-0{,}3}$	14
BMT 75	$74{,}9_{-0{,}05}$	55	38	$14_{-0{,}02}$	43	80	$110_{-0{,}3}$	15
BMT 85	$84{,}9_{-0{,}05}$	65	30	$16_{-0{,}02}$	48	100	$140_{-0{,}3}$	20

Contact / Order information

	Service GPM CO., LTD No. 368, Sec. 4, Huan Zhong Rd., Nan tun District, Taichung City, Taiwan
	+886-4-23805836
	+886-4-23805832
	www.GPMcnc.com
	info@gpmcnc.com

IMPORTANT

Please indicate in your orders:

Product data as per nameplate on the housing

1. Classification number (series, size)
2. Identification number
3. Order number
4. Gear ratio

Ordering data as per replacement-parts drawing and table

5. Identification number and quantity of the spare part requested.

Client

6. Company
7. Client's name and phone number.