



Operating Instructions

BB-1012en

Disc-Type Tool Turret

440.220

revision 2024/05/21

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:

 The new Revolution GPM CO., LTD MADE IN TAIWAN	Typ	①
	Id.-Nr.	②
		③
		④

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

BB-1012

Classification number :	Identification number :
440.220	

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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.

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

- 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.



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

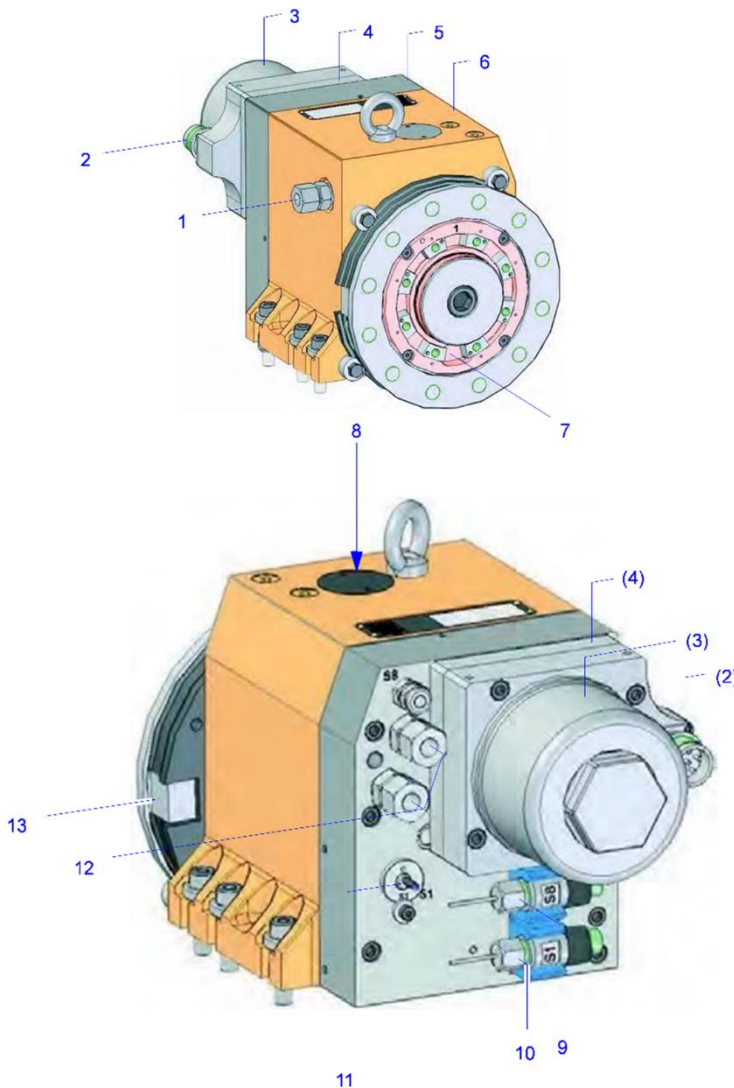


IMPORTANT

The turret is driven by one of the following motors:

- Variant A Turret motor from Messrs. GPM
 → *Replacement parts, page 20*
- Variant B Turret motor not from Messrs. GPM
 → *Assembly and installation, page 7*
 → *Replacement parts, page 20*

2.1 Designation of parts



1. Cooling lubricant connection
2. Connection for turret motor ¹⁾
3. Turret motor ¹⁾
4. Flange plate for turret motor
5. Bedding plate
6. Turret housing
7. Locating disk
8. Proximity switch S8
"Turret locked"
9. Connection for proximity switch S8
10. Connection for proximity switch S1 ¹⁾
11. Proximity switch S1 ¹⁾
"Turret reference point"
12. Hydraulic connections A and B
13. Cooling lubricant valve

¹⁾ depending on the order

2.2 Technical data

Number of indexing positions	8 or 12 or 16		
Perm. advance force F_z at $r = 250\text{mm}$	20000		N
Perm. transverse force F_x at $a = 200\text{mm}$	16000		N
Perm. tangential load (turret locked)	3600		Nm
Perm. mass moment of inertia of tool disk, tool holders, and tools depending on: Perm. unbalance (load moment) caused by tool holders and tools Rotation of tool disk – incl. acceleration and braking per fractional pitch – without acceleration and braking per additional fractional pitch	Load range		
	standard ¹⁾	high loads ^{1) 2)}	
	3.2	5.0	kgm ²
	40	63	Nm
	0.15	0.17	s
	0.09	0.09	s
Unlocking time	0.12		s
Locking time	0.12		s
Perm. indexing frequency (median switching angle $\phi_m = 90^\circ$)	16		rpm
Hydraulic operating pressure	50 \pm 10%		bar
Absorption volume Lock or unlock turret	45		cm ³
Operating pressure for cooling lubricant ³⁾	5 ... 25		bar
Turret mass (without tool disk)	approx. 70		kg
Max. mass of tool disk and tooling	160		kg
Perm. ambient temperature range	+10 ... +40		°C
	+50 ... +104		°F

¹⁾ Turret motor not from GPM

²⁾ GPM Turret motor

³⁾ In order to achieve an extended service life of the cooling lubricant valve, it is advisable to filter the cooling lubricant by $\leq 100\mu\text{m}$. Post-connected loads (spindle units with internal cooling lubricant guide a.o.) may require a higher degree of filter fineness. Note and comply with the manufacturer's instructions!

3 Assembly and installation

3.1 Overview



Clearing required prior to any work:

- Switch the machine power off.
- Depressurize turret.

1.	Mount turret motor, if necessary.	
	Turret motor not from GPM	→Page 7
2.	Connecting	
	Electrical installation	→EPB-1126 or EPB-1240
	Hydraulic system	→HP-489
	Vent hydraulic system	→Page 8
	Cooling lubricant	→Page 15
	Central lubrication	→Page 10
3.	Perform basic adjustments for the turret motor.	→Page 11
4.	Check function of disk-type tool turret with tool drive.	→SK-1473

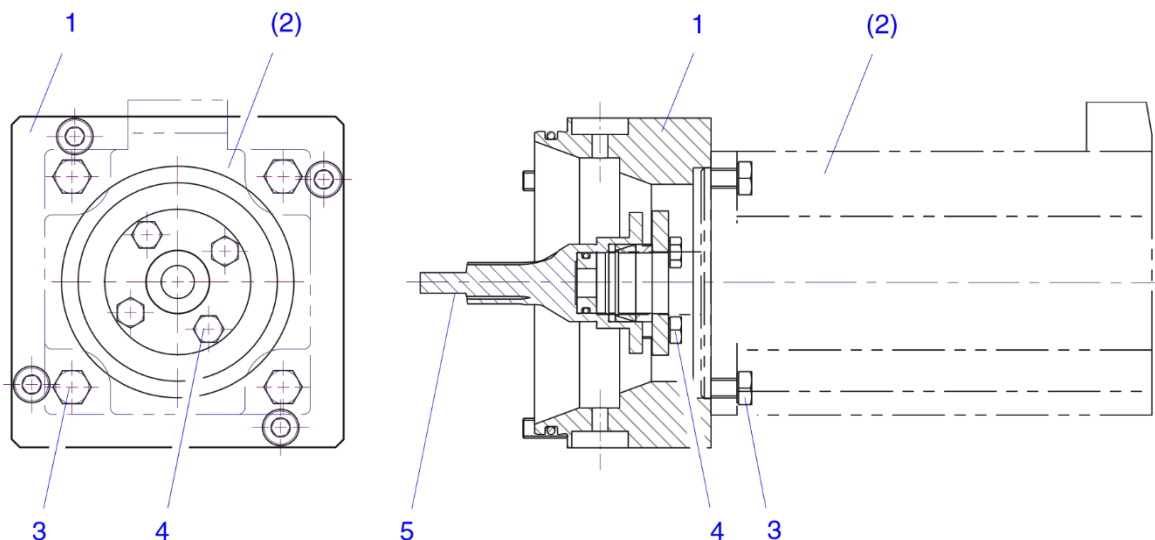
3.2 Turret motor

Turret motor not from GPM



Clearing required prior to any work:

- Switch the machine off.
- Depressurize turret.



- 1 Flange plate
- 2 Motor (not included in scope of delivery)
- 3 4× screws M6×16 (for fastening of motor)
- 4 4× screws M5×12 - 10.9 (for clamping of pinion)
- 5 Pinion shaft

Prepare and attach new motor



IMPORTANT

- Mount pinion axially down to stop.
- Tighten screws (4) crosswise.



8.5Nm

- Mount turret motor with pinion and tighten screws (3).

Basic adjustments → [Page 11](#)

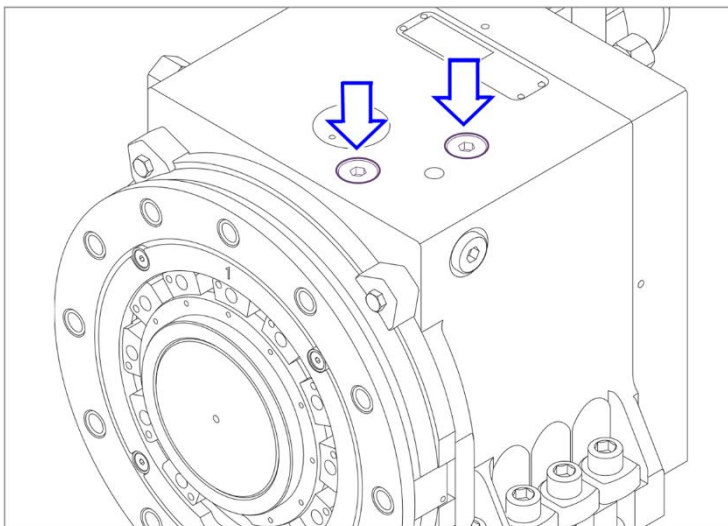
Dismantling

The turret motor is dismantled in the reverse sequence. → [Replacement parts Drive unit, page 22](#)

3.3 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 6](#)



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.
 - ⇨ 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.

3.4 Central lubrication



IMPORTANT

A connection to the central lubrication system is recommended for achieving an optimum operational reliability and service life.



WARNING

Risk of material damage by inappropriate lubricants.

- The lubricant should not contain any of the following substances:

Soda soap	Polyglycol
Soda complex soap	Silicon oils (methyl, phenyl)
Bentonite	Perfluoro-alkylether
Polycarbamide greases	Polyphenylether oil

- The lubricant should be selected in such a way that no unwelcome interactions will arise, if the original lubricant and the lubricant for the central lubrication system are mixed.

Please contact the lubricant manufacturer, if necessary.

Condition of supply

- The product is lubricated with grease. Lubricant used:

CENTOPLEX CX4/375 (KLÜBER)

- The M8×1 threaded connections for the central lubrication system are clogged and marked acc. to DIN 51502.



Connecting

- Connect all the connections marked for central lubrication systems to the central lubrication system of the machine.
- The volume of lubricant should be metered for each connection on the basis of the following standard values:

Oil	approx. 0.09 - 0.18	[cm ³ /h]
Grease	approx. 0.06 - 0.12	[cm ³ /24h]

3.5 Basic settings



IMPORTANT

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

To do so, the turret must be set into position 1 and locked.

➤ Determine position 1, if necessary.

Determine position 1

Proximity switch S1 is mounted: → *proceed to Variant A Trigger drive to position1 via control*

Proximity switch S1 is faulty or not mounted: → *proceed to Variant B Adjust position1*

Variant A Trigger drive to position 1 via control

➤ Unlock turret.

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

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

⇔ LED OFF and/or signal "Position 1".

➤ Lock turret.

⇔ Proximity switch S8 is activated (LED ON and/or signal "Turret locked").

Variant B Adjust position 1



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.

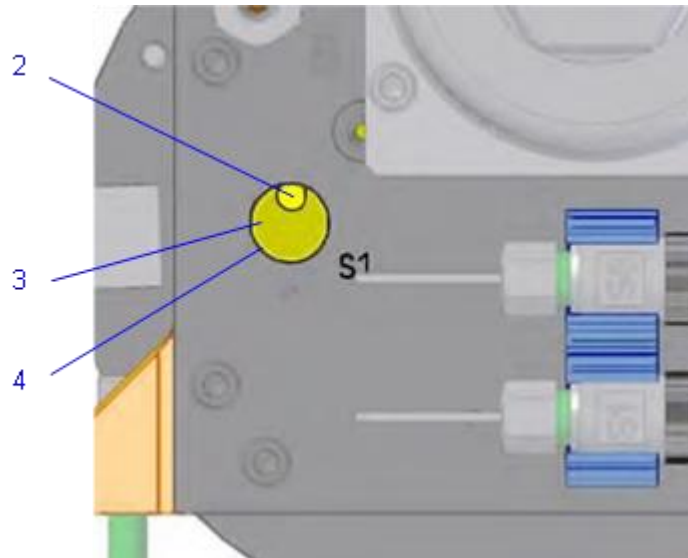
➤ Do not stay close to moving machinery components, especially within the swiveling range of the tools.



➤ Remove plug or proximity switch S1 (1).

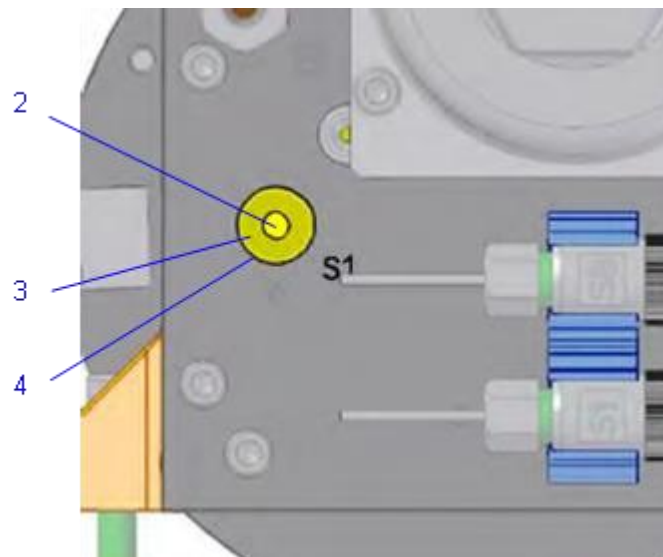
➤ Unlock turret.

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



➤ Observe the through-hole (4).

Rotate tool disk until bore (2) on gearwheel (3) appears inside through-hole (4).



➤ Align bore (2) on gearwheel (3) in the center of through hole (4).

➤ Lock turret.

⇔ Proximity switch S8 is activated (LED ON and/or signal "Turret locked").

➤ Refit plug or proximity switch S1 (1). → [Page 17](#)

Checking

Proximity switch S1 should not be activated.

⇔ LED OFF and/or no signal.

This position can now be taken over by the control unit as position 1.

4 Maintenance

Safety notes → [Page 3](#)

4.1 Overview

Planned preventive maintenance	→ Page 13
Repairs after fault conditions	→ Page 14

4.2 Service life

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

These values apply to

- collision-free operation,
- compliance with the specified operating conditions and the permissible loads, → [Technical data](#)
- connection to the central lubricating system of the machine. → [Central lubrication, page 10](#)

4.3 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 4000 operating hours of the machine respectively	Check cooling lubricant valve for wear and leakage. Replace any defective parts.	User → Page 15
	Check turret gearbox chamber.	User → Page 16
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 approx. 8 million indexing operations and/or approx. 5 years respectively	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).

4.4 Repairs after fault conditions



Clearing required prior to any work:

- Switch the machine off.
- Depressurize turret.

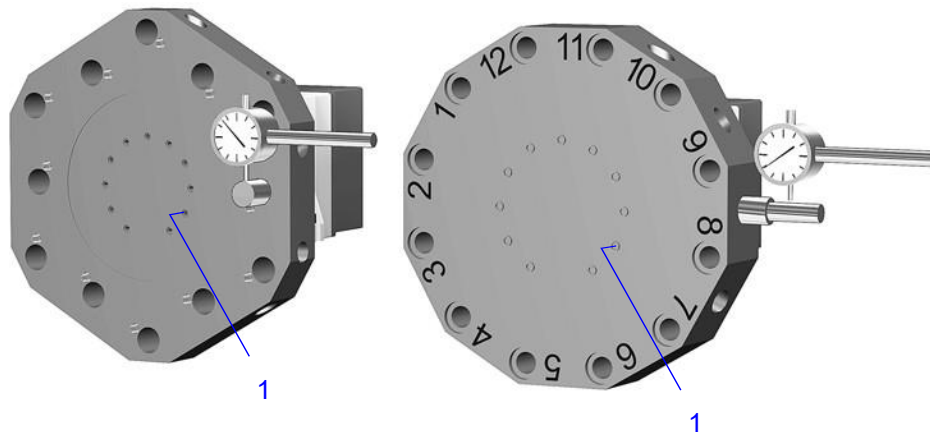
Fault	Cause	Remedy	Who carries out this task?
Incorrect center height, tool disk offset relative to locating disk	Collision when turret is locked	Turn back tool disk in the annular groove and align	User → Page 15
Tool disk does not rotate	Gearwheels are defective	Replace defective parts	GPM Service
	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 locating disk	Align axis to the locating disk	GPM Service
	Proximity switch S8 does not switch	Check proximity switch S8, set or replace if necessary	User → Page 18
Reference point travel for turret not possible	Proximity switch S1 does not switch	Check proximity switch S1, set or replace if necessary	User → Page 17
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 15
	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	

4.5 Aligning the tool disk

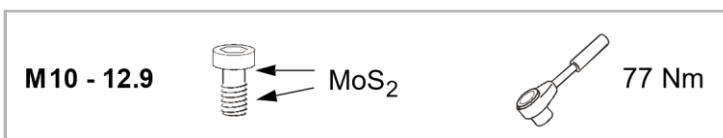
Preparation

- Lock turret.

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).



4.6 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](#)

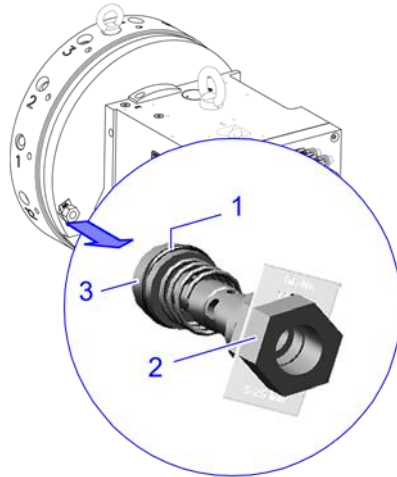
Replacing the cooling lubricant valve



Clearing required prior to any work:

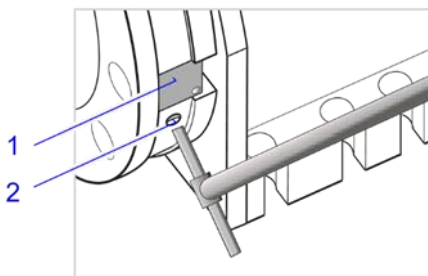
- Switch the machine power off.
- Depressurize turret.
- Turn off cooling lubricant supply unit.

Example 1 Cooling lubricant cartridge

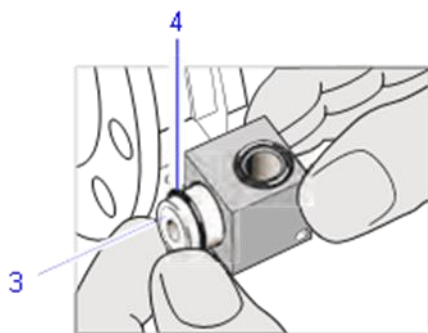


- Unscrew screw plug (2).
- Withdraw cooling lubricant cartridge complete with screw plug (2).
- Check cooling lubricant cartridge; if necessary, replace bushing (3) and O-ring seal (1).
- Refit cooling lubricant cartridge complete with screw plug.

Example 2 Cooling lubricant valve with valve carrier

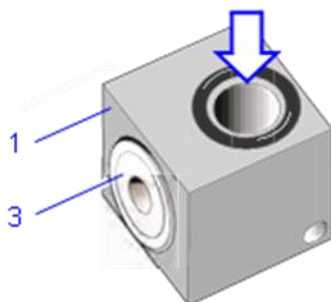


- Loosen setscrew (2).
- Withdraw valve carrier (1).

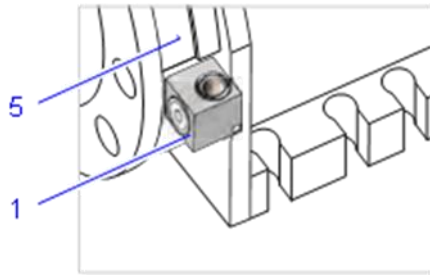


- Remove valve bushing (3), note any loose internal parts!
- Check O-ring seal (4).

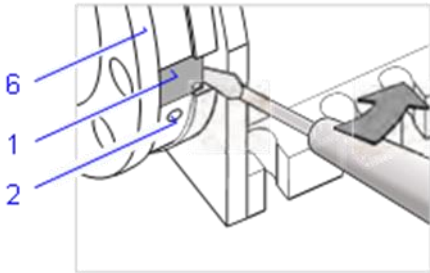
Replace cooling lubricant valve, if necessary.



- 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).

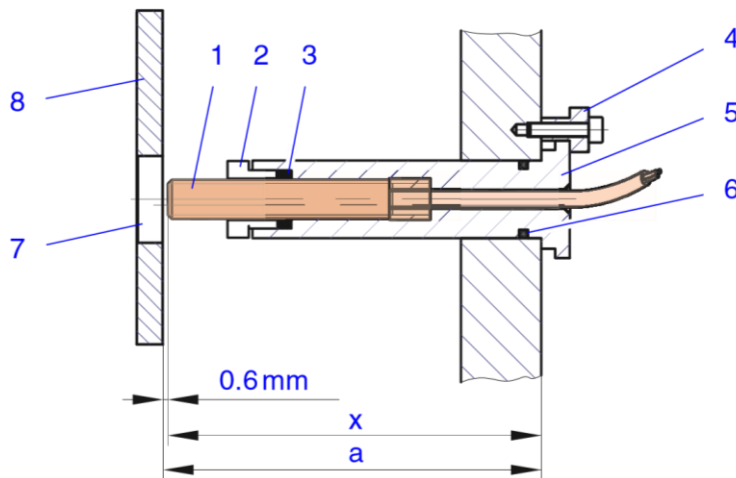
4.7 Proximity switch S1

Position of the proximity switch: → [Page 5](#)



IMPORTANT

Setting tasks require a 24V DC power supply.



Replacing

- Loosen claws (4).
- Pull out holder (5) for proximity switch (1), measure dimension x and note this.
- Unscrew pressure screw (2).
- Unscrew proximity switch (1).
- Fit new proximity switch with existing sealing ring and disk (3) and screw into holder (5); but replace sealing ring, if necessary.

Replacing

- Unlock turret.
- Do not rotate tool disk to position 1, but to any other position.
 - ⇒ As a result, dimension a can be measured accurately on gear (8).
- Lock turret.
- Set the proximity switch (1) according to the noted dimension x.
 - or
- Measure dimension a with depth gauge and set proximity switch (1) to $x = a - 0.6 \text{ mm}$.
- Lock proximity switch (1) with pressure screw (2), during that control dimension x.
- Insert holder (5) and fasten.
- Connect proximity switch (1) electrically.

Function check → [Basic settings, Variant A Trigger drive to position 1 via control, page 11](#)

4.8 Proximity switch S8

Position of the proximity switch: → [Page 5](#)

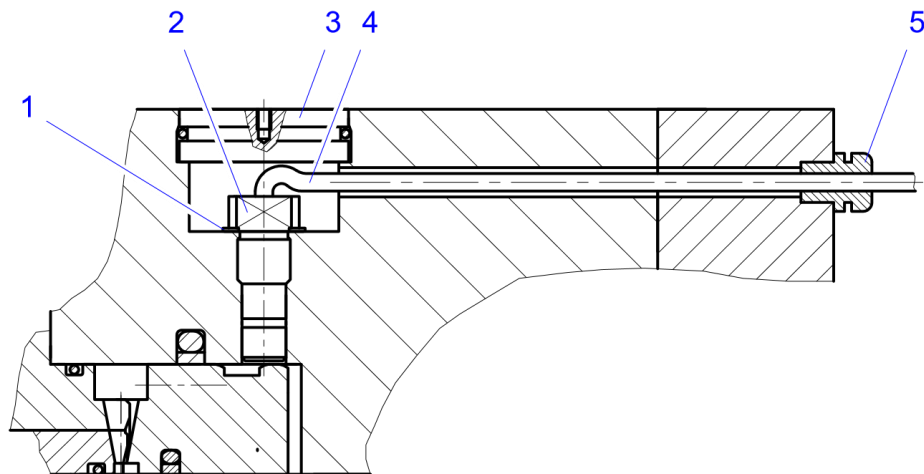


IMPORTANT

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

**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).

5 Replacement parts

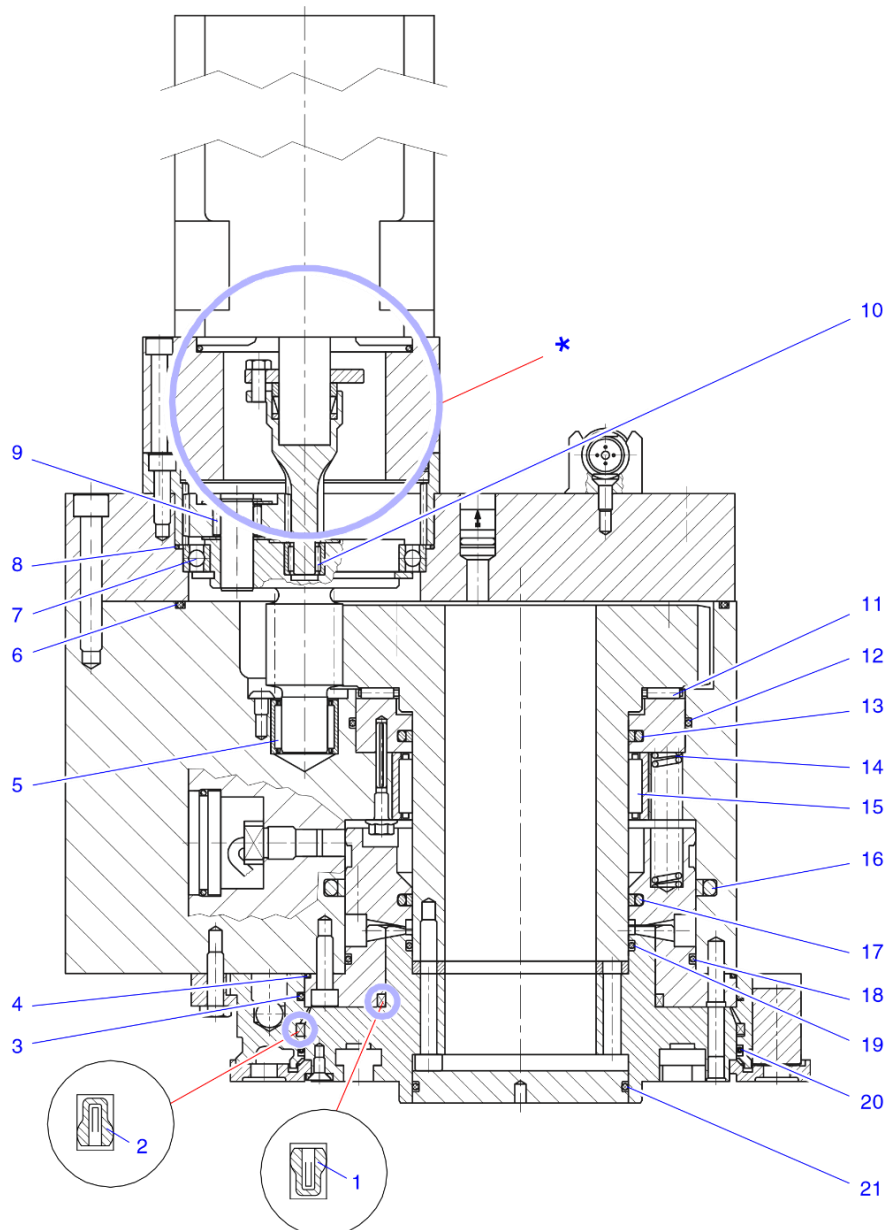


IMPORTANT

- Please contact GPM Services.
- Please follow the ordering instructions. → [Information at the end of the present manual](#)

Turret (without drive)	→ Page 20
Replacements parts group Drive	
Turret motor not from Messrs. GPM	→ Page 22
Turret motor from Messrs. GPM	→ Page 23
Proximity switches	→ Page 24

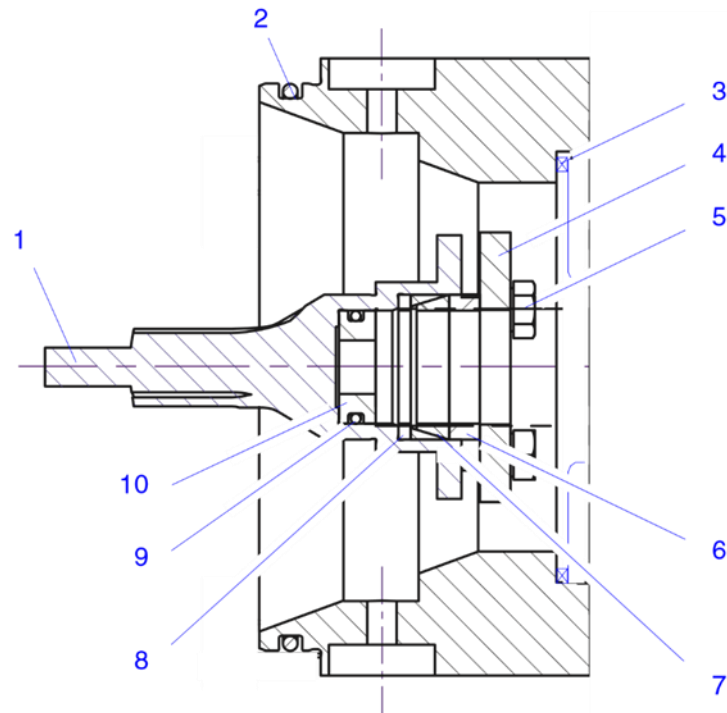
5.1 Turret (without drive)



No.	Ident No.	Designation	Qty.
1	071 224	FU groove ring	1
2	034 592	FU groove ring	1
3	058 506	O-ring seal	1
4	058 073	O-ring seal	1
5	105 555	Needle bearing	1
6	063 357	O-ring seal	1
7	065 715	Deep groove ball bearing	1
8	086 726	O-ring seal	1
9	034 532	Needle roller and cage assembly	3
*		Replacements parts group Drive → Page 22, 23	
10	107 299	Needle bearing	1
11	084 608	Thrust needle roller and cage assembly	1
12	001 098	O-ring seal	1
13	083 073	Surface ring	1
14	004 653	Compression spring	3
15	118 574	Needle roller and cage assembly	1
16	079 667	Surface ring	1
17	083 073	Surface ring	1
18	082 506	O-ring seal	1
19	065 718	O-ring seal	1
20	036 588	Spaghetti hose	0.63m
21	111 600	O-ring seal	1

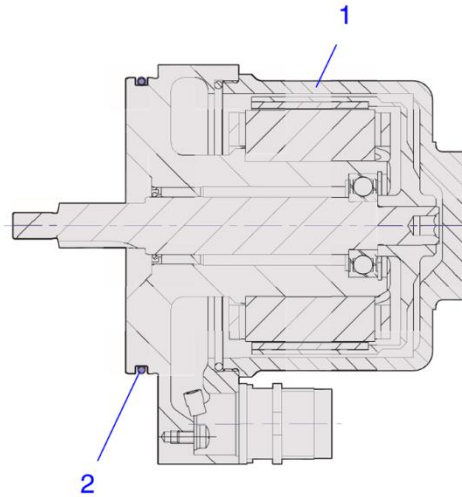
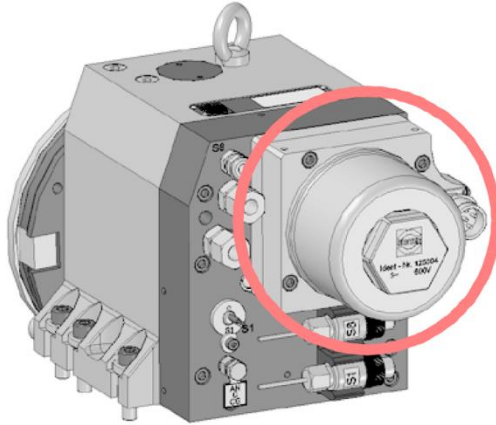
5.2 Drive unit

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

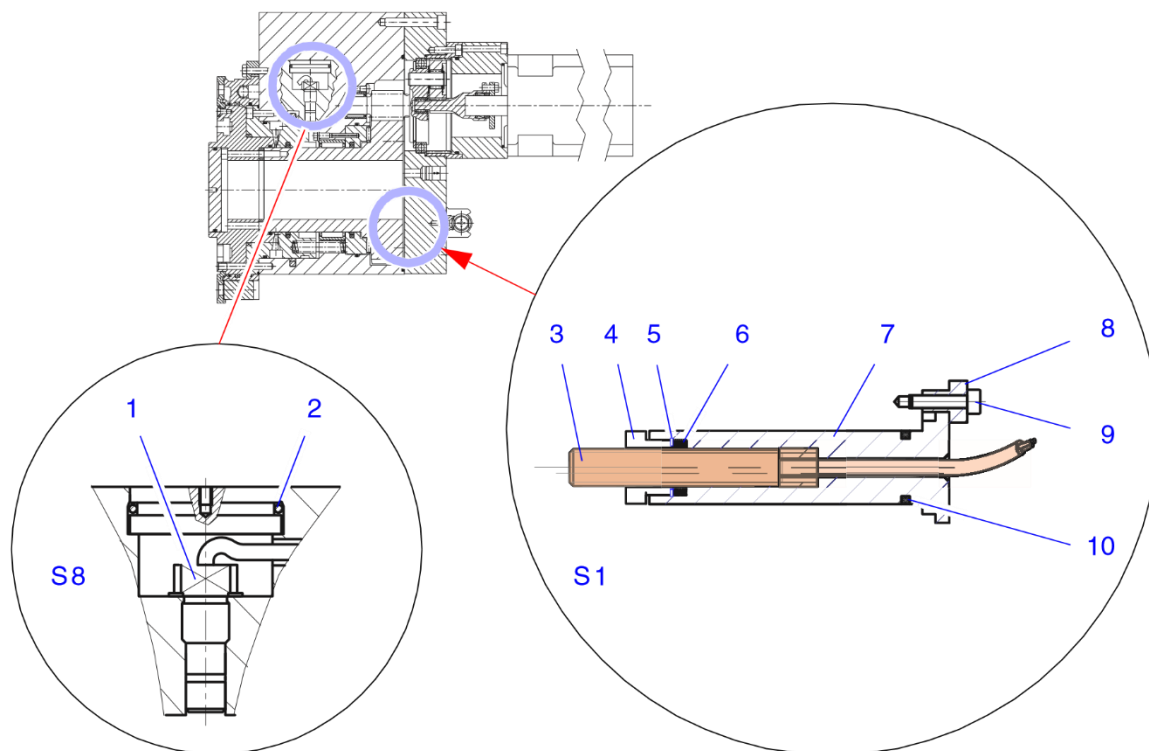
Turret motor from Messrs. GPM



No.	Ident No.	Designation	Qty.
1		Turret motor from Messrs. GPM ¹⁾	1
2	063 462	O-ring seal	1

¹⁾ data according to motor's nameplate

5.3 Proximity switches

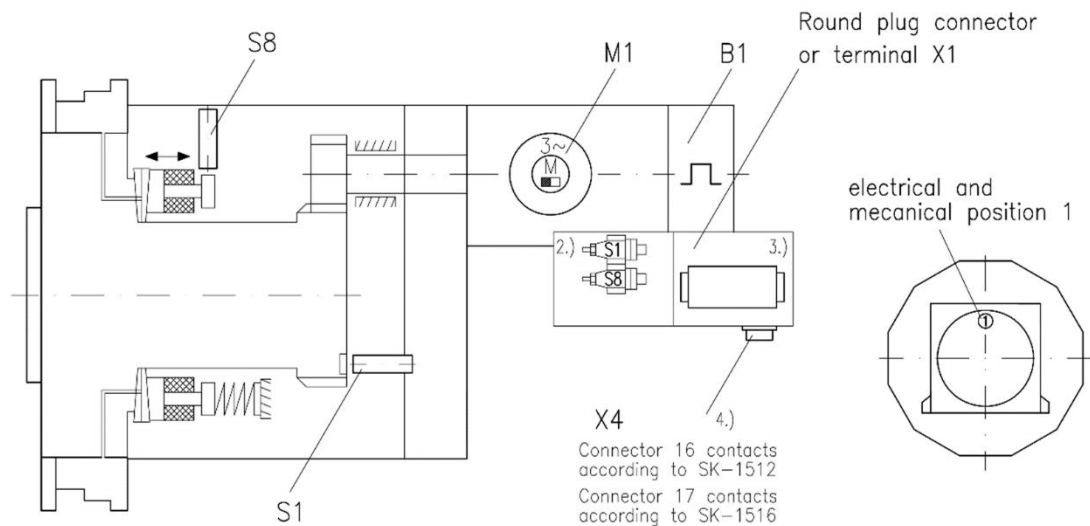


No.	Ident No.	Designation	Qty.
1	105 582	Proximity switch	1
2	082 505	O-ring seal	1
3	004 157	Proximity switch	1
4	061 467	Pressure screw	1
5	061 466	Pressure ring	1
6	061 465	Sealing ring	1
7	107 118	Holder (bearing sleeve)	1
8	037 269	Claw	1
9	004 446	Screw	1
10	060 308	O-ring seal	1

Appendix

Disk-type tool turret		
Wiring diagram	EPB-1126	440.2xx Turret motor not from GPM
	EPB-1240	440.2xx GPM Turret motor
Hydraulic diagram	HP-489	440.2xx
Diagram of functions	SK-1473	440.2xx
Control Unit		
Circuit diagram	EPS-1200	EK 600 – 446 – A0 – 00
	EPS-1230	EK 600 – 446 – A0 – DP (PROFIBUS)

Wiring layout	DISK Type Tool Turret 440.2..	EPB-1126 en Z-Doku-IdNr.090921
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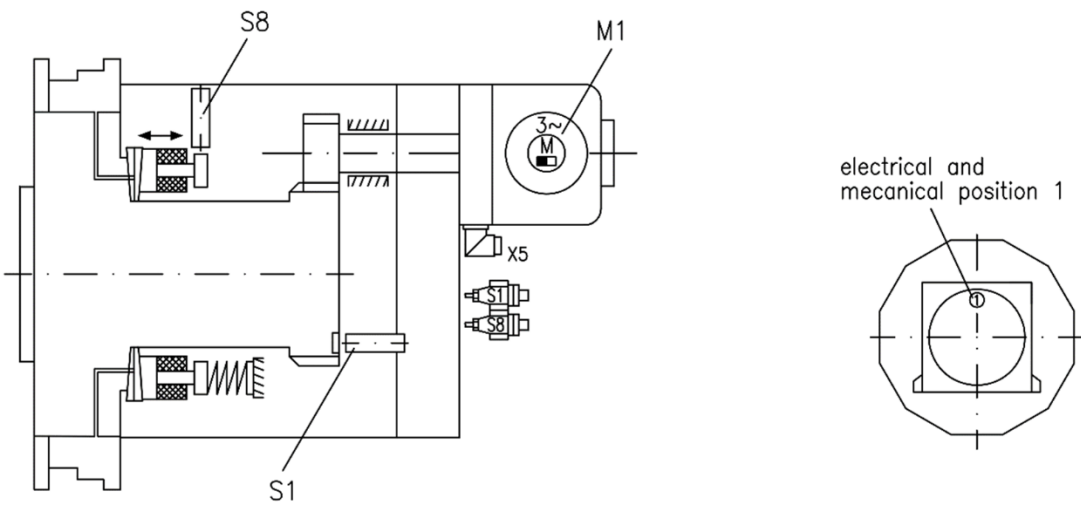


Designation	Element/Function	Line	Round plug 2.) connector M12 337248 Contact No.	3.) Terminal X1	4.) Connector X4 16 contacts	4.) Connector X4 17 contacts	Type	Supplier
S1	Proximity switch Reference point tool turret	1.) brown (+)	1	12	2	2	M8x45 Id.Nr. 4157	SAUTER
		blue (-)	3	11	1	1		
		black	4	1	3	3		
S8	Proximity switch "Tool turret locked"	1.) brown (+)	1	12			M12x37 Id.Nr. 105582	SAUTER
		blue (-)	3	11				
		black	4	8	4	4		
B1	Encoder system Tool Turret	1.)					according to order	
M1	Tool Turret driving motor AC-Servo	1.)					according to order	
				41	11	11	terminal for customer	
				42	12	12		
	Ground	green-yellow			16	17		

- 1.) Option
2.) Round plug connector (standard)
3.) Option terminal X1
4.) Option connector X4

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 440.2..		EPB-1240 en Z-Doku-IdNr.900746	
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The diagram illustrates the internal components and wiring of the DISK Type Tool Turret 440.2.. It shows a cross-section of the turret assembly with a reference point switch (S1) and a tool turret lock switch (S8). The AC-servo motor (M1) is connected to the turret. A top view of the turret shows the electrical and mechanical position 1.

Designation	Element/Function	Line	Round plug connector M12 4pol. Pin Contact No.	Motor-Connector X5 GR1 6pol. Pin Contact.-No.			Type	Supplier
S1	Proximity switch Reference point tool turret	brown (+)	1				M8x45 Id.Nr. 004157	SAUTER
		blue (-)	3					
		black	4					
S8	Proximity switch "Tool turret locked"	brown (+)	1				M12x37 Id.Nr. 105582	SAUTER
		blue (-)	3					
		black	4					
M1	Tool Turret driving motor AC-Servo	black		1			sensorless drive	SAUTER
		blue		2				
		brown		6				
		Ground green-yellow		⊕				

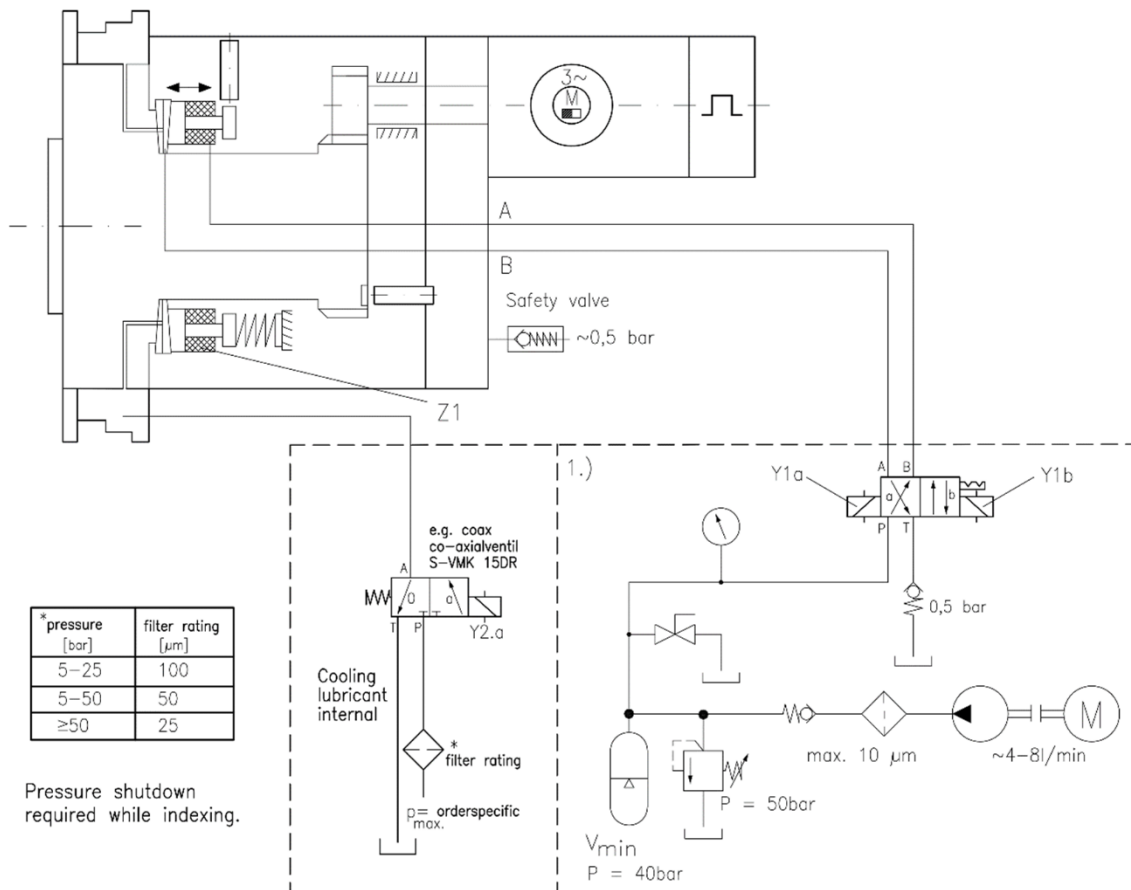
Technical Data of:		S1 - S8
Operating voltage:	10-24V DC	±20%
Max. residual ripple:	10%	
Max. load current:	200mA	
Nom. sensing distance:	1mm	
Temperature range:	-20° to +65°C	
Function:	n.o. (make) function	
Type:	pnp logic	

Hydraulics diagram

Disk-Type Tool Turret 433/437/439/440....

HP-489 en

Z-Doku-IdNr. 091154



Hydraulics supply (example)

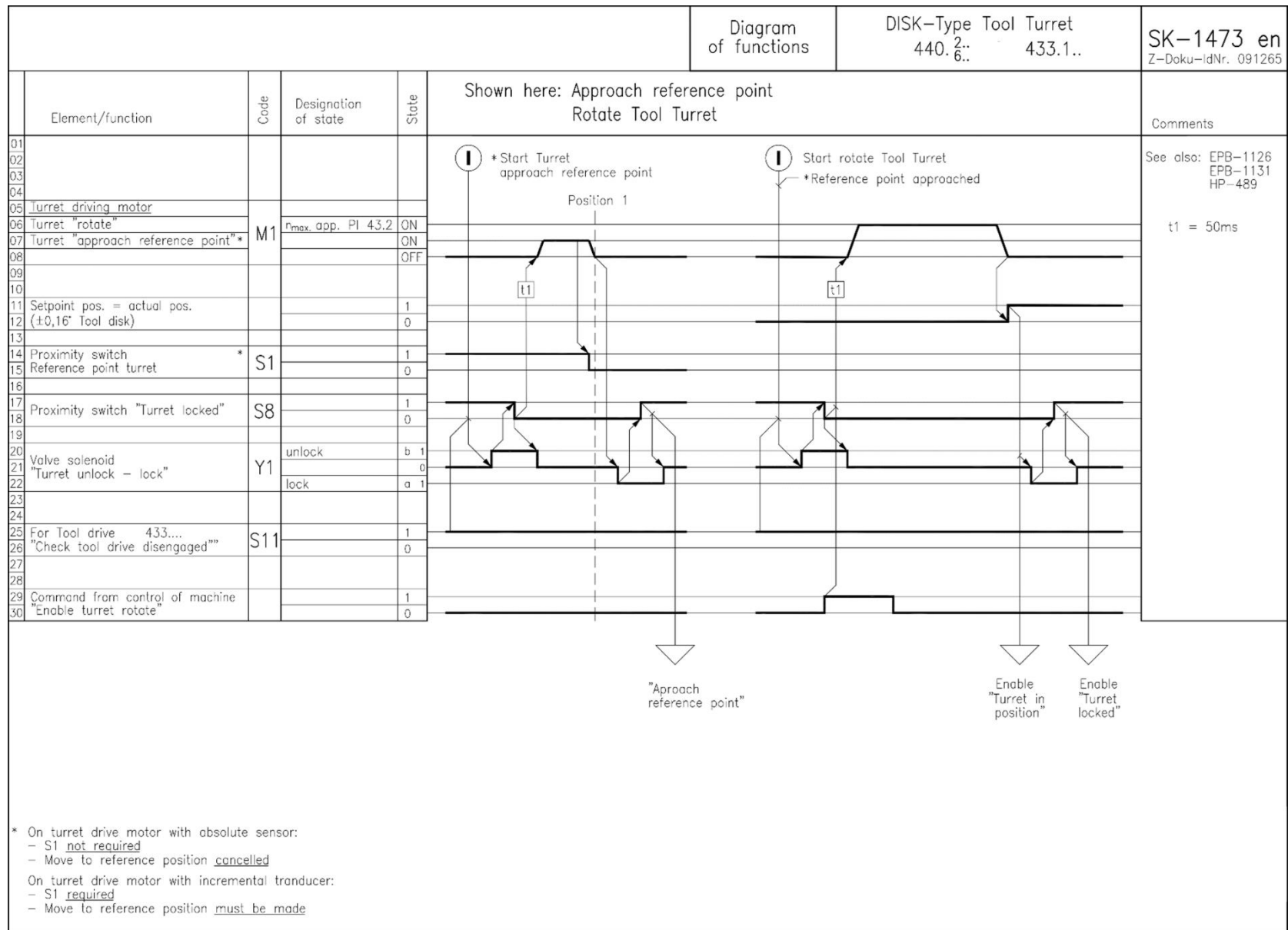
Oil quantity required per indexing cycle		Size				
		12	16	20	25	32
V	[cm ³]	≈ 15	≈ 30	≈ 45	≈ 65	≈ 114
\dot{V}	[l/min]	≈ 20				

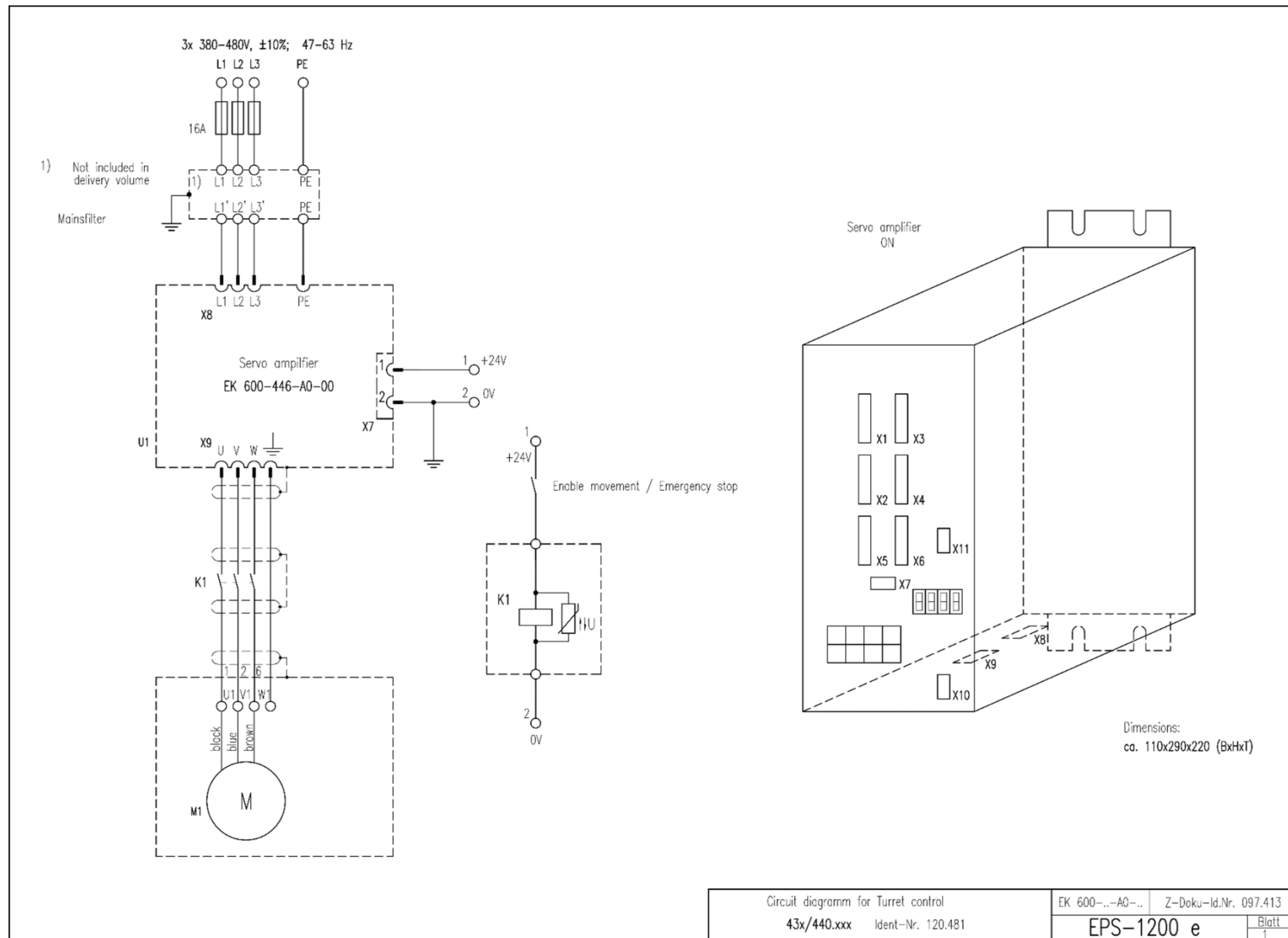
	Size				
	12	16	20	25	32
V _{min} [l]	0,7	0,7	0,7	2,0	2,0

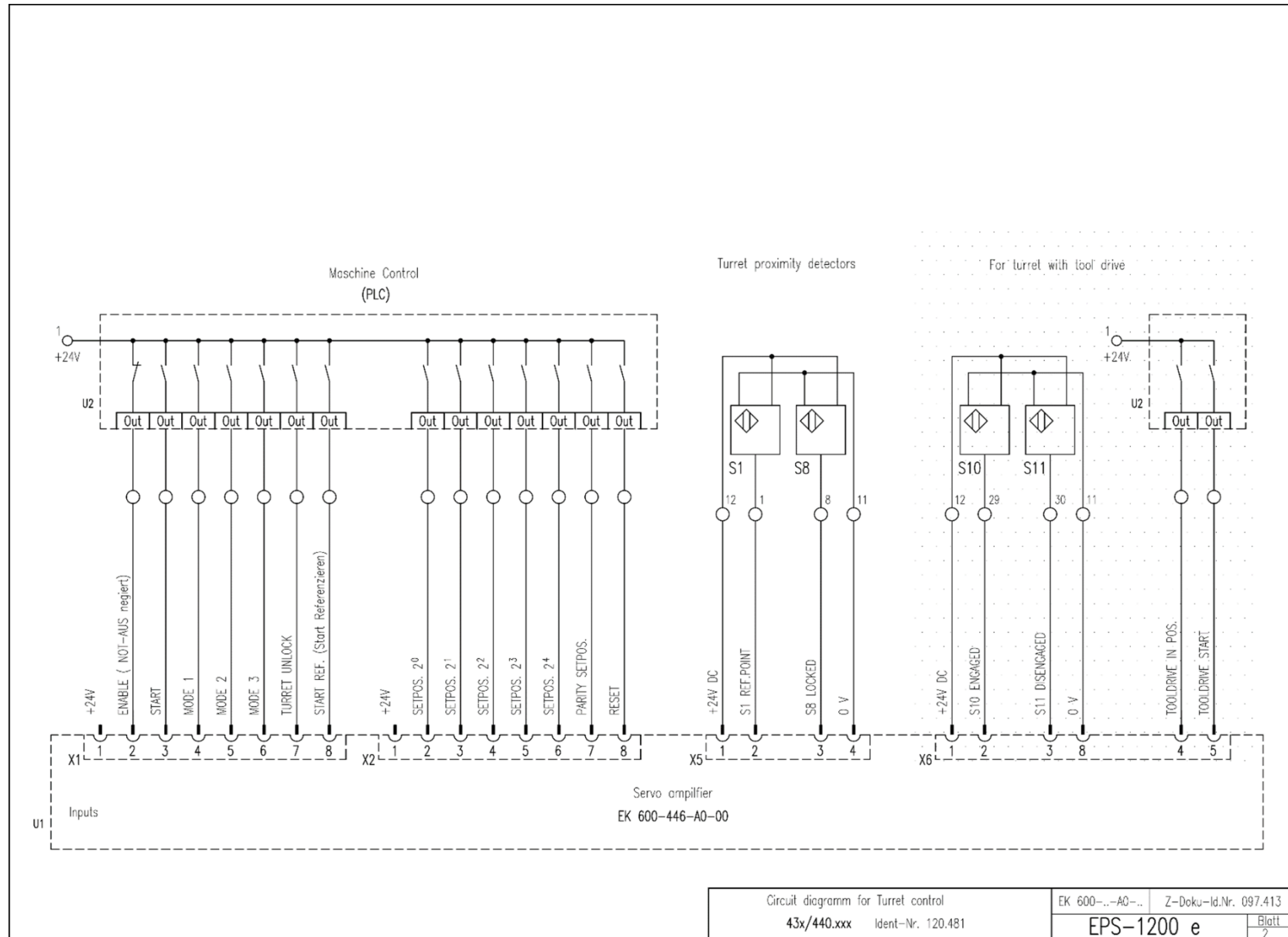
	Size				
	12	16	20	25	32
Recommended nominal diameter DN of line between distributing valve and turret:					
for line length ≤ 6	8	8	10	12	12
for line length > 6	10	10	12	15	15
Recommended rated quantity of valve	6	6	6	10	10

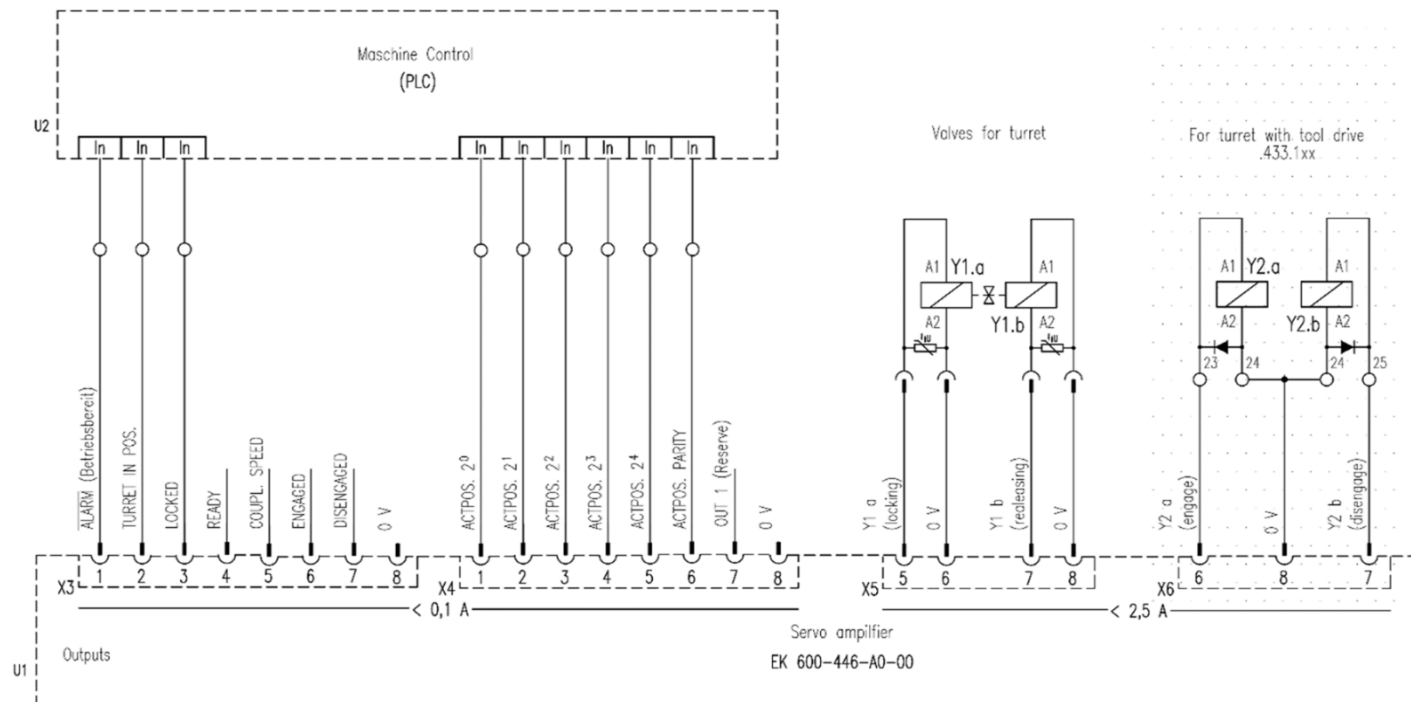
Table of functions	Y1a	Y1b
Turret	lock	0
	unlock	1

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



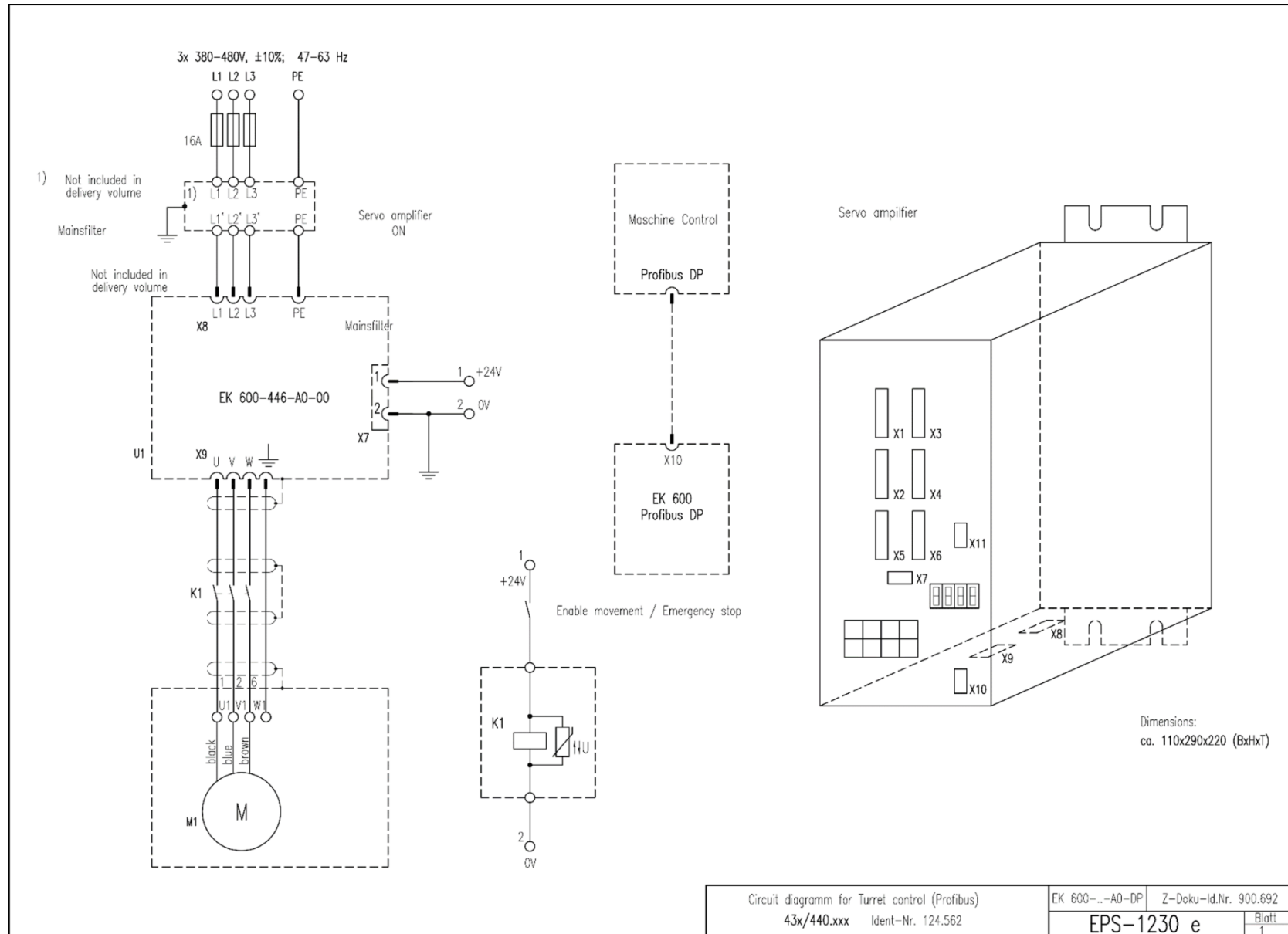


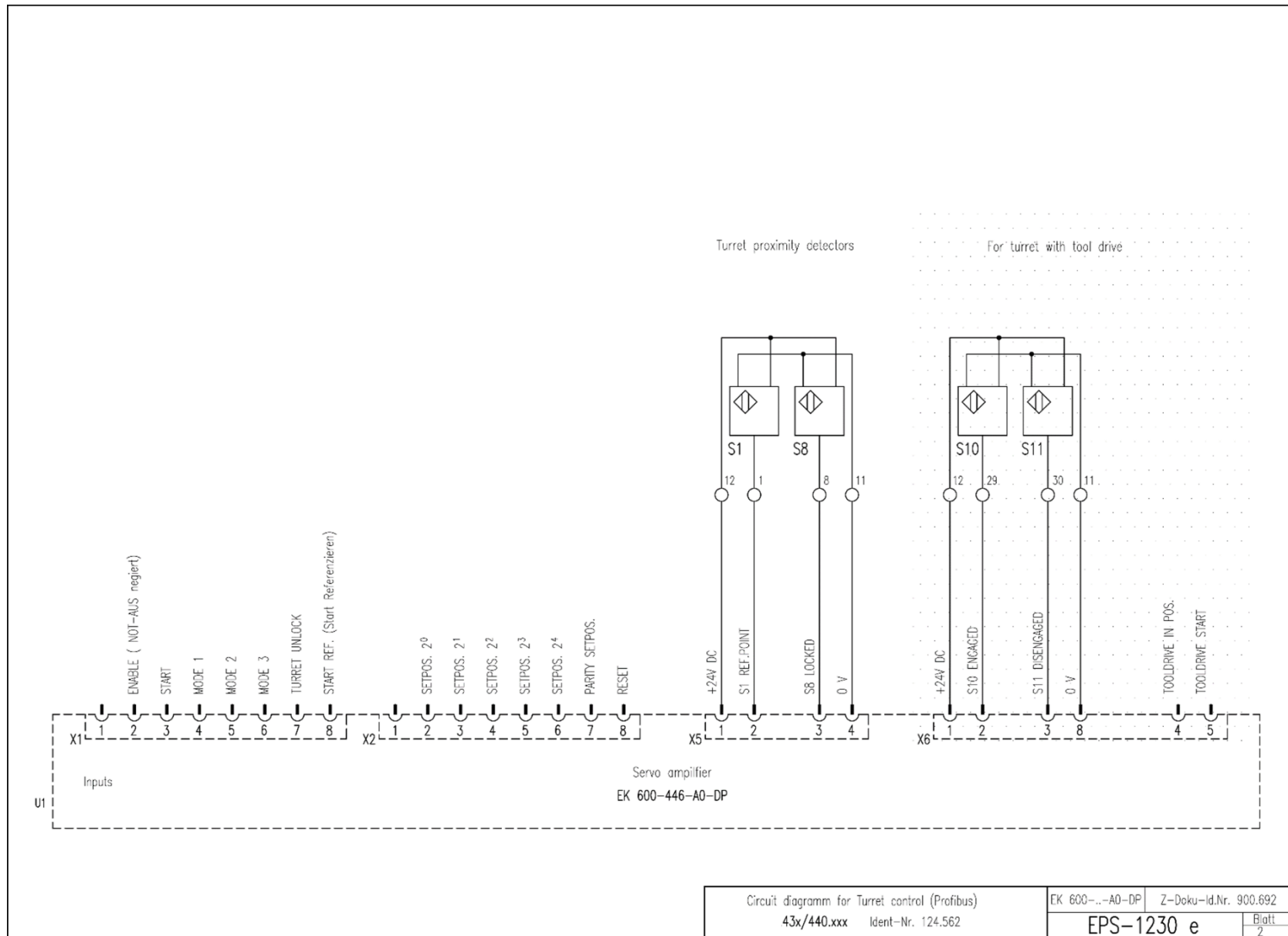


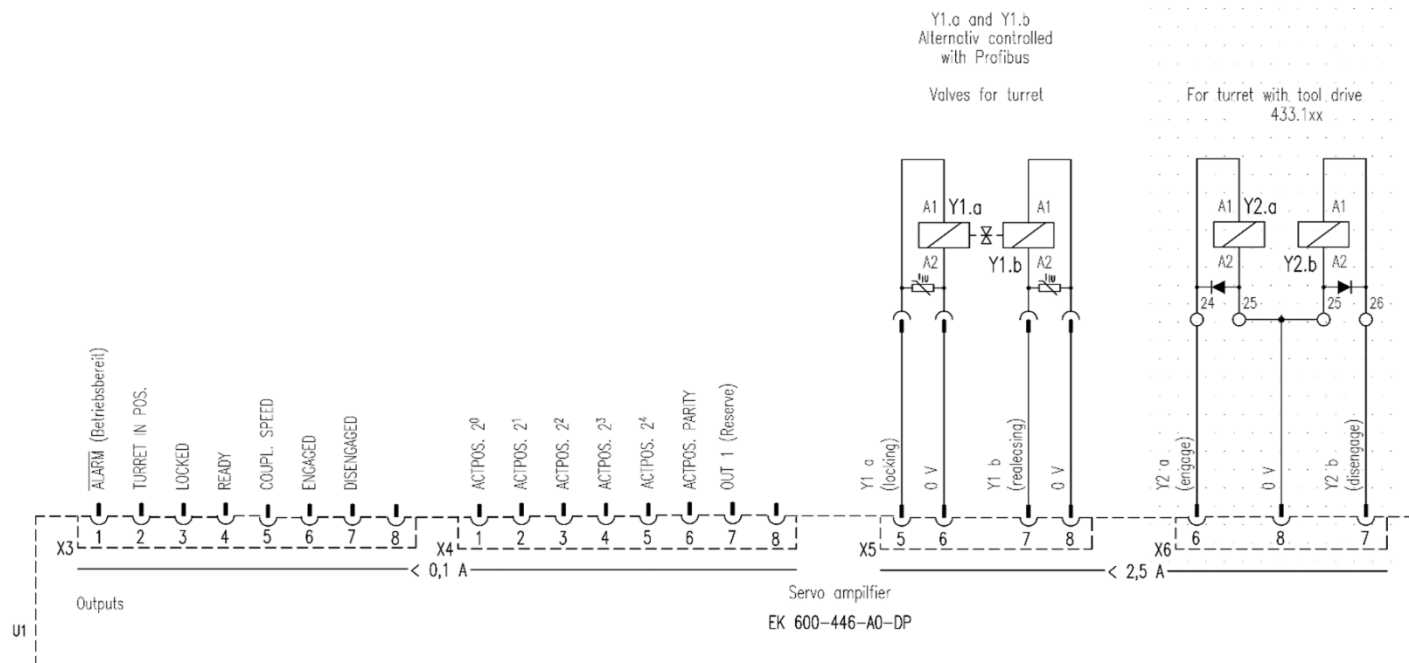


Circuit diagramm for Turret control
43x/440.xxx Ident-Nr. 120.481

EK 600-...-A0-... Z-Doku-Id.Nr. 097.413
EPS-1200 e Blatt 3







Circuit diagramm for Turret control (Profibus)

43x/440.xxx Ident-Nr. 124.562





EK 600-...-A0-DP

Z-Doku-Id.Nr. 900.692

EPS-1230 e

Blatt
3

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	+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.

 The new Revolution GPM CO., LTD MADE IN TAIWAN	Typ		①
	Id.-Nr.		②
			③
			④