

# Clamping force block TANDEM PGS3

Assembly and Operating Manual

## Imprint

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### Technical changes:

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Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

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**Please read the operating manual in full and keep it close to the product.**

## Table of Contents

<b>1 General .....</b>	<b>5</b>
1.1 About this manual.....	5
1.1.1 Illustration of warning notices .....	5
1.1.2 Applicable documents .....	6
1.1.3 Sizes.....	6
1.2 Warranty .....	6
1.3 Scope of Delivery.....	6
<b>2 Basic safety notes.....</b>	<b>7</b>
2.1 Appropriate use .....	7
2.2 Inappropriate use .....	7
2.3 Structural changes.....	8
2.4 Spare parts .....	8
2.5 Ambient conditions and operating conditions .....	8
2.6 Material limitations .....	8
2.7 Chuck Jaws .....	8
2.8 Personnel qualifications .....	9
2.9 Personal protective equipment .....	10
2.10 Transport.....	10
2.11 Protection during handling and assembly .....	10
2.12 Protection during commissioning and operation .....	10
2.13 Notes on safe operation.....	11
2.14 Disposal .....	11
2.15 Fundamental dangers .....	11
2.16 Protection against dangerous movements .....	12
2.17 Notes on particular risks .....	12
<b>3 Technical data .....</b>	<b>14</b>
<b>4 Assembly.....</b>	<b>15</b>
4.1 Tightening torques for screws .....	15
4.2 Connecting the clamping force block .....	16
4.3 Assembling the clamping force block on the machine table.....	18
<b>5 Maintenance and care .....</b>	<b>20</b>
5.1 Disassembling and assembling the clamping force block.....	20
5.2 Leak test .....	22
<b>6 Troubleshooting.....</b>	<b>23</b>
<b>7 Storage.....</b>	<b>24</b>

<b>8 Sealing kits, accessory packs and parts lists.....</b>	<b>25</b>
8.1 Sealing kit lists .....	25
8.2 Accessory kit .....	25
8.3 Parts lists .....	26
<b>9 Assembly drawings .....</b>	<b>27</b>
<b>10 Manufacturer certificate.....</b>	<b>28</b>

# 1 General

## 1.1 About this manual

This manual contains important information for the safe, correct use of the product.

It is an integral part of the product and must be kept accessible for personnel at all times.

Personnel must have read and understood this manual before beginning any work. The observance of all safety notes in this manual is a prerequisite to ensure safe work processes.

The illustrations are intended to provide a basic understanding and may deviate from the actual version.

Besides this manual, other documents which apply are those listed under ▶ 1.1.2 [ 6 ]

### 1.1.1 Illustration of warning notices

To make risks clear, the following signal words and symbols are used for safety notes.



#### **⚠ DANGER**

Denotes a hazard with a high degree of risk that, if not avoided, will result in death or serious injury.



#### **⚠ WARNING**

Denotes a hazard with a medium degree of risk that, if not avoided, could result in death or serious injury.



#### **⚠ CAUTION**

Denotes a hazard with a low degree of risk that, if not avoided, could result in a minor or moderate injury.

#### **NOTICE**

Information about avoiding material damage.

### 1.1.2 Applicable documents

- General Terms and Conditions \*
- Catalog data sheet for the attached product \*
- Technical data sheet for optional attachments \*
- Approval drawings

Documents marked with a star (\*) can be downloaded at **schunk.com**.

### 1.1.3 Sizes

This operating manual applies to the following sizes:

- PGS3 100, 140
- PGS3-LH 100, 140

## 1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the date of delivery from the production facility or 200,000 cycles\* under the following conditions:

- Observe the applicable documents, ▶ 1.1.2 [ 6 ]
- Observe the ambient conditions and operating conditions, ▶ 2.5 [ 8 ]
- Observance of the specified care and maintenance instructions ▶ 5 [ 20 ]

Parts touching the workpiece and wear parts are not included in the warranty.

\* A cycle consists of a complete clamping process ("Open" and "Close").

## 1.3 Scope of Delivery

**Clamping force block**

**PGS3 or PGS3-LH**

(without top jaws)

ACCESSORY KIT:

(for contents, see sealing kit list and parts list) ▶ 8.1 [ 25 ]

## 2 Basic safety notes

Improper handling, assembly and maintenance of this product may result in risk to persons and equipment if this operating manual is not observed.

### 2.1 Appropriate use

- The product is used for clamping metal and plastic workpieces on machine tools.
- The product may only be used within the scope of its technical data.
- The product is designed to be set up on a machine table or machine pallets.
- The product is intended for industrial and commercial use.
- Appropriate use of the product includes compliance with all instructions in this manual.
- Use suitable top jaws with a suitable interface.
- Clamping workpieces with temperatures between 0°C and 100°C.
- The outer dimensions of the workpiece must be smaller than or at most equal to the outer diameter of the clamping device.
- The workpiece must not undergo plastic deformation while under clamping force (clamping indentations are permissible).

### 2.2 Inappropriate use

The product is not being used appropriately if:

- the product is used as a press or a punch, as a toolholder, as a lathe chuck, as a drill or as a cutting tool.
- the technical data specified are exceeded during usage.
- workpieces are not properly clamped, paying particular attention to the specified clamping forces.
- the top jaws are not mounted properly.
- the product is not being operated properly.
- the product is operated in the stroke end positions.
- the guideways are overloaded due to the chuck jaws being too high or the selected clamping point being too high.
- the product has been insufficiently maintained.
- the product is used for turning applications over 100 RPM without consulting SCHUNK.
- the product is brought into contact with aggressive media, especially acids.
- the product is used in abrasive blasting processes, especially sandblasting.

## 2.3 Structural changes

### Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

## 2.4 Spare parts

### Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Only use original spare parts and spares authorized by SCHUNK.

## 2.5 Ambient conditions and operating conditions

### Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction in the service life of the product

- Make sure that the product is only used within its defined application parameters.
- Ensure that the product is of a sufficient size for the application.
- Ensure that maintenance and lubricating intervals are observed.
- When machining, use only coolant emulsions with anti-rust properties.
- Depending on the operating conditions, the function must be checked after a certain period of operation.

## 2.6 Material limitations

The product is made of steel alloys, elastomers, aluminum alloys and brass. In addition, Microgleit LP 410 grease, Branotect anti-rust oil and Renolit HLT2 are incorporated into the product as auxiliary and operating materials. The safety data sheet for Microgleit LP 410 can be found at [www.schunk.com](http://www.schunk.com).

## 2.7 Chuck Jaws

### Requirements of the chuck jaws

When using chuck jaws, please observe the following rules:

- Change chuck jaws at a standstill and without a clamped workpiece.
- Do not use welded jaws.

- Design the chuck jaws to be as low as possible. The clamping point must be as close as possible to the housing. (clamping points at a greater distance cause higher surface pressures in the jaw guides and can significantly reduce the clamping force.)
- If the clamping point is at a greater distance from the housing, the operating pressure must be reduced.
- After a collision, the clamping device and the chuck jaws must be subjected to a crack detection test before being used again. Replace damaged parts with original SCHUNK spare parts.
- The chuck jaw mounting screws and if present, the T-nuts, must be replaced if there are signs of wear or damage. Only use screws of quality grade 12.9 in compliance with the specified tightening torques. For clamping devices with fine serration, the jaw mounting screws must be screwed into the holes closest to the clamping point.

## 2.8 Personnel qualifications

### Inadequate qualification of personnel

Any work on the product by inadequately qualified personnel can lead to serious injuries and considerable material damage.

- All work must be performed by appropriately qualified personnel.
- Personnel must have read and understood the complete manual before beginning any work on the product.
- Observe country-specific accident prevention regulations and the general safety notes.

The following personnel qualifications are required for the various activities on the product:

<b>Qualified electrician</b>	Qualified electricians have the professional training, knowledge, and experience to work on electrical systems, to recognize and avoid potential dangers, and know the relevant standards and regulations.
<b>Specialist personnel</b>	Specialist personnel have the specialized training, knowledge, and experience to perform the tasks entrusted to them, to recognize and avoid potential dangers, and know the relevant standards and regulations.
<b>Instructed person</b>	Instructed persons have been instructed by the operator regarding the tasks entrusted to them and the potential dangers of inappropriate behavior.
<b>Manufacturer's service personnel</b>	The manufacturer's service personnel have the specialized training, knowledge, and experience to perform the work entrusted to them and to recognize and avoid potential dangers.

## 2.9 Personal protective equipment

### Use of personal protective equipment

Personal protective equipment serves to protect staff in the event of a danger that may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and place a hairnet over long hair when dealing with moving components.

## 2.10 Transport

### Handling during transport

Incorrect handling during transport can make the product unsafe and risks the danger of serious injuries and considerable material damage.

- During transport and handling, secure the product to prevent it from falling.
- Use the transport thread on the clamping device.

## 2.11 Protection during handling and assembly

### Incorrect handling and assembly

Incorrect handling and assembly can make the product unsafe and can risk the danger of serious injuries and considerable material damage.

- All work must only be performed by appropriately qualified personnel.
- Secure the system against accidental operation during all work.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

## 2.12 Protection during commissioning and operation

### Falling or violently ejected components

Falling and ejected components can lead to serious injury or death.

- Take suitable protective measures to secure the danger zone.

## 2.13 Notes on safe operation

### Incorrect manner of working by personnel

An incorrect manner of working can make the product unsafe and risks serious injuries and considerable material damage.

- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. Products for special ambient conditions are excluded.
- Rectify malfunctions as soon as they occur.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention, and environmental protection regulations for the application field of the product.
- Do not start the machine spindle until the force has built up in the chuck jaw and clamping is complete in the permissible operating range.
- Unclamping may only occur once the machine spindle has come to a standstill.

### IMPORTANT!

Following a longer shutdown period (more than 8 hours), always re-tension the clamping device in order to compensate for the setting properties of the clamping situation or possible pressure losses and the resulting loss of clamping force.

## 2.14 Disposal

### Handling of disposal

Incorrect handling during disposal can make the product unsafe and risks serious injuries and considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

## 2.15 Fundamental dangers

### General

- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- Do not reach into the open mechanism or movement area of the product during operation.

## 2.16 Protection against dangerous movements

### Safe condition

1. Clamping force block with workpiece:  
Workpiece clamped outside the end positions of the clamping force block with clamping pressure applied.
2. Clamping force block without workpiece, without clamping or release pressure applied.
3. Clamping force block with spring force:  
Clamped without energy without workpiece.  
Special feature: Due to the built-in spring, an opened clamping force block clamps without release pressure.  
Unexpected clamping movements could result if the release pressure fails. Take suitable measures, e.g. a pilot-controlled check valve with manual venting.

### Unexpected movements

If the system still retains residual energy, serious injuries can be caused while working on the product.

- Establish a safe state, switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.

## 2.17 Notes on particular risks



### ⚠ WARNING

**Risk of injury in the event of workpiece loss due to component failure on the product as a result of exceeding the technical data.**

- The product is only allowed to be used within the scope of its technical data.



### ⚠ WARNING

**Risk of injury due to immediate closing of the product with high spring force in the event of pneumatic pressure failure (AS variant).**

- Wait for the system to come to a complete standstill in the safe state.
- Do not reach into the clamping force block.



### ⚠ WARNING

**Danger of crushing due to the chuck jaws moving to the workpiece during the clamping procedure when loading and unloading manually.**

- Do not reach between the workpiece and the chuck jaw during the clamping procedure.
- Implement the safety functions according to the integrator's risk assessment.



### ⚠ WARNING

**Risk of injury in the event of workpiece loss due to failure or pressure reduction.**

- Implementing safety functions according to the integrator's risk assessment.
- Ensure stable pressure supply.
- Use pressure maintenance valves.



### ⚠ WARNING

**Risk of injury from falling parts during transport, assembly and disassembly of the product and its accessories.**

- Use suitable load handling equipment for transport.
- Do not linger in the danger zone.
- Wear protective equipment (protective shoes).



### ⚠ CAUTION

**Ergonomic risk to the musculoskeletal system when lifting and transporting the product using manual force.**

- Use load handling equipment for lifting and transporting.



### ⚠ CAUTION

**Allergic reactions or irritation due to skin or eye contact with lubricants on the product.**

- In case of foreseeable contact with lubricants on the product (e.g. when lubricating or cleaning),
- wear protective equipment (protective gloves, protective goggles).



### ⚠ CAUTION

**Danger for the operating personnel in case of insufficient clamping force due to ejection or falling of the workpiece!**

Due to settling behavior, the clamping force may decrease over time.

- Ensure that the clamping pressure is applied to the clamping force block while the workpiece is being machined.
- Re-clamping of the workpiece with manual or pneumatic clamping force blocks.

### 3 Technical data

Installation position	any
Operating temperature [°C]	+5 to +60
Noise emission [dB(A)]	≤ 70
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]
Max. speed of rotation [rpm]	100

Size	Stroke/ jaw [mm]	Clamping force at max. pressure* [kN]	Max. pressure [bar]	Repeat accuracy ** [mm]	max. jaw height [mm]	Weight [kg]
PGS3	100	2	10	6	0.02	5
	140	3	17	6	0.02	9
PGS3-LH	100	6	4.5	6	0.02	5
	140	7	8.5	6	0.02	9

\* Clamping force is the arithmetic sum of the individual forces occurring at the chuck jaws at distance "H" (see also catalog).

\*\* Distribution of the clamping position with 100 consecutive clamping operations.

## 4 Assembly



### ⚠ WARNING

**Risk of injury due to accidental actuation of the clamping force block during assembly and connection.**

- Make sure the power supply for the clamping force block is off during assembly and connection.
- Perform maintenance, modifications, or installations outside of the danger zone.



### ⚠ WARNING

**Risk of injury from clamping block or chuck jaws falling during transport, installation or removal!**

- Make sure the clamping block and chuck jaws do not fall during transport, installation or removal.
- Use a crane and/or a transport truck for transportation.
- Only install the clamping block on machines with the appropriate connection dimensions.

### 4.1 Tightening torques for screws

**Tightening torques for mounting the clamping system on the machine table (screw quality 10.9)**

Screw size	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Tightening torque $M_A$ (Nm)	4.2	7.5	13	28	50	88	120	160	200	290	400	500

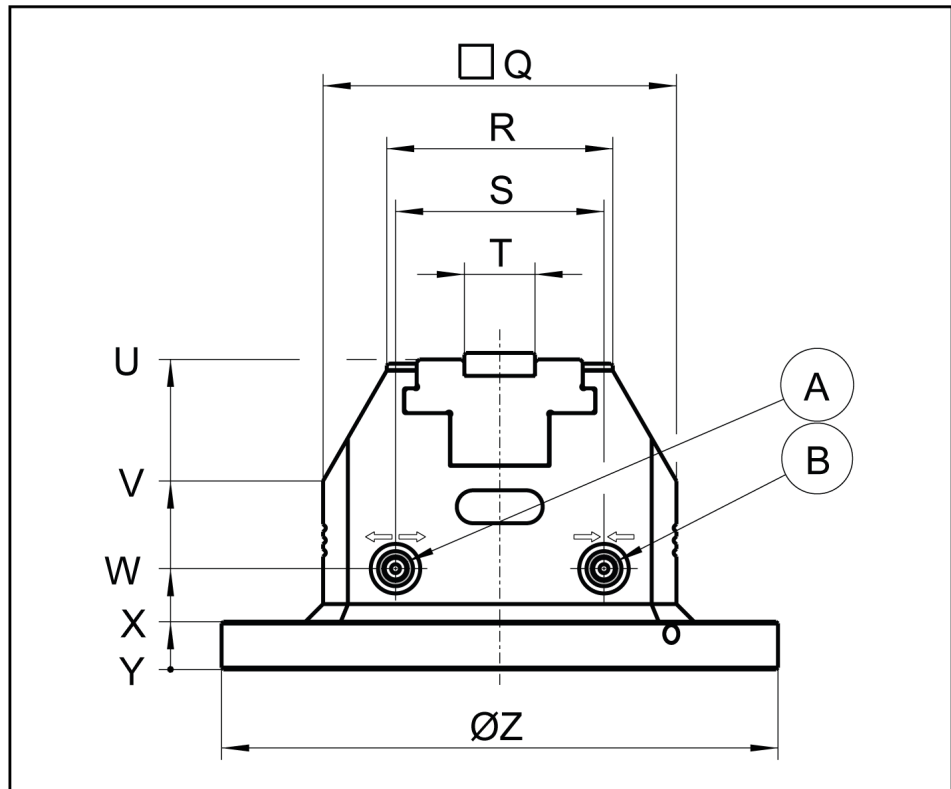
**Tightening torques for mounting top jaws on the TANDEM clamping force block (screw quality 12.9)**

Screw size	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
Tightening torque $M_A$ (Nm)	5	9	15	32	62	108	170	262	510	880

**Tightening torques for mounting the chuck piston onto the cylinder piston (screw quality 12.9)**

Screw size	M5	M8	M10	M12
Tightening torque $M_A$ (Nm)	9	32	62	108

## 4.2 Connecting the clamping force block



Dimension	100	140
Q [mm]	100	140
R [mm]	64	91
S [mm]	59	88
T [mm]	20	28
U [mm]	87.7	91.2
V [mm]	53.3	45
W [mm]	28.5	32
X [mm]	13.5	13.5
Y [mm]	0	0
Z [mm]	158	208

### NOTICE

**Risk of workpiece loss and damage to the automated system due to loss of air pressure caused by damaged pneumatic lines.**  
 Always make sure the connections are tight, and use appropriate protection covers to protect the pneumatic hoses and lines from hot chips and falling parts.

The clamping force block has two air connections: **A** and **B**.  
 Connection for OPEN (**A**) and connection for CLOSE (**B**).

Thread for pneumatic fitting (frontal): M5

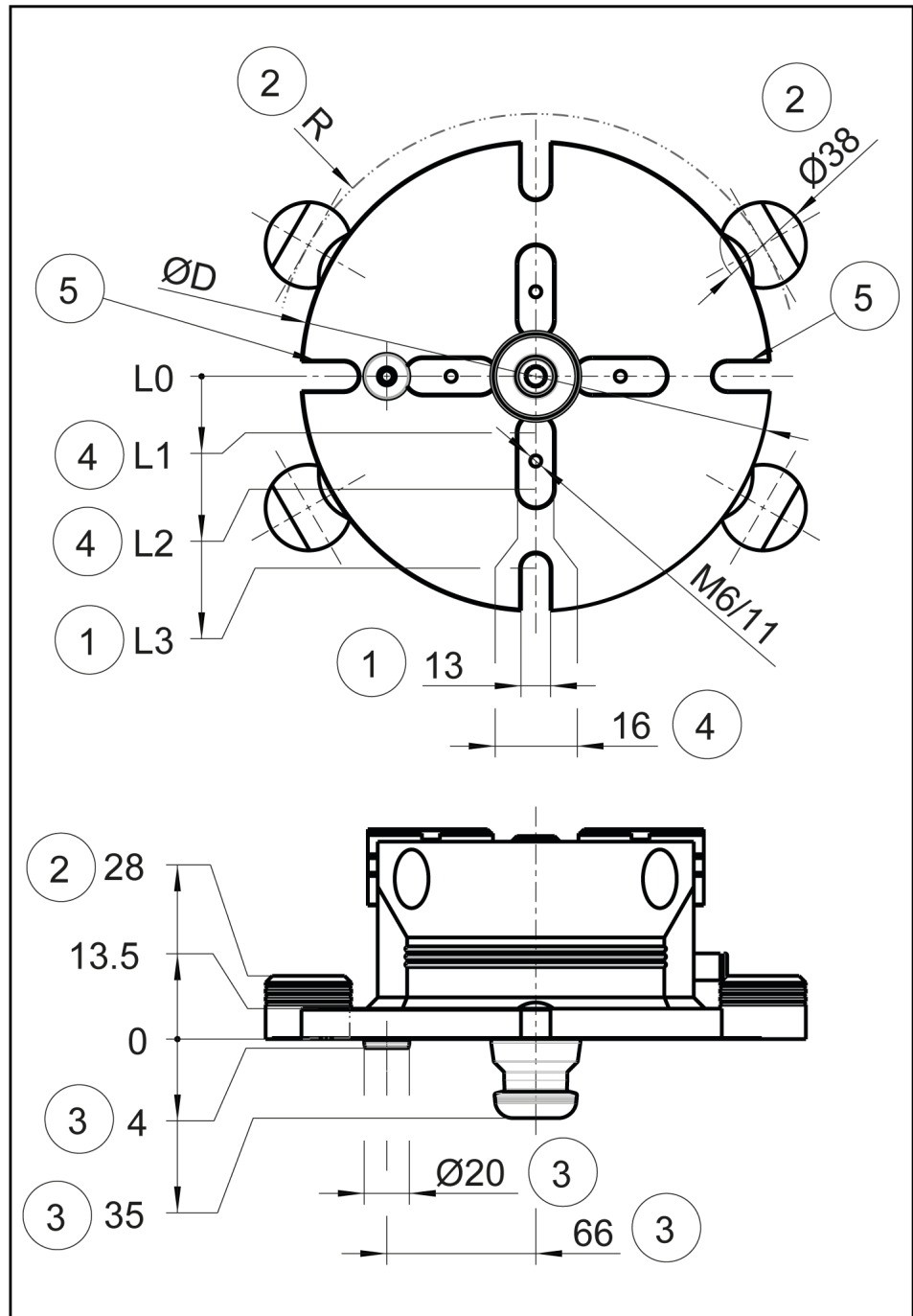
NOTE:

The air connections at the front come sealed with locking screws (item 11) on delivery of the clamping force block.

Compressed air supply requirements: Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]

Unconditioned compressed air contains dust and oil particles as well as moisture, all of which can lead to malfunctions or premature wear in the clamping force block. The oiler should be no more than 2 meters from the coupling point.

### 4.3 Assembling the clamping force block on the machine table



1. Option of mounting with M12 screws
2. Option of mounting with cylindrical clamp blanks
3. Option of mounting on clamping stations
4. Option of mounting with T-nuts
5. Grooves in the direction of the indexing pin only with PGS3 140 (-LH)

<b>Dimension</b>	<b>100</b>	<b>140</b>
R [mm]	86.5	116.5
D [mm]	158	208
L0 [mm]	0	0
L1 [mm]	23	25
L2 [mm]	46	50
L3 [mm]	63	85

#### **Mounting via T-slots (option 1 + 4):**

After mounting two T-nuts and two M6 screws, the clamping force block is fixed to the machine table via at least two oblong holes of the mounting flange using M12 screws. The T-nuts (ID 9985705) and the M6 screws (ID 9980388) are available separately as accessories.

#### **Mounting via cylindrical clamps (option 2):**

The clamping force block is fixed to the machine table in combination with four cylindrical clamps. The cylindrical clamps (ID 8508199) are available separately as accessories.

#### **Mounting on clamping station (option 3):**

After mounting the clamping pin and indexing pin, the clamping force block is prepared for set-up on SCHUNK NSL3 150 clamping stations. Use an M10 x 40 screw (12.9) for mounting the clamping pin. The clamping pin (ID 0471151) and indexing pin (ID 0471980) are available separately as accessories.

## 5 Maintenance and care

The item numbers specified for the corresponding individual components relate to the chapter Drawings, ▶ 9 [☐ 27].

Please observe the following instructions in order to keep the clamping system operating smoothly:

- Upgrade the base jaws and the chuck piston at least every three months or more often if necessary (see chapter ▶ 5.1 [☐ 20], Disassembling and assembling the clamping force block). Clean housing, base jaws and chuck piston and reassemble everything.

### **IMPORTANT!**

Please regularly check the clamping device for tightness by applying a clamping force tester over a longer period of time (>10 min.). The clamping force should not drop during this period. Please adjust the inspection interval to the operating conditions of the clamping device, however, we do recommend conducting a check every 5,000 clamping cycles at the latest.

### **5.1 Disassembling and assembling the clamping force block**

When replacing wearing parts (e.g. seals – for seal kit lists see ▶ 8.1 [☐ 25]) adhere to the following order:

NOTE:

The base jaws (2), chuck piston (3) and housing (1) are made to go together. These parts cannot be replaced individually. To replace these parts, ship the entire clamping force block to SCHUNK along with a repair order.

1. Apply 6 bar of air pressure to the clamping system until the jaws are in the OPEN position.
2. Remove the covering strip (item 8) and the guide strips (item 6).
3. Remove the cylindrical screw (item 69) from the chuck piston.
4. Remove the pressure line.
5. Loosen the screws (items 82, 84) and disassemble the clamping system from the mounting flange (item 5). Air may escape at this point.
6. To remove the chuck piston (item 3), screw in the center bore.
7. Pull the base jaws (item 2) out of the housing (item 1).
8. Before pulling off the mounting flange (item 5), all the screws first need to be removed.
9. Remove the seals (item 42).
10. Underlay the clamping force block so the cylinder piston (item 4) can be pushed out.
11. Remove the seals (items 40, 45).

12. Clean all the parts thoroughly and check for damage and wear. **Replace damaged and worn parts with original SCHUNK spare parts.**
13. Lubricate the new seals (items 40, 41, 42, 45) with Renolit HLT 2 or an equivalent grease.
14. Mount the new seals carefully. The seals must not be damaged in the process.
15. Grease the sliding surfaces of the cylinder and piston with Renolit HLT 2 or equivalent grease.
16. Place the cylinder piston (item 4) loosely into the cylinder. Make sure the cylinder piston (item 4) is level and not tilted.
17. Gently press the quad ring (item 40) inward from all sides, so that it slides more easily over the edge of the housing (item 1).
18. Press the cylinder piston (item 4) into the cylinder of the housing (item 1). Do not tilt the cylinder piston (item 4).
19. Insert the O-rings (item 42) into the mounting flange (item 5) and place the O-ring (item 45) around the mounting flange (item 5).
20. Insert the mounting flange (item 5) into the housing (item 1), making sure the openings for the air feed-throughs are aligned.
21. Screw the mounting flange (item 5) onto the housing (item 1). Use a torque wrench ▶ 4.1 [15].
22. Grease the sliding surfaces of the housing (item 1), base jaws (item 2) and chuck piston (item 3) with Renolit HLT 2.
23. Assemble the base jaws (item 2) and the chuck piston (item 3). Be sure to observe the installation position for the base jaws and the chuck piston.
24. Connect the clamping system to the air supply and move the jaws to the CLOSED position.
25. Screw down the chuck piston (item 3) and cylinder piston (item 4). Tighten the screw (item 69) with a torque wrench ▶ 4.1 [15].
26. Fasten the guide strips (item 6) and the covering strip (item 8).
27. Check for leaks.

## 5.2 Leak test

The following components are required to check for leaks: pressure gauge, shut-off valve, supply line and quick coupler.

- Check for leaks in the clamping system in the OPEN and CLOSED positions.
  1. Connect the components to the open CLOSED connection in the following order:  
pressure gauge – shut-off valve – quick coupler – supply line.
  2. Pressurize the clamping force block.
  3. Close the shut-off valve and remove the supply line.
  4. Leave the clamping force block force clamped for 24 hours.
  5. After 24 hours, the clamping force block is:
    - sealed if the pressure gauge indicates a drop in pressure of less than 0.5 bar.
    - leaking if the pressure gauge indicates a drop in pressure of more than 0.5 bar.

If the clamping system is leaking, check the screws first (e.g. with Metaflux leak detection spray). Seal any leaking screws.

Once the screws are sealed, check for leaks and replace if necessary (see Disassembling and assembling the clamping block ▶ 5.1 [📄 20]).

## 6 Troubleshooting

### Clamping force block chuck jaws will not move

Possible cause	Solution(s)
Air supply interrupted.	Check air supply.
System pressure too low.	Increase system pressure according to clamping system technical specifications.
Connections mixed up.	Check connections and functions and connect properly.

### Piston will not move

Possible cause	Solution(s)
Fan not oiled.	Check maintenance unit, perform maintenance work. Place the oiler closer to the clamping system. Set the required oil quantity.
Chuck piston screw broken (overload)	Send clamping system to SCHUNK for repairs or disassemble clamping system and repair using original SCHUNK spare parts ▶ 5.1 [☐ 20]
Piston rod or piston rod screw connection broken (overload)	Send clamping system to SCHUNK for repairs or disassemble clamping system and repair using original SCHUNK spare parts ▶ 5.1 [☐ 20]

### Clamping force block does not complete stroke

Possible cause	Solution(s)
Chips or dirt between covering strip and base jaws.	Unscrew the covering strip (item 7) and remove chips and dirt.

### Clamping force getting weaker

Possible cause	Solution(s)
Clamping force block not sealed tightly.	Check connection and seal screws; reseal or replace.
Seals damaged.	Disassemble clamping force block ▶ 5.1 [☐ 20] and replace all the seals (see sealing kit lists ▶ 8.1 [☐ 25]).

## 7 Storage

When storing the product for a longer period of time, observe the following points:

- Clean the product and lubricate it lightly.
- Store the product in a suitable transport container.
- Only store the product in dry rooms.
- Protect the product from major temperature fluctuations.

**NOTE:** Before recommissioning, clean the product and all attachments, check for damage, functionality and leaks.

## 8 Sealing kits, accessory packs and parts lists

When ordering spare parts, the type, size and, if possible, the serial number of the clamping force block must always be stated to avoid delivery mistakes.

**Seals, sealing elements, fittings, springs, bearings, screws, wiper bars and parts that come into contact with the workpiece are not covered by the warranty.**

### 8.1 Sealing kit lists

Sealing kit *	ID number
Size 100	1449887
Size 140	1452863

\* For included items, see note **X** in the Parts List chapter below. Seals are wearing parts and are recommended to be replaced during maintenance. The sealing kit can only be ordered as a complete kit.

### 8.2 Accessory kit

Accessory kit *	ID number
Size 100	1449876
Size 140	1453263

\* For included items, see Note **Z** in the Parts List chapter below.

### 8.3 Parts lists

**TANDEM PGS3 100** (ID number: 1446779)

**TANDEM PGS3-LH 100** (ID number: 1446791)

**TANDEM PGS3 140** (ID number: 1452817)

**TANDEM PGS3-LH 140** (ID number: 1452818)

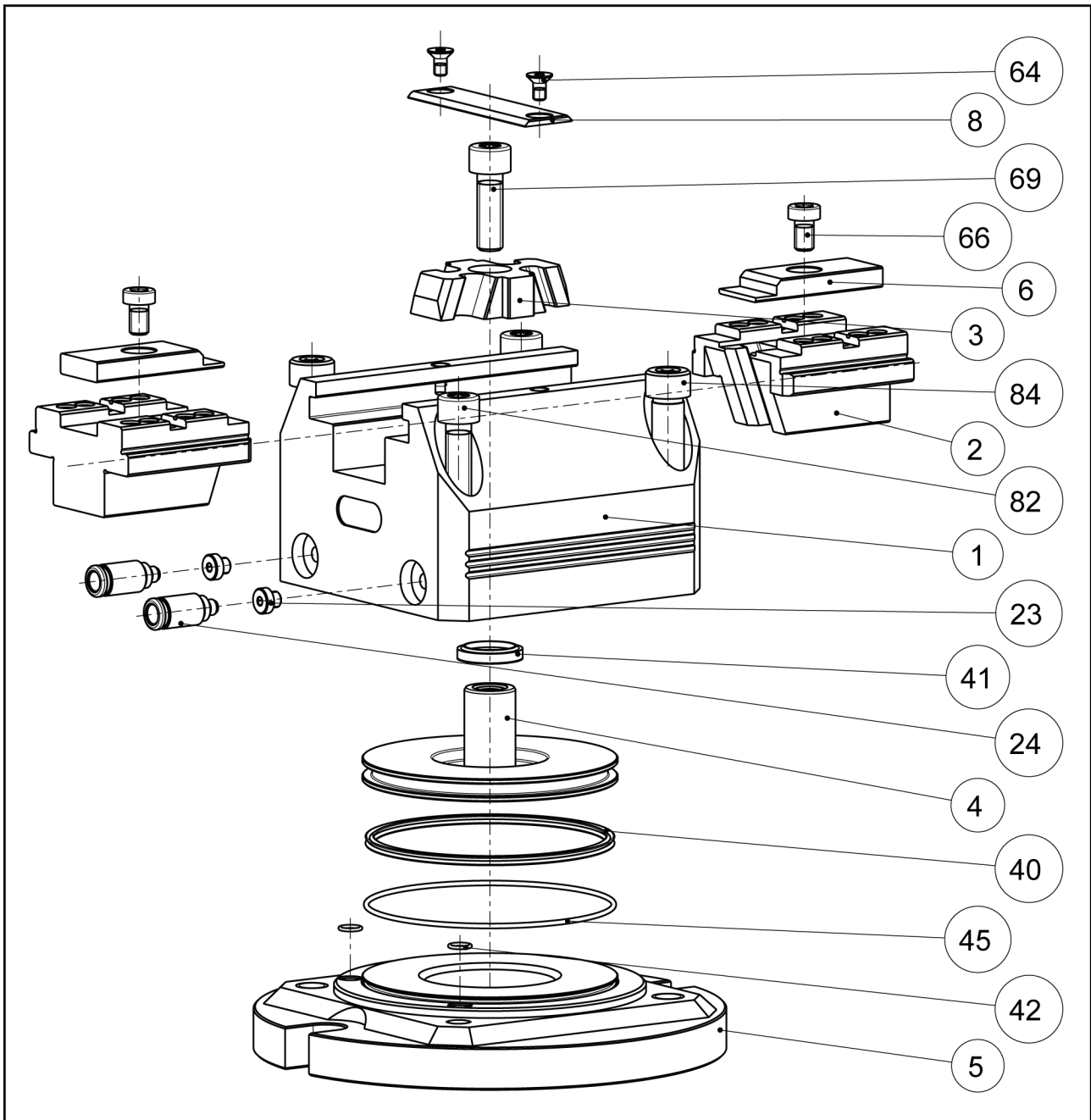
Item	Designation	Quantity	Note
1	Body	1	*
2	Base jaws	2	*
3	Chuck piston	1	*
4	Cylinder piston	1	
5	Mounting flange	1	
6	Guide strip	2	
8	Covering strip	1	
23	Locking screw	2	
40	Quad ring	1	<b>Y</b>
41	Combined sealing element	1	<b>Y</b>
42	O-ring	2	<b>Y</b>
45	O-ring	1	<b>Y</b>
64	Countersunk screw	2	
66	Screw	1	
69	Screw	2	
80	Threaded insert	1	
82	Countersunk screw	1	
84	Screw	3	
86	Screw	8	<b>Z</b>
94	Pneumatic connection	2	<b>Z</b>

#### Parts list key

**Y** included in the sealing kit    **Z** included in accessory kit

\* Individual components are specially tuned to one another and cannot be replaced by the customer.

## 9 Assembly drawings



## 10 Manufacturer certificate

Manufacturer / Distributor:	H.-D. SCHUNK GmbH & Co. Spanntechnik KG Lothringer Str. 23 D-88512 Mengen
Product:	Clamping force block
Designation:	TANDEM
Type designation:	KSH, KRH, HZS

**Heinz-Dieter SCHUNK GmbH & Co. Spanntechnik KG** certifies that the above-mentioned products, when used as intended and in compliance with the operating manual and the warnings on the product, are safe according to the national regulations and:

- a **risk assessment** has been carried out in accordance with ISO 12100:2010.
- an **operating manual** for the assembly instructions has been created in accordance with the contents of the Machinery Directive 2006/42/EC Annex I No. 1.7.4.2. and the contents of the provisions of Annex VI of the Machinery Directive 2006/42/EC.
- **Markings** have been made in accordance with EN 1550:1997+A1:2008 Section 6.3.1, VDMA 34192:2019 Section 6.3 or ISO 16156:2004 Section 6.3. The requirements of Annex I No. 1.7.3. of the Machinery Directive 2006/42/EC have been complied with.
- the relevant basic and proven safety principles of the Annexes of **ISO 13849-2:2012**, taking into account the requirements of the documentation have been observed for the component. The parameters, limitations, ambient conditions, characteristic values, etc. for proper operation are defined in the operating manual.
- an  $MTTF_D$  value of 150 years can be estimated for mechanical components using the informative procedure in Table C.1 of ISO 13849-1:2015.
- **fault exclusion** against the fault "Unexpected release without pending release signal".
- the **fault exclusion** against the fault "Breakage during operation" in compliance with the parameters, limitations, ambient conditions, characteristic values and maintenance intervals, etc., specified in the operating manual.
- that internal bore diameters in the **pipe or control lines** are at least 2 mm for pneumatic clamping systems and at least 3 mm for hydraulic clamping systems

### Harmonized Standards applied:

- **ISO 12100:2010** Safety of machinery – General principles for design – Risk assessment and risk reduction

### Other related technical Standards and specifications:

- **VDMA 34192:2019** Safety requirements for clamping devices for use on machines

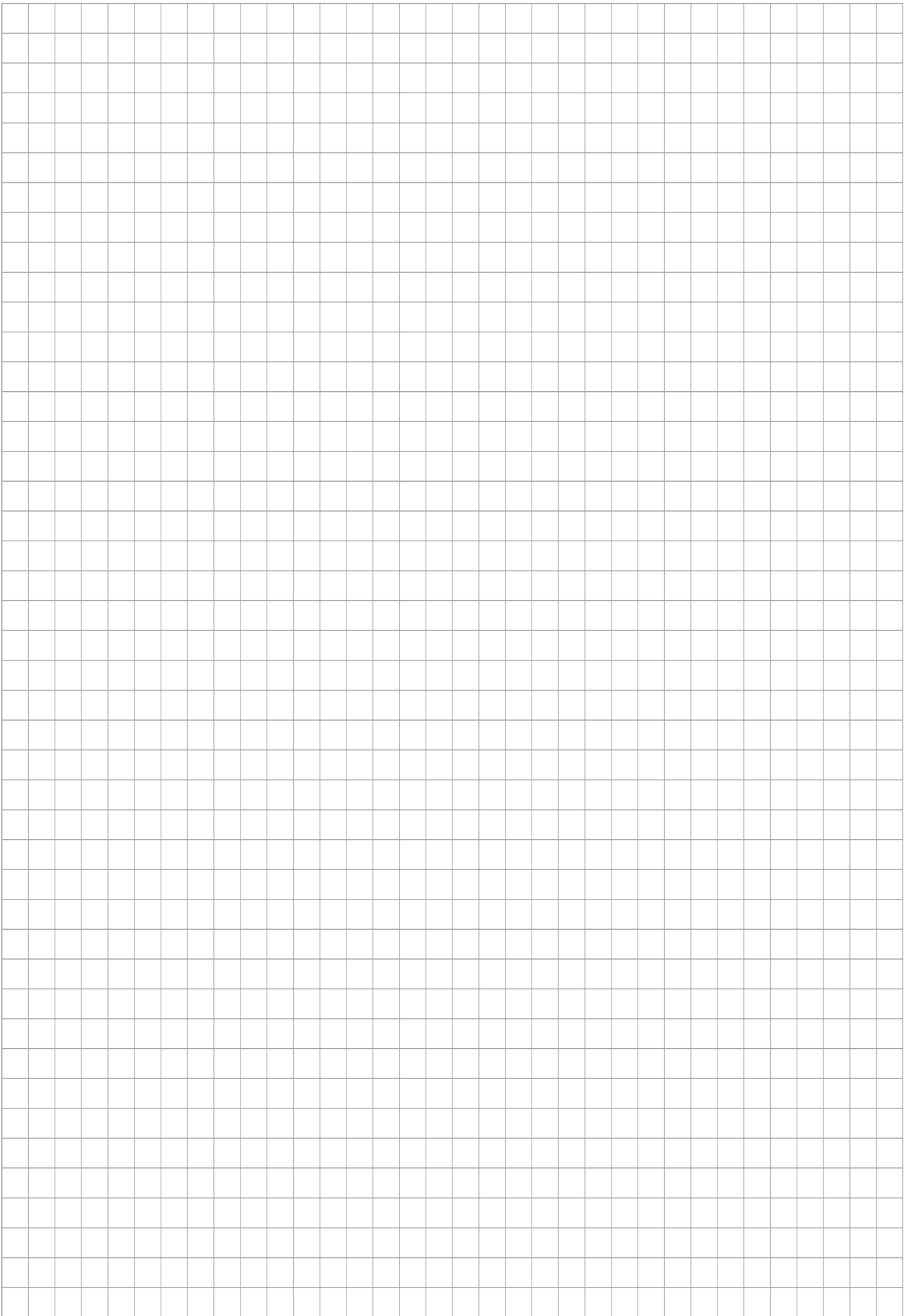
Mengen, 25th of April 2023

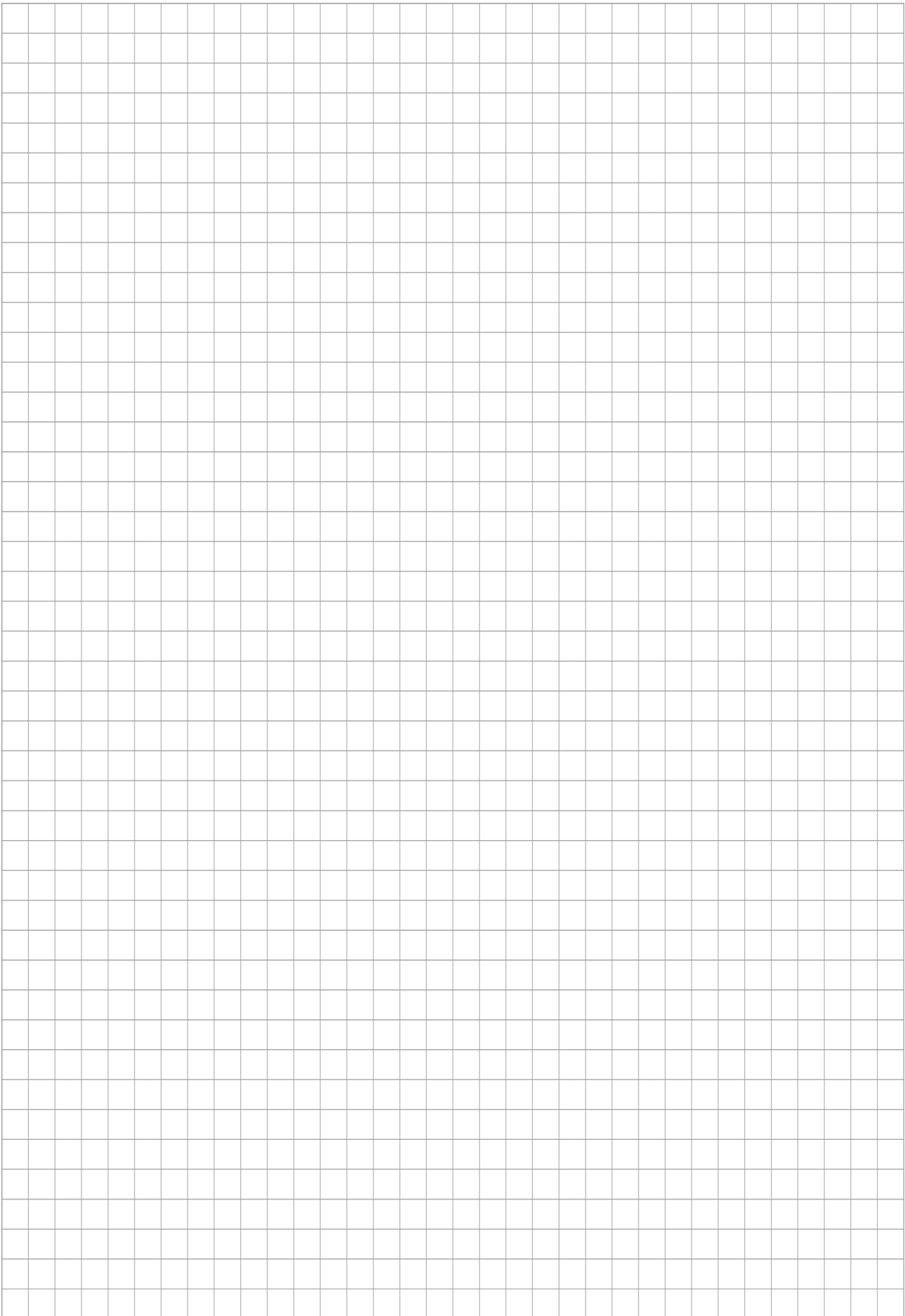
*Signature: see original declaration*

*Signature: see original declaration*

p.p. Philipp Schröder  
Head of Development standard products

p.p. Alexander Koch  
Head of Engineering Design special products









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