

TENDO Zero

Hydraulic Expansion Toolholder



Superior Clamping and Gripping



1 General

1.1 About this manual

This manual is part of the product and contains important information for safe and correct use. It must be kept accessible at all times. Personnel must have read and understood this manual before starting any work. All safety notes and the associated specifications in particular must be observed and complied with. Illustrations may differ from the actual design.

1.2 Applicable documents

– General terms of business

– Catalog data sheet of the purchased product

The other applicable documents can be downloaded from schunk.com.

1.3 Warranty

The warranty is valid for 24 months from the date of delivery from the production facility if the product is used as intended and in compliance with the prescribed operating data.

Wear parts and parts that come in contact with the tool or machine are not covered by the warranty.

1.4 Illustration of warnings

WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.

CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

NOTICE

Material damage!

Information about avoiding material damage.

1.5 Scope of delivery

- Product
- Assembly and Operating Manual

1.6 Accessories

The following accessories for the product are available separately:

- Test shaft for monitoring the expansion rate
- Allen key for operating the clamping screw
- Hexalobular socket wrench for adjusting the concentricity
- Hexagon socket wrench for length adjustment
- GZB-S intermediate sleeves for clamping several different shank diameters
- GZB-S sleeve remover for removing intermediate sleeves

2 Basic safety notes

2.1 Appropriate use

- The product is used to clamp rotationally symmetric tools.
- The product is intended for industrial use.
- The product is intended for installation in a machine/automated system. The applicable guidelines for the machine/automated system must be observed and complied with.
- The product may only be used and operated within the scope of the technical data and the specifications in this manual, ► Chap. 3.

2.2 Inappropriate use

The product is not being used as intended if:

- The information in the technical data is not observed when using and operating the product ► Chap. 3.
- The maintenance and storage instructions are not observed ► Chap. 5.
- The product is used with heat shrinking technology.

2.3 Ambient conditions and operating conditions

The ambient and operating conditions must correspond or be adapted to the version of the product and the specifications in the technical data.

2.4 Structural changes, spare parts

Structural changes such as modification and reworking, e.g. additional threads, bore holes or attachments, may only be carried out with the written approval of SCHUNK. Only use original spare parts and spares authorized by SCHUNK.

2.5 Notes on safe operation

- The product must not be clamped without a tool above 25°C.
- Never combine multiple product extensions.
- Only use SCHUNK intermediate sleeves and always insert up to the fixed backstop point. The use of intermediate sleeves can reduce the transmittable torque.
- Long, projecting or heavy tools may only be clamped if the speed of rotation is reduced according to the ambient and operating conditions on site. The level of reduction is the responsibility of the operator and must ensure safe operation of the product.
- Maintain and service the product on a regular basis.
- Do not remove the air bleed screw (secured with pin or resin).
- All repair work must be performed by SCHUNK.
- The operational safety and function of the product must not be impaired by external influences.
- Follow the country-specific applicable safety, accident prevention, and environmental protection regulations for the application field of the product.
- Use mechanical screwdrivers only after approval by SCHUNK.

2.6 Personnel qualifications

- All operations may only be carried out by personnel that are qualified and instructed for the respective operation.
- Personnel qualifications must comply with the on-site country-specific requirements and laws.

2.7 Personal protective equipment

- When working on and with the product, follow the respective country-specific legal requirements for occupational health and safety, and wear the necessary personal protective equipment.
- Follow country-specific accident prevention regulations and the general safety notes.

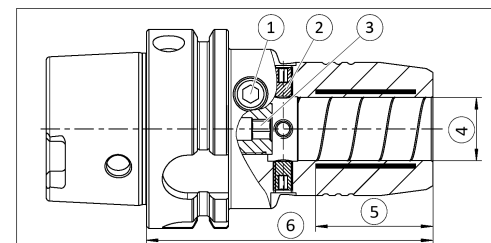
2.8 Transport

To avoid product damage, the transport and handling of the product must be adapted according to the version, weight and packaging of the product. If necessary, use additional aids.

3 Technical data

Operating temperature range [°C]	20 – 50
Test temperature for the clamping force control [°C]	20 – 25
Max. coolant pressure [bar]	80
Max. adjustment travel of the length-setting screw [mm]	2
Tool shank tolerance	h6
Max. tightening torque of the clamping screw [Nm]	10 – 12
Preload torque of set-screws for the concentricity adjustment [Nm]	1
Max. tightening torque of set-screws for the concentricity adjustment [Nm]	3
Max. correctable run-out error [µm]	10*

* for a projecting length of 2.5 x clamping diameter.



- ① Clamping screw
- ② Set-screws for the concentricity adjustment
- ③ Length-setting screw
- ④ Clamping diameter
- ⑤ Minimum clamping depth
- ⑥ Projecting length L1

Clamping Ø [mm]	Permissible transmittable torque** [Nm]	Minimum clamping depth [mm]	Permissible radial force F on the product at 50 mm projecting length L1 [N]
6	16	27	225
8	23	27	370
10	45	31	540
12	90	36	650
14	110	36	900
16	185	39	1410
18	240	39	1580
20	330	41	1860
25	400	47	4400
32	650	51	6500

Clamping Ø [inch]	Permissible transmittable torque** [Nm]	Minimum clamping depth [mm]	Permissible radial force F on the product at 50 mm projecting length L1 [N]
1/4	17	27	225
3/8	45	31	540
1/2	95	36	650
5/8	185	39	1410
3/4	310	41	1860
1	400	47	4400
1 1/4	650	51	6500

** Tool shank minimum tolerance h6, oiled tool shank.

The loading limits of the spindle holder must be observed!

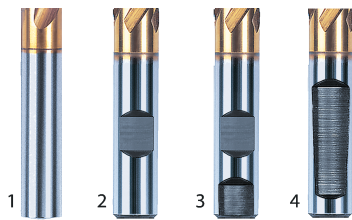
Max. speed of rotation*** for clamping diameter

Clamping Ø [mm]	6	8	10	12	14	16	18	20	25	32
Max. speed of rotation [RPM]	50000								25000	
L1 below 125 mm	30000								20000	
L1 above 125 mm										

Clamping Ø [inch]	1/4	3/8	1/2	5/8	3/4	1	1 1/4
Max. speed of rotation [RPM]	50000					25000	
L1 below 125 mm	30000					20000	
L1 above 125 mm							

*** depending on the interface of the spindle and tool to be clamped.

3.1 Permitted shank types



1. Shank type according to DIN 1835-1 form A and DIN 6535 form HA
2. Shank type according to DIN 1835-1 form B and DIN 6535 form HB (up to $\varnothing$ 20 mm)
3. Shank type according to DIN 1835-1 form B and DIN 6535 form HB (from $\varnothing$ 25 mm)
4. Shank type according to DIN 1835-1 form E and DIN 6535 form HE

Tool shanks with reliefs (type 2, 3 and 4) can impair the balancing grade and concentricity of the overall system.

4 Operation

4.1 Basic information

WARNING

Risk of injury due to ejected parts!

The max. speed of rotation of the machine/automated system must be reduced when using long, projecting or heavy tools and with extensions.

WARNING

Risk of injury and material damage due to the expansion sleeve bursting!

If not used as intended, the expansion sleeve may burst. This can cause metal shards and oil to be ejected from the product under high pressure, resulting in serious injury.

- Never heat the product in heat shrink devices; only perform a tool change using the integrated clamping screw.
- Do not exceed the specified operating temperature.

CAUTION

Risk of injury from tools with sharp edges!

Sharp edges on tools can cause cuts.

- Wear protective gloves when assembling the tool.

NOTICE

Material damage due to burrs and dirt!

- The tool must be free of burrs and dirt at the shank.

NOTICE

Material damage due to incorrect minimum clamping depth!

Too small a clamping depth of the tool leads to a loss of accuracy and torque on the product.

- Observe the minimum clamping depth of the tool.

NOTICE

Potential impairment of the clamping function and damage to the product!

If the product is not used as intended, the clamping function may be impaired or the product may get damaged.

- Only operate the clamping screw by hand.
- Do not adjust the tool length when the tool is clamped.

4.2 Mounting tool

1. Unclamp the product by loosening the clamping screw.
NOTE: The clamping screw is not secured against falling out!
2. If required, the tool length can be adjusted by screwing the integrated length adjustment screw in or out. Observe the adjustment travel of the length adjustment screw ▶ Chap. 3.
3. Ensure that the set-screws for adjusting the concentricity do not protrude into the clamping bore and thus obstruct the joining of the tool.
4. Insert the tool to the minimum clamping depth or stop.
5. Screw the clamping screw in by hand until it reaches the stop. Observe the maximum specified tightening torque ▶ Chap. 3.

4.3 Assembling the product

1. Position the product with tool correctly in the machine interface and tighten.
NOTE: Observe the machine manufacturer's specifications!
2. Check that the product is in the correct position and securely clamped in the machine.

IMPORTANT! Safe clamping of the product in the machine must be ensured!

4.4 Adjusting concentricity

Use a suitable measuring device with a resolution of 0.001 mm to adjust the concentricity. **NOTE:** When using an intermediate sleeve, the concentricity cannot be adjusted.

1. Mount the tool ▶ Chap. 4.2.
2. Mount the product ▶ Chap. 4.3. **NOTE:** The concentricity is ineffective if the product is not mounted in the machine during this process.
3. Slightly screw in all set-screws for the concentricity adjustment. Observe the specified preload torque ▶ Chap. 3.
4. Check the concentricity.
5. Screw in set-screw(s) on the opposite side of the highest deflection to correct the run-out error. Observe the specifications for the max. tightening torque of the set-screws for the concentricity adjustment ▶ Chap. 3.
NOTE: Do not change the remaining set-screws in the process.
6. Check the concentricity and correct again if necessary

4.5 Tool change

1. Unclamp the product by loosening the clamping screw.
NOTE: The clamping screw is not secured against falling out!
2. Loosen all set-screws for the concentricity adjustment.
3. Remove tool.
4. Mount new tool ▶ Chap. 4.2.

5 Maintenance and storage

If you have any questions regarding maintenance, our technical after-sales service is available during our business hours:

Service telephone: +49-7133-103-2956

service.toolholder@de.schunk.com

All repair work may only be performed by SCHUNK!

5.1 Cleaning the clamping bore

Clean the clamping bore during every tool change with a cleaning agent containing solvents and a cleaning brush.

5.2 Checking the clamping force

Check the clamping force before initial use, after approx. 100 tool changes and at least every 3 months.

1. Unclamp the product by loosening the clamping screw.
NOTE: The clamping screw is not secured against falling out!
2. Insert the test shaft to the minimum clamping depth.
3. Screw the clamping screw in by hand until it reaches the stop. Observe the maximum specified tightening torque ▶ Chap. 3.
4. The clamping force is no longer sufficient if the test shaft can be pulled out of the product with little effort using two fingers.

In this case, send the product to SCHUNK for inspection.

5.3 Lubricating the clamping screw

CAUTION

Allergic reactions if lubricating grease comes into contact with the skin.

- Wear protective gloves to lubricate the clamping screw.

It is necessary to adapt the cleaning and lubrication of the clamping screw to the ambient conditions. Especially in the case of high clamping frequencies, high operating temperatures, and abrasive dirt or dust. For optimum lubrication of the clamping screw, we recommend copper paste MOLYKOTE CU 7439. (100 g tube, ID 9247204).

1. Unscrew the clamping screw from the product.
IMPORTANT! The actuating piston underneath is not secured against falling out and must not be removed!
2. Clean the clamping screw and actuating thread and check for damage to the thread flanks. Replace if necessary.
3. Lubricate the clamping screw and actuating thread.
4. Screw the clamping screw into the product.
5. Check the clamping force ▶ Chap. 5.2.

5.4 Storage

- Lightly oil the entire surface of the product.
- Only store the product in an unclamped state and protected against corrosion.
- Store the product in a suitable transport container.
- Protect the product from excessive temperature fluctuations.
- NOTE:** Before recommissioning, clean the product and check for damage, functionality and tightness!

6 Disposal

- Follow local regulations on dispatching product components for recycling or proper disposal.
- Alternatively, you can return the product to SCHUNK for correct disposal.

Copyright:

This manual is protected by copyright. The author is SCHUNK GmbH & Co. KG. All rights reserved.

Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

Document number: 1510527
Edition: 02.00 | 03/11/2022 | en

SCHUNK GmbH & Co. KG
Spann- und Greiftechnik
Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar

Tel.+49-7133-103-0
Fax +49-7133-103-2399
info@de.schunk.com
schunk.com



1510527