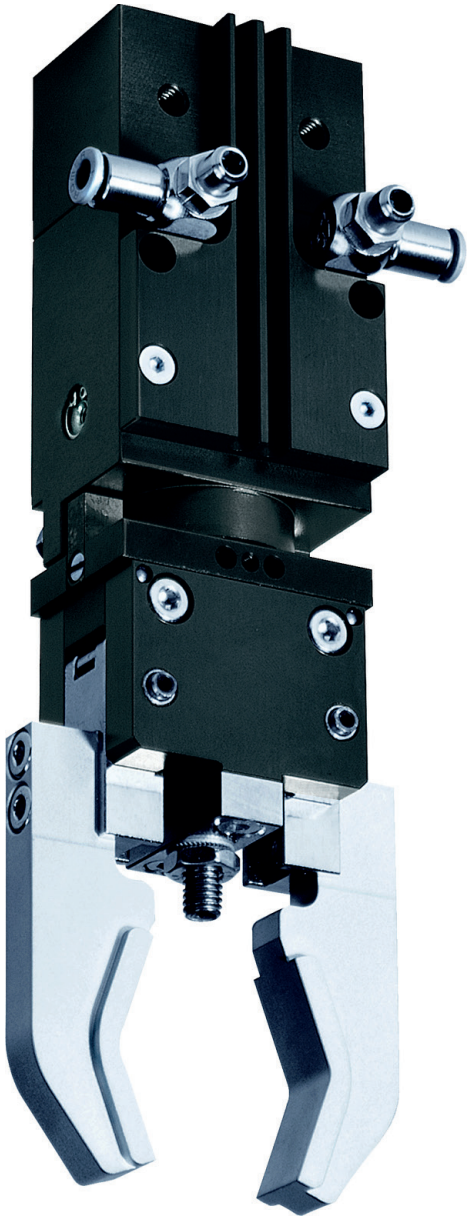
INSTALLATION
AND
OPERATING INSTRUCTIONS



Handling
Technology

DGK series
2-jaw angular rotary gripper

THE KNOW-HOW FACTORY

1. Supporting documents

NOTE:
The following documents are available for download on our website. Only the documents currently available on the website are valid.

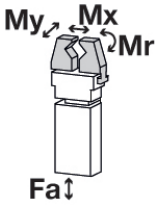
- Catalog
- Drawings, performance data, information about accessory parts, etc.
- Technical data (data sheets)
- General Terms and Conditions of Business, including warranty information

2. Proper use

NOTE:
The DGK series rotary gripper may only be used in its original state, with original accessories, without any unauthorized changes and within the scope of its defined parameters for use.
Zimmer GmbH shall accept no liability for any damage caused by improper use.

The gripper is designed for operation with compressed air only. It is not suited for operation with other media such as liquids or gases. The gripper is used as defined under "Proper use" in enclosed rooms for briefly gripping, handling and holding parts. It is not suitable for clamping workpieces during a machining process or for direct contact with perishable goods.

	DGK20N
Torsional moment **Mr** [Nm]	0.8
Tilting moment, horizontal axis **Mx** [Nm]	0.8
Tilting moment, vertical axis **My** [Nm]	1
Max. permitted force **Fa** [N]	150



Only the accessories permitted for this type series are allowed to be installed on the rotary grippers.
⇨ Regarding this, see the Handling Technology catalog

3. Safety notes

1. Installation, commissioning, maintenance and repairs may only be undertaken by qualified experts in accordance with these installation and operating instructions.

2. The gripper is state-of-the-art. It is fitted to industrial machines and is used to hold workpieces. Hazards can originate from the gripper only in the following exemplary situations:
   - The gripper is mounted, used or maintained improperly
   - The gripper is not used for its intended purpose
   - The local regulations (legislation, guidelines, directives), such as the EC Machinery Directive,
   - The accident prevention regulations (UVV in Germany) and the installation and operating instructions

   are not observed.

3. The gripper may be used only in accordance with its proper use and technical data.
   ZIMMER GmbH shall accept no liability for any damage caused by improper use.

4. Any use other than the intended use requires written approval from Zimmer GmbH

5. Do not reach into the operating range of the gripper.

6. Make sure that the energy supply is disconnected and that there is no pressure in the handling system before you fit, set, retool, maintain or repair the gripper.

7. In case of maintenance, renovation or expansion work, remove the gripper from the machine and carry out the work outside the danger zone.

8. When commissioning or testing, make sure that the gripper cannot be actuated by mistake.

9. Modifications to the grippers, such as adding drill holes or threads, may be made only with prior approval from ZIMMER GmbH.

10. The specified maintenance intervals and compressed air quality specifications are to be observed; also refer to the Maintenance section. When using the gripper under extreme conditions (see Item 11), the maintenance interval must be adapted depending on the extent of the contamination. Please contact our hotline for this purpose.

11. Use of the swivel jaws under extreme conditions, such as aggressive liquids and abrasive dust, is subject to prior approval from Zimmer GmbH

12. When disassembling handling systems with integrated springs, exercise increased caution because of the **spring tension that is always present.**

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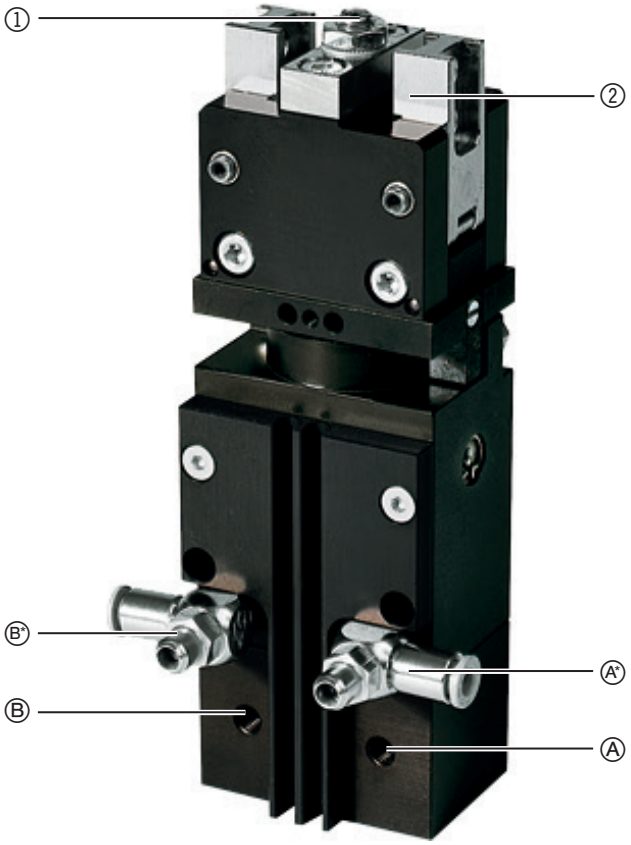
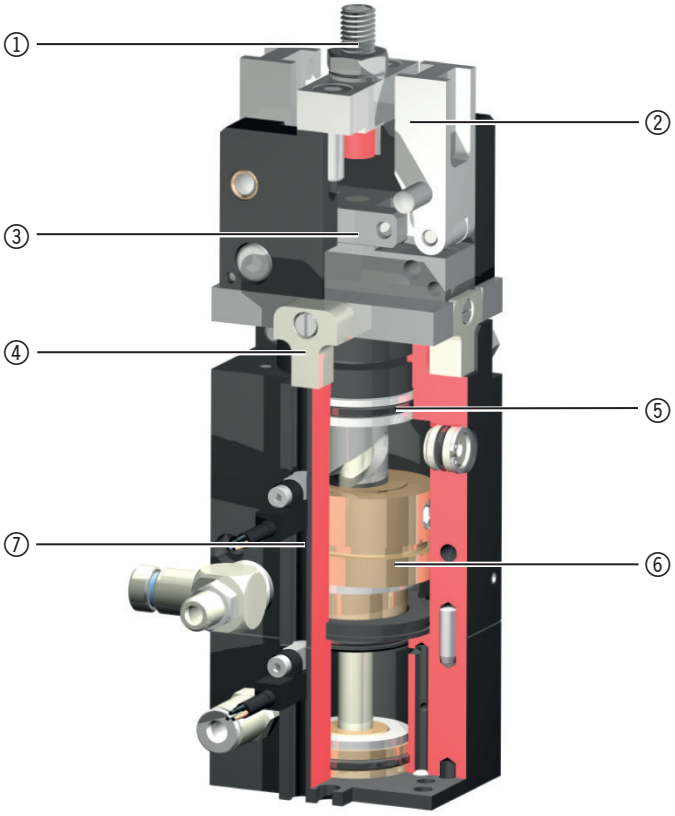
4. Function

The DGK series 2-jaw angular rotary gripper combines two functions. Gripping and swiveling motions can be carried out simultaneously. The swivel angle of 90° or 180° can be selected as desired by the user using corresponding mechanical limit stops. The rotational speed can be adjusted using an air flow control valve.





① : **Stroke adjustment screw**
Infinitely variable opening stroke

② : **Gripper jaw**
Holder of the individual gripper fingers

③ : **Positively driven wedge hook mechanism**
Synchronized movement of the gripper jaws, mechanically self-limited

④ : **End position 0°/90°/180° adjustable**
End stops for 0°/90°/180° included in the scope of delivery

⑤ : **Cam gear**
robust and low-wear

⑥ : **Pneumatic drive**
Two double-acting pneumatic rotor cylinders

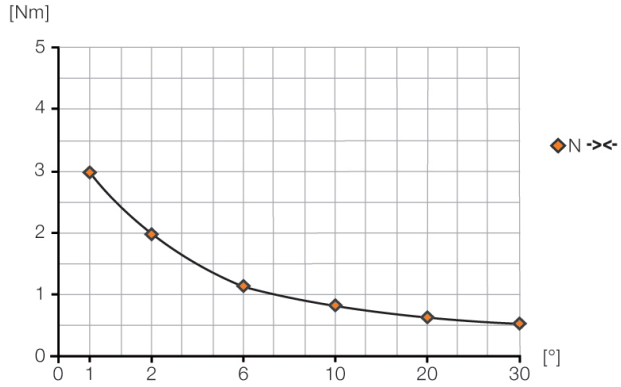
⑦ : **Slot for magnetic field sensors**
Sensing of the rotational position and gripper finger position

ⒶⒷ : **Air connection for gripping**

Ⓐ*Ⓑ* : **Air connection for rotating**
with air flow control valve for adjusting the rotational speed

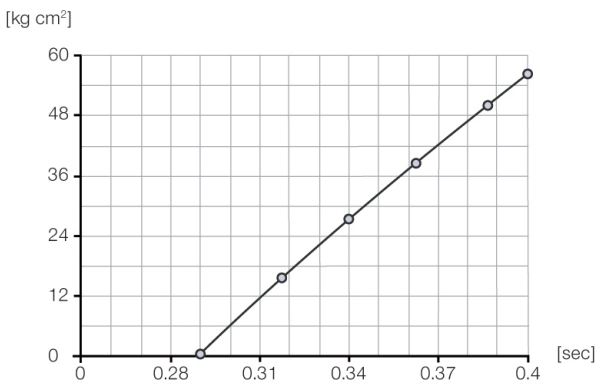
5. Technical data

Gripping moment chart



The chart shows the gripping moment depending on the opening angle of the gripper fingers.

Swivel time chart



The chart shows the swivel time depending on the moment of inertia.

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		DGK20N*
Stroke per gripper jaw	mm	90
Gripping moment when closing	Nm	3
Gripping force during closing	N	150
Closing time/opening time	s	0.25
Torque	Nm	0.5
Repeatability +/-	mm	0.1
Repeatability +/-	°	0.05
Axial bearing load	N	960
Radial bearing load	Nm	10
Min./max. operating pressure	bar	3 to 8
Min./max. operating temperature	°C	+5 to +80
Cylinder volume per cycle	cm^3	9
Cylinder volume per cycle 90°	cm	4.6
Cylinder volume per cycle 180°	cm^3	9.2
Weight	kg	0.55

*) All values determined at 6 bar
Please always compare the technical data with the corresponding tables on the Internet at www.zimmer-group.de!

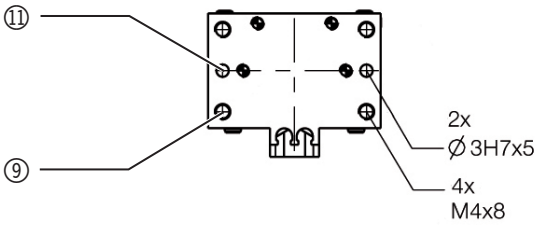
6. Installation

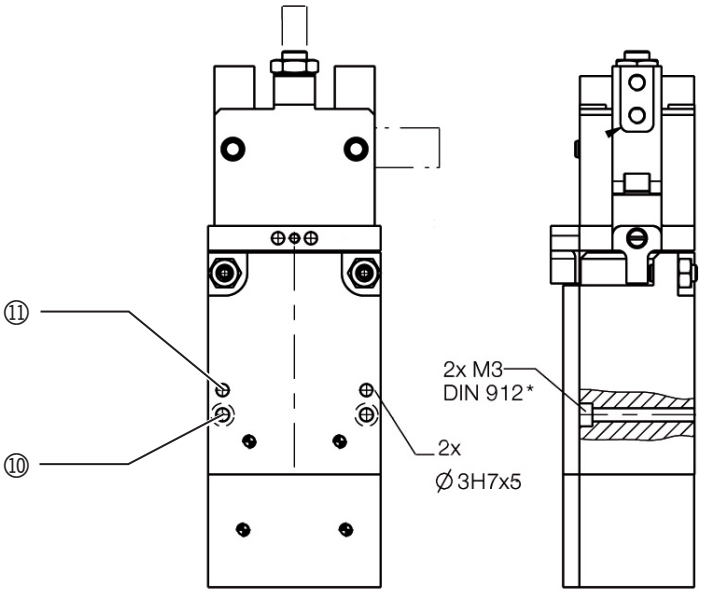
DANGER:
Risk of injury in case of unexpected movement of the machine or system into which the DGK gripper is to be installed.
► Switch off the energy supply to the machine before all work
► Secure the machine against being switched on unintentionally
► Check the machine for any residual energy

The gripper can be fastened from multiple sides by means of the internal thread ⑨ or the screw through-holes ⑩.

For centering the gripper, the pin holes ⑪ are provided.

Strength class of screws: 8.8
Maximum tightening torque M3: 1.3 Nm
Maximum tightening torque M4: 3.0 Nm





NOTE:
It is mandatory to observe the specified length of the mounting screws!

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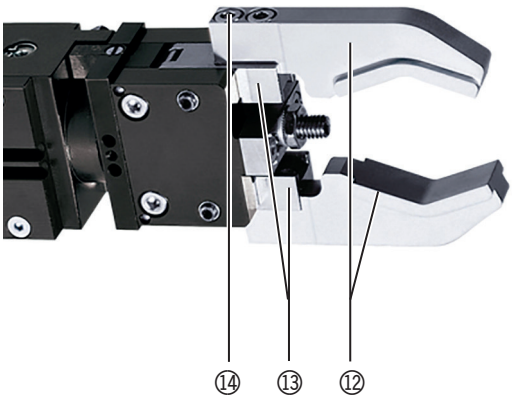
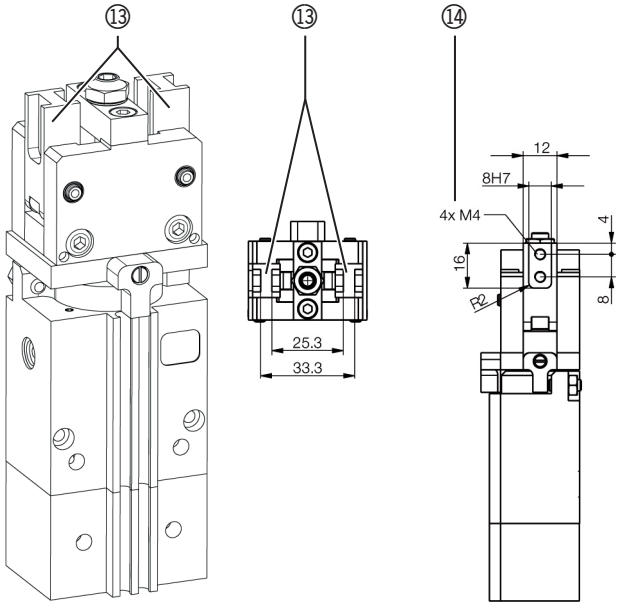
6.1 Installing the customer-specific gripper fingers

The customer-specific gripper fingers ⑫ are fastened on the gripper jaws ⑬ via the tapped holes ⑭.

The position of the gripper fingers ⑫ is determined via the shape of the mating part in the gripper jaws ⑬.



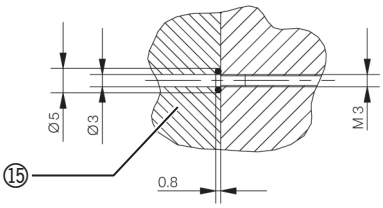


6.2 Installing the pneumatic connections

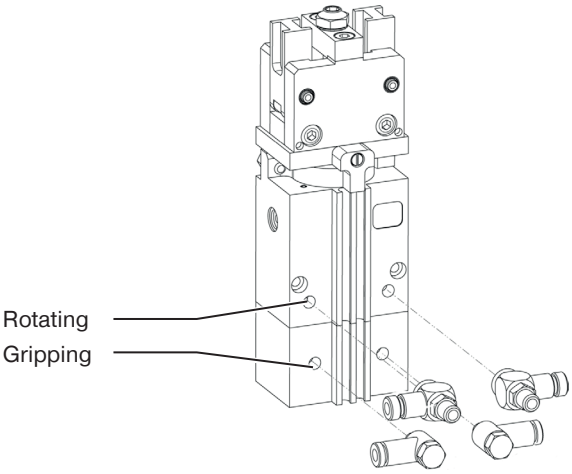
Gripping

Pneumatic fittings for connecting to the power supply can be mounted directly on the gripper.

For hoseless connection, the adapter plate ⑮ must be configured accordingly with a seal. (Image bottom)



The connections for the power supply of the gripper are identified by **A, B, A‘, B‘** for gripping.



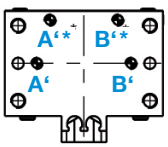
Rotating

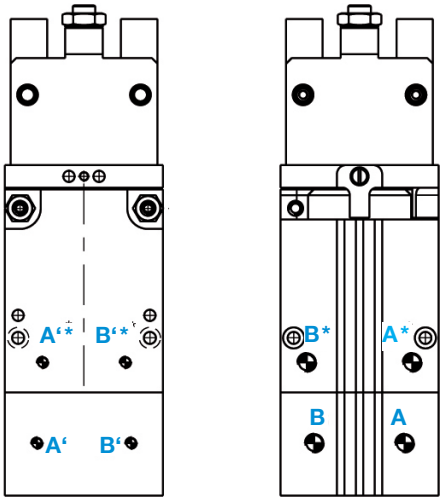
Flow control valves for connecting to the power supply are mounted directly on the gripper at the factory.

For hoseless connection, the adapter plate must be configured accordingly.

However, it must always be ensured that the rotary gripper has an air flow control valve and is operated at reduced speed to prevent increased wear. If this gripper is operated with air flow control valve, the warranty claim for this gripper is void.

The connections for the power supply of the gripper are identified by **A*, B*, A‘*, B‘*** for gripping.





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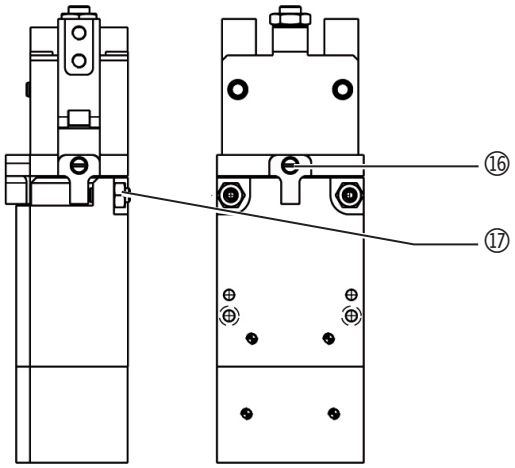
6.3 Setting the swivel angle

The rotary gripper is supplied with a second limit stop as an accessory.

Installing this limit stop ⑯ reduces the swivel angle of the gripper to 90°.

A fine adjustment of the swivel angle in the range of +/- 3° can be configured via the adjustment screw ⑯.



6.4 Setting the magnetic field sensors

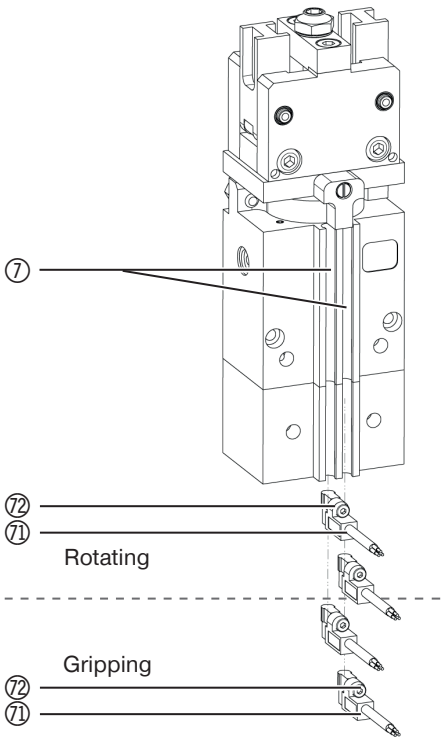
The positions of the gripper fingers and the stop positions of the swivel movement are detected using magnetic field sensors actuated indirectly via a magnet fastened to the corresponding piston.
After installing the individual gripper fingers, the switching points are adjusted to the workpiece to be gripped and to the end position of the swivel movement.
The positions of the gripping movement are detected using two sensors arranged at the bottom of the drawing and those of the end position of the swivel movement are detected using the two sensors arranged on top.

The magnetic field sensor is inserted into the integrated slot ⑦ to set the switch points.

- ▶ Push the magnetic field sensor ⑦1 until it reaches the switch-on point (LED on).
- ▶ Mark this point
- ▶ Continue to push the magnetic field sensor until it reaches the switch-off point (LED off)
- ▶ Also mark this point
- ▶ Then push the sensor back again until it reaches the switch-on point (LED on).

The optimum magnetic field sensor position is between the two tagged points.

- ▶ Carry out this adjustment process with each sensor
- ▶ Observe the maximum tightening torque of the attachment screws ⑦2.



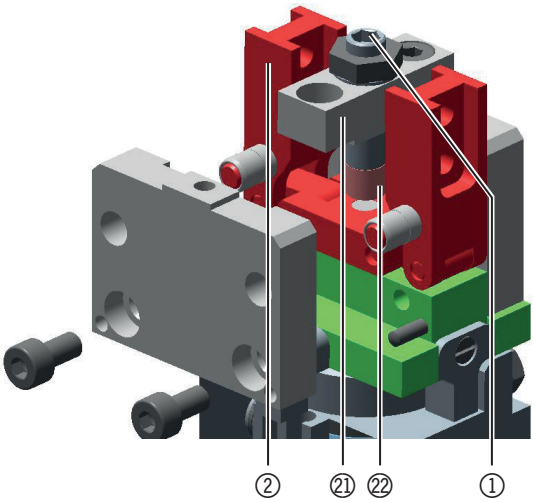
6.5 Setting the opening stroke

The adjustment screw ① delimits the stroke of the toggle lever and, through this action, determines the opening angle of the gripper jaws ②.

- ▶ Loosen the lock nuts
- ▶ Adjust the adjustment screw using an Allen wrench until the desired opening angle is reached
- ▶ Tighten the locknut once again

- ▶ Turn the adjustment screw to the right:
- ⇨ Stroke is narrowed
- ⇨ Opening angle narrows

- ▶ Turn the adjustment screw to the left:
- ⇨ Stroke is enlarged
- ⇨ Opening angle is enlarged



Information:
The bridge ②1, in which the adjusting screw ① is mounted must not be dismantled or replaced by a fixed stop.
⇨ **Destruction of the gripper is possible**
The adjusting screw is equipped with an elastomer head ②2. The gripper must not be operated without this elastomer head
⇨ **Destruction of the gripper is possible**

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7. Maintenance

The DGK type rotary grippers are maintenance-free for **up to 1.5 million gripping cycles**.
This maintenance-free operation is ensured under the following conditions:

- Drive with filtered compressed air in accordance with EN ISO 8573-1:2001, Class 2.4.1.
- Clean environment
- Use in accordance with performance data

Even though the rotary gripper is, as mentioned, maintenance-free, perform a regular **monthly** check for any corrosion, damage or dirt.
Clean the rotary gripper as needed using a commercially available machine cleaning agent and then apply an anti-corrosion agent to the housing.

INFORMATION:
A complete disassembly of the rotary gripper for maintaining the seal must only be carried out by ZIMMER GmbH.

8. Declaration of incorporation in terms of the EU Machinery Directive 2006/42/EC on Machinery (Annex II 1 B)

In terms of the EU Machinery Directive 2006/42/EC (Annex II 1 B)
Name and address of the manufacturer: Zimmer GmbH, Im Salmenkopf 5, 77866 Rheinau, Germany

We hereby declare that the incomplete machines described below

Product designation: 2-jaw angular rotary gripper
Type designation: **DGK**□□□

satisfy the following basic requirements of the Machinery Directive 2006/42/EC:
No. 1.1.2., No. 1.1.3., No. 1.1.5., No. 1.3.2., No. 1.3.4., No. 1.3.7., No. 1.5.3., No. 1.5.4., No. 1.5.8., No. 1.6.4., No. 1.7.1., No. 1.7.4.

We also declare that the specific technical documents were produced in accordance with Annex VII Part B of this Directive.
We undertake to provide the market supervisory bodies with electronic versions of special documents for the incomplete machine through our documentation department, should they have reason to request them.

The incomplete machine may only be commissioned if the machine or system in which the incomplete machine is to be installed has been determined to satisfy the conditions of the Machinery Directive 2006/42/EC and the EC Declaration of Conformity has been produced in accordance with Annex II 1 A.

Authorized representative for compiling the relevant technical documents

Kurt Ross	See manufacturer's address	Rheinau, Germany, 11/16/2006	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Director

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8. Your notes

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