

Object Safety in the Event of Energy Breakdown:



The GMG-grippers are not self-locking in their kinematics. Due to this fact and in case of need, object safety must be realized for a limited period of time by a back pressure valve in the input line of compressed air or by the application of a 5/3-port directional control valve with closed neutral position. Adequate measures must at all times be taken to ensure that no person stands in the danger area under or direct nearby the gripper.

Some grippers carry the possibility of limited object safety through the attachment of (gas) springs on the gripper. The springs lose material strength and operating effect with time due to gas pass off. Due to these reasons, the function of the spring should be checked and necessary parts should be replaced.

Maintenance and Lubrication:



GMG-grippers have high-quality maintenance and lubrication-free slide bearings made of special plastics. Metallic contact of the moving parts that would have to be lubricated do not exist in the gripper system.

The pneumatic cylinder receives a permanent lubrication at the factory. Thus, the gripper can also be operated with unoled compressed air. The compressed air should be free from condensation.

Parts subject to wear and attrition, as for example seals, bearings, shock absorbers, springs and proximity switches, should regularly (on a monthly basis) be checked for operating condition and, if necessary, be replaced. The manufacturer's guarantee applies to these additional parts.

By operation in dusty or aggressive media, it is important to keep the sliding rods clean. It is strongly recommended to clean the dust off of the sliding rods on a weekly basis.

By usage of fats and oils, it is recommended to use types that do not age or resinify. Resining fats and oils, as well as sticky substances, damage the seals and further impede the gripper motion.

If you have any questions please do not hesitate to contact us:



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OPERATING INSTRUCTIONS FOR GMG-GRIPPER SYSTEMS TYPE A, B, C AND E



General Note:

Please read these operating instructions carefully before starting to work with the gripper system and keep it safe for later use!

Incorrect use and inadmissible changes impair function, operation safety and life span of the product!

This instruction manual and the manufacturer instructions belong to the documentation of the machine, in which the gripper is built into. Please read the manufacturer declarations and instructions and follow them carefully!

Safety Instructions:

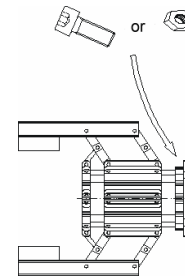


While the gripper is connected with compressed air or in motion, there should be no human body contact! Risk of injury due to great mechanical forces!

Protecting devices should be fixed at the gripper system in order to prevent human danger during the operation of the gripper!

Maintenance and assembly work at the gripper (e.g. fixing of top jaws) is only permitted when the gripper is free of compressed air!

If the gripper represents a hazard for human beings, adequate safety measurements or covers have to be implemented.



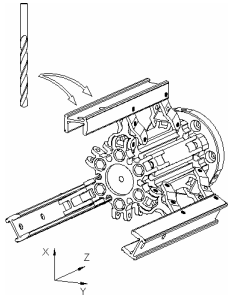
Assembly of the Gripper:

To attach the gripper to a robot, a handling device or another device, the gripper has a connecting flange with 3 to 12 connecting bores with counterbores for screws DIN EN ISO 4762 or for nuts. There is a central bore in the gripper flange with ISO tolerance H7 to center the gripper.

If a pinned joint is provided for securing an exact position of the gripper, do not detach the gripper flange from the gripper body. Fix the flange to the robot or handling device in such a way, that when the gripper is in horizontal position, the shock absorber of the flange is situated below it.

Fixing of Gripper Top Jaws without the Detachment of Gripper Fingers:

We recommend the top jaw fixing bores to be attached by GMG prior to assembly of the gripper. The easiest way of attaching the gripper top jaws to the gripper fingers is to make tap holes in the gripper top jaws and through bores in the gripper fingers without detaching the fingers from the gripper body.



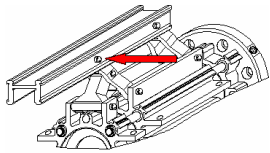
Fixing elements which will be attached at the bottom of the finger should have enough distance to the moving links in order to avoid impairing the moving links from proper operation.

The slots of the finger profile can be used for sliding blocks to fix the gripper top jaws. This quick and flexible change of top jaws is not suitable for high loadings along the gripper fingers (Z-axis).

To get the dimensions of the finger profiles please have a look at the GMG catalogue or web site under www.gmg-system.com.

Detachment of the Gripper Fingers to fix the Gripper Top Jaws:

If the gripper fingers should be detached for making bores in the finger profile, the bearing pins of the gripper fingers have to be knocked out with a suitable pin punch (put a wooden block below the gripper finger). In this connection the direction of assembling and disassembling has to be noticed (see picture on the left). When driving in the pin with the pin punch the bearing pin has to be guided in a straight line in order to avoid deforming the bore. If a bearing pin has become loose, please secure it with a suitable liquid lock. The thrust washers have to be fixed back to the bearing pins.

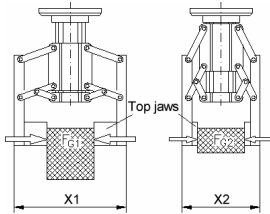


Assembling of the bearing pin in direction of arrow, reverse for disassembly

Attention: At some gripper fingers reliefs are at the inside of the profile to prevent a collision of the moving links with the gripper finger. Make sure the fingers are in the right direction when attachment occurs! This applies in particular to the shortest finger (order number 00), to the Lifting- and Clamping-Module and to special fingers, which are longer at the flange side.

Determination of Gripping Force:

Due to the mechanical design of the gripper, the gripping force is much lower when the gripper fingers are closed (small gripping width) than when the gripper fingers are opened (large gripping width). Therefore the choice of the top jaw height is decisive for the gripping force. Moreover, the gripping force can be controlled by regulating the air pressure. For determination of the required top jaw height and the working air pressure refer to the diagram of "Gripping force-Gripping range-Displacement of slide".



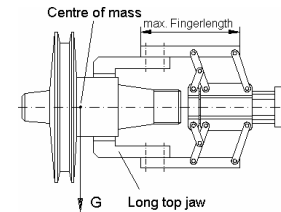
Gripping Force: $F_{G1} > F_{G2}$
Gripping Width: $X1 > X2$

Generally, aim should be to grasp each object with the least required air pressure. The maximum specified operating pressure is:

$$P_{max} = 6 \text{ bar} = 0,6 \text{ N/mm}^2 = 0,6 \text{ Mpa} = 87 \text{ psi}$$

Overload of the Gripper:

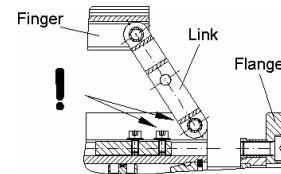
The specified load capacity stated in the catalogue should not be exceeded! If the center of mass of the gripping object is outside the finger length 04 and the gripper runs with the highest air pressure stated in the catalogue the gripper fingers can be overexerted by too high a leverage. In this case the working air pressure has to be reduced adequately for lowering the gripping force. Maximum of air pressure.



Stroke Adjustment and Soft Gripping of Sensitive Objects:

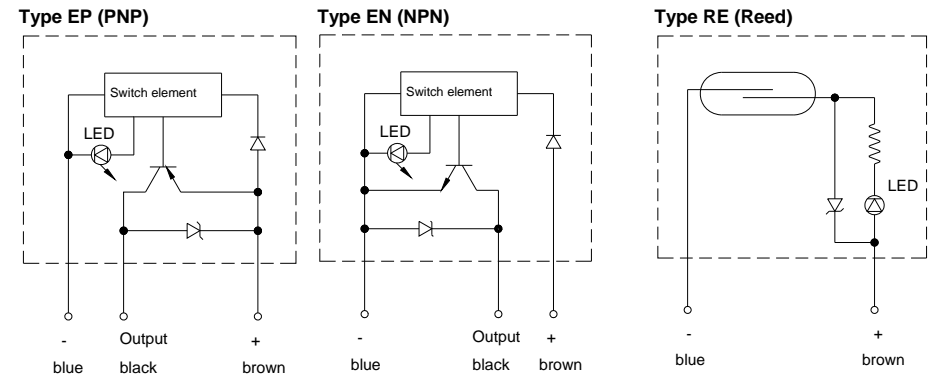
The gripper stroke can be adjusted on both sides by the stop pins installed at the slide (not with gripper sizes B102 and C103). The stop occurs constantly on both sides against the hydraulic shock absorber.

The stop pins should be adjusted in a way that double contact is avoided, so that after safe gripping of the object, the piston of the shock absorber still has a remaining stroke of approximately 1 mm to its end. When continuously gripping the same object it is advisable to adjust the stroke as short as necessary, thus minimizing cycle time and air consumption.



Attention: With the gripper sizes A 06, C 06 and E 03 the stop pins must not be reset too close to the end of the slide so in such a way that the screw head can crash against the moving link!

Connection of Proximity Switches:





Declaration of manufacturer

According to the latest edition (93/44/EWG, schedule II B) of the EG Machine Instructions:

Herewith we declare that the following GMG gripper models

A-06, B-02, B-10, C-03, C-06, C-10, C-16, E-03, HS-03, WG-03 and WG-06

as delivered, must be installed into a machine, a robot or a handling system.

In addition, do not put the gripper in operation until assured that the machine or robot to which it is connected meets the actual (EG, CSA, FCC) Machine Instructions, especially the latest edition of the safety regulations.

To operate the gripper it is necessary to have particular knowledge about automation and gripper operation.



GMG GmbH

(Company Management)