

GRIPHI TYPE C PIEZOELECTRIC MICROGRIPPER

ABSTRACT

The DS describes the main features of the GriPhi Type C piezoelectric microgripper. It includes technical data and drawings.

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REVISION HISTORY

List of changes from original release to current revision.

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

CHANGES FROM REV. A

Page 3: size and dimensional drawing updated to the new Type C microgripper standard.

Page 4: mounting updated to the new Type C microgripper standard.

Page 5: force-opening plot updated to the new Type C microgripper standard.

CHANGES FROM REV. B

Page 5: grippers stroke corrected for Types B and C

CHANGES FROM REV. C

Page 4: figure with example of jaws

CHANGES FROM REV. D

Example of STD Symmetric and Asymmetric tips and dimension of GriPhi Type C

CHANGES FROM REV. F

Force opening performance (Theoretical Analysis)

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1. Features

- Gripper stroke – Up to 1.2 mm
- Clamping force – Up to 4 N
- Dimensions – 70 x 16 x 9 mm
- Sample size – from 1 mm up to 3 mm
- Initial opening – Adjustable by grub screw
- Shape – Available on request
- High vacuum version – Available on request
- Position sensor – Available on request
- Closed-loop control – Available on request

2. Applications

- Micro optics manipulation
- Fiber optics connection
- Fiber bundle positioning
- Precision mounting and adjusting
- Biological sample manipulation
- High-dynamic applications

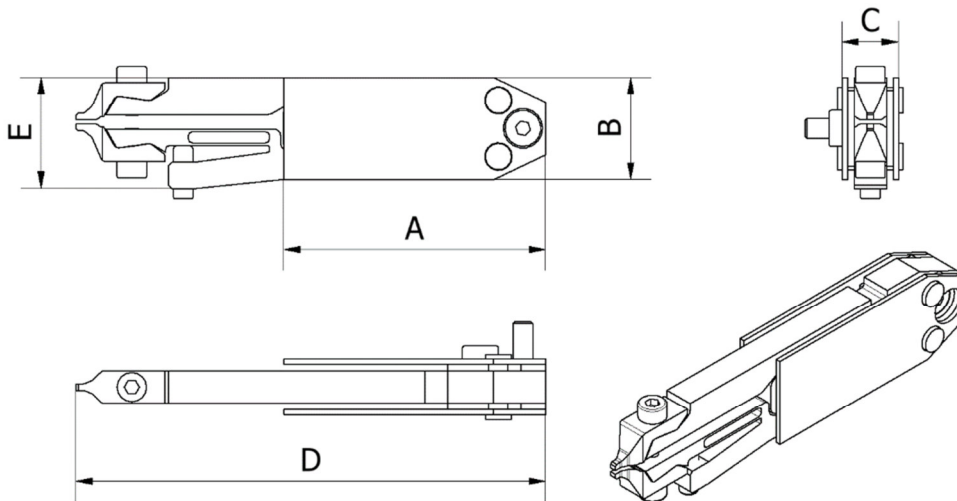
3. Description

The GriPhi Type C piezoelectric microgripper can handle samples whose size is above 1.0 mm. Thanks to its low inertia; it is suitable for high-dynamic applications. The mechanism which transforms the piezo stroke into the gripper stroke is designed by means of FEM (Finite Elements Method) analysis. This makes it possible to tune the opening and strength levels as desired by the customer.

The GriPhi Type C system is fully compatible with the GriPhi Driver devices cod. PH-DR10-0000 provided by Phi Drive. Even if the GriPhi Type C system is highly customizable, this DS refers to the standard version of the microgripper.

4. Dimensions

Fig. 1, Main dimensions of the microgripper.

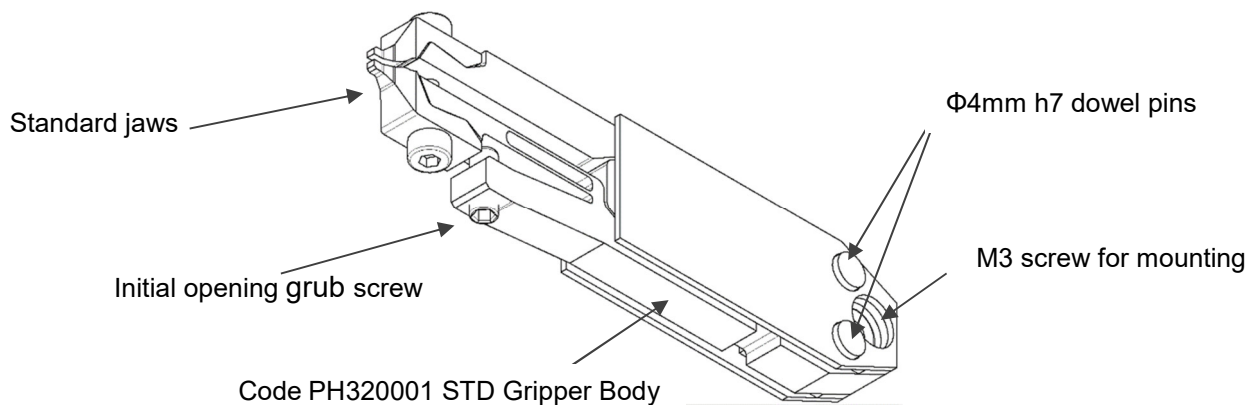


Tab. 1, Main dimensions of the microgripper.

A		B		C		D		E	
40.0	mm	15.6	mm	8.60	mm	71.8	mm	16.9	mm

5. Mounting

Fig. 2, Mechanical interfaces.



6. Jaws

The standard jaws for the GriPhi Type C piezoelectric microgripper are specifically designed to fully exploit the capabilities of the system. Hereafter it is reported a table with basic and optional components highlighting the main characteristics. However, the standard jaws can be customized as desired to meet specific needs.

Fig. 3, Example of STD Symmetric tips.

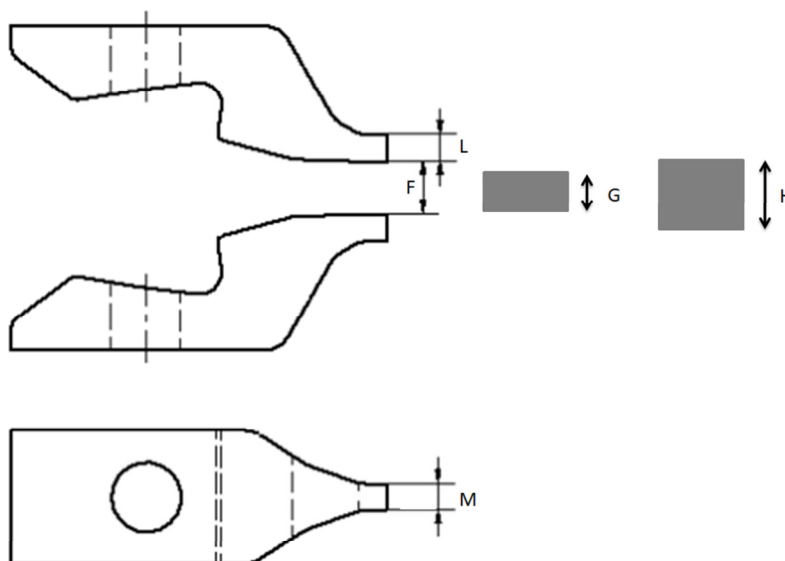
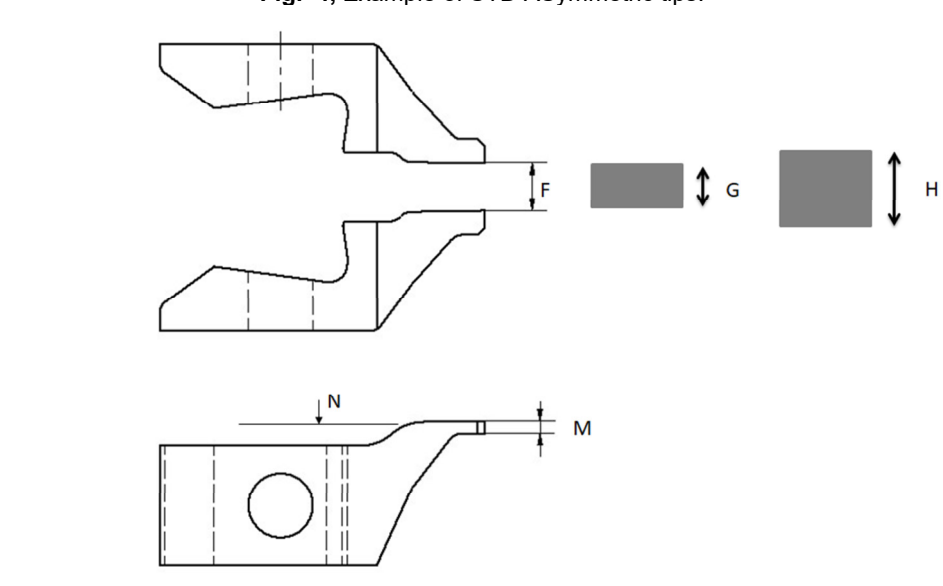


Fig. 4, Example of STD ASymmetric tips.



Tab. 2, Mechanical components and dimension of GriPhi Type C, commercial code **PH-GP10-0000**.

CODE	DESCRIPTION	G [mm]	F [mm]	H [mm]
PH320001	STD Gripper Body for interchangeable tips	-	-	-
PH-GP11-0000	STD Symmetric tips 0,7 mm	0.5	0.7	1.0
PH-GP11-0001	STD Symmetric tips 2 mm	1.7	2	2.2
PH-GP11-0002	STD Symmetric tips 5 mm	4.7	5	5.2
PH-GP11-0003	STD Symmetric tips 0 mm	0	0	0.2
PH-GP12-0000	STD ASymmetric tips 0,7 mm	0.5	0.7	1.0
PH-GP12-0001	STD ASymmetric tips 2 mm	1.7	2	2.2
PH-GP12-0002	STD ASymmetric tips 5 mm	4.7	5	5.2
PH-GP12-0003	STD ASymmetric tips 0 mm	0	0	0.2

F = initial opening

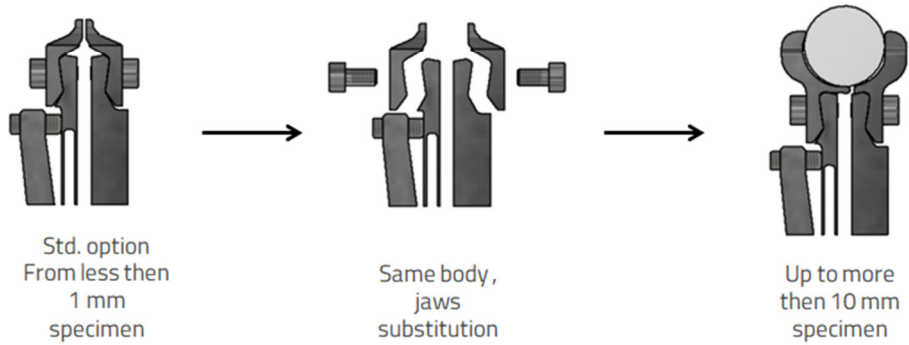
G = minimum specimen width

H = maximum specimen width

6.1. Replaceability

Jaws are interchangeable and the shape can be customized according to the shape of the specimen.

Fig. 5, Example of changing procedure.



6.2. Special shape for round lenses and other

Fig. 6, Example of tips to grip round lenses.

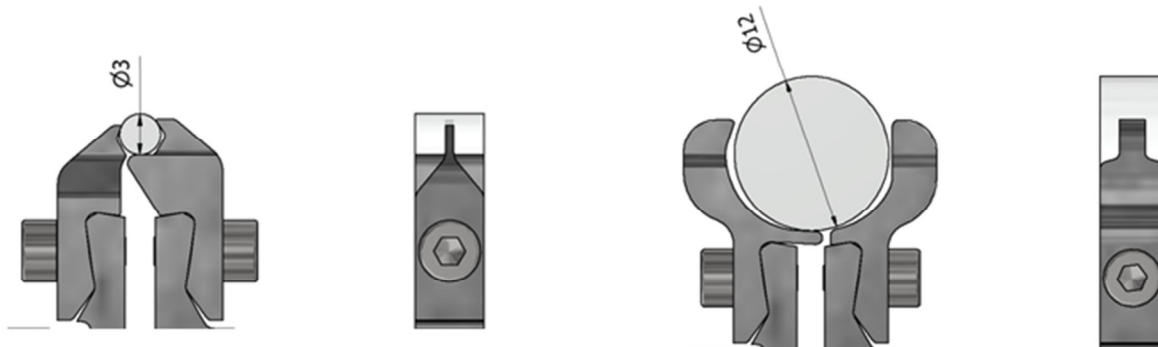
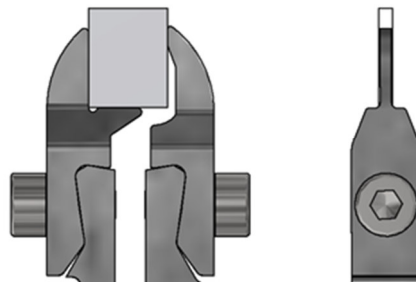


Fig. 7, Example of tips to grip square object



7. Technical data

7.1. Force-opening performance (Theoretical Analysis)

The initial opening is given by the distance at which the two grippers are located in the rest configuration of the piezo. For example the GriPhi standard with a nominal initial opening of 0.7 mm can be reduced to 0.2 mm by the adjustment grub. This guarantees that the force acting on the sample remains constant at 0.5 N for sample from 0.5 mm to 1 mm (Fig. 8, Fig. 9).

Fig. 8, Force-opening performance on a sample of 0.5 mm.

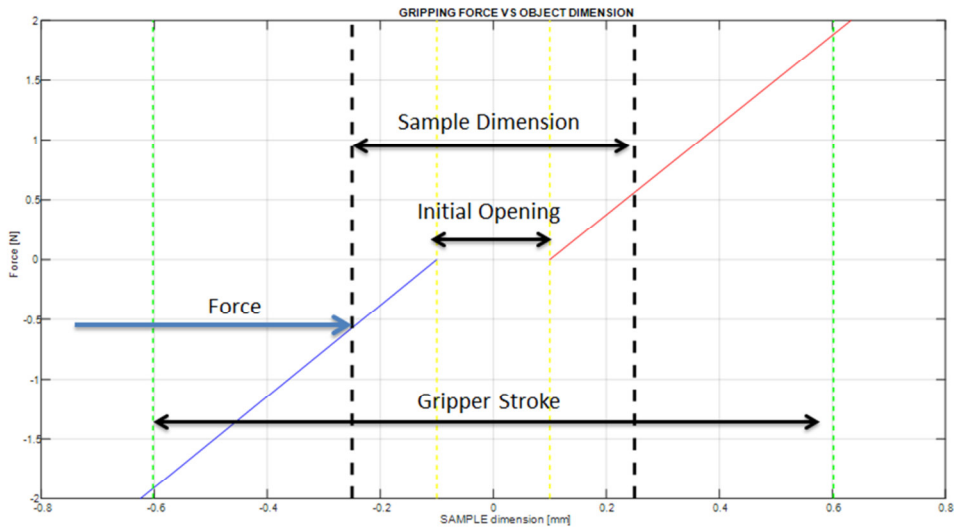
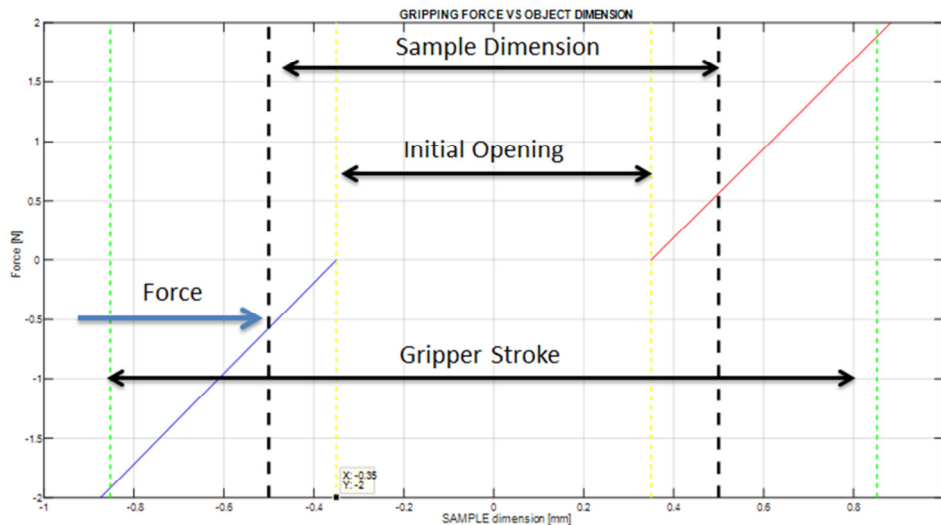


Fig. 9, Force-opening performance on a sample of 1 mm.



7.2. Mechanical specifications

Tab. 3, Mechanical specifications of the GriPhi standard microgrippers.

	Type A	Type B	Type C	Unit
Axis of motion	X	X	X	
Gripping stroke	0.8	1.0	1.2	mm
	500	1000	1200	µm
Clamping force at ½ stroke	1	1	1	N
Opening/closing time	<50	<50	<50	ms
Resolution*	<80	<100	<100	nm
Speed	14	10	8	mm/s
Initial gap**	0.0-0.3	Up to 1.5	Up to 15	mm
Availability of the HV (High Vacuum) version	YES	YES	YES	
Rated opening-closing cycles	>40 million	>40 million	>40 million	

*Equipped with GriPhi Driver

**Customizable and adjustable via grub screw

7.3. Electrical specifications

The GriPhi Type C system is fully compatible with the GriPhi Driver devices cod. PH-DR10-0000 provided by Phi Drive.

NOTES:

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