GRIPHI TYPE B PIEZOELECTRIC MICROGRIPPER

ABSTRACT

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

Author(s): De Sanctis O.
Release Date: 05 Oct. 2022
Last Revision: 25 Oct. 2022

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 B microgripper standard.
Page 4: mounting updated to the new Type B microgripper standard.
Page 5: force-opening plot updated to the new Type B microgripper standard.

CHANGES FROM REV. B

Page 5: grippers stroke corrected for Types B and C

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. Features

- Gripper stroke – Up to 0.70 mm
- Clamping force – Up to 2 N
- Dimensions – 55 x 22 x 8 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

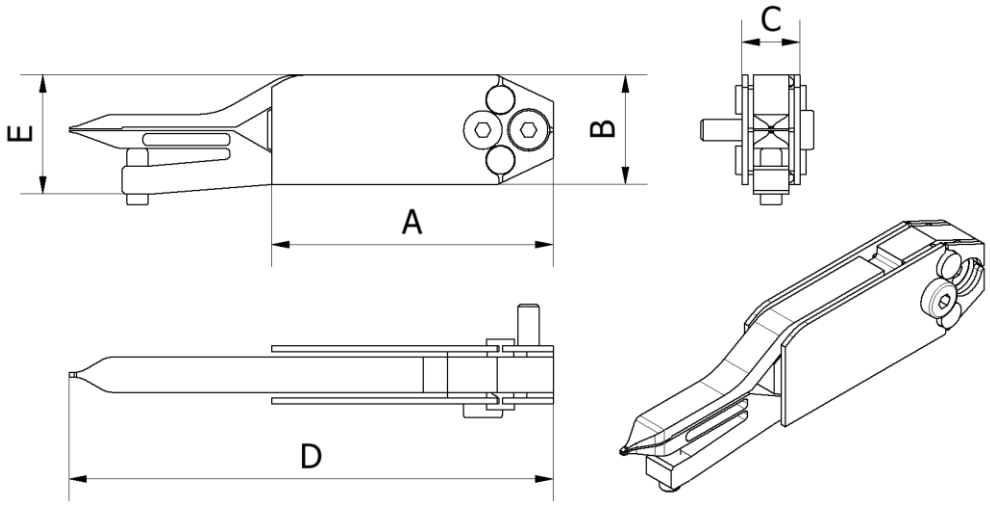
- Micro optics manipulation
- Fiber optics connection
- Fiber bundle positioning
- Precision mounting and adjusting
- Biological sample manipulation
- High-dynamic applications

3. Description

The GriPhi Type B piezoelectric microgripper can handle small samples whose size stands between 0.2 mm and 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 B system is fully compatible with the GriPhi Driver devices provided by Phi Drive. Even if the GriPhi Type B system is highly customizable, this DS refers to the standard version of the microgripper.

4. Dimensions

Fig. 1: Main dimensions of the microgripper

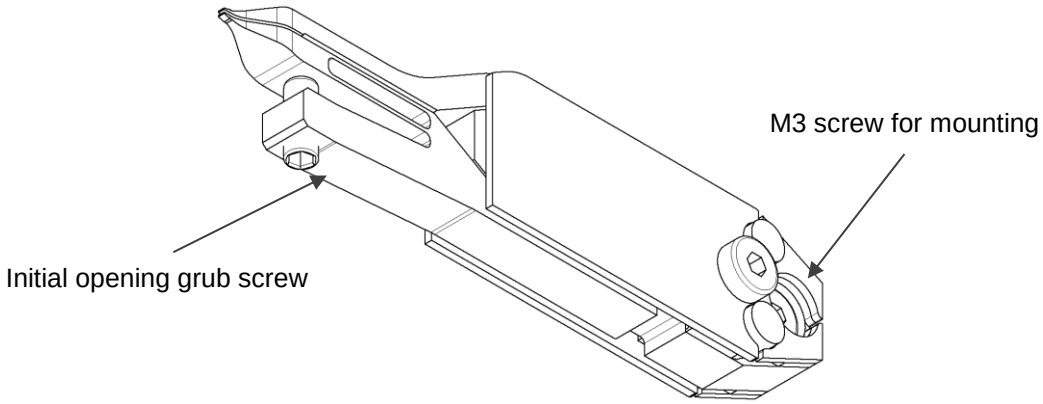


Tab. 1: Main dimensions of the microgripper

A		B		C		D		E	
40.0	mm	15.6	mm	8.20	mm	68.8	mm	16.9	mm

5. Mounting

Fig. 2: Mechanical interfaces



6. Jaws

The standard jaws for the GriPhi Type B piezoelectric microgripper are specifically designed to fully exploit the capabilities of the system. However, they can be customized as desired to meet specific needs.

Fig. 3: Type 1 (left) and Type 2 (right) jaws

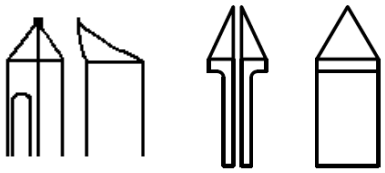
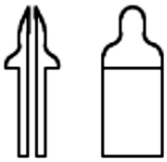


Fig. 4: Example of Type 0 jaws (customized jaws)



6.1. Replaceability

Jaws can be **monolithic** or **interchangeable** on request.

6.2. Shape

6.2.1. Type 0

Type 0 jaws are customized jaws which can be designed according to the specific needs of a customer.

6.2.2. Type 1

Type 1 jaws are asymmetrical and normally used to grab samples horizontally – that is, when grippers stay parallel to the surface on which samples are located.

6.2.3. Type 2

Type 2 jaws are symmetrical and normally used to grab samples vertically – that is, when grippers stay perpendicular to the surface on which samples are located.

7. Technical data

7.1. Force-opening performance

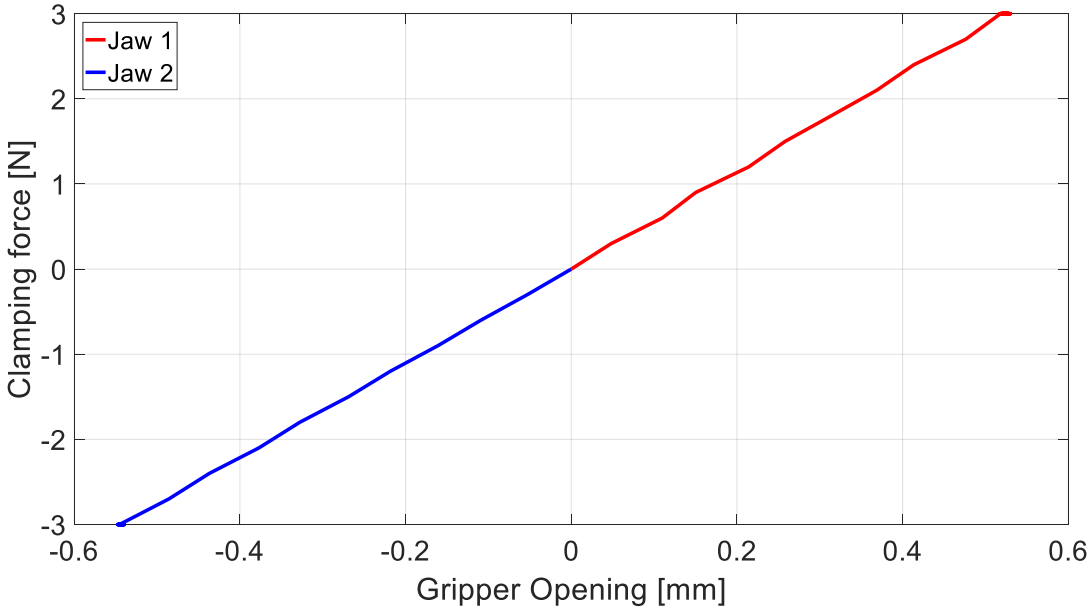


Fig. 5: Standard Type B force-opening performance

7.2. Mechanical specifications

Tab. 2: Mechanical specifications of the GriPhi microgrippers

	Type A	Type B	Type C	Unit
Axis of motion	X	X	X	
Gripping stroke	0.8	1.0	1.2	mm
	800	700	500	µm
Clamping force at ½ stroke	2	2	2	N
Opening/closing time	<50	<50	<50	ms
Resolution*	<100	<100	<80	nm
Speed	10	14	8	mm/s
Initial gap**	0.0-0.3	Up to 1.5	Up to 4.0	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

Tab. 3: Electrical specifications of the GriPhi microgrippers

	Type A	Type B	Type C	Unit
Voltage	150	150	150	V
Capacitance	1.44	1.44	1.44	µF

NOTES:

IMPORTANT NOTICE AND DISCLAIMER

Phi Drive S.r.l. makes every effort in ensuring accurate and reliable technical information contents in this document and in every other kind of shared documentation, including datasheets, application notes or other design resources and advice.

However, the information in this document is subject to changes and provided “AS IS”. Phi Drive S.r.l. reserves the right to make changes without further notice to any specifications or products mentioned herein to improve reliability.

