

## Pneumatic Flat Grips

For tensile testing rubbers, plastics, elastomers, textiles, cloth, and paper, in specimen geometries such as plates, films, and wires, a good option is pneumatic flat grips. Quick clamping and a repeatable clamping force are advantages of pneumatic flat grips.

Available with maximum capacities up to 10 kN (2,200 lbf) for standard grip sets and up to 5 kN (1,100 lbf) for bellows-type grip sets. The main difference between these two types of pneumatic flat grips is their operational temperature range: -10 to 180°C (14 to 356°F) for the standard set and the bellows-type set withstands -70 to 200°C (-94 to 392°F).

1 kN (220 lbf), 5 kN, and 10 kN pneumatic grip sets are supplied with single-side file-teeth grip faces, and the 50 N (11.0 lbf) grip sets come with flat grip faces installed. Additional grip face options, including wave, rubber-coated, and high-strength rubber-coated, are available. See the section on Grip Faces for Pneumatic Flat Grips for further details.

The air pressure range of these grips is 0.2 MPa (2 kgf/cm<sup>2</sup>, 29 psi) to 0.7 MPa (7 kgf/cm<sup>2</sup>, 102 psi). A 0.7 MPa (7 kgf/cm<sup>2</sup>, 102 psi) air compressor is needed to operate the grips. In certain regions, an air compressor is available as an accessory.

Opening and closing of grips can be controlled by: a foot valve unit, an F-type crosshead-linked foot switch, a hand-operated switching unit, the smart controller on AG-X plus models, and the main operation panel on AGS-X 20 kN (4,400 lbf) and above frame capacity models.

The foot valve unit is applicable to all AG-X plus series, AGS-X series, and EZ-X series models and is the most commonly used grip operator. The other grip control options are supplied to fit specific models and are available as part of pneumatic flat grip kits, which include upper and lower grips, grip faces, and a grip controller. Please contact your local Shimadzu representative for information about pneumatic flat grip kits.

In addition, for operator protection, finger guards are available based on the type of grip faces installed. For the bellows-type grip sets, finger guards come as standard. Finger guards for standard grip sets need to be ordered along with the grips because a grip modification is needed.

Additional items needed for operation:

- An external 0.7 MPa (7 kgf/cm<sup>2</sup>, 102 psi) air compressor

### Relevant Materials

Rubber, Plastics, Textiles, Cloth, Paper

### Relevant Specimens

Plates, Films, Wires

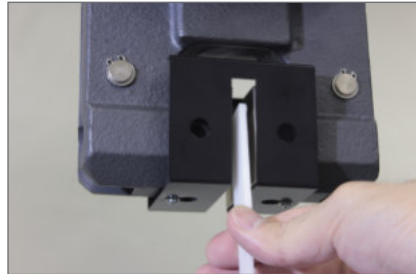


## Operation

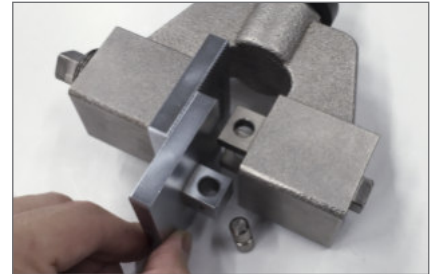
When air is applied to the grips, the operating force of an actuator is multiplied by a lever which simultaneously closes the left and right faces, clamping the test specimen at the centerline of the grip. The clamping force is held constant throughout testing and the clamping force can be tailored by adjusting the air pressure supplied to the grips.



Operation with both hands by using the Foot Valve Unit



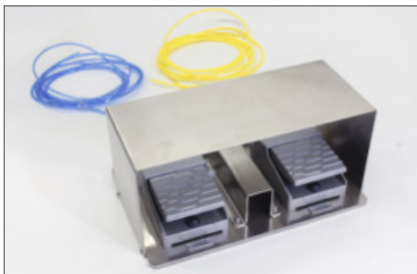
(Option) Finger guard avoid nipping the finger during closing the grips



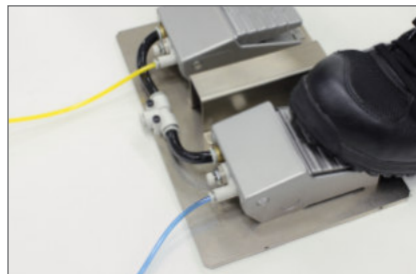
Possible to change grip face suitable for your sample

### • Foot Valve Unit

Foot valve unit, as a switch for opening and closing the pneumatic type grips, correspond to the Shimadzu various pneumatic grippers. Left and right foot switch is compatible with the upper and lower grips. Switch is an alternate type, once you step on and the switch keeps applying the air pressure, the grip are closed, and you step on again, the grip are opened. Depending on the material, the air pressure of chucking can be controlled by the adjusting screw.



Foot Valve Unit with cover  
Upper and Lower Grip's switch are separated



Open and close the grips by the foot switch  
(Alternate type switch)



Grip force is changeable  
by air pressure adjusting screw

### • Hand-operated Switching Unit

Hand-operated Switching Unit has two switches for the upper and lower grips. By switching the open and close by hand, you can open and close the each grip.



### • Smart Controller Operation

You can control the pneumatic grip series with smart controller of AG-X plus series and AGS-X 20kN and above frame capacity model.

Operation switch is divided into for gripping and for opening. The switch for gripping is two stage switch, once pressing the switch, the upper grip is closed, and pressing again, the lower grip is closed. The switch for opening is one stage switch. Once pressing the switch, the upper and lower grips are opened together.



Smart Controller for AG-X plus Series

## • F-type crosshead-linked foot Switch

By using F type crosshead-linked foot switch, after you grip a specimen with the upper and lower grip by foot switch, automatically the test can start after a few second(this function can be ON / OFF).

Foot switch is divided into for gripping and for opening. The switch for gripping is two stage switch, once stepping the gripping switch, the upper grip is closed, and stepping again, the lower grip is closed. The switch for opening is one stage switch. Once stepping the switch for opening, the upper and lower grips are opened together(it is also possible to automatically open after the end of the test).



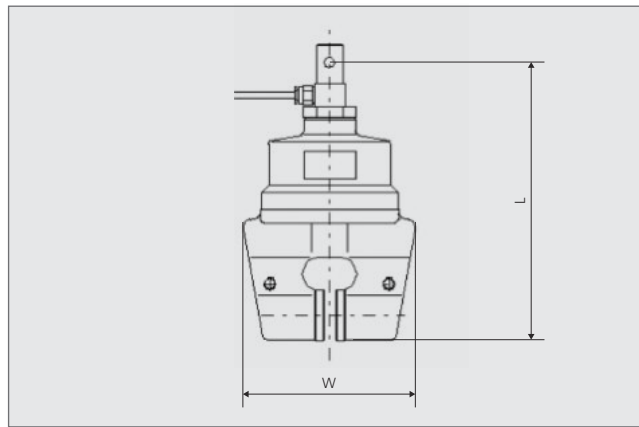
## Specification



Maximum Grip Capacity			Applicable Specimen Thickness Note 1	Grip Face Size		Temperature Range Note 2	Grip Size		Upper Grip Mass	Upper Grip Ø Fitting (Ø pin)	Lower Grip Ø Fitting (Ø pin)
				Width	Length		Width	Length			
N	kgf	lbf	mm (in)	mm (in)	mm (in)	°C (°F)	mm (in)	mm (in)	kg (lb)	mm	mm
<b>Standard pneumatic flat grips</b>											
10,000	1,000	2,200	0 to 10 (0 to 0.39)	60 (2.4)	50 (2.0)	-10 to 180 (14 to 356)	154 (6.1)	278.5 (11.0)	16.5 (36.4)	25 (10)	25 (10)
5,000	500	1,100	0 to 6 (0 to 0.24)	60 (2.4)	50 (2.0)	-10 to 180 (14 to 356)	154 (6.1)	235 (9.3)	5.7 (12.6)	16 (6.5)	16 (6.5)
1,000	100	220	0 to 6 (0 to 0.24)	50 (2.0)	30 (1.2)	-10 to 180 (14 to 356)	102 (4.0)	174 (6.9)	1.7 (3.7)	16 (6.5)	16 (6.5)
50	5.0	11.0	0 to 6 (0 to 0.24)	35 (1.4)	25 (0.98)	-10 to 180 (14 to 356)	64 (2.5)	135 (5.3)	0.4 (0.9)	10 (4)	16 (6.5)
<b>Bellows type pneumatic flat grips</b>											
5,000	500	1,100	0 to 6 (0 to 0.24)	85 (3.3)	50 (2.0)	-70 to 200 (-94 to 392)	180 (7.1)	346 (13.6)	6.5 (14.3)	16 (6.5)	16 (6.5)
1,000	100	220	0 to 6 (0 to 0.24)	50 (2.0)	30 (1.2)	-70 to 200 (-94 to 392)	120 (4.7)	241 (9.5)	2 (4.4)	16 (6.5)	16 (6.5)
50	5.0	11.0	0 to 6 (0 to 0.24)	35 (1.4)	25 (0.98)	-70 to 200 (-94 to 392)	80 (3.1)	192 (7.6)	0.6 (1.3)	10 (4)	16 (6.5)

Note 1: The applicable specimen thickness is valid only for grip faces supplied with the grips and may change when other grip faces are used.

Note 2: The operational temperature range of pneumatic flat grips is reduced to between 0 and 60°C (0 and 140°F) when rubber-coated grip faces are installed.

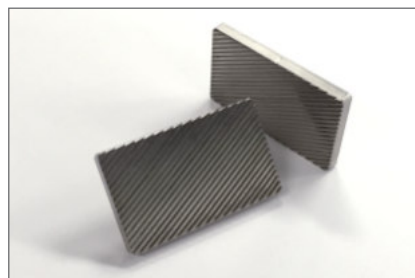


## Ordering Information

P/N	Description
<b>Standard Pneumatic Flat Grip Sets</b> Includes: upper and lower standard pneumatic flat grips and grip faces	
346-52350-04	10 kN standard pneumatic flat grip set with single-side file-teeth grip faces (model PFG-10kNA)
346-52349-01	5 kN standard pneumatic flat grip set with single-side file-teeth grip faces (model PFG-5kNA)
346-52348-01	1 kN standard pneumatic flat grip set with single-side file-teeth grip faces (model PFG-1kNA)
346-52347-01	50 N standard pneumatic flat grip set with flat grip faces (model PFG-50NA)
<b>Bellows Type Pneumatic Flat Grip Sets</b> Includes: upper and lower bellows type pneumatic flat grips and grip faces	
343-05657	5 kN bellows type pneumatic flat grip set with single-side file-teeth grip faces (model PFG-5kNSA)
343-07924-01	1 kN bellows type pneumatic flat grip set with single-side file-teeth grip faces (model PFG-1kNSA)
343-09508-11	50 N bellows type pneumatic flat grip set with flat grip faces (model PFG-50NSA)
<b>Accessories</b>	
346-59687-01	Foot valve unit with cover to operate grips with air hoses to connect to grips
346-59687-02	Foot valve unit without cover to operate grip with air hoses to connect to grips (RoHS compliant)
346-59687-51	Foot valve cover
<b>Finger Guard Sets for Pneumatic Flat Grips with Standard Grip Faces</b> Includes: two finger guards (two finger guard sets are needed for a pair of grips)	
346-55251-06	Finger guard set for 10 kN pneumatic flat grips
346-55251-05	Finger guard set for 5 kN pneumatic flat grips
346-55251-04	Finger guard set for 1 kN pneumatic flat grips
346-55251-03	Finger guard set for 50 N pneumatic flat grips

## Grip Face

The file teeth grip faces are standard accessories of all grips. If you need the other type of grips face, please refer to the document "Grip face for Pneumatic Flat Grips".



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