

Pneumatic Capstan Grips for Yarn and Cables

These pneumatic grips are used for tensile testing yarn and metal cables and hold specimens using a capstan design. Initial tension can be applied to the specimen to aid sample mounting and alignment and the pneumatic action enables quick and easy specimen insertion.

Pneumatic capstan grips for yarn and cables are available with maximum capacities up to 5 kN (1,100 lbf). For 1 kN (220 lbf) and 5 kN grips, initial tension is provided by a spring, and force values applied are between 0.2 N (0.044 lbf) and 2 N (0.44 lbf). For the 50 N capacity grips, discrete forces of 0.005 N (0.0011 lbf), 0.05 N (0.011 lbf), and 0.1 N (0.022 lbf) can be applied via weights as initial tension.

Pneumatic capstan grip sets that comprise upper and lower grips with flat grip faces are available. These pneumatic capstan grips are operated with a maximum air pressure of 0.7 MPa (7 kgf/cm², 102 psi). As such, a grip operator to open and close the grips faces is required. In addition, a 0.7 MPa (7 kgf/cm², 102 psi) air compressor is needed to supply the air pressure.

Grip operator options for the 1 kN and 5 kN capacity grips are a foot valve unit or a C-type crosshead-linked interlock switch. The C-type interlock switch starts the crosshead automatically when the upper and lower grip faces close and the grip faces are automatically released when the crosshead returns to its original height after testing. A foot valve unit or a hand-operated switch are the options for grip face control on the 50 N capacity grips.

The foot valve unit is the most commonly used grip operation method. Available as an accessory, it is compatible with all series of universal testers. For the other grip operators, grip kits are available that, in addition to upper and lower grips, include the grip operator. These grip kits are tailored to specific testing machine models.

Please contact your local Shimadzu representative for further information about grip kits and the availability of an air compressor in your region.

Additional items needed for operation:

- A 0.7 MPa (7 kgf/cm², 102 psi) air compressor



Relevant Materials

Yarn, Metals

Relevant Specimens

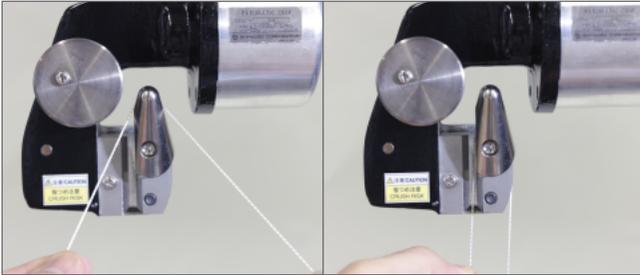
Cables, Cords

Relevant Standards

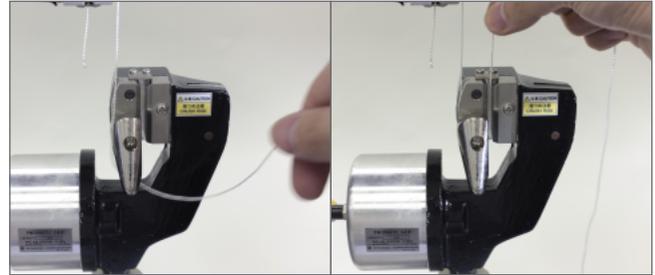
JIS K1013, JIS K1095

Operation

To mount a specimen, the specimen is placed around the capstan and then threaded between the grip faces. An initial load is applied before the pneumatic grip operator is used to close the grip faces. A major benefit of pneumatic action is that a constant force is applied to the grip faces during testing.



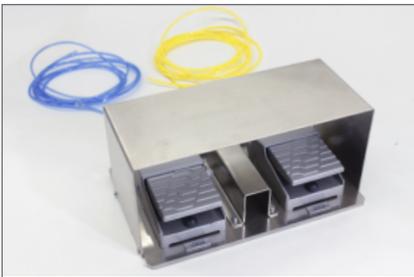
Operation of the upper grip



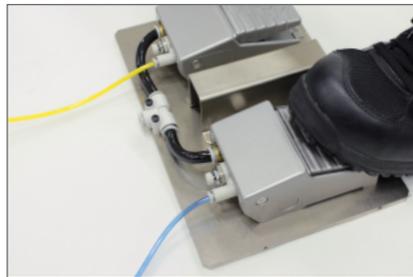
Operation of the lower grip

• Foot Valve Unit

The foot valve unit is a switch for opening and closing pneumatic grips, and is compatible with various Shimadzu pneumatic grips. The left and right foot switches control the upper and lower grips, respectively. Once you activate a switch, pressurized air is continually supplied to close the grips and apply a constant clamping force. Stepping on the switch a second time deactivates it and opens the grips. The chucking force can be controlled by adjusting the air pressure using the adjusting screw, meaning the force can be adjusted for a particular material.



Foot valve unit with cover. Switches for upper and lower grips 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

The hand-operated switching unit has two switches, one for the upper grip and another for the lower grip. Activating and deactivating the switches by hand closes and opens each grip, respectively.



• C-type Crosshead-linked Interlock Switch

The C-type crosshead-linked interlock switch, located on the back of the lower grip, closes the upper and lower grips, and then automatically starts a test. After testing, the crosshead returns to its original position and the grip faces are released. In addition, this function can be turned off so that the interlock switch operates as a standard grip closing switch.



Specification



5 kN

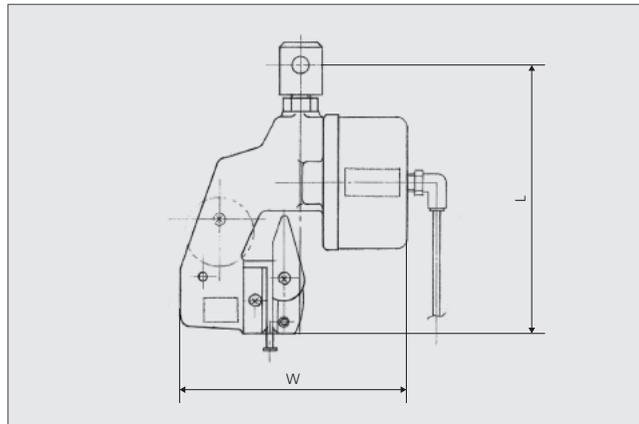


1 kN



50 N

Maximum Grip Capacity			Temperature Range	Grip Size		Upper Grip Mass	Upper Grip Ø Fitting (Ø pin)	Lower Grip Ø Fitting (Ø pin)
				Width	Length			
N	kgf	lbf	°C (°F)	mm (in)	mm (in)	kg (lb)	mm	mm
5,000	500	1,100	5 to 60 (41 to 140)	240 (9.4)	200 (7.9)	7.8 (17.2)	16 (6.5)	16 (6.5)
1,000	100	220	5 to 60 (41 to 140)	140 (5.5)	130 (5.1)	1.5 (3.3)	16 (6.5)	16 (6.5)
50	5.0	11.0	5 to 60 (41 to 140)	65 (2.6)	85 (3.3)	0.3 (0.66)	10 (4)	16 (6.5)



Ordering Information

P/N	Description
Pneumatic Capstan Grip Sets for Yarn and Cables Includes: upper and lower pneumatic capstan grips for yarn and cables with flat grip faces	
343-23325-10	5 kN pneumatic capstan grip set for yarn and cables
341-29148-10	1 kN pneumatic capstan grip set for yarn and cables
344-10960-10	50 N pneumatic capstan grip set for yarn and cables
Accessories	
346-59687-01	Foot valve unit without cover to operate grips with air hoses to connect to grips (RoHS compliant)
346-59687-02	Foot valve unit with cover to operate grip with air hoses to connect to grips (RoHS compliant)
346-59687-51	Foot valve cover
Additional Grip Faces	
343-09126-01	Additional grip faces for 5 kN pneumatic capstan grips for yarn and cables
343-09126-03	Additional grip faces for 1 kN pneumatic capstan grips for yarn and cables
343-09126-04	Additional grip faces for 50 N pneumatic capstan grips for yarn and cables

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